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Student Satisfaction and Session of Study as Predictors of Loyalty Among University Students

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Abstract

The continuous growth in the global economy has led to a snowballing request for higher education and an increase in the institutions that offer higher degrees. Therefore, higher educational institutions must create student satisfaction to sustain students' loyalty. This study examined the influence of students' satisfaction and study sessions on loyalty among students. Two hundred and eighty-two students were selected to complete Student Satisfaction and Loyalty scales. Hierarchical regression and multivariate analysis were used to analyse the data. Results indicated that student satisfaction positively correlates with student loyalty. All the components of student satisfaction were positively correlated with student loyalty. The level of loyalty was higher for weekend- and evening-track students compared to morning-session students. However, there was no significant difference in levels of student satisfaction between morning, evening, and weekend sessions. The current study adds to existing research on satisfaction and loyalty by analysing the many factors of satisfaction and their influence on student loyalty. The study employs the Dissonance Theory of Pleasure to explain how student services might undermine student loyalty. In today's competitive environment, increasing student happiness is critical when student loyalty is required to ensure the survival of higher education institutions in the global context. Thus, it is recommended that, for a university to survive, improving student satisfaction must be a priority to increase student loyalty.

Keywords: dissonance theory of pleasure, loyalty, satisfaction, session of study, students.

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1. Introduction

Every business institutions desire to achieve its goals and missions (Kwan et al., 2022). These goals and missions may include institutional growth, attracting more customers, increasing sales, accessibility of the product, and so on (Pop et al., 2019). However, the underlying aim of these goals and missions is to maximise profit. The extent of profit maximisation also depends on how satisfied customers are, which is directly related to customer loyalty (Chandra et al., 2018). One of the most imperative indicators of an efficient organisation is customer loyalty. Since there is a direct linkage between customer satisfaction and customer loyalty, it is apparent that any study that assesses customers' loyalty levels must integrate customer satisfaction (Todea et al., 2022).

According to Oliver (1999), customer loyalty is a "deeply held commitment to repatronise a preferred product/service consistently in the future, thereby causing repetitive same-brand or same-brand set purchasing, despite situational influences and marketing efforts having the potential to cause switching behaviour" (p. 7). Loyalty among students deals with the feeling of affection or attachment to an institution and, for that matter, a recommendation to other potential students (Pop et al., 2020). The ability of the higher educational institution to entice new students and retain current ones depends on students' satisfaction (Kwan et al., 2022; Todea et al., 2022).

With the increased global competition of higher education institutions, an institution's ability to retain enrolled students is as important as enticing new ones. Since keeping existing students is less costly than attracting new ones, maintaining a long-term relationship with the existing students helps to reduce market costs (Mariutti, Giraldi, 2020). Additionally, an educational institution can gain some strategic competitive advantage if it strives to maintain long-term relationships with existing students (Kunanusorn, Puttawong, 2015). As indicated by Zhai (2022), the tendency for students to be loyal is due to the services students receive whilst in the university as students. The loyalty of students can also encourage constructive or pleasant word-of-mouth commendations from the students during and after their years of study in the institution (Arif et al., 2013).

Loyalty is related significantly to the level of satisfaction among customers (Farahmandian et al., 2015). According to Kaur and Bhalla (2018), customer satisfaction refers to a subjective summary judgement or a summary of cognitive and emotional responses after accumulative experiences with a specific product or service. In an educational context, student satisfaction can be referred to as the successful experience of learning outcomes and the student's perceptions of all the facets of the institution (Yan, 2017). Martirosyan (2015) also defined student satisfaction as the subjective assessment of the experiences and numerous outcomes associated with the services received as a student. This definition focuses not only on the learning accomplishments of the student but also on the likeness of the general student experiences.

Universities should strive to identify the facets of satisfaction and improve it since students' level of satisfaction is the unquestionable means by which the universities can maximise profit. According to Weerasinghe and Fernando (2018), academic institutions can achieve student satisfaction in general by understanding the various needs of the student and providing those needs to their satisfaction. Yan (2017) identified six elements or needs of student satisfaction. These are the image of the institution, academic facilities, faculty members (lecturers), university administrators, academic user fees, and extra-curricular activities.

The image of the institution is the summation of the beliefs, attitudes, and impressions that a student holds toward the institution (Yusoff et al., 2015). The perception of the student image of the university is built by the knowledge systems that ascend from feelings, extant experiences, and the feelings salvaged from the student's memory. An image has two elements: the functional and the emotional elements. The functional element deals with the concrete characteristics of the institution, and the emotional element also deals with the psychological components confirmed by attitudes and feelings toward the institution (Yan, 2017). An assessment of the image of an educational institution can help learn about the particular strengths the institution should highlight and the sort of information the institution should communicate to the public (Özdoğru, Akyürek, 2022).

Academic facilities deal with the physical facilities of an institution (Maksüdünov et al., 2016). Such facilities include laboratories, offices, libraries, classrooms, and other vital resources. Faculty members are the individuals who are responsible for reaching a course. In this study, faculty members refer to lecturers assigned a course to teach and award grades (Shahsavar, Sudzina, 2017). Examples of faculty members are full professors, associate professors, lecturers,

and assistant lecturers. Faculty members have regular interaction with the students. Due to this, how the students perceive them determines whether they will be satisfied or not (Yan, 2017). University administrators are members of the university who offer support and other administrative services to the university (Maksüdünov et al., 2016). University administrators are those responsible for officially enrolling and processing administrative operations relating to an individual's candidature (Al Hassani, Wilkins, 2022). An academic user fee is a fee the university authorities determine for students to pay. It includes all the other levies taken from the students for their membership as students. Students can enrol in an academic institution if they have the financial ability (Yan, 2017). The ability to pay academic user fees gives the impression of satisfaction, which promotes student loyalty (Shahsavar, Sudzina, 2017). Extra-curricular activities do not fall part of the scope of a regular curriculum but are approved officially by the university authorities. They usually carry no academic credit. According to Todea et al. (2022), student loyalty relies on students' general satisfaction with the institutional context and other factors, including the institution's image, university administrators and lectures, academic user fees, and extra-curricular activities.

Moreover, the tendency to feel satisfied, which has been found to lead to students' loyalty to the institution, depends on the study session (Lee, 2017). The study session indicates the day and time students attend school (Kamran et al., 2022). Traditionally, the focus on higher levels of education has been in the mainstream in Ghana, where students go to school in the morning (Zeng, Wang, 2021). Due to technology and the need to learn whilst working, different sessions have emerged (Hodges et al., 2020). Common sessions in most higher institutions in Ghana are morning, evening, and weekend. Morning students refer to those who go to school at normal academic times of learning. These student school hours begin at 8 am and close at 5 pm from Mondays to Fridays. Evening and weekend sessions are ideal for individuals who prefer to study outside the normal working hours (Meguid, Collins, 2017). Evening students attend classes from 5 pm to 9 pm from Mondays to Fridays, while weekend students attend classes online or face-to-face on Saturdays and Sundays (Lee, 2017). Evening and weekend classes allow those working to gain additional qualifications whilst simultaneously working. Each session is associated with different interactions and experiences, influencing their loyalty and satisfaction (Mazirah et al., 2015).

2. Theoretical framework and literature review

The theoretical underpinning of the study is the Dissonance Theory (Festinger, 1957). The Dissonance Theory suggests that "a person who expected a high-value product and received a low-value product would recognise the disparity and experience cognitive dissonance" (Festinger, 1957: 12). The expectations that are not confirmed create psychological discomfort or a state of dissonance which reduces the extent to which the individual will be loyal and continue to purchase the product (Xi et al., 2022). According to the theory, the post-exposure ratings mostly result from the expectation level. Dissonance Theory, therefore, argues that the satisfaction or dissatisfaction created by expectations determines whether an individual will continue to utilise the service or product and recommend the same to others.

Numerous studies exist on the correlation between customer satisfaction and customer loyalty and have indicated a significant positive relationship between customer satisfaction and customer loyalty (Alqurashi et al., 2019; Todea, 2022). According to Zhai (2022), numerous researchers proffer that the satisfaction of consumer significantly predicts their loyalty, which invariably leads to a higher profit. Eom and Ashill (2016) and Martirosyan (2015) also opined that there is a significant relationship between customer satisfaction and consumer loyalty. According to Farahmandian et al. (2013), a significant positive association exists between customer satisfaction and customer loyalty in Malaysia. As Farahmandian et al. (2013) explain, customer satisfaction is a means through which customers see themselves as more important and creates mutual rewards for customers to be loyal. However, few of the studies have concentrated on students as customers. This means that few of these studies have concentrated on students. The few studies that focused on students indicated a positive relationship between student satisfaction and student loyalty (Maksüdünov et al., 2016; Weerasinghe & Fernando, 2018).

Moreover, few studies have assessed the impact of student satisfaction on student loyalty. A study by Yan (2017) shows that the components of student satisfaction influence student loyalty. Among the components of student satisfaction, satisfaction with the image of the institution predicted a significantly higher amount of variance to student loyalty than the other components of satisfaction. Similarly, Al Hassani and Wilkins (2022) indicate that satisfaction with the image and the non-teaching

activities significantly predict students' loyalty. Yet, other components (non-teaching staff, lecturers, work itself, promotion, and supervision) relate moderately to students' loyalty.

Concerning the sessions of study, Tsedzah and Obuobisa-Darko (2015) found that students who deviated from the traditional morning session were more satisfied and demonstrated a higher level of loyalty than the morning sections. Moreover, Andoh et al. (2019) assessed the relationship between the traditional morning section and online classes on satisfaction among students. The findings indicated that those who attended online classes were more satisfied due to the flexibility and occupation than the morning session. However, the study by Amponsah et al. (2018) did not report any significant effect of study sessions and student loyalty and satisfaction.

Moreover, even though previous studies have assessed the association between student satisfaction and student loyalty, there is a paucity of studies on the relationship between the components of satisfaction among students and loyalty (Alqurashi et al., 2019; Kwan et al., 2022). Moreover, the focus has been on mainstream students, not evening and weekend sessions. Based on the above, the study contributes to the existing literature by achieving two objectives. First, the study seeks to assess the elements of satisfaction on loyalty among students, and second, the study attempts to determine the session of study on satisfaction and loyalty among students. Extant literature conspicuously lacks enough empirical research in this regard. This study will thus provide some substantial contribution to the available literature.

Consequently, the researchers stated the following research hypotheses:
1. The combined elements of student satisfaction will envisage significant student loyalty.
2. Each component of student satisfaction will account for a significant amount of student loyalty.
3. There will be a significant difference in satisfaction between students in the morning, evening, and weekend sessions.
4. There will be a significant difference in student loyalty between students in the morning, evening, and weekend sessions.

3. Method
3.1. Research approach and design
The study was a quantitative survey that utilised a cross-sectional design. The design was appropriate as it allowed a large amount of data to be collected at a specific time.
3.2. Sampling and sample size
The population comprises students attending Ghana Communication Technology University (GCTU) in the Greater Accra Region of Ghana. The GCTU is a newly flexed public university in Ghana with a population of fewer than 2000 students. Because of the competition among universities in Ghana, the tendency for the student in the university to be satisfied will help attract more students due to their recommendations. We used the purposive sampling method to select 300 participants. This sampling technique was suitable as it guided researchers to sample who met our inclusion criteria. This technique assumes that "researchers' knowledge about the population can be used to hand-pick sample members" (Sarfo et al., 2022: 59).

Out of the 300 questionnaires distributed, 282 were retrieved, giving a response rate of 94 %. The majority (83.3 %) of the respondents were females, and the age of the respondents ranged from 21–43 years. The respondents were also undergraduate students from level 100 to level 400, with 29.4 % in the morning session, 37.9 % in the evening session, and 32.7 % in the weekend session (refer to Table 1).

Table 1. Demographic characteristics of the respondents (n = 282)

Variables	Category	Frequency	Percentage
Gender			
	Males	47	16.7
	Females	235	83.3
Age			
	Below 20 years	42	14.9
	20 – 30 years	93	33.0
	31 – 40 years	86	30.5
	At most 41 years	61	21.6

Level of Study			
	Level 100	48	17.0
	Level 200	30	10.6
	Level 300	80	28.4
	Level 400	124	44.0
Session of Study			
	Morning	83	29.4
	Evening	107	37.9
	Weekend	92	32.7

3.3. Measures

All the constructs were measured using questionnaires. Aside from the questionnaires on the demographic characteristics sought for the study session, two distinct questionnaires were used. The questionnaires are described beneath:

Students Satisfaction: The Students Satisfaction Scale (SSS) was developed by Yan (2017) to assess how university students are satisfied with the various facets of the university. The questionnaires assess six elements of student satisfaction. These six elements encompass a comprehensive evaluation of student satisfaction. The SSS is a 15-item scale that measures the six elements; university image, academic facilities, lecturers, non-teaching staff, facility User Fee, and extra-curricular activities. Responses to the six elements are rated on 5-point response options ranging from "Strongly Disagree" to "Strongly Agree". The scale has a Cronbach's alpha of .91. A sample item is "*I am offered an opportunity to participate in a variety of extra-curricular activities to share my own interests with others.*" A higher score indicates a higher level of student satisfaction.

Student Loyalty: The loyalty of students was also assessed using Student Loyalty Scale developed by Todea et al. (2022). The scale consists of an 8-item measure soliciting students' motive of recommending the institution to others based on 4-point Likert scale options ranging from "Strongly Disagree" to "Strongly Agree". Todea et al. (2022) found the scale very reliable, producing a Cronbach alpha of .89. The questionnaires were modified to suit students' satisfaction with their academic institution. A sample item is "I will encourage friends and relatives to attend university". A higher score on the scale indicates higher levels of student loyalty.

3.4. Procedure for data collection

The face-to-face method was adopted to get a higher response rate. In this case, the researcher visited the prospective respondents and their informed consent was sought. When they were granted permission to take part in the survey, the questionnaires were given to them, and those with enough time completed them immediately. Those who did not have enough time to respond to the questionnaires were left in their custody, and the researcher visited them the following day to collect the questionnaires. The researchers used approximately two weeks to collect data from the respondents.

3.5. Analysis of data

The Statistical Package for Social Science (version 24.0) programme was used to analyse data. Descriptive analysis of data and intercorrelations among the variables were first established before the hypotheses were analysed using multivariate and regression analyses.

4. Results

4.1 Descriptive analysis

Table 2 shows the variables' nature that helps interpret the results. The key findings in the table include the descriptive, skewness, and kurtosis showing that the constructs are normally distributed.

Table 2. Descriptive statistics of the study variables (N = 282)

Variables	Min	Max	Mean	SD	Skewness	Kurtosis
General Satisfaction	18.00	35.00	23.93	9.23	-.59	.03
Image	5.00	16.00	8.27	4.53	.43	.08
Faculty	4.00	15.00	11.97	4.01	.72	.26

User Fees	2.00	5.00	6.60	2.83	-.68	.49
Facilities	2.00	16.00	7.64	3.85	.61	.50
Administrators	2.00	8.00	5.50	1.87	-.67	.35
Extra-curricular	3.00	11.00	7.93	3.90	-.13	-.45
Loyalty	9.00	31.00	22.04	10.12	-.01	.56

The normality of the data was assessed using skewness and kurtosis. Tabachnick and Fidell (2001) indicated that a variable is normally distributed if the kurtosis and skewness values range from -2 to +2. From the analysis, all the values of kurtosis and skewness for the measures (i.e., general satisfaction, satisfaction with image, faculty, user fees, facilities, administrators, extra-curricular activities, and student loyalty) ranged between +1 and -1. This means all the measures are normally distributed and can be analysed using parametric tests.

The total scores of the constructs were obtained after adding the total number of items for the 282 respondents. As revealed in the table, the mean level of student satisfaction ranged from 18.00 to 35.00 (M = 23.93, SD = 9.231). With a mean score of 25.50 indicating an average level of satisfaction, the mean score of 22.18 obtained in this study shows that the students generally have a lower level of satisfaction. Moreover, the respondents had a total score ranging from 9.00 to 31.00 (M = 22.04, SD = 10.12). With a mean score of 19.5, indicating an average level of loyalty, the score (M=30.04) obtained shows that the students are loyal to the university, although they have lower satisfaction levels.

The mean scores of student satisfaction with the image of the university ranged from 5.00 to 16.00 (M = 8.27, SD = 4.53), and their satisfaction with faculty members ranged from 4.00 to 15.00 (M = 11.97, SD = 4.01). Students' satisfaction with academic user fees ranged from 2.00 to 15.00 (M = 6.60, SD = 2.83). The total score of satisfaction with the academic facilities ranged from 2.00 to 16.00 (M = 7.64, SD = 3.85), and that of satisfaction with administrators ranged from 2.00 to 8.00 (M = 5.50, SD = 1.87). Moreover, satisfaction with extra-curricular activities ranged from 3.00 to 11.00 (M = 7.93, SD = 3.90). Assessing these parameters, the mean level of satisfaction with administrators is the lowest. This means that students are less satisfied with administrators than with other satisfaction elements.

4.2. Correlation coefficient showing the relationship between the variables.

The test for descriptive statistics was followed with a determination of the relationships between the underlying variables. Results are shown in Table 3.

Table 3. Correlation matrix showing the nexus between underlying variables

No.	Variables	1	2	3	4	5	6	7
1.	Image	.-						
2.	Faculty	.04	-					
3.	User Fees	.28**	.23*	-				
4.	Facilities	.25**	.17*	.30**	-			
5.	Administrators	.22*	.35**	.49**	.22*	-		
6.	Extra-curricular	.27**	.20*	.30**	.32**	.18**	-	
7.	General Satisfaction	.57**	.42**	.38	.39**	.13*	.31**	-
8.	Loyalty	.27**	.49**	.43**	.45**	.36**	.22**	.41**

Note: *p < .05, **p < .01

The Pearson correlation coefficient established the inter-correlation between all the essential variables. It is important noting note that the student satisfaction construct had six elements (satisfaction with the image of the university, faculty members, academic user fee, facilities, administrators, and extra-curricular activities) (Yan, 2017). These elements were assessed as a composite variable and also individually.

Based on the results illustrated in Table 3, the relationship between all the variables is positive and significant except the relationship between satisfaction with the image of the university and the faculty members. The relationship between student satisfaction as a composite variable and student loyalty is significantly positive (r = .41). With the elements of satisfaction, satisfaction with the faculty members had a significantly higher relationship with student loyalty compared to the other aspects of satisfaction.

4.3. Hypothesis testing
H1: The combined elements of student satisfaction will envisage significant student loyalty. This hypothesis was analysed using simple regression analysis, as shown in Table 4.

Table 4. Regression coefficients of student satisfaction as a predictor of student loyalty

Model	B	Std. Error	*F*	β
(Constant)	5.371	5.286		
Satisfaction	.449	.095	22.394	.410**

Note: $R^2 = .168$, **$p < 0.01$

As demonstrated in Table 4, student satisfaction positively correlated with student loyalty (β = .410, $p < .01$). Student satisfaction accounted for 16.8 % of the variance in student loyalty ($R^2 = .168$, $F_{(1, 282)} = 22.394$, $p < .01$). This confirms the first prediction that the combined elements of student satisfaction will envisage a significant amount of student loyalty.

H2: Each element of student satisfaction will envisage a significant amount of student loyalty. Multiple regression was used to analyse this prediction, with the results in Table 5.

Table 5. Regression model of the components of student satisfaction as predictors of student loyalty

Model 1	B	SEB	β	t	*p*
(Constant)					
Image	.177	.589	.609	3.699	.001
Faculty members	.624	.165	.279	3.781	.001
User fees	.204	.600	.342	2.007	.047
Facilities	.528	.191	.209	2.769	.007
Administrators	.320	.205	.124	1.559	.022
Extra-curricular activities	.528	.202	.201	2.616	.010

Note: R= .513, R^2= .481, $F_{(6, 275)}$= 18.309

The model of the impact of the elements of student satisfaction as predictors of student loyalty was found to be significant ($F_{(6, 275)} = 18.309$, $p < .01$) with the six components of student satisfaction (satisfaction with the image of the university, faculty members, academic user fee, academic facilities, administrators, and extra-curricular activities) accounting for 48.1% (R^2 =.481) of the variance in student loyalty (see Table 5).

With the individual elements, satisfaction with the image of the university (β = .460, t = 6.832, p = .01), with the faculty members (β = .460, t = 6.832, p = .01), academic facility user fees (β = .266, t = 3.742, p < .05), facilities (β = .191, t = 2.702, p < .01), administrators (β = .184, t = 2.707, p < .01) and extra-curricular activities (β = .114, t = 2.032, p < .01) all accounted significantly to student loyalty. This means that all the components of student satisfaction contribute significantly to the change in student loyalty. This confirms the prediction that each element of student satisfaction will envisage a significant amount of student loyalty.

H3: Student satisfaction will be significantly different between students in the morning, evening, and weekend sessions.

H4: Student loyalty will significantly differ between students in the morning, evening, and weekend sessions. These predictions were also analysed with the multivariate analysis of variance with the results demonstrated in Table 6 and Table 7.

Table 6. Impact of the session of study on student satisfaction and loyalty

Variable	Morning Mean (SD)	Evening Mean (SD)	Weekend Mean (SD)	F	df	p
Student Satisfaction	22.21 (7.70)	21.13 (10.76)	25.97 (7.67)	2.967	(2, 271)	.056
Student Loyalty	20.21 (8.84)	23.44 (10.58)	24.91 (8.62)	8.151	(2, 271)	.001

From Table 6, the study session has no significant impact on students' level of satisfaction ($F_{(2, 271)}$ = 2.967, p = ns). This means students in the morning session (M = 22.21, SD = 7.70), evening session (M = 22.13, SD = 10.76), and weekend session (M = 25.97, SD = 7.67) perceive equal levels of satisfaction. Thus, the third prediction that there will be a significant difference in satisfaction between students in the morning, evening, and weekend sessions was not supported.

However, the session of study has a significant influence on student loyalty ($F_{(2, 271)}$ = 8.151, p < .05). This supports the fourth prediction that there will be a significant difference in student loyalty between students in the morning, evening, and weekend sessions. Multiple comparisons were conducted to determine which group means differ significantly (see Table 7).

Table 7. Multiple comparisons of sessions of study on student loyalty

No.	Study session	1	2	3
1.	Morning	-	3.23*	4.70*
2.	Evening	-	-	1.47
3.	Weekend	-	-	-

Note: *p < .05

Assessing the multiple comparison results shown in Table 7, the mean score of loyalty among the students in the morning session (M = 20.21, SD = 8.84) is significantly lower than the evening session (M = 23.44, SD = 10.58) and weekend session (M = 24.91, SD = 8.62). However, no significant difference exists in the student loyalty score between morning, evening, and weekend sessions. This means the morning session students are less loyal to the university than the evening and weekend session students.

5. Discussion
The study's results designated that student satisfaction has a significant positive correlation with student loyalty. This means that an increase in student satisfaction levels tends to increase student loyalty. This finding is consistent with extant studies that examined the nexus between student satisfaction and student loyalty (Alqurashi et al., 2019; Mariutti, Giraldi, 2020; Todea, 2022), which indicated a significantly negative association between student satisfaction and student loyalty. The finding can also be explained by the Dissonance Theory (Festinger 1957), which suggests that a feeling of dissatisfaction hampers loyalty, and dissatisfaction comes about when expectations are not met. Students have certain expectations before deciding even to buy admission forms. When these expectations are not met, their level of satisfaction decreases, which is likely to hamper the level of loyalty.

Again, the study found that all the components of student satisfaction predict student loyalty. Consistent with the results of this study, an overall body of literature on students has supported the positive relationship between elements of satisfaction such as the image of the university, academic facilities, user fees, and faculty members of student loyalty (Al Hassani, Wilkins, 2022; Maksüdünov et al., 2016; Weerasinghe, Fernando, 2018). The finding also agrees with Yan (2017) study, which revealed that the components of student satisfaction (satisfaction with image, faculty, user fees, facilities, administrators, extra-curricular activities, and student loyalty) are associated significantly with student loyalty.

Moreover, the researchers also predicted a significant difference between the study sessions and student satisfaction and loyalty. There was no significant difference between the study sessions (morning, weekend, and evening) and student satisfaction which agrees with previous literature (Amponsah et al., 2018; Tsedzah, Obuobisa-Darko, 2015). However, the findings indicated that evening and weekend students were likelier to stay loyal to the university than in the morning

session. This finding is consistent with extant literature indicating that students in the other sessions are more likely to recommend a school to others than in the morning session. As explained by Andoh et al. (2019), students in the evening and weekend sessions are always working, so they can meet their friends and, therefore, stay loyal by recommending the university to them as it is likely that they may be looking for possible flexible opportunities to school. Moreover, students who attend the morning session have their mates attending other universities. They will not recommend the university to them when they consider the fees students pay and the services they receive.

6. Practical and theoretical contributions

The study makes some contributions to the existing body of research in the area of student loyalty and satisfaction. Although we studied the nexus between satisfaction and loyalty, it takes a different dimension by using students as the population. Moreover, to the best of our knowledge, as researchers, no study has assessed the relationship between satisfaction and loyalty among students in a Ghanaian university. Cultural dimensions are significant to consider in the context of satisfaction and loyalty since they significantly influence students' loyalty. Thus, there is a significant difference in the factors that affect student satisfaction and loyalty in sub-Saharan African and European countries.

Moreover, Yan (2017) has called for replication in his study of satisfaction and loyalty involving students. The current study also contributes to the satisfaction and loyalty literature by investigating the different elements of satisfaction and its impact on student loyalty. The study invokes the Dissonance Theory of Satisfaction to explain how the services received by students can hamper student loyalty. In such a competitive context nowadays, where the loyalty of students is needed to enhance the survival of tertiary institutions in Ghana, strengthening student satisfaction is very necessary nowadays. The findings can also have imperative practical implications for the university's management. Since it emerged that enhancing the satisfaction of students influences their level of loyalty positively, to strengthen student loyalty, the management of the university must first enhance student satisfaction, which will go a long way to improving the long-term relationships between the university and the students. This will influence loyal students always to give a good testimony about the university and recommend the university to others. Therefore, enhancing student loyalty requires an understanding of the factors that affect satisfaction, the lack of which has unpleasant sequels for both students and the university.

Secondly, to build a long-lasting relationship with all the educational stakeholders, the university must focus on developing their trust as part of the relationship. The long-term relationship will be damaged if there is a lack of trust in the institution (Alqurashi, 2019). Moreover, knowledge of the various dimensions of satisfaction can assist the university's management in providing a better service. The study found that some students were not satisfied with some of the elements of the university that determine student satisfaction – for example, the mean satisfaction score towards the administrators and the academic user fees. So, the students are not satisfied with these aspects of the universities. Therefore, every facet of the university needs to be improved. Lastly, the session of the study was found to have an impact on loyalty. The evening and weekend students were more loyal than the morning students. Therefore, the university's target should be evening and weekend students since they will lead to more recommendations and possibly improve the institution's image to attract competent students.

7. Limitations and conclusion

This study has some limitations that invariably need to be addressed. The population was restricted to only students of GCTU. This means that it excluded all the other public and private higher institutions in Ghana. Thus, the use of data from a simple source paves room for the same method bias. It would have been better if student satisfaction and loyalty were investigated across different universities in Ghana so that the findings could be generalised and policies and interventions could benefit the larger population of institutions in Ghana. Future studies need to collect data from multiple sources (different universities).

Moreover, the study employed a descriptive correlational study. Thus, causal inferences cannot be made. Even though the study found a significant influence of student satisfaction on student loyalty, the direction of causality cannot be established. The use of a longitudinal survey can help to establish causality.

In conclusion, this study employed a cross-sectional survey that assessed the extent to which student satisfaction and study session can affect student loyalty. The findings of the study suggested that student satisfaction has a significant impact on student loyalty. The session of study also had a significant impact on student loyalty, with weekend and evening session students reporting a higher tendency to be loyal to the university. Contrary to the prediction, the study session had no significant impact on student satisfaction. Based on this, the management of the university should identify relevant factors of student satisfaction and loyalty based on their significance in the present context and allocate resources to improve the image and status of the university to entice students and get more funds. Furthermore, identifying and fulfilling students' demands across all study sessions is important to satisfy students and make them loyal to improve the university's survival, recruitment drive and growth.

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10. Competing interests
The authors declare no competing interests.

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Modeling of the Creative and Constructive Modus of Youth Civic Activity

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Abstract

This manuscript is devoted to the development of a pedagogical model of the creative and constructive mode of civic activity of the younger generation at the conceptual level. It expresses the methodology of axiological, humanistic-oriented, integrated approaches. The authors presented the results of an ascertaining experiment to substantiate the effectiveness of the developed pedagogical model and the sufficiency of organizational and pedagogical conditions as well. They relied on a theoretical basis in determining the goals and objectives of experimental work, in developing its plan, content, criteria and levels of formation of the creative and constructive mode of civic activity of the younger generation. According to the authors, the pedagogical model of the creative and constructive modus of civic activity of the younger generation is structurally functional. The realization of the content of the creative and constructive component of the mode of civic activity of the younger generation involves the active development of critical thinking of students, the acquisition by students of social cultural experience of confronting social radicalism and intolerance, the formation of practical skills of constructive action skills in potentially unpredictable situations. The creative and constructive component of the mode of civic activity reflects the value (reflexive) and behavioral criteria of its formation. The materials of the article can be useful to teachers, social educators in carrying out educational work with the younger generation on the formation of patriotism, love for their homeland, prevention of radicalism and intolerance.

Keywords: creative and constructive modus of civic activity, education, youth, modeling, prevention of radicalism and intolerance.

1. Introduction

The topic of the manuscript is in line with the current scientific problem of reducing risks from uncontrolled spread and accumulation in the minds of the younger generation of ideas of

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extremism, aggression and delinquent behavior and the fundamental rationale for the construction and application in education of modern methods and methods of their prevention.

The relevance and importance of the problem under consideration is due to the growing scale of the illegal actions of the younger generation and their accumulation in society. This creates a global social and socio-psychological and pedagogical problem.

The process of socialization of the younger generation is possible to consider using the concept of "mode". We understand this term as a way of existence or action of something, as well as a variety of types and directions of the considered scientific activity. In this case, we consider the creative and constructive mode of civic activity of the younger generation as a sequence of socio-pedagogical actions to activate civic and patriotic self-determination, awareness of personal meanings of socially useful activities, development of system relations and the need for self-realization in the patriotic and civic spheres of life of the younger generation.

The author's interpretation of the concept of "creative and constructive mode of civic activity of the younger generation" is the most valuable.

The pedagogical model of the creative and constructive modus of civic activity of the younger generation being developed by us at the conceptual level expresses the methodology of axiological, humanistic-oriented, integrated approaches. Their implementation means strengthening the use of the educational component of the educational process at the university, saturation of the value-semantic content of the relations between the participants of educational relations on the transfer of socio-cultural experience, accentuation of consciousness on the formation of creative and constructive experience.

The humanistic orientation of the content of pedagogical education provides for the inclusion of students in creative and constructive activity and reflection in situations of socio-moral choice, the creation of a positively saturated emotional space of interaction between participants in educational relations, orientation to the development of students' ability to creativity and co-creation (Belentsov et al., 2019).

The pedagogical model of the creative and constructive modus of civic activity of the younger generation is structurally functional. Firstly, it reflects the structure of the creative and constructive mode of civic activity in the educational process. Secondly, the model assumes the introduction into the process of professional training of the future bachelor of pedagogy and education of the leading pedagogical conditions for the formation and development of a creative and constructive mode of civic activity of students in order to optimize education, overcome intolerance and social radicalism.

2. Materials and methods

The theoretical basis of the project is based on the theory of interaction of the individual, the collective and the social environment, the theory of social education in the process of socialization of the individual, theoretical provisions on social values and their influence on the formation of the personality of a citizen.

A complex of modern pedagogical methods was used in solving research problems. Theoretical methods (generalization, systematization, classification, interpretation of the material) were used. Systematization, classification, modeling of the studied phenomena and processes and the problem-chronological method of grouping the research material were used.

Pedagogical experiment was used at the ascertaining stage of experimental work to determine the initial level of formation of citizenship of the younger generation.

In this paper, the t-test is used as a method of statistical verification of our hypothesis. The application of the t-test is associated with checking the equality of the mean values in two samples. The sample averages have a normal distribution. Experimental work is carried out in order to ensure the process of forming a creative and constructive mode of civic activity on the basis of Kursk State University. 50 students in the field of training 44.03.01, 44.03.05 Pedagogical education of the 1st, 2nd, 3rd courses of Kursk State University and educational organizations of Kursk take part in it. Students and students are divided into two groups: experimental and control groups in the following ratio (25 people (control) and 25 people (experimental)).

3. Discussion and results

The implementation of the model of the creative and constructive mode of civic activity of the younger generation of the future teacher requires an emphasis on the content-structural and functional parameters.

The structural parameter of the pedagogical model of the creative and constructive modus of civic activity of the younger generation. The pedagogical model in the structural and content sense correlates with the main components of the civic activity of the younger generation: creative-constructive and knowledge components.

The content of the creative and constructive component of the mode of civic activity of the younger generation presupposes the active development of critical thinking of students, the acquisition by students of social cultural experience of confronting social radicalism and intolerance, the formation of practical skills of constructive action skills in potentially unpredictable situations. The creative and constructive component of the mode of civic activity reflects the value (reflexive) and behavioral criteria of its formation.

The knowledge component of the creative and constructive mode of civil activity of the younger generation is decisive from the point of view of students receiving theoretical information of the following conceptual categories. "Civic engagement" as a basic universal category, "creative and constructive mode of civic engagement" and its determinants, "interpersonal trust and solidarity", "social responsibility and justice", "all-Russian identity" are fundamental in understanding the topic under consideration (Martynov, 2020: 78). The knowledge component of the creative and constructive mode of civic activity of the younger generation reflects the cognitive criterion of its formation.

Table 1. Pedagogical model of the creative and constructive mode of civic activity of the younger generation

Purpose: formation of a creative and constructive mode of civic activity

Tasks: to use the educational potential of educational organizations of secondary general and higher education for the development of a creative and constructive mode of civic activity of students; to develop software and technological support for the formation of a creative and constructive mode of civic activity

Methodological basis:	**Principles:**
- comprehensive, - axiological, - humanistically oriented approaches, - ideas of socialization and social activity of lich-news The theoretical basis is based on the theory of interaction of the individual, the collective and the social environment; the theory of social education in the process of socialization of the individual; theoretical provisions on social values and their influence on the formation of the personality of a citizen.	• integrity • reflections • continuity

Pedagogical conditions:
- preservation of the humanistic foundations of the educational process and the community-collective way of life of educational organizations of secondary general and higher education, - subject-the subjective nature of the relations of participants in the educational process, - formation of a creative and constructive educational environment with a focus on the development by participants of value relations of opposition to destructive manifestations.

Pedagogical technologies:	**Organizational forms:**	**Tools, methods and techniques:**
1. Actualization of civil self-determination of students. 2. Formation of a system of personal meanings of	Classes with training elements Role-playing games Excursions Meetings	information methods, dialogue, discussion,

participation in public life	Debates	brainstorming,
3. Formation of a system of civil relations with the family, educational organization, municipal association, state	Scientific discussions	training exercises, social engineering
4. Creating conditions for self-realization in the activity		

Criteria of formation: cognitive, evaluative-reflexive, behavioral

Levels of formation: high, medium, satisfactory, unacceptable

Result: bachelor of Pedagogy with a creative and constructive civic position

Source: the table is compiled by the author

The functional parameter of the pedagogical model of the formation of the creative and constructive modus of civic activity of the younger generation reflects the consistent and purposeful introduction of pedagogical conditions into the educational process of the university to optimize the process of formation of the creative and constructive mode of civic activity. They allow teachers to design the educational space of the university in accordance with the dominant target setting – the formation of creative and constructive civic activity among future teachers.

In particular, the following pedagogical conditions are being introduced into the educational process of Kursk State University:

- preservation of the humanistic foundations of the educational process and the community-collective way of life of educational organizations of secondary general and higher education,

- subject-the subjective nature of the relations of participants in the educational process,

- formation of a creative and constructive educational environment with a focus on the development by participants of value relations of opposition to destructive manifestations.

We concretize each of these pedagogical conditions.

Preservation of the humanistic foundations of the educational process and the community-collective structure of educational organizations of secondary general and higher education. The humanistic foundations of the educational process imply the subjective position of the student. He is the subject of free and responsible self-creation, the bearer of individual experiences and the author of his own formation.

Such an attitude to the student suggests that teachers abandon simplifications in understanding youth, recognize and take into account the ontological states, emotions and moods of youth (Nikovskaya, 2015: 142). Respect for the world of youth requires teachers not only to realize the importance of caring for students, but also the practical ability to tactfully enter this world, listen to them and hear them (Bederkhanova i dr., 2012: 17).

Subject-the subjective nature of the relations of participants in the educational process. Subject-subject interaction is a special relationship of perception of the teacher and the student as equal partners of professional communication. Thanks to this, the participants of the interaction get the opportunity to reveal and broadcast their individual "I" to a partner in professional communication. The teacher always communicates with a peculiar personality, an active participant in the joint educational process.

Students' awareness of their own subjectivity lies in the position of "I am myself". This strengthens and develops his desire for positive self-awareness, independence, self-determination, self-organization (Yartseva, 2014: 80).

The social purpose of the teaching staff is to help the student in self-development through the assimilation and reproduction of existing cultural norms.

Ensuring the implementation of this pedagogical condition is carried out through the system of advanced training of the university teaching staff with a pedagogical understanding of the definition of "creative and constructive mode of civic activity of the younger generation" and mastering modern and innovative educational technologies. An additional educational program of advanced training "Formation of creative and constructive civic activity: pedagogical areas of activity" will be developed by us to implement this pedagogical condition. The teaching staff of

Kursk State University and the class leaders of the organizations of secondary general education in Kursk will become listeners of this program.

Structurally, the professional development program will be presented in three modules. The I module is aimed at updating theoretical knowledge about subject-subject interaction, the II module will be presented with the content and forms of socio-civic education of the younger generation, the III module will reveal the essence of civic education as a priority form of educational work, will outline the range of innovative educational technologies in civic education.

Formation of a creative and constructive educational environment with a focus on the development by participants of value relations of opposition to destructive manifestations.

Within the framework of this condition, the educational process of the university appears in the context of the interaction of participants in educational relations on their acquisition of general cultural, professional experience and experience of creative and constructive relations. The fundamental idea of the value content of pedagogical education is at the heart of the construction of a creative and constructive educational environment.

The inter-level integration of the structures of the creative and constructive educational environment at the university will be carried out by means of active inclusion of students in various educational social practices, in particular:

at the academic level:

- organization of practical training in the International Children's Center "Artek", the All-Russian Children's Center "Orlyonok";
- participation in the work of student psychological assistance services to provide free psychological assistance to socially vulnerable segments of the population;
- "Substitute teacher" - a regional action to replace teachers of educational organizations with absence for a good reason;
- "Pedagogical volunteering" - a project to provide professional assistance by senior students in academic subjects to students of the border territories of the Kursk region in preparation for the unified state exam (11th grade), the main state exam (9th grade);
- "Volunteer Tutor" is a project to provide feasible professional assistance to senior students in academic subjects to children under guardianship.

at the scientific level:

- potential participation of students in scientific and practical conferences, round tables, seminars to discuss promising areas for the development of civic engagement of the younger generation:
- International scientific and Practical conference "Socialization of the younger generation in the real and digital environment";
- All-Russian teleconference dedicated to the 200th anniversary of the birth of K.D. Ushinsky, with the participation of educational organizations in Russia;
- Round table "Pedagogical Science for young researchers" dedicated to the start of the Year of Teacher and Mentor in Russia;
- University Championship "Scientific discussions".

at the social level:

- creation and work of student social structures at the university to form the socio-moral foundations of a constructive and constructive positive climate in the educational environment;
- cooperation of the university with non-profit organizations on the implementation of measures for the development of civic engagement;
- volunteer activities to increase the level of civic culture and social responsibility (assistance to children in special correctional institutions, sick and elderly people).

The technological component of the pedagogical model includes a set of educational technologies for the formation of a creative and constructive mode of civic activity of the younger generation.

The analysis of the scientific literature on the problem of the formation of the creative and constructive mode of civic activity of the younger generation revealed its insufficient development and predetermined the need to organize an experimental study to substantiate the effectiveness of the developed pedagogical model and the sufficiency of organizational and pedagogical conditions. We relied on a theoretical basis in determining the goals and objectives of experimental work, in developing its plan, content, criteria and levels of formation of the creative and constructive mode of civic activity of the younger generation.

The purpose of the experimental work is to verify the reliability of the theoretical propositions put forward, the effectiveness of the developed system of the creative and constructive mode of civic activity and the pedagogical conditions of its functioning.

The limited sample size does not allow us to extend the research data to all students of Kursk State University. In this case, they characterize only students in the field of training 44.03.01, 44.03.05 Pedagogical education of 1, 2, 3 courses.

The level of formation of the creative and constructive mode of civic activity is the main indicator of the effectiveness of experimental conditions. The following criteria for assessing the level of formation of the creative and constructive mode of civic activity were determined.

1. The cognitive criterion is determined by the level of formation of students' theoretical ideas about the following phenomena: "civic activity" as a basic universal category, "creative and constructive modus of civic activity" and its determinants, "interpersonal trust and solidarity", "social responsibility and justice", "all-Russian identity".

2. The reflexive criterion is determined by the ability of the future teacher to assess creative and constructive civic behavior, to evaluate his own actions in professional activity on issues of civic participation, its creative and constructive component, to correct his own behavior in order to prevent aggressiveness, social radicalism and intolerance.

3. The behavioral criterion represents the student's civil resistance to manifestations of aggression, radicalism, destructive behavior and to reproduce creative and constructive patterns of behavior in his professional activity.

The combination of criteria determines the level of formation of the creative and constructive mode of civic activity. It can be high, medium, satisfactory, unacceptable.

The high level is characterized by a significant level of development of civic literacy, civic feelings, civic values and civic engagement (Filonov, 2022: 11). The student has a solid and deep knowledge of the history of the Motherland, critical thinking, the inability to destroy statehood and harm the Motherland with a high level of constructive civic activity. Such a student takes an active part in socially useful activities, strives to benefit his state and society with his work (Solovyov, 1998: 65).

The average level of formation of creative and constructive civic activity allows the student to positively relate to civic duties, his civic duty due to an adequate image of the Motherland, the image of a citizen of his country (Nikitin, 1995: 24) and a meaningful understanding of his rights and his responsibility to its people. This level provides resistance to negative influences from the outside, to the effects of the media. The intermediate level provides an opportunity to develop and realize their potential in civic activities, actively participate in building a civil society.

A satisfactory level of formation of constructive civic activity provides prospects for further civic education. A young man with a satisfactory level of formation of the creative and constructive modus of civic activity actively participates in the affairs of an educational organization, municipality, region. Thus, he himself creates the conditions for his further progressive development. In this case, students become vulnerable to negative influences from the outside. Insufficient responsibility, stereotypical thinking, low self-criticism, inadequate self-assessment of oneself as a subject of socially useful activity, unstable attitude to civil rights and duties serve as the basis for the development of a destructive orientation of the civic position.

The unacceptable level of formation of creative and constructive civic activity reflects the presence or emergence of destructive tendencies among students. Under the condition of excessive activity (Savotina, 2002: 40), such a level of citizenship may indicate developing negative activity.

We conduct a qualitative assessment of the formation of the creative and constructive mode of civic activity of the younger generation on the basis of the identified criteria and levels. We will describe a number of selected diagnostic techniques in more detail.

The test questionnaire of L.V. Bayborodova "Diagnostics of the level of education" is used to determine the level of education of young people. The methodology is designed to assess the level of development of patriotism, curiosity, diligence, kindness, responsiveness and self-discipline in the student (Rozhkov, Bayborodova, 2018: 124-125).

I.E. Kuzmina's test questionnaire "Assessment of value orientations in patriotic consciousness" is used to measure the value orientations of the civil-patriotic consciousness of students. This diagnostic tool is designed to identify the emotional and value attitude of students to the processes of cognition, communication and activity in relation to their state (Kuzmina, 1998).

Express diagnostics of tolerance level (Soldatova i dr., 2019). It is designed to identify the respondent's attitude to the general surrounding world and to certain groups of people: representatives of national minorities, people of low social status, and the elderly. The level of general, ethnic and social tolerance is determined using a questionnaire.
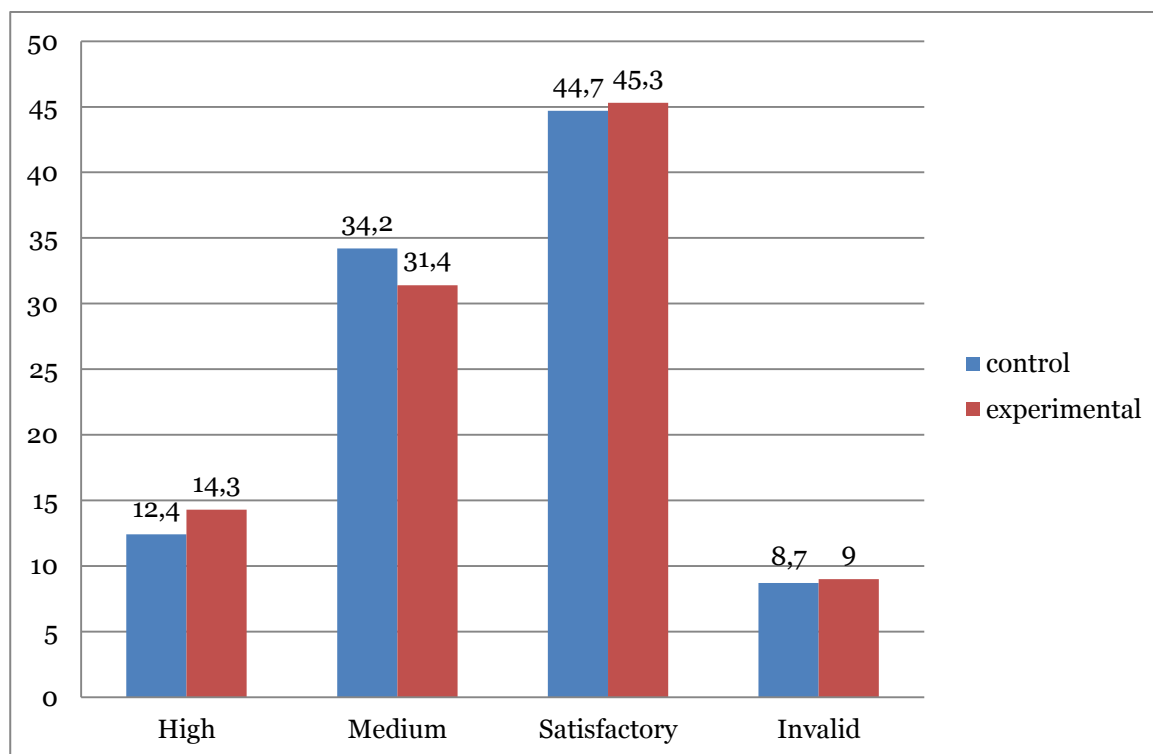
Fig. 1. The results of the distribution of students according to the level of development of the creative and constructive mode of civic activity
Source: the table is compiled by the author

The reliability and validity of the empirical results obtained is ensured by the use of a set of diagnostic techniques, pedagogical supervision, expertise of research and project activities of students.

The study of the level of formation of the creative and constructive modus of citizenship among students of the control and experimental groups became the goal of the ascertaining stage of pedagogical experiment.

Characteristics of the sample population. The majority of respondents are students aged 16 to 21. This is 50 people (100 %) in absolute terms. The form of study is full-time. 28 people (56 %) women and 22 people (44 %) men. The majority of respondents – 41 people (82 %) are students of 1,2,3 senior courses of the university.

The results of the survey. The results of the survey and analysis of the data obtained allowed us to make some significant generalizations. The answers to the first set of questions helped to identify the actual knowledge of students about citizenship, civic engagement and their attitude to these concepts. In particular, to the question "What is the creative and constructive mode of civic activity?" a significant part of the students – 21 people (43 %) identify it with active social activity for the benefit of the motherland. Another 10 respondents (20 %) are convinced that "the creative and constructive mode of civic engagement is closely related to social responsibility and justice", 5 people (10 %) associate the creative and constructive mode of civic engagement with interpersonal trust and solidarity and other categories.

The study also consisted in a comparative analysis of the indicators of the level of formation in two groups of the creative and constructive mode of civic activity. We have identified. A higher degree of expression of the creative and constructive mode of civic activity is represented in more adult students of the 2nd, 3rd courses. At the same time, analytical data indicate minimal differences between groups according to certain criteria of the level of formation of the creative and constructive mode of civic activity.
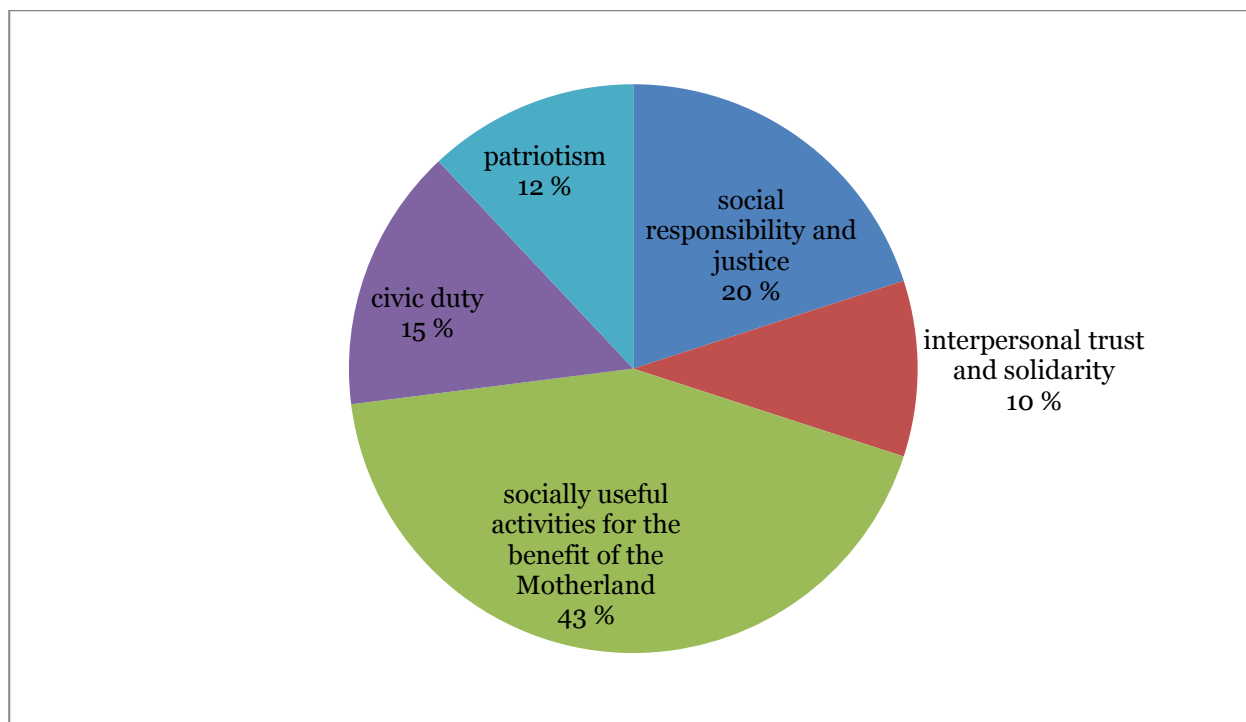
Fig. 2. Associations with the concept of creative-constructive modus of civic activity
Source: the table is compiled by the author

Thus, among the participants of the experimental group, only 24 % are characterized by a high level of formation of the creative and constructive mode of civic activity.

Such students are distinguished by adequate knowledge of the peculiarities of the history of Russia. Positive civic identity, identification with Russian citizens, deep knowledge of the fate of the Motherland, its multinational composition (Shtukarev, 2021: 94), its modern politics, interest in the socio-economic and political life of the country, developed civic values determine their desire to actively participate in public affairs, the ability to subordinate personal interests to public ones.

Table 2. Results of a comparative analysis of indicators of the level of formation of students of the creative and constructive mode of civic activity

Criteria	Students of the experimental group (M ± m), score Students of the control group (M ± m), score	Students of the experimental group (M ± m), score Students of the control group (M ± m), score	t	p
Cognitive	33,23±1,800	32,44±1,900	1,23	> 0,05
Reflexive	31,45±2,000	33,72±1,700	1,96	<0,05
Behavioral	35,32±2,300	33,84±2,000	0,76	> 0,05
Note-hereafter M – arithmetic mean; m – representative error; t – Student's criterion; p – significance level; bold – statistically significant differences.				

Source: the table is compiled by the author

A satisfactory level of knowledge about civil society, about the history of Russia, about democratic values, human rights is characteristic of many students. The study showed. Some modern young people are not interested in the events of their country. They have a superficial knowledge of its political, economic, social, and spiritual life.

The unacceptable level of development of the creative and constructive modus of civic activity presupposes its destructive nature. It was detected in 8.57 % of participants in the control group and 10.00 % of students in the experimental group.

We focus on the practical absence of significantly significant differences in the percentage distributions of students of the two experimental groups in terms of the level of formation of their creative and constructive mode of civic activity was not revealed ($\chi 2 = 13.723$, $p > 0.04$).

However, a comparative analysis of the indicators for each criterion revealed the absence of significant differences between the two groups according to the reflexive criterion.

4. Conclusion

1. The results of the study allow us to draw an important conclusion about the need to update and search for new forms, means and methods of developing the creative and constructive mode of civic activity of youth.

2. The results of the expert assessment of the level of formation of the constructive civic position of the youth of two research groups (control and experimental) also indicate a satisfactory level of formation of the creative and constructive mode of civic activity and the need to fill it with modern content. According to teachers, the majority of students highly value interpersonal trust, solidarity, social responsibility and justice.

3. Organizational and technological support and methods of pedagogical monitoring of the creative and constructive modus of civic activity of the younger generation, the development of a module of polysubject pedagogical management of the process of formation and development of creative and constructive civic activity of the younger generation are awaiting further solutions and development.

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Methods and Techniques for the Formation of Reading Literacy among Students in the Process of Studying Historical Disciplines

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Abstract

The relevance of this research is connected with the need to improve the quality of Russian education, the growth of its competitiveness in the conditions of the XXI century, which is impossible without the development of functional literacy, of which reader literacy is an integral part. When analyzing the methodological methods of teaching students of pedagogical universities, attention is focused on the training of future teachers who are able to further develop reading literacy among secondary school students. The development of reading literacy is a complex and lengthy process implemented during the study of various disciplines, including historical ones. The formation of reading literacy involves the use of various types of text: continuous, discontinuous, mixed, composite, as well as various tasks aimed at developing such skills as finding and extracting information from the text, the ability to integrate and interpret the text, the ability to comprehend and evaluate the text and use the knowledge obtained from the texts for practical purposes. The development of reader literacy is carried out using such techniques and methods as the analysis of historical sources, the use of infographics, working with cases, and more. The study was practically tested in the course of the author's work with control and experimental groups of students. In the context of modern teaching methods, reader's literacy acquires a universal or supra-objective character. At the same time, this issue is a new, little-studied and promising technology not only within the framework of secondary, but also higher education.

Keywords: reading literacy, reading skills, text, sources of information, cases.

1. Introduction

At the turn of the XX-XXI centuries, UNESCO developed a series of documents focused on qualitative changes in approaches to the development of education. They note that the purpose of education is to develop and educate people who are able to think critically, be able to analyze current problems, look for ways to solve problems, and be able to take responsibility. This requires

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the development of national education systems and an objective assessment of learning outcomes (Vsemirnaya deklaratsiya...). In the context of evaluating learning outcomes, the results of practical experience are contained in international comparative studies of the quality of education (PISA, TIMSS, PIRLS, etc.) (Aleksashkina i dr., 2020). These studies are focused on the general education system, but they can also be taken into account when analyzing the problems of higher education, since the unpreparedness of high school graduates affects the inefficiency of their studies at the university. The data of the above-mentioned studies were used to set tasks for the development of the competitiveness of domestic education. In order to steadily increase the quality of education, the Decree of the President of Russia Vladimir Putin on July 21, 2020 defined the key national goals and objectives for the development of the domestic education system. The Government has been instructed to ensure the global competitiveness of Russian education, the entry of the Russian Federation into the top 10 countries in the world in terms of the quality of general education (Ukaz Prezidenta..., 2020). To do this, it is necessary to use new educational technologies aimed at developing a variety of competencies of students, including reading literacy. At the same time, on the one hand, an increase in the level of basic general and secondary general education should contribute to the influx of competent applicants to universities who will master the higher education program more effectively, and on the other hand, the development of reading literacy among students of pedagogical universities will contribute to the formation of competent specialists, future teachers who will continue to work in general education institutions. It is impossible not to agree with the position that "to teach the skills of the XXI century, you need to have a teacher of the XXI century" (Saavedra, Opfer, 2012).

In accordance with the Federal State Educational Standard, the main activities of students of higher educational institutions include project and research activities, which are based on the competence of professional reading.

Reader literacy refers to the definition proposed in the PISA international study. "Reading literacy is a person's ability to understand, use, evaluate texts, reflect on them and engage in reading in order to achieve their goals, expand their knowledge and capabilities, and participate in social life" (PISA, 2018). Conventionally, reading skills are divided into several groups:

1. The ability to find and extract information from the text;
2. Ability to integrate and interpret text;
3. The ability to comprehend and evaluate the text (Tsukerman, 2010).
4. The ability to use the knowledge gained from the text for practical purposes (Strelova, 2021b). Drawing on the experience of PISA allows us to carry out research on the formation of meta-cognitive competencies, which include reading literacy (Depren, Depren, 2022).

The purpose of this article is a comprehensive description of methods and techniques for the formation of reading literacy among university students as an important component of functional literacy. Of course, achieving this goal is impossible without an empirical basis, which, firstly, was pedagogical diagnostics (in the form of input and output control of students' skills and abilities), and secondly, the inclusion of effective technologies in the teaching methodology of a specific historical discipline, which will be discussed below. In general, this study includes an analysis of the works of modern authors devoted to the reading competence and reading skills of students, the implementation of experimental work on the basis of a specific university and a description of methodological recommendations for the development of reading skills.

2. Literature review
This study includes an analysis of the works of modern foreign and domestic authors devoted to the reading competence and reading skills of students. It seems appropriate to focus on the most fundamental studies.

In 1956, the American educator, President of the International Literacy Association William Gray formulated the general characteristic of literacy as "a set of skills, including reading and writing, applied in a social context" (Gray, 1969). In fact, he laid the foundations of the theory of literacy, which is still developing dynamically and continues to be relevant in the XXI century.

More than thirty years ago, Tatiana Serova, one of the leading experts in the field of linguistics and methods of teaching foreign languages, focused on the problem of professionally–oriented reading, describing it as "a complex speech activity conditioned by professional needs and representing a form of active indirect verbal communication that allows overcoming spatial and temporal barriers in people's social activities ..." (Serova, 1989). This definition can in many ways

be considered universal and applicable to social disciplines, including competencies formed in the study of historical disciplines.

B. Oskarsson, J. Halazh, I.A. Zimnaya, A.V. Khutorskoy studied the issues of professionally-oriented reading within the competence approach, calling reading skills "basic skills" or "key competencies" of a person (Mazaeva, 2013). It is noteworthy that the content of concepts gradually began to change. Increasingly, instead of the concept of "reading", the concept of "literacy" has been used as combining the processes of both writing and reading. At the same time, the concepts of "reading literacy" and "reading literacy" should be separated. The first concept emphasizes the characteristics of the reading process itself, the second – the qualities of the reader developed during reading (Smetannikova, 2017). We can also talk about the synonymy (in general) of two terms – reader competence and reader literacy (Kadyrova, Arzieva, 2019).

German scientists Mario Handel et al. Teacher literacy is defined as a complex of metacognitive knowledge (Händel et al., 2013).

As Professor Andrey Sokolov notes: "over the past fifteen years or so, attention has been paid to reader literacy not only in Russia, but also in foreign didactics… At the same time, in relation to historical disciplines, reader literacy can be called historical literacy or disciplinary literacy" (Sokolov, 2021).

In the context of a decline in reading competence among modern students, domestic authors, following their Western colleagues, began to turn their attention to the formulation of basic concepts and problems related to the development of reading activity. President of the Russian Reading Association, Professor Nina Smetannikova defines reading competence as "the quality of preservation of what has been read, formed on the basis of a person's general culture, providing the opportunity to solve emerging educational, academic, social and professional tasks adequately to situations in broad social interaction and educational and professional activities" (Smetannikova, 2007). Reading skills are characterized not as mechanical reproduction, but as a deeply personal and valuable assessment of the reader. In turn, reading historical texts provides ample opportunities both for the development of intellectual abilities and for the adoption of value norms (including citizenship, a sense of historical responsibility, belonging, etc.).

A well-known specialist in the field of social and cultural anthropology, Professor Elena Orlova characterizes reader competence as "the ability to select and understand written texts containing information presented in different socio-cultural codes; skills of working with written texts" (Orlova, 2009). Tatiana Pletyago characterizes reader competence as "a personality quality manifested in the readiness and ability to actualize and transform personal and professional experience in the process of interpreting, understanding and personal comprehension of the text through the use of information retrieval strategies, operating with cultural codes, an effective combination of discursive-analytical and imaginative-emotional ways of mastering cultural experience, traditional and electronic forms readings. Having a meta-subject character, reader's competence at the stage of general education becomes the basis for the development of general cultural competence of the individual, and in the process of university education, in addition to this, stimulates the development of professional competence of the student" (Pletyago, 2013).

In the conditions of digitalization of modern society and education, a number of other problems arise. Focusing only on some of them, it can be noted that this is an increase in the role of the Internet in comparison with traditional literature in general and electronic texts in particular. American researcher Donald Lew points out that the Internet is a leading technological tool for teaching, including reading literacy (Leu et al., 2014). At the same time, it is necessary to carry out work at the university to prepare students to search for information on the Internet, evaluate it and synthesize it. Taiwanese researcher Su Yen Chen also draws attention to the fact that the widespread introduction of digital technologies has changed the format of interaction in modern society, which certainly affects the educational contacts of teachers and students (Chen, 2018).

To date, the traditional reading of books in paper form has actually been replaced by screen (digital) reading. As Nina Smetannikova notes, "reading an electronic text makes it difficult to perform all those tasks that we traditionally perform after reading a linear text". This in turn leads to a reduction in the volume of reading (up to 25-30 pages per week) and the volume of text being read (students try to choose a text of 2-3 pages). And there is also the problem of "False understanding – a phenomenon when a reader connects words the way he thinks a writer could connect them, but not at all the way it is actually written in the text … since a modern student almost does not read the author's text from the screen, he searches for an answer to the question

posed, selects keywords in the text, scans only sentences containing them, and combines them into its text (text scanning, viewing reading)" (Smetannikova, 2019).

In the works of Chinese authors, the idea also appears that reader literacy allows solving a number of difficulties, namely, finding the main idea of the text, understanding unfamiliar terms and words, and drawing conclusions (Kao et al., 2022).

American educators also focus on the development of reader literacy: "teachers now rely less on textbooks and more on primary sources, recognize the advantage of critical thinking over mechanical memorization. They are more concerned with disciplinary literacy, that is, so that students read with understanding, construct texts and realize the interpretive nature of history" (Downy et al., 2016).

A significant contribution to the formulation of practical recommendations for the development of reading literacy among schoolchildren in the study of the subject "History" was made by Doctor of Pedagogical Sciences, Professor Olga Strelova. She is the author of a series of articles on the potential of international comparative research tools for assessing the quality of education and on the preparation of teachers for the use of PISA-tools in teaching history. In his research, Olga Strelova introduces the concept of "Tasks on reading literacy", which means not a mechanical combination of several texts and tasks, but a complex pedagogical construction (Strelova, 2021a). The significance of this pedagogical construction will be discussed below.

In conclusion, it should be noted that foreign and domestic researchers agree on the importance and expediency of the formation of reading literacy as part of the functional literacy of a modern student and focus on definitions, specifics of methods and techniques and the complexity of this technology.

3. Materials and methods

Various methods were used in the study, but the main ones were observation, pedagogical diagnostics, and reflection. As a focus group, students of 2-5 courses of the Faculty of History and Philology of the Blagoveshchensk State Pedagogical University, studying in the field of training 44.03.05 Pedagogical Education, profiles "History" and "Social Studies" were selected, who were familiarized with the purpose, objectives, and progress of the upcoming research, which was carried out from January to May 2023. The study was conducted within the framework of contact types of work in the classroom on the discipline "History of Asian and African countries" (further in the article examples of tasks from the program of this academic discipline will be given); 130 students took part in the work. In each course, the students were divided into two groups. In the control groups, classes were conducted according to traditional materials, forms and methods of work. The experimental groups used project-based tasks, interactive teaching methods and, in particular, tasks aimed at developing reading literacy skills.
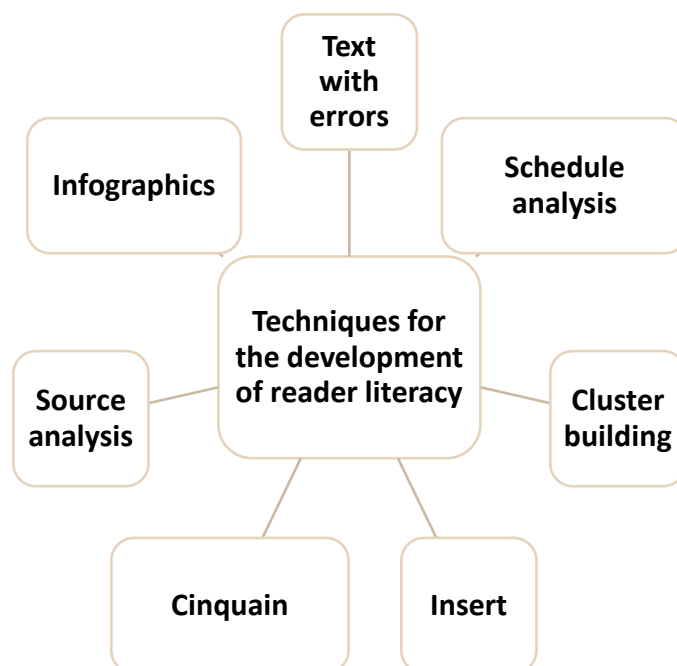
Fig. 1. Basic techniques for the development of reader literacy

In January 2023, an initial knowledge check was carried out in the form of an input control, and in May – a final check (output control). As a result, the initial hypothesis was confirmed: for the studied skill groups, higher indicators were observed in the experimental groups than in the control groups. Depending on the skill groups and academic groups of students, the difference in indicators ranged from 2-3 to 18-40 points on a one-point scale.
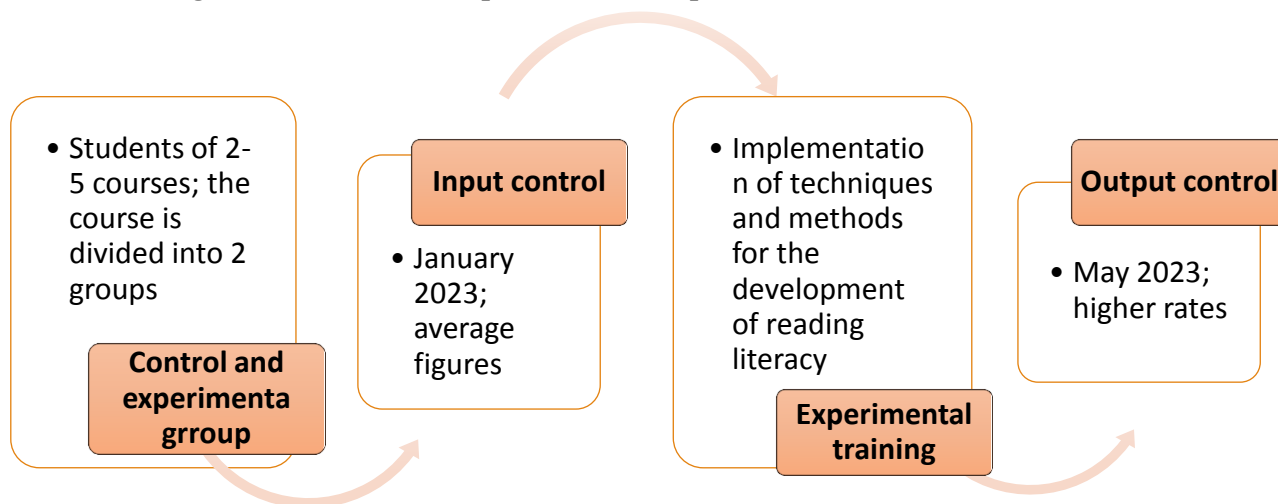
Fig. 2. Study methodology plan

The procedure for conducting the input control involved performing 7 tasks: text with errors, table analysis, map assignment, graph analysis, cluster compilation, work with an insert, and cinquain compilation. The time allotted for this event was 90 minutes (2 academic hours). Students in two groups (control and experimental) were offered the same tasks of the same type and level, which they had to complete during the specified time. The division into groups was conditional, on a formal basis (2, 3, 4, 5 courses). At the time specified by the schedule, the tasks were performed by a specific group, without contacts with other groups. At the end of the control time, students handed over printed forms with completed tasks. After checking the tasks of all groups, the results were brought to the students. The input control materials were subsequently used to analyze the results that formed the basis of this study.

During the study (during the semester), classes were conducted in control groups using traditional methods, and in experimental groups using techniques for the development of reading literacy (Figure 1). At the end of the semester, the exit control was carried out. The same parameters (time, number of tasks, groups) were used for the output control procedure. At the same time, the content of the tasks was subjected to some correlation taking into account the studied academic discipline and the results of the entrance control.

4. Results

The results of the study presented in this paper can be divided into two groups. The first group includes the analysis of changes in the quality of students' knowledge as a result of the application of methods and techniques for the development of reading literacy. The second group includes the analysis of the methods and techniques themselves, which were used in the course of experimental educational work and can be considered in many ways universal in the methodology of teaching social disciplines at the university.

As already mentioned above, an entrance check was carried out at the beginning of 2023, in which all 130 students took part. They had to demonstrate the "primary" knowledge and skills of working with certain tasks. Some of the tasks presented were well known to students, for example, working with text with errors, analyzing tables, performing tasks on historical maps, and it is quite natural that they demonstrated fairly good indicators. Some tasks were quite new and naturally caused more difficulties. Then, during the semester, the students were divided into control and experimental groups. In the control group, classes were conducted mainly using traditional technologies, and in the experimental group, the emphasis was on the development of reading literacy, including using non-traditional techniques and tasks. At the end of the semester, an exit

control was carried out, which confirmed the initial hypothesis. Indeed, the reading literacy skills of students in academic groups began to vary from 2-3 to 40 and 18-20 points. The diagram below also serves as a confirmation.
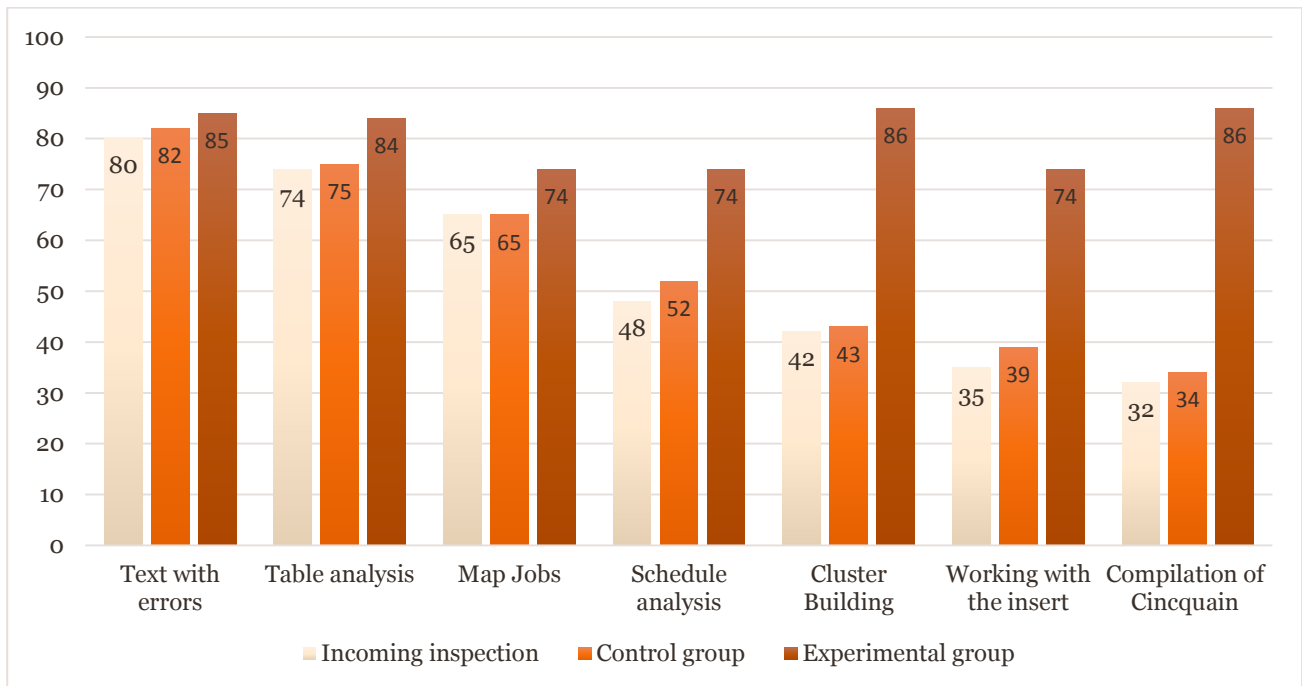
Fig. 3. Comparative results of input and output control for some methods of reader literacy development
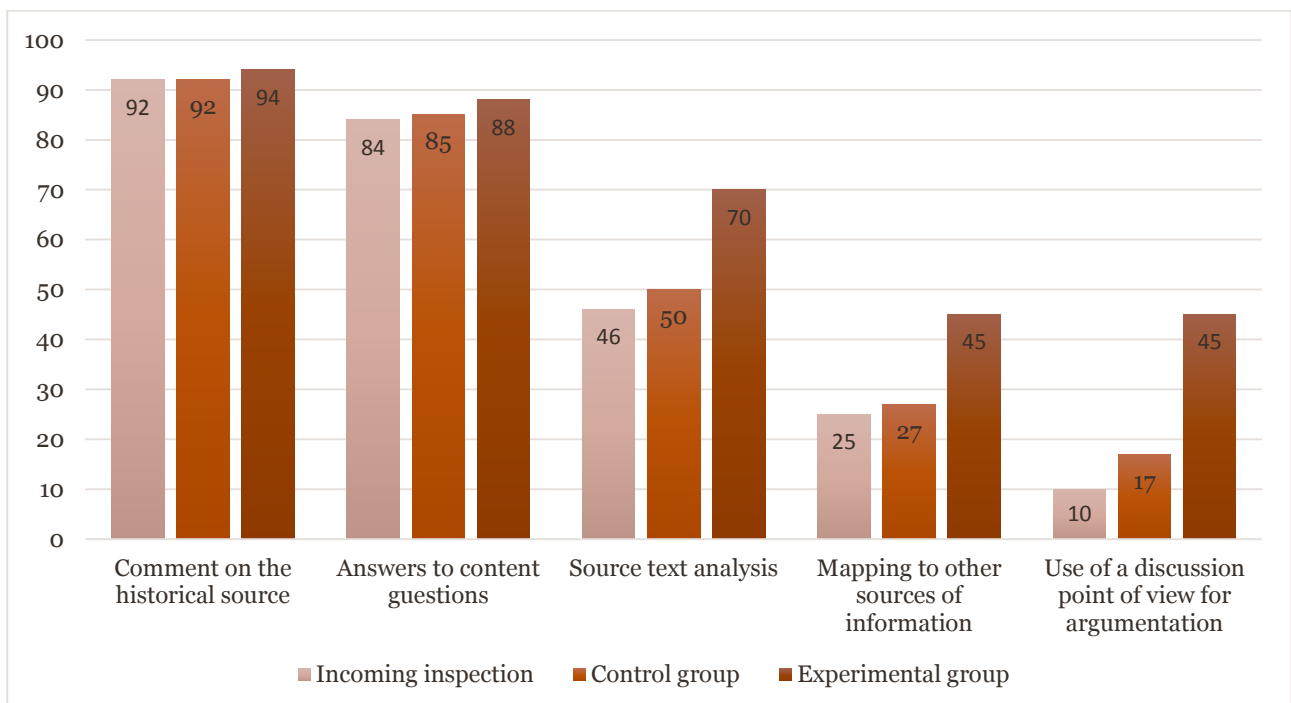
Fig. 4. Comparative results of incoming and outgoing inspection of historical source skills

The first groups of tasks, such as a general comment on a historical document, answers to questions on the content of the document are more traditional and less time-consuming for students, therefore, higher results were initially demonstrated for them. In turn, the development of reading literacy allows students to form new competencies in the ability to analyze the text more

deeply, the ability to correlate with other sources of information and use the knowledge gained to argue their position.

Next, we should proceed to the analysis of the second group of research results – namely, the techniques and methods for the development of reader literacy.

Common knowledge testing tools are texts in all their diversity, and this becomes especially relevant in the context of an increase in the volume of independent work of students at the university. The study of historical disciplines involves the use of various texts. It is necessary to focus on the conditional classification of texts in the context of the formation of reader literacy. In the classroom, students work with different types of text:

1. Continuous or continuous texts (without images, for example, historical sources, reference literature, literary texts).

2. Incomplete or discontinuous texts (graphs, charts, tables, maps, photographs, etc.). They include both printed and visual texts, arranged in a certain order, for example, in chronological or other sequence (first official, and then unofficial sources). Incomplete texts, or infographic texts, are called texts of the future; they reflect social, business, personal, educational situations that a person faces in real life (Filippova, 2022).

3. Mixed texts (which include elements of continuous and discontinuous texts). These are various texts, also called multiple texts, which differ in their format and structure; they assume a combination of printed text with electronic text, the presence of hyperlinks. The diversity of such texts is that they can represent different approaches to a specific historical problem. It is important that texts about the same historical fact, phenomenon can relate to different periods and create conditions for a "dialogue of cultures vertically" (Strelova, 2020).

4. Composite texts containing several texts, each of which was created independently of the other, is coherent and complete. For example, texts containing mutually exclusive or complementary points of view are combined into a composite text. At the same time, the texts are presented in thematic unity and are intended to lead to the conclusion that different sources can be selected for the same topic.

As noted above, there are such methods of forming reader literacy as searching and extracting information from the text, interpreting the information contained in the text, integrating or linking individual messages of the text into a single whole, comprehending and evaluating the content of the text.

To specify the work with texts, let's turn to the tasks in which these methods are used.

Search and extract information from the text

To develop this group of reading skills, students are invited to search for additional information in special reference literature, in databases and information and reference systems (the Portal of the Scientific Electronic Library, the website of the Institute of Scientific Information on Social Sciences of the Russian Academy of Sciences, etc.), in electronic library resources (the Educational platform Yurayt, EBS Lan, etc.).

Extraction information is aimed at achieving such substantive results as:

1. Formation of skills to comment on historical sources (determine authorship, place and time of creation, phenomena and processes described in them);

2. The ability to analyze the text of the source, including determining the position of the author and participants of the described events;

3. The ability to answer questions on the content of historical texts and drawing up plans, tables, diagrams based on them;

4. The ability to correlate the content of a historical source with other sources of information when studying specific events, phenomena and processes;

5. The ability to use historical sources to argue controversial points of view.

Integration and interpretation of the information contained in the text

Integration involves connecting different pieces of information, including for comparison and understanding of cause-and-effect relationships. The development of this group of reading skills assumes a more complex level of work for both teachers and students, and is aimed at the formation of the following skills:

1. The ability to update information (based on the analysis of the facts of previous eras to give examples from modern reality);

2. To identify the interrelation of the spheres of society's life;

3. Mastering the techniques of searching for relevant information (educational texts, media materials, infographics, photo and video files, etc.);

4. The ability to correlate and verify the content of several sources of information;

5. The ability to generalize, analyze, concretize information from various sources on the topics studied, correlate it with their own knowledge and personal social experience, the ability to draw conclusions.

Comprehension and evaluation of the form and content of the text

Tasks forming this group of skills require students at the university to rely on their own experience and knowledge, the ability to put forward hypotheses. It requires the use of knowledge and ideas that go beyond the text, as well as the ability to abstract reasoning. To do this, it is necessary to continue the formation of such skills as:

1. The ability to compare and correlate facts, phenomena and processes in history and the design of comparison results in the form of tables, diagrams, clusters, mental maps;

2. The ability to determine and explain their attitude to the most significant events and historical figures;

3. Orientation in scientific concepts and specifics of interpretation in historical science.

Using new knowledge and skills for practical purposes and non-standard situations

This skill contributes to the effective work of students in the study of new topics, in the framework of seminars, colloquiums, participation in subject weeks (annual Week of the History of the East), during production pedagogical practices in secondary educational institutions, pedagogical skill competitions, research activities (Student Scientific Association).

When working with the text, questions that stimulate students' research activity play an important role. Conditionally, there are several options for classifying tasks with questions:

Low and high level issues:

1. Low-level issues;

2. High-level issues (problematic issues).

Questions about B. Bloom's taxonomy:

1. Questions on knowledge;

2. Questions for understanding;

3. Application questions;

4. Questions for analysis;

5. Questions for synthesis (Make a diagram, cluster on this topic);

6. Questions for evaluation.

Questions can be classified by the number of possible answers – open (many answers) and closed (a limited number of answers); by the degree of expression in the text – explicit and hidden; in relation to the cognitive goal – suggestive and nodal, etc.

Next, I would like to draw attention to some innovative techniques that also contribute to the formation of reader literacy. These include technologies for the development of critical thinking using such methodological techniques as insert, cinquain, cluster, mental map.

Insert is one of the techniques of the technology of developing critical thinking through reading and writing. This technique is used when working with text, with new information and is really a technology for effective reading. When reading the text, students mark it with special icons: v – "I know this", + – "this is new information for me", - (minus) – "this contradicts what I knew", ? – "it's not clear to me, I need an explanation". Students make markings in their notes, pencil on the margins of textbooks and anthologies, it is also possible to compile a table (Appendix 1).

Cinquain is a creative work in the form of a short poem of five non-rhymed lines. In the first line of the cinquain, a noun is proposed that expresses the topic or subject of the work; in the second line, two adjectives characterizing the main idea, qualitative characteristics; the third line is represented by three verbs that describe the actions to which the topic is devoted; the fourth line is a sentence that includes the distinctive features of the phenomenon being described; the fifth line is a conclusion or personal attitude (Appendix 2).

A mental map or an intelligence map is a technique for effective recording and visualization. The entry begins in the center of the sheet in the form of a keyword (topic). Then the map is supplemented with branches with basic subtopics from which new branches are built up. At the same time, images, symbols, and various colors are used. Mental maps help organize the main theses of a lecture, seminar, or brainstorming session. They allow you to creatively solve learning

tasks and store new material in memory for longer. Mental maps are also used to develop critical thinking skills (Tseng, 2020).

Cinquain, mental map, insert and other techniques are used in the context of interactive learning, when they are created not individually, but by mini-groups of students, after which these creative products are exchanged and evaluated. Within the framework of interactive learning, methods of dramatization and theatricalization can be used. Therefore, it becomes possible to improve reading skills through theatricalization (Paige et al., 2019). Creating your own graphic, text and creative works also contributes to the development of reader literacy.

Reader literacy is also formed through the use of case technology. Thus, students divided into problem groups are offered sets of various primary sources. In fact, these cases are incomplete, composite texts (Appendix 3).

Questions and tasks for texts, photos and video materials are aimed at attribution of sources, critical analysis of their content, characterization of the value attitudes of participants in the events of 1937 and the positions of modern historians and politicians. The implementation of such a case contributes to the comprehensive reconstruction of a historical event in the minds of modern students and the actualization of their knowledge. In addition, as noted by a number of Russian authors: "Students' awareness of the fact that cases can be used in their own teaching activities significantly affects the motivation for research and memorization of the material" (Solodikhina, Solodikhina, 2019).

Of particular interest are problem tasks using the conceptual apparatus. These can be both private-historical (single), and general historical and even sociological concepts. Students are offered a concept and the task is to find its features in various texts. For example, students should characterize the concept of "statism" taking into account not only general, but also specific Oriental features based on working with texts: Ataturk K. Selected speeches and speeches, 1966 and Lee Kuan Yu. From the third world to the first. Singapore History 1965–2000, 2018). Another effective technique for the formation of reader literacy can be the search for additional sources of information. For example, students get acquainted with a specific historical source that mentions an event, a fact, a person and are given the task to select other sources where this event or person appears.

The inclusion of folklore, as well as works of classical and modern literature in the educational materials of university disciplines can also contribute to the development of reader's literacy. For example, T. Dreiser's novel "The Financier" is being studied at Harvard Business School. Professionally-oriented reading is also included in the course programs of domestic universities. In particular, students of history are recommended to read works from the series "Literary Monuments", founded by the USSR Academy of Sciences in 1947 and numbering over 700 books, as well as works published in the series "The Lives of wonderful People" (more than 1 thousand books). These books are presented in electronic form and often, unlike printed publications, are more accessible in educational activities, while in DjVu and PDF formats they allow you to save the original background, fonts, illustrations, which is an important component of historical documents and prevents many problems associated with reading electronic texts.

The works closest to the subject under study were written by researchers mainly on the formation of reading literacy among students in general and secondary schools. At the same time, the training of students in higher educational institutions has its own psychological, pedagogical and methodological features. It should also be noted that the level of functional and reader literacy, and finally, improving the quality of education, directly depend on the joint efforts of all participants in the educational process: the state, methodological workers and teachers to form a modern educational environment for students, including students (Medzhidova et al., 2021).

5. Discussion

The conducted research was aimed at analyzing the works of modern authors devoted to the issues of reader literacy, included experimental work and the development of examples of tasks for the development of students' reading competencies.

The experimental educational work carried out during the semester with students of history confirmed the theoretical justification of the importance of the formation of reader literacy. We agree with Nina Smetannikova (Smetannikova, 2007) that reading competencies allow solving educational and professional tasks, which is undoubtedly important for students studying in the direction of "Pedagogical Education" as future teachers.

I would also like to note the significance of the works of Olga Strelova. The methodological recommendations developed by her on the use of "Tasks on reading literacy" and the development of "Reading literacy skills" among schoolchildren became the basis for the development of tasks for the development of reading literacy among students, naturally taking into account the psychological and pedagogical characteristics of students studying at the university.

Speaking about the problems, I would like to confirm the correctness of the positions of D. Leu (Leu et al., 2014) and Su Yen Chen (Chen, 2018), who note the importance of the Internet and digital technologies in modern society. On the one hand, the Internet contributes to a decrease in reading literacy in the traditional sense, since students spend less time reading and taking notes, sometimes mindlessly copying electronic text. On the other hand, digital technologies expand the boundaries of the educational process and the capabilities of its participants. With the correct organization of the educational process, when students learn effective methods of work and receive specially formulated tasks, the Internet and digital technologies become an important additional tool for gaining knowledge and developing practical skills (working with diagrams, tables, developing mental maps, etc.).

It is impossible not to agree with the position of the American researcher J. Loewen points out that students should master such skills as reading effectively, finding the main ideas in the text (film or other source); reading critically, assessing whether the ideas are supported by evidence; using the writing format effectively; speaking correctly and more (Loewen, 2010).

I would like to note that the results of theoretical and practical research have not revealed fundamental discrepancies in the works of both foreign and domestic researchers devoted to the problems of reader literacy. Some differences in the formulations of concepts do not lead to internal significant contradictions. In general, the authors agree on the formulation of the concept, content and meaning of reader literacy in the educational process.

The results of the practical study confirmed the hypothesis about the effectiveness of the development of reading literacy among university students. It was also demonstrated more successful formation (in the experimental group in comparison with the control group) of a number of skills and abilities, for example, such as searching and extracting information from the text, interpreting information, comprehending, evaluating and applying information.

The methodological recommendations presented in the section "research results" can be used by participants of the educational process (both teachers and students) in the process of studying and teaching humanities in general and history in particular.

6. Conclusion

Texts, questions, tasks, forms of work on the development of reading literacy should not be used in the form of a regular set, in the form of a complex pedagogical structure. Reader literacy is a part of functional literacy and is aimed at the formation of meta-subject results. Therefore, her role in classes in historical disciplines goes beyond one subject (for example, the history of Asian and African countries) and acquires a universal or supra-subject character. Therefore, the above construction should consist of several different texts, not only printed, but also electronic. Motivational work should be organized aimed at immersing students in a situation not only of an educational, but also of a personal and social nature, and at their interest in participating in interactive and value-oriented activities. Texts and assignments should be compiled largely according to the structure of cases and, on the one hand, should contradict each other in order to activate interest and cognitive activity, and on the other hand, lead students to logical conclusions. All skill groups should also be involved (if possible). In addition, the problematic nature of the tasks will help students resolve cognitive contradictions, show creativity and independence. It is also possible to intentionally use uncertainty in the ways of actions – i.e. students are not offered a strict algorithm for solving educational tasks, but are given freedom for creativity; direct links to competitive sources, to certain methods of cognitive activity and its results are not given.

The work on the formation of reader literacy involves the active use of hypertext in a narrow sense (the transition from one text to another, most often in electronic format) and in a broad sense (the transition from text to a system of other types of information, including infographics). Reading literacy tools are distinguished by their multimedia nature, i.e. the ability to combine text with audio and video files, the use of multimedia presentations and interactive flat displays (IFPD). For the effective development of reading literacy, on the one hand, a high level of interactivity as social communication is necessary, and on the other hand, a high level of interactivity as social

communication is characteristic. Working in interacting groups turns out to be more effective, and the joint solution of the set educational tasks, in turn, unites the team of students.

In the process of observing students in the course of interactive work, problem-based learning, including the project format, a freer and more effective operation of texts in solving various educational tasks, including non-standard type, was revealed. Students have become better oriented in infographic and composite texts, the effectiveness of information interpretation and the quality of answers to high-level questions have increased. Students began to form an effective algorithm for working with a variety of texts.

Summing up the research work, I would like to emphasize that such skills as assessing the quality and reliability of sources, understanding multiple texts and connections between them, synthesizing disparate information taking into account several points of view, the ability to personally evaluate and update information can act as indicators of the formation of reader literacy.

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Appendix 1

An example of filling in the insert table on the topic "National Liberation movement in India", based on the analysis of M. Gandhi's letters on non-resistance to L. Tolstoy and others

v	+	−	?
Mahatma Gandhi was a staunch supporter of nonviolent struggle	In his autobiography, Gandhi writes about the great influence that Tolstoy had on him	In July 1939, Gandhi wrote a letter to Hitler asking him to prevent a war	Gandhi opposed British imperialism no less than he opposed Nazism, but insisted on nonviolent resistance to them

Appendix 2

An example of a cinquain on the topic "Countries of Tropical Africa in the first half of the twentieth century":

Africa.
Black, exotic.
Attracts, fascinates, scares.
A rich and patriarchal continent of jungles and savannas.
Colonial dependence.

Appendix 3
A selection of texts on the topic "The Nanjing tragedy of 1937":
1. Materials of textbooks on the history of Asian and African countries (L.S. Vasiliev, A.M. Rodriguez, B.V. Safronov).
2. Materials of the "National Memorial" dedicated to the tragedy in Nanjing (http://www.cngongji.cn/russian/index.htm
3. Photo and video materials made by the Japanese in occupied Nanjing (The Nanjing Massacre Project // https://divinity-adhoc.library.yale.edu/Nanking/Photographs.html
4. Chinese and Japanese sources interpreting the events and the number of victims in December 1937 in different ways in Nanjing.
5. English-language studies (Iris Zhang's book "The Rape of Nanjing. The Forgotten Holocaust of the Second World War", 1997).
6. Eyewitness accounts of the events in Nanjing.
7. Materials of a publicistic nature (L. Mlechin's film "The Night of Japanese Soldiers").
8. Feature films (films "Don't cry, Nanjing", 1995, "City of Life and Death", 2009, "Flowers of War", 2011, etc.).

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Hellison's Model of Personal and Social Responsibility in the Educational Context: A Systematic Review

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Abstract
In recent years there has been an increase in violent behaviour among students. Numerous research studies support the power of appropriate pedagogical guidance through Physical Education as a great opportunity to tackle this problem. In this sense, the aim of this study was twofold: 1) To carry out a systematic review to analyse the effects on students of the interventions carried out through Hellison's Personal and Social Responsibility Model in the subject of Physical Education; and 2) To describe and analyse these interventions. For this purpose, the guidelines provided in the PRISMA Declaration were followed and five databases were searched: Web of Science, SPORTDiscus full text, SCOPUS, ERIC and PsycINFO. After multiple screens, a total of 12 reports were included, all of which met the proposed eligibility criteria. The results provided scientific evidence on the successful application of the Hellison's Model, producing positive changes in a multitude of variables, highlighting those related to the satisfaction of Basic Psychological Needs, behavioural patterns, understanding of feelings and the development of educational values in students. In short, the teaching of Physical Education based on the MRPS could have a strong potential to develop more responsible individuals in their daily lives, providing interesting training possibilities for teachers and coaches.

Keywords: values, physical education, pedagogical models, primary education, secondary education.

1. Introduction
Concern about students' violent behaviour in schools has increased in recent years (Medina, Reverte, 2019). Schools are crucial in reducing these disruptive behaviours and promoting pro-social behaviours (López et al., 2012), and the subject of physical education is seen as a great

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opportunity for the promotion of personal and social values and skills (Van der Mars, 2020). However, this educational influence through the subject of Physical Education will depend on the approach with which it is implemented (Bloom, Smith, 1996), since the educational aspect is not connected to the practice of exercise, but to the guidelines given to it, and it is necessary to provide this practice with the corresponding educational nuances (Ruiz et al., 2015). Therefore, the role of the teacher will be crucial, as it is the teacher who decides the pedagogical orientation of the teaching-learning process (Andersson, 2019).

The implementation of intervention programmes in the context of Physical Education, and the analysis of the effects they have on the development of values, as well as personal and social competences in students, has become a topic of growing interest for numerous researchers (Gutiérrez-Marín et al., 2019). Thus, some investigations have focused on the analysis of the effects produced by the application of pedagogical models such as Sport Education (Bessa et al., 2020), Cooperative Learning (Engels, Freund, 2020), the Intercultural Movement Education programme (Grimminger-Seidensticker, Möhwald, 2020), or the Delphi programme (Cecchini et al., 2008). Among these models, Hellison's (1995) Teaching Personal and Social Responsibility (TPSR) stands out, which is considered to be one of the main approaches in the development and promotion of social learning through physical education (Wright, Walsh, 2020), as well one of the aspects related to responsibility and the acquisition of life skills (Hellison et al., 2000). Although it was originally created to promote values through physical activity and sport in young people at risk of exclusion (Hellison, 2011), over the last few years it has been used to promote psychosocial skills such as respect, empathy, self-control, effort and cooperation in different areas (sport, competitive or extracurricular), with students and athletes from different socio-economic and socio-demographic contexts (Carreres-Ponsoda et al., 2021). The main aim of this model is to make young people responsible for their own well-being and that of others, while incorporating strategies to exercise control over their daily lives, so that they can be effective in their social context (Hellison, 2003), trying to transfer these acquired behaviours and attitudes to the context of the home or community, so that they can take control of their lives (Hellison, 2011).

In order to achieve this purpose, the TPSR proposes five levels of responsibility: (1) Respect for the rights and feelings of others; (2) Self-motivation (Participation and effort); (3) Self-direction (Personal autonomy); (4) Empathy and social relations (Helping others and leadership); and (5) Transfer to other social contexts (Hellison, 2011). In some studies carried out with primary school students, the results showed improvements in self-regulation, with a decrease in delinquent behaviour and a greater number of responsible behaviours (Escartí et al., 2010), while increasing self-motivation and respect for one's own feelings and those of others (Pascual et al., 2011). As for Secondary Education, significant improvements were obtained, both in intrinsic motivation and in the self-control area, observing a decrease in anti-sports behaviours during Physical Education classes (Cecchini et al., 2003), fostering values of respect, effort, goal setting and leadership skills (Ward et al., 2012). Furthermore, other interventions found positive changes in the behavioural patterns of the participants, decreasing aggressive and disruptive behaviours (Escartí et al., 2006), developing more socially and personally responsible levels (Wright et al., 2010).

In relation to the systematic reviews performed on the TSPR, the following stand out: Pozo et al. (2018), which included studies prior to 2015; Baptista et al. (2020), who conducted a review of the application of the TSPR in the extracurricular context; and Sánchez-Alcaraz et al. (2020), which focused on the implementation of the TSPR, both in the educational and sports context, although studies prior to 2017 were included. Therefore, as far as we know, no systematic review has been performed on the effects of the implementation of TSPR in the context of physical education in Primary and Secondary Education including research carried out in the last 5 years. Accordingly, the questions guiding the review were the following: Which variables have been the most studied in the implementation of the TPSR; What are the main effects of TSPR on boys and girls in Primary and Secondary Education; What are the main effects of TSPR on boys and girls in Primary and Secondary Education? Thus, the objectives of this research were: 1) To carry out a systematic review to analyse the effects on students of the interventions carried out through Hellison's Personal and Social Responsibility Model in the subject of Physical Education; and 2) To describe and analyse these interventions.

2. Method

For this systematic review, the guidelines of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement (Page et al., 2021) were followed, as well as the corresponding practical guide for systematic reviews with or without meta-analyses (Moher et al., 2015).

Eligibility criteria

The inclusion criteria applied in this study were: a) research articles published in international peer-reviewed journals; b) papers including the implementation of the TPSR-based programme, as well as the analysis of its effect; c) studies carried out in Physical Education classes at the Primary and Secondary Education stages; d) publication date of the studies between 2018 and 2022; e) written in Spanish, English or Portuguese; f) research studies with control and experimental group intervention; g) inclusion of pre-test and post-test measures; h) being an experimental, quasi-experimental study or a randomised controlled trial; and finally, i) reports had to be available in full text. In terms of exclusion criteria, the following were proposed: a) studies based on systematic or literature reviews; b) manuscripts designed as opinion articles, theses, conference proceedings, books or book chapters; c) interventions delivered to students outside the Primary or Secondary Education stages; and, finally, d) articles not available in full text.

Information sources and search strategies

The search was undertaken until May 2022 in the following databases: Web of Science, SPORTDiscus, SCOPUS, ERIC, and PsycINFO. The search phrase was composed of four clearly differentiated blocks: (1) Hellison's Model OR Personal and Social Responsibility; (2) AND Physical Education; (3) AND Primary School OR Secondary School; (4) AND Intervention OR Experimental OR Quasi-experimental OR Randomized Controlled Trial.

Study selection and data extraction process

An analysis of the title and abstract of the manuscripts was executed, after which a total of 8 articles were selected for review. Additionally, after analysis of the reference lists of the selected papers, 29 reports were found and analysed, out of which 4 articles were added to the review. Finally, a total of 12 articles were included for data collection. In order to reduce selection bias, studies were independently reviewed by two researchers. In case of discrepancies, these were resolved in consultation with the third researcher.

Quality assessment

The Standard Quality Assessment Criteria for quantitative and qualitative studies (Kmet et al., 2004) was used to assess the quality of the papers. Two researchers assessed the quality of the studies independently. In case of discrepancies, these were solved in consultation with the third researcher.

3. Results

Selection of studies

A total of 4,094,844 studies were identified in the initial search. Once the filters were applied to each database in relation to the proposed eligibility criteria, a total of 3,707 articles remained for study. Finally, after performing the analysis of the documents, 12 articles were included for review (see Figure 1).

Quality assessment

Item quality scores were expressed as percentages, ranging from 0 to 100 %, varying from .75 to .88 (see Table 1). Inter-rater agreement was calculated using the intra-class correlation coefficient, yielding a score of .671 (p < .05), indicating a substantial degree of agreement (Landis, Koch, 1977). After implementing inter-rater agreement, a conservative cut-off point was agreed upon for the selection of evaluators, including those studies with scores of no less than 75 % (> .75). The overall scores assigned by the first observer ranged from .75 to .88, while those of the second observer ranged from .77 to .83.
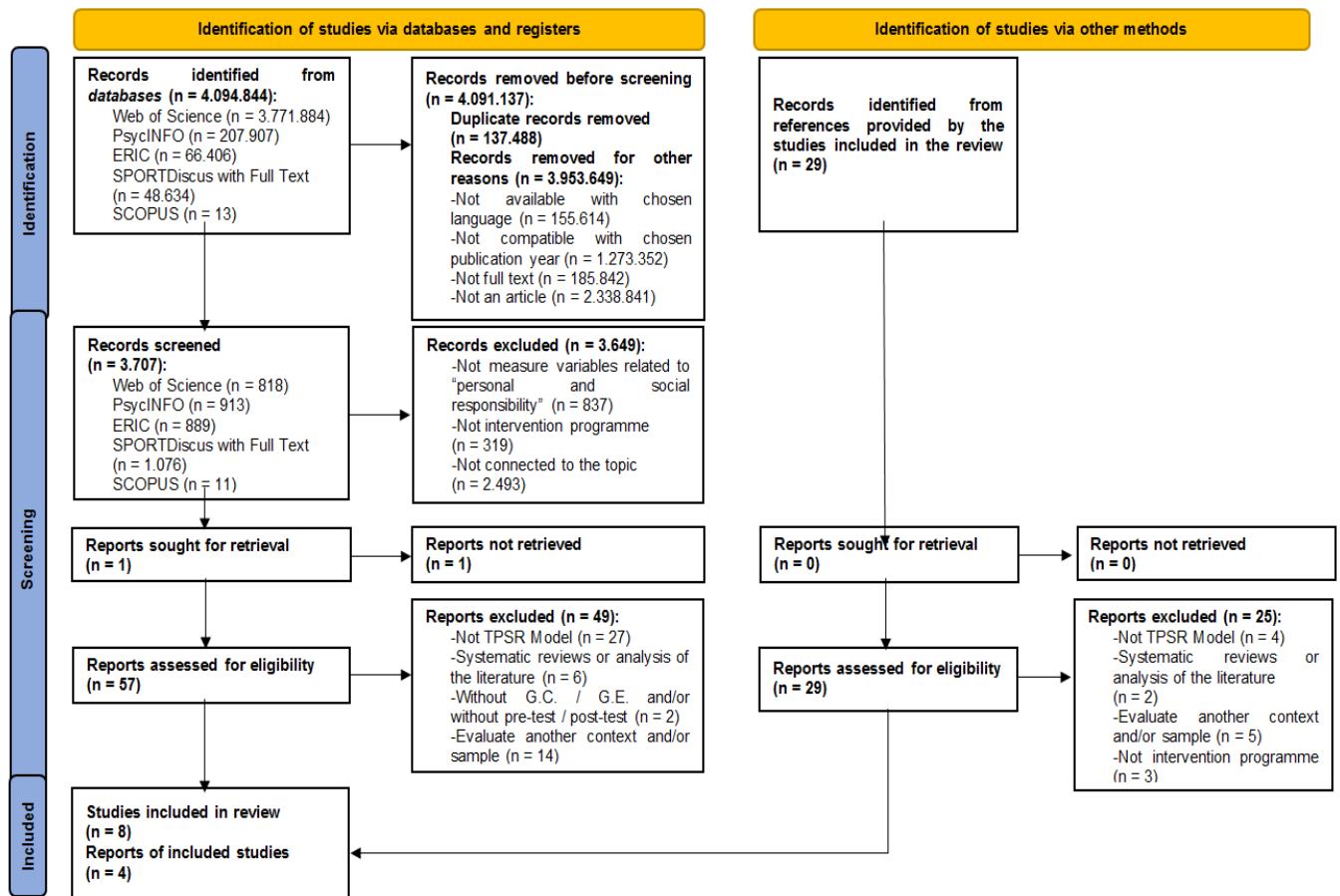
Table 1. Assessment of the studies' quality

Studies	Observer 1	Observer 2
Pozo et al. (2022)	.88	.83
Manzano-Sánchez et al. (2021)	.83	.77
Sánchez-Alcaraz et al. (2021)	.87	.80
García-García et al. (2020)	.79	.77
Merino-Barrero et al. (2020)	.75	.80
Pérez-Ordás et al. (2020)	.85	.79
Manzano-Sánchez, Valero-Valenzuela (2019a)	.83	.80
Manzano-Sánchez et al. (2019)	.83	.77
Manzano-Sánchez, Valero-Valenzuela (2019b)	.81	.77
Prat et al. (2019)	.77	.77
Sánchez-Alcaraz et al. (2019)	.77	.77
Buišić, Dorđić (2018)	.87	.83

Characteristics of the studies
The main characteristics of the selected studies are presented below (see Tables 2 and 3).

Table 2. Characteristics and duration of the study, participants, assessment instruments and intervention protocol

Studies	Country	Study duration	N (Gender) N (CG and EG)	Subjects age	Participant characteristics	Instruments/ Variables	Protocol CG	Protocol EG
Pozo et al. (2022)	Spain	8 months weekly sessions of 55 minutes each A total of 56 sessions	210 (110 girls) (100 boys) CG: 107 (55 Girls; 52 boys) EG: 103 (55 girls; 48 boys)	10-12 years old M = 11.04 SD = .497	Prim. Ed. students with marginalisation and delinquency problems with no previous experience with the TPSR	Empathy variable: Spanish version of the Bryant's Empathy Index (Del Barrio et al., 2004) Emotional intelligence variable: Spanish version of the Trait Meta-Mood Scale (Fernández-Berrocal et al., 2004).	NR	TPSR (Hellison, 1995)
Manzano-Sánchez et al. (2021)	Spain	8 months NR	257 (106 girls) (151 boys) CG: 67 EG (EF): 100	12-16 years old M = 15.28 SD = 3.20	Secondary school students from a low-middle socio-economic background with no previous experience with the TPSR	Personal and Social Responsibility variable: Spanish version of the Personal and Social Responsibility Questionnaire (PSRQ). Variable Basic Psychological Needs: Spanish version of the Psychological Need Satisfaction in Exercise (PNSE) scale Motivation variable: Spanish version of the Échelle de Motivation en Éducation (EME) (Núñez et al., 2005): Variable social behaviours: Spanish version of the Teenage Inventory of Social Skills (TISS) (Inderbitzen and Foster, 1992; Inglés et al., 2003). Perception of violence variable: Spanish version of the Questionnaire on School Violence (CUVE) (Álvarez et al., 2013). Classroom social environment variable: Cuestionario para Evaluar el Clima Social Escolar (CECSE) (Trianes et al., 2006). Resilience variable: Spanish version of the Resilience Scale (RS-14) (Sánchez-Teruel et al., 2015)	NR	TPSR (Hellison, 1978)

	Sánchez-Alcaraz et al. (2021)	García-García et al. (2020)
Country	Spain	Spain
Duration	1 month	5 months
Sessions	2 weekly sessions of 60 minutes each — 8 sessions	2 weekly sessions of 55 minutes each — A total of 29 sessions
Sample	672	57 (25 girls) (32 boys)
	NR	
	CG: 334 EG:338	CG: 31 (15 girls; 16 boys) EG: 26 (10 girls; 16 boys)
Age	13-15 years old ($M \pm SD = 14 \pm 2$ years old)	11-14 years old $M = 11.93$ $SD = .73$
Participants	Secondary school students from schools with middle-level socio-demographic profiles with no previous experience of the TPSR	Primary and secondary school students, with similar socio-demographic profiles. No previous experience with the TPSR
Variables	Violent behaviours variable: Ad hoc instrument designed by Anguera et al. (2012) and validated for the Spanish context by Sánchez-Alcaraz et al. (2018).	Personal and social responsibility variable: (PSRQ) (Escartí et al., 2011). Prosocial and antisocial behaviour variable: (TISS) (Inderbitzen, Foster, 1992; English et al., 2003). Empathy variable: Spanish version of the Interpersonal Reactivity Index (IRI) scale (Pérez-Albéniz et al., 2003). School violence variable: Spanish version of the California School Climate and Safety Survey (CSCSS) (Fernández-Baena et al., 2011). Physical activity level perception variable: Spanish version of the Physician-based Assessment and Counselling for Exercise (PACE) (Martínez-Gómez et al., 2009).
Control group	Teacher's usual methodology	Traditional teaching, using the teaching technique: Direct Instruction
Experimental group	TPSR (Hellison, 2011)	TPSR (Hellison, 1978; 2003; 2011)

	Pérez-Ordás et al. (2020)	Merino-Barrero et al. (2020)
Country	Spain	Spain
Duration	8 months	5 months
Sessions	2 weekly sessions of 55 minutes each	2 weekly sessions of 55 minutes each
	A total of 56 sessions	A total of 29 sessions
Sample	210 (110 girls) (100 boys)	72 (34 girls) (38 boys)
Groups	CG: 107 (55 girls; 52 boys) EG: 103 (55 girls; 48 boys)	Prim. Ed.: 40 Sec. Ed.: 32
Age	10-12 years old	11-13 years old
	M= 11.04 SD = .497	M= 12.05 SD = 1.12
Participants	Prim. Ed. students with marginalisation and delinquency problems (112 from upper-middle socio-economic backgrounds; 98 from lower-middle socio-economic backgrounds) with no previous experience of the TPSR	Primary and secondary school students, with intermediate socio-demographic profiles and no previous experience with the TPSR.
Variables	Physical and verbal aggression variable: Spanish version of the Physical and Verbal Aggression Scale (Del Barrio et al., 2001). Social responsibility behaviours variable: Video recording of two sessions following the instructions of Escartí et al. (2006) and a recording sheet.	Personal and social responsibility variable: (PSRQ) (Escartí et al., 2011). Variable Basic Psychological Needs: Spanish version for school contexts of the Basic Psychological Needs in Exercise Scale (Moreno-Murcia et al., 2008). Motivation variable: Motivation Questionnaire for Physical Education (Sánchez-Oliva et al., 2012). Sportspersonship variable: Spanish version of the Multidimensional Sportspersonship Orientation Scale (MSOS) (Martín-Albo et al., 2006). Intention to be physically active variable: Spanish version of the Intention to be Physically Active Scale (IPAS) (Moreno-Murcia et al., 2007). Physical and verbal aggression variable: Spanish version of the Physical and Verbal Aggression Scale (Del Barrio et al., 2001). Social responsibility behaviours variable: Video recording of two sessions following the instructions of Escartí et al. (2006) and a recording sheet.
Teaching	Teacher's usual methodology	Teaching technique: Direct instruction
Model	TPSR (Hellison, 1995)	TPSR (Hellison, 2011)

	Manzano-Sánchez, Valero-Valenzuela (2019b)	Manzano-Sánchez et al. (2019)	Manzano-Sánchez, Valero-Valenzuela (2019a)
	Spain	Spain	Spain
	7 months	8 months	4 months
	NR	NR	NR
	272 (139 girls)(133 boys)	85 (45 girls)(40 boys)	25 (11 girls)(14 boys)
	Prim. Ed.: 207 Sec. Ed.: 65	CG: 50 (28 girls; 22 boys) EG: 35 (17 girls; 18 boys)	CG: 11 (2 girls; 9 boys) EG: 14 (9 girls; 5 boys)
	9-14 years old	14-18 years old	9-11 years old
	M=11.13 SD = 1.78	M=16.22 SD = .41	M= 9.96 SD = .84
	Primary and secondary school students, from two public schools with a similar average socio-economic level.	Secondary school students with similar socio-demographic profiles with no previous experience with the TPSR	Prim. Ed. students with similar socio-demographic and socio-cultural characteristics
	No previous experience with the TPSR		No previous experience with the TPSR
	Personal and social responsibility variable: (PSRQ) (Escartí et al., 2011). Basic Psychological Needs variable: (PNSE) (Moreno-Murcia et al., 2008). Motivation variable: Spanish version of the Motivation Toward Education Scale (TISS) (Inderbitzen, Foter, 1992; Núñez et al., 2005). Social behaviours variable: (TISS) (Inderbitzen, Foter, 1992; Inglés et al., 2003). Perception of violence variable: (CUVE) (Álvarez et al., 2013). Classroom social climate variable: (CECSE) (Trianes et a., 2006)	Motivation variable: Motivation in Physical Education Questionnaire (CMEF) (Sánchez-Oliva et al., 2012). Personal and social responsibility variable: (PSRQ) (Escartí et al., 2011). Basic Psychological Needs variable: (PNSE) (Moreno-Murcia et al., 2008). Intention to be physically active variable: (IPAS) (Moreno-Murcia et al., 2007). Satisfaction with life variable: Spanish version of the Satisfaction with Life Scale (Atienza et al., 2003)	Personal and social responsibility variable: (PSRQ) (Escartí et al., 2011). Variable Basic Psychological Needs: Subscale referring to autonomy (PNSE) (Moreno-Murcia et al., 2011). Motivation variable: (EME) (Núñez et al., 2005). Self-concept variable: Self-Concept Questionnaire (AF5) validated for the Spanish context by García and Musitu (1999). Classroom social climate variable: Cuestionario de Evaluación del Clima Social en el Aula (Pérez et al., 2009). Educational values variable: Semi-structured interview based on Patton's slogans (2002)
	Teaching technique: Direct instruction	NR	NR
	TPSR (Hellison, 2011)	TPSR (Hellison, 2011)	TPSR (Hellison, 2011)

	Prat et al. (2019)	Sánchez-Alcaraz et al. (2019) *Study no. 2	Bušić, Đorđić (2018)
Country	Spain	Spain	Serbia
Duration / sessions	3 months; NR	4 months; 2 weekly sessions of 60 minutes each; A total of 32 sessions	2 months; 3 weekly sessions of 45 minutes each; A total of 24 sessions
N	44 (21 girls)(23 boys)	563 (240 girls)(323 boys)	100 (46 girls; 54 boys)
CG / EG	CG: 22; EG: 22	NR	CG: 55 (23 girls; 32 boys); EG: 45 (23 girls; 22 boys)
Age	14-15 years old	12-15 years old.	8-10 years old
M / SD	M=13.95 SD =1.08	M= 13.73 SD = 1.83	NR
Sample	Secondary school students in the third year of a public secondary school in the province of Lleida (Spain)	Primary Ed. students (6th grade) and Secondary Ed. students (3rd grade) from Spanish public schools.	Prim. Ed. students from two schools in the city of Sombor (Serbia)
	NR	NR	NR
Variables / instruments	Basic Psychological Needs variable: Spanish version for school contexts of the Basic Psychological Needs in Exercise Scale (BPNES) (Moreno-Murcia et al., 2008). Self-determined motivation variable: (CMEF) (Sánchez-Oliva et al., 2012). Sportspersonship variable: (MSOS) (Martín-Albo et al., 2006). Intention to be physically active variable: (IPAS) (Moreno-Murcia et al., 2007). Lifestyle variable: Corto Krece Plus Test (Serra et al., 2003).	Personal and social responsibility variable: Spanish version of the Personal and Social Responsibility Questionnaire (PSQR) (Escartí et al., 2011). Sportspersonship variable: (MSOS) (Martín-Albo et al., 2006). School violence variable: (CSCSS) (Fernández-Baena et al., 2011)	Personal and Social Responsibility Variable: (PSQR) (Li et al., 2008) Motivational orientations: Self-Regulation Questionnaire (Ryan, Connell, 1989; Goudas et al., 1994). Athletic competence, social acceptance and behavioural patterns variable: Subscales of the Self-Perception Profile for Children (SPPC) (Harter, 1985a). Peer support variable: Support Scale for Children (Harter, 1985b) Motor skills variable: Observation and completion of a rubric.
Control methodology	Traditional style, using the technique of direct instruction teaching.	Teacher's usual methodology	Teacher's usual methodology
Intervention	TPSR (Hellison, 1985; Hellison, 2003)	TPSR (Hellison, 2011)	TPSR (Hellison, 2003)

N: Sample size; M: Mean; SD: Standard deviation; Prim. Ed.: Primary Education; Sec. Ed.: Secondary Education; PE: Physical Education; CG: Control Group; EG: Experimental Group; TPSR: Teaching Personal and Social Responsibility; NR: Not reported.

Table 3. Objective, design, intervention programme and main research results

Studies	Studies' purpose	Design	Intervention programme		Main results
			Control G.	Experimental G.	
Pozo et al. (2022)	The aim of the study was twofold: (1) to research the effects of a TPSR-based programme on empathy and perceived emotional intelligence in PE; and (2) to compare the results obtained among primary school children from medium-low and medium-high socio-economic backgrounds.	Quasi-experimental, with pre-test and post-test measures (2 CG/2 GE). Quantitative analysis of intervention data	NR	The TPSR adapted to the context of the participants was implemented following the guidelines of Escartí et al. (2005) and Marín (2011). Each session followed this structure: (1) Awareness talk: Reminder about the levels of responsibility and goals proposed in the session; (2) Responsibility in action: Strategies were taught for the development of responsibility; (3) Reflection time: Teacher and students shared perceptions about the session; and (4) Self-assessment: Learners self-evaluated their responsibility development within the session. The strategies used in the programme to develop	The intervention was more effective in participants' understanding of feelings in the medium-high background group. Improvements were found in the factors of feelings of sadness, emotional intelligence, attention and repair in the lower-middle background group, compared to the upper-middle background group. The TPSR was particularly useful for improving emotional intelligence in more vulnerable socio-economic contexts.

				accountability were based on Wright and Craig (2011).	
Manzano-Sánchez et al. (2021)	To implement the TPSR to assess its impact on psychological and contextual variables in Secondary School students, comparing the differences between a EG applying it to several subjects other than PE, another EG applying it exclusively to PE, and a CG.	Quasi-experimental, with pre-test and post-test measures (1 CG/1 GE). Quantitative analysis of intervention data	NR	Each delivered session followed the format proposed by Hellison (1978), although it was modified by combining the fourth and fifth parts. At the end of each session, teacher and students shared perceptions of the session, and students self-evaluated their responsibility developed within the session. In the sessions delivered, different tasks were designed to develop the levels of responsibility, following the guidelines of Manzano-Sánchez et al.)	Improvements were found in the variables of self-determination, classroom social climate and prosocial behaviours of students belonging to the EG. These changes were more significant in the female gender
Sánchez-Alcaraz et al. (2021)	To implement a programme in PE classes based on the Teaching of Personal and Social Responsibility (TPSR), to investigate the effects on disruptive behaviour in secondary school students.	Quasi-experimental, with pre-test and post-test measures (1 CG/1 EG). Quantitative analysis of intervention data	The teacher's usual methodology was followed, structuring the session in three parts: (1) Warm-up; (2) Physical activity lesson; (3) Relaxation.	The TPSR was implemented. Each session delivered followed a five-part format, proposed by Hellison (2011): (1) Relational time: Teacher-student interaction for bonding during the sessions; (2) Awareness talks: Objectives and values to be developed in the session are presented; (3) Physical activity plan: Strategies for the development of student responsibility are carried out; (4) Group meeting: At the end of each session teacher and students shared insights about the session; and (5) Reflection/self-evaluation: Students self-evaluated their responsibility developed within the session.	A decrease in violent behaviours (physical aggression, verbal aggression and disruptive behaviours) developed in the EG after the intervention. The implementation of the TPSR was effective for improving school coexistence, decreasing violent behaviours (physical and verbal aggression) and undisciplined behaviours (classes with continuous interruptions) in adolescents.
García-García et al. (2020)	To analyse, in a Teaching personal and social responsibility programme (TPSR), the perceptions of students and their families in relation to responsibility, pro-social behaviour, empathy, perception of violence and levels of physical activity.	Quasi-experimental, with pre-test and post-test measures (1 CG/1 EG). Quantitative analysis of intervention data	The traditional teaching methodology was followed. The session was structured in three parts: (1) Warm-up: Joint mobility exercises; (2) Main part: Technical exercises; (3) and Relaxation: Stretching	The TPSR was implemented. Each session delivered followed the format proposed by Hellison (1978; 2003; 2011), although it was modified, by combining the fourth and fifth parts in the same session.	Positive effects were found in the variables of personal responsibility, as well as a positive trend in the perception of the levels of physical activity performed, both in the CG and the EG. However, on the other hand, increases in antisocial behaviour and perception of violence were found in both groups (CG and EG), showing contradictory results.
Merino-Barrero et al. (2020)	The objective of the study was twofold: (1) to assess the impact of a teaching programme for personal and social responsibility in PE classes; and (2) to extend the study of the TPSR, assessing its effects on responsibility, motivation, satisfaction of Basic Psychological Needs, sportspersonship and intention to be physically active outside school, in Primary and Secondary School students.	Quasi-experimental, with pre-test and post-test measures (1 CG/1 EG). Quantitative analysis of intervention data	The direct instruction teaching technique based on Rosenshine's (1983) and Metzler's (2011) instructions was implemented. The students were not allowed to make decisions and the teacher kept full control of the class.	The TPSR was conducted with five levels of responsibility (Escartí et al., 2012). Each session delivered followed the following format (Hellison, 2011): For the implementation of the programme, general and specific strategies were undertaken, as well as strategies for resolving conflicts, both individual and collective (Escartí et al., 2013).	Significant improvements developed in EG participants in terms of personal and social responsibility, self-determined motivation, satisfaction of Basic Psychological Needs (competence, autonomy and social relationships), sportspersonship and intention to be physically active outside school. The TPSR was especially useful for the improvement of self-determined motivation and the generation of positive psychosocial behaviours.
Pérez-Ordás et al. (2020)	The objective of the study was twofold: (1) to research the results of a TPSR-based programme on the variables of aggression and social responsibility; and (2) to compare the effects produced by this model in primary schoolchildren from medium-low and medium-high socio-economic backgrounds.	Quasi-experimental, with pre-test and post-test measures (2 CG/2 EG). Quantitative analysis of intervention data	The teacher's usual methodology was followed	Each session delivered followed this structure: (1) Awareness talk: Reminder about the levels of responsibility and aims proposed in the session; (2) Responsibility in action: Strategies were taught for the development of responsibility; (3) Reflection time: Teacher and students shared perceptions about the session; and (4) Self-evaluation: Students self-evaluated their responsibility developed within the session.	Significant improvements were found in the variables of physical and verbal aggression, with a greater decrease in the female gender of the EG belonging to the medium-low socioeconomic context. On the other hand, social responsibility behaviours improved in both socioeconomic contexts (lower-middle and upper-middle). TPSR was effective when it came to improving

					aggressive and prosocial behaviours in Primary Ed. students from low-performing schools.
Manzano-Sánchez, Valero-Valenzuela (2019a)	To apply the TPSR to a group of 4th year Primary Ed. students, in order to assess its effects on responsibility, autonomy, motivation, self-concept and classroom social climate, as well as to test its potential for application in other subjects, in addition to PE.	Quasi-experimental, with pre-test and post-test measures (1 CG/1 EG). Mixed Method (qualitative and quantitative analysis)	NR	The TPSR was implemented. Each delivered session followed the format proposed by Hellison (2011), although it was modified by combining the fourth and fifth parts. At the end of each session, teacher and students shared perceptions of the session, and students self-evaluated their responsibility developed within that session. For the implementation of the programme, general and specific strategies were implemented, as well as strategies for resolving conflicts, both individual and collective (Escartí et al., 2013).	Improvements were found for the EG in the variables of autonomy, social responsibility, intrinsic and introjected motivation, self-concept and classroom social climate. However, no significant changes were observed in the personal responsibility variable.
Manzano-Sánchez et al. (2019)	To analyse the implementation of the TPSR in Secondary School students, in order to assess its effects on responsibility, Basic Psychological Needs, motivation, life satisfaction and intention to be physically active, as well as to test its differences based on gender.	Quasi-experimental, with pre-test and post-test measures (1 CG/1 EG). Quantitative analysis of intervention data	NR	The TPSR was conducted following Hellison's (2011) guidelines. For the implementation of the programme, general and specific strategies were carried out, as well as strategies for resolving conflicts, both individual and collective (Escartí et al., 2013).	Improvements were found in all variables, being more significant in the female gender, where higher levels of personal and social responsibility, development of Basic Psychological Needs (BPN) and intrinsic motivation in PE classes were observed.
Manzano-Sánchez, Valero-Valenzuela (2019b)	Implement a programme based on the TPSR in Primary and Secondary Education, to analyse the effects on responsibility, satisfaction of the BPN, motivation, pro-social behaviour, violence and classroom climate, and to compare its application with other subjects.	Quasi-experimental, with pre-test and post-test measures (1 CG/1 EG). Quantitative analysis of intervention data	The teaching technique of direct instruction was applied, where everything was organised and decided by the teacher, making the teacher the centre of the learning process, keeping full control over the class at all times.	The TPSR was used. Each session delivered followed the format proposed by Hellison (2011), although it was modified by combining the fourth and fifth parts. After each session the teacher and students shared perceptions of the session, and the students self-assessed their responsibility developed within that session.	Improvements were found for the EG in the variables of personal and social responsibility, self-determined motivation and satisfaction of the BPNs. In addition, there was a positive trend towards prosocial behaviours, classroom climate, as well as a decrease in antisocial behaviours.
Prat et al. (2019)	To analyse an implementation of the TPSR in the field of PE in order to show the impact it has on classroom dynamics, physical activity levels and lifestyle in secondary school students.	Quasi-experimental, with pre-test and post-test measures (1 CG/1 EG). Quantitative analysis of intervention data	The teaching technique of direct instruction (homework assignment) was used. Everything was organised and controlled by the teacher, leaving little participation to the students in the development of the session.	The TPSR was implemented. Each session followed the format proposed by Hellison (2003). For the implementation of the programme, strategies were carried out for the development of affective relationships and social competences, the opportunity to make decisions and the possibility of transferring these attitudes to the everyday context (Tarín-Moreno et al., 2013).	Significant improvements were observed in terms of participation in the PE classes of the students belonging to the EG, leading to a development of their BPN, levels of sportspersonship in free time, intention to be physically active, motivation towards PE, as well as an increase in their levels of active lifestyle.
Sánchez-Alcaraz et al. (2019) *Study no. 2	To apply the TPSR in PE classes, to students in primary and secondary education, in order to determine the changes produced in terms of the acquisition of personal and social responsibility, levels of sportspersonship and school violence.	Quasi-experimental, (Montero and León, 2007), with pre-test and post-test measures (2 CG in Prim. Ed./2 EG in Second. Ed.) Quantitative analysis of intervention data	The teacher's usual methodology was followed. The sessions followed the classic format: (1) Warm-up; (2) Main part; and (3) Cool down.	The TPSR was conducted with five levels of responsibility (Hellison, 2011), being level 5 (transfer to other social contexts) involved from the beginning throughout the programme. General and specific strategies (Hellison, 2011), as well as strategies aimed at resolving conflicts, both individual and collective, were carried out for the implementation of the programme.	Improvements were found for the EG in the variables of personal and social responsibility, commitment to sports participation, concern and respect, both for the established rules and for their teammates and opponents in the game, predicting positively sportspersonship and negatively violent behaviour in the students.
Buišić, Dordić (2018)	To analyse the effectiveness of the TPSR in the context of PE, specifically in the Primary Education stage, in order to verify its influence on students' personal and social responsibility, motivational	Quasi-experimental, with pre-test and post-test measures (1 CG/1 EG). Quantitative	The teacher's usual methodology was followed. The sessions did not encourage	The TPSR was implemented. The programme followed the format proposed by Hellison (2003), although it was modified by maintaining four of its five levels of responsibility: (1) Self-monitoring; (2) Effort; (3) Self-regulation; and	Significant improvements in the EG were found in line with the variables of effort and progress, control of one's own behaviour, mutual respect and setting individual achievement

orientations, self-assessment of sport competences, social competence and behavioural control, peer support, as well as on the acquisition of motor skills.	analysis of intervention data	students to behave responsibly, nor did they implement strategies to develop personal and social responsibility in students.	(4) Support. Each session was structured as follows: (1) Beginning with an introductory assembly, setting the objectives for the session; and (2) Closing the session with a group meeting/self-evaluation, where perceptions of the session were shared, and students self-evaluated their responsibility developed within the session. To implement the programme, specific teaching strategies were used (Hellison and Walsh, 2002).	goals, producing most outstanding improvements in motor learning mastery, responsibility and self-determined motivation.

Prim. Ed.: Primary Education; Sec. Ed.: Secondary Education; PE: Physical Education; CG: Control Group; EG: Experimental Group; TPSR: Teaching Personal and Social Responsibility; BPN: Basic Psychological Needs; NR: Not reported.

4. Discussion

The objectives of this study were: 1) To conduct a systematic review to analyse the effects on students of interventions using Hellison's Personal and Social Responsibility Model in Physical Education; and 2) To describe and analyse, in turn, these interventions.

In terms of the context of application of the investigations, all the studies were conducted within the subject of Physical Education, at the Primary and Secondary Education stages. The studies in Primary Education (6-12 years old) amounted to a total of 4/12 studies (Buišić, Dordić, 2018; Manzano-Sánchez, Valero-Valenzuela, 2019a; Pérez-Ordás et al., 2020; Pozo et al., 2022), as did those carried out in Secondary schools (12-16 years old) (Manzano-Sánchez et al., 2019; Prat et al., 2019; Manzano-Sánchez et al., 2021; Sánchez-Alcaraz et al., 2021). The same number of studies (4/12) were performed in both educational stages (Manzano-Sánchez, Valero-Valenzuela, 2019b; Sánchez-Alcaraz et al., 2019; García-García et al., 2020; Merino-Barrero et al., 2020; García-García et al., 2021; Prat et al., 2021; Prat et al., 2021).

Regarding the instruments used in the different research studies, for those which conducted a quantitative analysis of the data, the use of questionnaires and scales based on values of responsibility and behavioural patterns was most common (11/12), with the Spanish version of the Personal and Social Responsibility Questionnaire (PSRQ) (Escartí et al., 2011) being the most widely used instrument to measure these variables, adapted to the educational sphere. It should also be noted that other instruments were used to measure different variables. Some of them were: (1) Satisfaction of the BPN, being the Spanish version of the Psychological Need Satisfaction in Exercise (PNSE) scale, validated in the educational context by Moreno-Murcia et al. (2011), the most widely used for this purpose; (2) Sportspersonship, using the Spanish version of the Multidimensional Sportspersonship Orientation Scale (MSOS) (Martín-Albo et al., 2006); (3) Intention to be physically active, through the Spanish version of the Intention to be Physically Active Scale (IPAS) (Moreno-Murcia et al., 2007); and (4) Quality of life, through the Spanish version of the Satisfaction with Life Scale (Atienza et al., 2003).

According to the intervention protocol followed in the different control groups, a total of 4/12 studies used traditional teaching, based on the direct instruction teaching technique (Prat et al., 2019; García-García et al., 2020; Manzano-Sánchez, Valero-Valenzuela, 2019b; Merino-Barrero et al., 2020). In addition to using direct instruction, in other research studies (4/12) the teacher's usual methodology was applied (Buišić, Dordić, 2018; Pérez-Ordás et al., 2020; Sánchez-Alcaraz et al., 2019; Sánchez-Alcaraz et al., 2021). On the other hand, 4/12 studies did not report information on the intervention programme followed by the control group of their research (Manzano-Sánchez, Valero-Valenzuela, 2019a; Manzano-Sánchez et al., 2019; Manzano-Sánchez et al., 2021; Pozo et al., 2022). Regarding the methodology used in the experimental groups, all the studies used a teaching based on the TPSR, however, some research (3/12) implemented this model following the original structure of the session proposed by Hellison (2011) divided into parts, while in other interventions (9/12) parts (4) and (5) were combined (Buišić, Dordić, 2018; Manzano-Sánchez, Valero-Valenzuela, 2019a; Manzano-Sánchez, Valero-Valenzuela, 2019b; Prat et al., 2019; Sánchez-Alcaraz et al., 2019; García-García et al., 2020; Pérez-Ordás et al., 2020; Manzano-Sánchez et al., 2021; Pozo et al., 2022; Manzano-Sánchez et al., 2022).

Taking into account the results obtained in the different investigations, it was found that the implementation of the TPSR produced improvements in four main aspects: (1) Behaviour; (2) Emotions; (3) Psychological variables; and (4) Development of values.

Firstly, with regard to behavioural patterns, the studies carried out by Pérez-Ordás et al. (2020) and Manzano-Sánchez et al. (2021), who obtained positive changes corresponding to behavioural patterns, which were more significant in the female gender, stand out. In contrast to these data, the intervention by Sánchez-Alcaraz et al. (2013) achieved higher levels of personal and social responsibility in students in the experimental group, although these were significant in the male gender in both educational stages. Similar results were drawn from the studies by Jung and Wright (2012) in adolescent students at risk of exclusion, although no differences by gender were established, positive improvements were found in terms of the development of personal and social responsibility behaviours, thus decreasing different undisciplined behaviours. On the other hand, in the research carried out by Sánchez-Alcaraz et al. (2021), in addition to obtaining a decrease in aggressive and disruptive behaviours after teaching the sessions based on the TPSR, respect and empathy were fostered, thus improving the school coexistence of the students participating in school. In line with these results were the findings of the research carried out by Gordon (2010), Buckle and Walsh (2013), and Manzano-Sánchez et al. (2020). Nevertheless, the study conducted by García-García et al. (2020), offered contradictory results as an increase in antisocial and violent behaviours was perceived in both the control group and the experimental group.

Secondly, concerning the findings on emotional variables, Pozo et al. (2022) compared two schools from different socio-economic backgrounds (lower-middle and upper-middle). The results indicated positive improvements related to the understanding of feelings, being more significant in the experimental groups belonging to the medium-high context. Nonetheless, they found significant improvements in emotional intelligence variables in the experimental groups belonging to the most vulnerable contexts. These results are in line with those reported by Balderson and Sharpe (2005), who found a development in the levels of social values, positive emotional and social behaviour in students, and improvements in conflict resolution during the lessons taught.

Thirdly, regarding the results related to psychological variables, Prat et al. (2019) and Merino-Barrero et al. (2020) found significant improvements in students in the experimental group in terms of levels of personal and social responsibility, self-determined motivation and the satisfaction of BPN, as well as the intention to be physically active outside the school context, which is consistent with the findings of Hayden et al. (2012). Nevertheless, Manzano-Sánchez and Valero-Valenzuela (2019a) found positive changes in all of the variables named above, except for levels of personal responsibility. Furthermore, in the research conducted by Manzano-Sánchez and Valero-Valenzuela (2019b), there was an increase in integration, empathy and classroom social climate in the students belonging to the experimental group, with these results standing out more positively in the female gender (Manzano-Sánchez et al., 2019). In contrast, Martínez and Gómez-Mármol (2017) obtained more favourable results for the male gender, although no significant differences were detected in terms of the variables of social responsibility, fun and participation. Buišić and Dordić (2018) meanwhile found significant improvements in the experimental group, related to the variables of effort and progress, behavioural self-control, mutual respect and the establishment of achievement goals, with the most important improvements developing in the variables of motor learning mastery, responsibility and self-determined motivation. These data are consistent with those found by Balderson and Martín (2011).

Finally, regarding the results obtained in the variables corresponding to values education, Sánchez-Alcaraz et al. (2019) reported positive changes in the development of educational values, such as commitment, concern and respect, both for the established rules and for their classmates, positively predicting sportspersonship and negatively predicting violent behaviour in the students belonging to the experimental group. These data are in line with those obtained in other studies such as those of Cecchini et al. (2007).

In general, it was observed that there were no significant differences in the variables studied in relation to the educational stage. However, the results seem to be more favourable and to be developed to a greater extent in Primary School students, which is consistent with the findings of Sánchez-Alcaraz et al. (2014).

The results obtained in this systematic review should be treated cautiously, due to the existence of some limitations which should be taken into account. Firstly, although most of the studies reported positive improvements in students, there was a certain lack of unanimity, as some

of them presented contradictory data (Manzano-Sánchez, Valero-Valenzuela, 2019a; García-García et al., 2020). One reason for this might be the inclusion of few longitudinal studies in which long-term implementation is carried out (Hellison, Walsh, 2002). On the other hand, most of the research studies included in this review were conducted in Spain, and the studies assessed a wide variety of variables, with disparate objectives and results, making it difficult to compare the findings drawn from them. Future lines of research could focus on the implementation of the TPSR and analyse its transfer to other contexts such as Early Childhood Education. The analysis of the implementation process of TPSR-based programmes could also be addressed. Additionally, future studies could examine the effectiveness of the Model after a period of time, in order to analyse the maintenance of the effects in the medium/long term.

5. Conclusion

In order to answer the questions raised at the beginning of the manuscript, one should underline that the studies implementing the TPSR analyse variables such as personal and social responsibility, satisfaction with the BPN, followed by those variables measuring levels of sportspersonship and intention to be physically active. Emotional intelligence, lifestyle, resilience and classroom social climate are also studied, but to a lesser extent. On the other hand, the results of the interventions reveal that Hellison's TPSR produces, both in Primary and Secondary students, positive changes in terms of behavioural and psychological variables, understanding of one's own and others' feelings, as well as a high development of educational values in the person, such as empathy, effort or cooperation, in addition to other aspects related to self-control, self-esteem, autonomy and leadership goals. Likewise, this model can become a reference for the promotion and encouragement of fair play or sportspersonship, as improvements are obtained in terms of respect, both for the rules of the game and for their own teammates and opponents. Moreover, these improvements are developed in a more significant way in students belonging to the Primary Education stage.

These findings, although cautiously, in view of the need for further research, may be useful for both teachers and coaches when creating school environments where the development of responsibility and respect, as well as positive behaviours and values in students is a priority.

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Assessing the Competence of Early Childhood Education Students at Teacher Education Universities in Vietnam in Terms of Implementing STEAM Education

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Abstract

The article explores the competence of students majoring in early childhood education at teacher education universities in Vietnam in terms of implementing STEAM education based on self-assessment. The results of a survey of early childhood education students in their third and fourth (final) years at three universities in different provinces/cities of Vietnam show that students rated themselves as meeting all or most of the requirements of STEAM education for children. The students did not rate themselves as unsatisfactory or slightly satisfactory in any aspect. In terms of the specific aspects of competence, the students rated themselves as meeting all of the requirements for content related to the "professional qualities and ethics expressed in the organization of STEAM education" and rated themselves as meeting the majority of the requirements for items related to "knowledge and skills for organizing STEAM education for children," which had the lowest mean scores. Therefore, universities and other stakeholders need to promote the effectiveness of the training they provide to enable such students to further develop their competence in STEAM education for preschool children, especially in terms of knowledge and skills in organizing STEAM educational activities for children. Differences in the competence levels of students from different universities also require further attention.

Keywords: STEAM education, early childhood education students, Vietnamese teacher education, competences, training programs.

1. Introduction

STEAM originated as an innovative idea at the Rhode Island School of Design in the United States. It was then employed by many educators, gradually spreading to other educational organizations in the United States and other countries. It is a new approach to education, in which

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science, technology, engineering, mathematics and the arts are used to teach and guide students (Nguyen, 2020). According to Kim and Chae (2016), in this era of globalization, future scientists need to possess both a firm foundation in STEM education and possess creative problem-solving and professional skills, which are advanced through an education in the arts. A report from the US Bureau of Labor Statistics in 2021 predicted that STEM- and STEAM-related occupations would grow 8.8 % between then and 2028. It also stated that the median annual salary for STEM/STEAM jobs was $ 84,880, compared with $ 37,020 for other occupations (The New Tenth Foundation, 2021).

In general, STEAM can be described as "a developing educational model of how the traditional academic subjects (silos) of Science, Technology, Engineering, Arts, and Mathematics can be structured into a framework by which to plan integrative curricula. STEAM: Science and Technology, interpreted through Engineering and the Arts, all based in a language of Mathematics" *(*Yakman, 2008). Nguyen and Ta (2021) add, "Over time, the original term Arts was gradually expanded into the term Arts Liberal. The liberal arts element emphasizes creative activities and freedom of thought expressed through art forms, language, music, philosophy, physical movement, etc. in the process students apply a combination of knowledge, skills and techniques to solve practical and meaningful problems for themselves and the community" (p. 312). According to Land (2013) and Madden et al. (2013), STEAM is not simply about "adding" an artistic element to an equation or using an artistic element (design) in a lesson. It is about finding connections between the arts and STEM content and then teaching and evaluating this content in schools.

The STEM/STEAM debate is profoundly significant in shaping education and fraught with difficulties. According to advocates of STEAM, STEM students should appreciate and understand the aesthetics associated with a good product. They have to admit that what they design must be friendly and attractive because what begins as a rudimentary technical product must eventually be experienced and felt by the user. Many technology designers have been plagued by this problem – they design a product but it is not adopted by users, so it dies. From this perspective, art is an important element of the dialogue between STEM and STEAM. Without the creativity and freedom of the arts, STEM would not exist. The arts help students become well-rounded citizens of the twenty-first century who are open to learning; they provide an opportunity for students to broaden their horizons and express themselves in a particular field. In other words, the arts have an undeniably important role in STEM education (Tran, Le, 2019).

Research by educational scientists in the United States, Australia, India, and other countries show that the ideal age to start applying STEAM education is in preschool (Chesloff, 2013; Colker, Simon, 2014). STEAM education is appropriate for the learning features and characteristics of preschoolers, who love to ask questions and explore (DeJarnette, 2018; Nguyen, Dao, 2022; Sharapan, 2012). In Vietnam, according to the Ministry of Education and Training's Circular No. 32/2018/TT-BGDDT, dated December 26, 2018, STEAM is now included in the main curriculum of general education. The 2018 New General Education Curriculum also indicated a switch from a content-based to a competency-based approach, which is suitable for STEAM education. The process of integrating knowledge from separate subjects builds students' competence, which can also help them to work in the modern technology-driven world (Dang, 2020; Nguyen et al., 2022).

In order to implement this circular and related policies from the state, the Department of Education and Training has implemented guidelines on STEAM education in many provinces and cities in Vietnam. The Early Childhood Education Curriculum promulgated by the Ministry of Education and Training is a framework that allows preschools to develop and adjust their curricula in accordance with actual conditions. Curriculum development and implementation can be achieved through a variety of approaches. Integrating STEAM in the Early Childhood Education Curriculum not only ensures that a school's curriculum can meet the requirements of the Early Childhood Education Curriculum promulgated by the Ministry of Education and Training but also allows children to develop skills, qualities, and competencies suitable for the 2018 New General Education Curriculum. This creates a solid educational foundation for them and builds their confidence and readiness in the transition period from preschool to primary school (Pham, Vu, 2020).

In general, STEAM in early childhood education is being implemented by educators as well as preschools as a new educational approach to help preschool children practice, explore, and experience different things and develop into well-rounded individuals. This approach also matches the psychological characteristics of children. STEAM education provides a firm foundation for children transitioning to another level of education.

Although many debates about STEAM education have emerged in academia, research on STEAM education in preschools is limited. According to Brophy, Klein, Portsmore, and Rogers (2008), who believe that early childhood STEAM receives little attention, this lack of focus is unfortunate because young children are born with attributes that help them develop as scientists and engineers but require suitable education to become apparent. Similarly, DeJarnette (2018) reveals that there has been an increase in the positive and self-empowering tendencies of preschool teachers in terms of implementing STEAM education for their learners; however, the rate of implementation is still limited.

In Vietnam, the situation is no different. STEM/STEAM education is widely mentioned in research on general education, from the primary school to the high school level, yet studies concerning STEAM education in early childhood education are still lacking (Ho et al., 2020; Bui et al., 2022). Besides, most current research on STEAM education for preschools in Vietnam is about the organization of STEAM education activities instead of investigating STEAM teaching-related activities for prospective teachers.

Given these circumstances, this research investigates STEAM education for preschoolers in Vietnam. Specifically, the study explores the competence of students majoring in early childhood education at teacher education universities in Vietnam in terms of implementing STEAM education based on self-assessment. The focus of this research is not only related to the lack of research on STEAM education but also stems from the fact that teachers have the greatest influence on student performance (Sanders, 2009; Sanders, Rivers, 1996). Many recent studies have shown that teachers play a particularly important role in organizing STEAM education activities at all levels, from preschool to high school (Nguyen et al., 2017). They need to have a full, comprehensive, and unified understanding of STEAM education and connect its activities with others to ensure that it is implemented with synchronization and efficiency (Nguyen, Wall, 2020). Moreover, the training of students at teacher education universities is crucial to creating teachers with the qualities and competence needed for the effective organization of STEAM education activities for preschoolers.

2. Theoretical background and research methodology

In fact, courses at Vietnamese teacher education institutions are aimed at providing students with various skills, such as those necessary to provide STEAM education for preschool children. Different universities achieve this aim to varying degrees. Students are aware of this educational approach, as well as the skills required to implement it. This research, in analyzing how early childhood education students self-assess their capacity to deliver STEAM education, focuses on the forms of competence required at different steps/stages related to early childhood education, in general, and those that are specific to STEAM education. This is because STEAM education is one of the educational activities for preschool children, but it does have some peculiarities.

In addition, the ways in which early childhood teachers are expected to be competent in STEAM teaching are related to institutional matters. Therefore, in this study, the items designed to find out the competence in STEAM education of early childhood education students were built with reference to related theories and the Professional Standards of Preschool Teachers outlined in Circular 26/2018/TT-BGDDT, dated October 8, 2018, issued by the Ministry of Education and Training of Vietnam. This is a framework of the basic requirements for preschool teachers, which specifies the qualities and competencies they need to achieve to perform the task of nurturing, caring for, and educating children (The Ministry of Education..., 2018).

Based on the overview, the research team identified five aspects of competence for early childhood education students: professional qualities and ethics embodied in STEAM educational activities; knowledge and skills in organizing STEAM educational activities; developing a STEAM education plan for learners of different grades; assessing children's progress through participating in STEAM education activities; building a safe and friendly STEAM education environment.

These five aspects were measured using a four-point scale to assess the specific level of the early childhood education students' competence in STEAM education for preschool learners. The specific levels were as follows. 1: does not meet the requirements of STEAM education for preschool learners; 2: meets a few requirements of STEAM education for preschool learners; 3: meets the majority of the requirements of STEAM education for preschool learners; 4: meets all of the requirements of STEAM education for preschool learners. Based on the formula (Maximum-Minimum)/n = (4-1)/4 = 0.75, the levels were transformed into the following four ranks: 1 – 1.75: does not meet the requirements of STEAM education for preschool learners; 1.76 – 2.50: meets a

few requirements of STEAM education preschool learners; 2.51 – 3.25: meets the majority of the requirements of STEAM education for preschool learners; 3.26 – 4: meets all of the requirements of STEAM education for preschool learners (Malhotra, Birks, 2007).

The study surveyed 600 female student–teachers majoring in early childhood education, including 189 students from University A, 200 students from University B, and 211 students from University C. All of these students were in the third (334 students) or fourth (final) year (266 students) of their studies. This sample helped provide information that accurately reflects the competence in STEAM education that students obtain through university training programs, as these students had completed most of the courses. (Fourth-year students mainly take a few extra courses in addition to an internship.) The survey was conducted from September to November 2022.

These institutions were selected because they are all universities with a long history of teacher education in Vietnam, including early childhood education. In addition, these three institutions are governed according to three different modes of governance. Specifically, University A is a key teacher education university in Vietnam under the governance of the Ministry of Education and Training, established in 1957. University B is a member institution of a regional university located in Central Vietnam, established in 1957. University C developed from a college (providing three-year programs) and has been under the governance of the People's Committee of C Province since 2009. The diverse selection of universities offering preschool teacher education programs is helpful to make comparisons and provide information that can serve to improve the programs at each institution and similar institutions in terms of governance characteristics. It can also help institutions learn from each other in developing their training activities.

3. Results
3.1. Professional qualities and ethics embodied in STEAM educational activities

The Professional Standards of Preschool Teachers, as outlined in Circular 26/2018/TT-BGDDT, dated October 8, 2018 and issued by the Ministry of Education and Training, consider the standard on teacher qualities and ethics to be the most important, listing it first. Accordingly, preschool teachers must possess professional qualities and ethics, which means "complying with the regulations on teacher ethics training; sharing experiences, supporting colleagues in moral training and creating teachers' styles" (The Ministry of Education..., 2018: 3). In addition, in the socio-cultural context of Vietnam, the teacher is seen as an example of ethics – an expectation that has deep roots in Vietnamese educational philosophy and is influenced by Confucianism and Buddhism (Vu, Nguyen, 2022). Therefore, the competence of teachers cannot be separated from their qualities and ethics in the Vietnamese context. To explore this content, the study included five items: "being fair in evaluating children," "being exemplary," "having a sense of responsibility," "being scientific," and "being professional" in the organization of STEAM educational activities. The survey results showed that all items had mean values from 3.19 to 3.53; the highest mean belonged to "having a sense of responsibility."

Table 1. Students' self-assessment of their professional qualities and ethics embodied in STEAM educational activities

	Professional qualities and ethics embodied in STEAM educational activities	Number	Mean	Std. Dev.	Rank
1	Being fair in evaluating children	600	3.41	0.66	3
2	Being exemplary	600	3.47	0.61	2
3	Having a sense of responsibility	597	3.53	0.59	1
4	Being scientific	598	3.19	0.72	5
5	Being professional	599	3.31	0.71	4

3.2. Knowledge and skills in organizing STEAM educational activities

Some of the key components of competence are the knowledge and skills to organize STEAM education for children. In STEAM education, students learn primarily through the process of solving problems. Educational and psychological studies show that playing is a natural method of learning that promotes healthy development among children. Children are excited to play; when engaging in an educational game, they can explore, create, improvise, and expand their

understanding of a subject (Nguyen, 2000). Games that require skills such as social communication and problem-solving help children learn STEAM subjects more effectively (Cutter-Mackenzie, Edwards, 2013). Therefore, when exploring the competence of student teachers in organizing STEAM educational activities, the study provided items in which learners self-evaluated their organization of various activities for children.

For preschool students, educational activities can take the popular form of STEAM lessons and experiential activities. STEAM lessons have thematic content associated with solving a problem. Students participate in learning actively and proactively. They also must apply the knowledge they have just learned to solve the problem, thereby contributing to the formation of competence. Depending on the specific subject and facilities, schools can apply different STEAM content in various ways. For STEAM experiential activities, the experiential activities and content selected must be associated with the implementation of the objectives of the early childhood education program, creating excitement and motivation for learners to develop their qualities and competence (Nguyen et al., 2022). Therefore, the organization of STEAM education through lessons and experiential activities was surveyed in this research.

Specifically, this aspect was evaluated through 12 items, all of which had means greater than 2.51. The item with the highest mean (3.18) was "understanding the meaning and importance of STEAM education for children's psychophysiological development" and the one with the lowest mean (2.69) was "being able to research STEAM education materials written in foreign languages (books, scientific articles, educational programs, educational models)."

Table 2. Students' self-assessment of their knowledge and skills in organizing STEAM educational activities for children

	Knowledge and skills in organizing STEAM educational activities for children	Third-and fourth-year students		Third-year students		Fourth-year students	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
1	Understanding the essence of STEAM education	2.99	0.76	2.88	0.75	3.14	0.74
2	Understanding the meaning and importance of STEAM education for children's psychophysiological development	3.18	0.70	3.06	0.70	3.34	0.66
3	Being able to research STEAM education materials written in foreign languages (books, scientific articles, educational programs, educational models)	2.69	0.88	2.61	0.91	2.80	0.83
4	Being skilled in organizing activities for child development in which STEAM educational content is integrated	2.98	0.86	2.85	0.91	3.15	0.76
5	Being able to organize STEAM educational activities according to various themes.	2.94	0.86	2.81	0.88	3.13	0.78
6	Being able to apply information technology in STEAM education (knowing how to use software in STEAM education, interactive boards, kidmart games, electronic lectures, simple technology devices,...)	3.03	0.84	2.90	0.82	3.19	0.83
7	Knowing how to manage children in the process of organizing STEAM educational activities during school hours	3.12	0.75	3.00	0.75	3.27	0.73

8	Promoting the positivity of each child in the process of participating in STEAM educational activities (e.g., children are observed and given opportunities to work in groups, practice, present in front of the class)	3.15	0.75	2.99	0.76	3.36	0.68
9	Demonstrating artistic abilities in the organization of STEAM educational activities (in choosing teaching and learning equipment and educational methods and evaluating children)	3.03	0.78	2.89	0.81	3.21	0.71
10	Being able to review, edit, and perfect STEAM education programs for children	2.89	0.87	2.71	0.88	3.14	0.79
11	Being able to propose new theories of STEAM education for children	2.80	0.89	2.66	0.89	3.00	0.86
12	Being able to propose initiatives to leaders for adjusting the policies and guidelines on the organization of STEAM education activities	2.70	0.95	2.51	0.93	2.97	0.91

3.3. Developing a STEAM education plan for learners of different grades by school year

The study also explored the participants' levels of competence in terms of the application of knowledge and skills to develop STEAM plans for children of different grades. This is a practical requirement since teachers working in preschools must comply with the teaching requirements of their schools when applying STEAM education in the curriculum. The steps of developing an educational plan – from specifying educational goals and content to identifying the necessary educational equipment – were assessed by the students themselves. In addition, the study also considered when and how to assess children, along with improving the planning process after each school year. The survey results showed that most of the items (6 out of 7) had means of 3.0 or higher. The item with the highest mean (3.08) was "being able to identify teaching and learning equipment for STEAM education for children of different grades by school year." The only item with a mean lower than 3.0 was "being able to improve STEAM education planning for children of different grades after each school year" (mean: 2.95).

Table 3. Students' self-assessment of their competence in developing STEAM education plans for learners of different grades

	Developing a STEAM education plan for learners of different grades by school year	Third-and fourth-year students		Third-year students		Fourth-year students	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
1	Being able to identify STEAM education goals for children of different grades by school year	3.03	0.81	2.90	0.82	3.21	0.75
2	Being able to identify STEAM education content for children of different grades by school year	3.08	0.81	2.95	0.83	3.27	0.74
3	Being able to identify the form of STEAM education for children of different grades by school year	3.02	0.83	2.84	0.83	3.26	0.76
4	Being able to identify STEAM education methods for children of different grades by school year	3.01	0.83	2.85	0.83	3.24	0.78

5	Being able to identify teaching and learning equipment for STEAM education for children of different grades by school year	3.10	0.81	2.93	0.82	3.34	0.73
6	Being able to identify the time and forms of testing and assessment of children of different grades by school year	3.00	0.81	2.87	0.83	3.19	0.76
7	Being able to improve STEAM education planning for children of different grades after each school year	2.95	0.88	2.79	0.90	3.17	0.82

3.4. Assessing children's progress through their participation in STEAM education activities

Student assessment is one of the key components of STEAM education that student–teachers must be skilled at. The study explored students' opinions on various items related to this aspect of teaching. In particular, the item with the highest mean (3.04) was "being skilled in assessing children's progress in STEAM in terms of learning attitudes" and the item with the lowest mean (2.90) was "being skilled in assessing children in the form of integration."

Table 4. Students' self-assessment of their competence in assessing children's progress through their participation in STEAM education activities

	Assessing children's progress through their participation in STEAM education activities	Third-and fourth-year students		Third-year students		Fourth-year students	
		Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev.
1	Being skilled in assessing children's progress in terms of STEAM knowledge	2.96	0.81	2.78	0.80	3.20	0.75
2	Being skilled in assessing children's progress in STEAM in terms of learning attitudes	3.04	0.82	2.86	0.82	3.28	0.75
3	Being skilled in assessing children in the form of integration	2.90	0.83	2.76	0.84	3.09	0.78
4	Being skilled in assessing children in a thematic form	2.93	0.84	2.80	0.86	3.11	0.79

3.5. Building a safe and friendly STEAM education environment

In order to make STEAM education effective, preschool teachers – in addition to individuals in relevant functional departments – must know how to build a safe and learner-friendly STEAM educational environment. The survey results showed that the majority of students considered themselves to meet this requirement: the means of all of the relevant items on the survey were higher than 3.0. The item with the highest mean (3.66) was "being able to collaborate with children's parents or guardians during STEAM educational activities."

3.6. Comparison of groups of participants
Third- and fourth-year students

The research also tested whether there was a difference in the opinions of the third- and fourth-year students, as determined by the mean values of the items on the survey. If the p-value value of the t-test were less than 0.05, this would indicate a difference in the opinions of the third- and fourth-year students. The t-test in the "equal variances not assumed" row was used. The results

showed a difference between the third- and fourth-year students in all aspects. Fourth-year students had higher mean scores than third-year students.

Table 5. Students' self-assessment of their competence in building a safe and friendly STEAM education environment

	Building a safe and friendly STEAM education environment	Third-and fourth-year students		Third-year students		Fourth-year students	
		Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev.
1	Being able to build a physical environment to ensure safety for children (arranging classrooms, using educational equipment, creating opportunities for children to interact with specific materials, etc.)	3.14	0.75	2.96	0.78	3.38	0.65
2	Being able to build a psychological environment that ensures a friendly relationship between teachers and children	3.18	0.76	2.96	0.77	3.45	0.66
3	Being able to collaborate with children's parents or guardians during STEAM educational activities	3.66	0.77	3.02	0.80	3.37	0.69

Table 6. Independent Samples Test of third-year and fourth-year students' mean scores for aspects of STEAM education

Independent Samples Test									
	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95 % Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Professional qualities and ethics embodied in STEAM educational activities									
Equal variances assumed	16.42	0	-2.51	598	0.01	-0.10	0.04	-0.18	-0.02

Equal variances not assumed			-2.55	593.01	0.01	-0.10	0.04	-0.18	-0.02

Knowledge and skills in organizing STEAM educational activities for children

Equal variances assumed	12.83	0.00	-3.78	597	0.00	-0.19	0.05	-0.29	-0.09
Equal variances not assumed			-3.87	596.95	0.00	-0.19	0.05	-0.29	-0.09

Developing a STEAM education plan for learners of different grades by school year

Equal variances assumed	12.99	0.00	-5.48	598	0.00	-0.31	0.06	-0.42	-0.20
Equal variances not assumed			-5.63	597.87	0.00	-0.31	0.06	-0.42	-0.20

Assessing children's progress through participating in STEAM education activities

Equal variances assumed	8.77	0.00	-3.75	598	0.00	-0.21	0.06	-0.33	-0.10
Equal variances not assumed			-3.79	588.91	0.00	-0.21	0.06	-0.33	-0.10

Building a safe and friendly STEAM education environment

Equal variances assumed	6.40	0	-5.06	598	0.00	-0.27	0.05	-0.38	-0.17
Equal variances not assumed			-5.17	597.24	0.00	-0.27	0.05	-0.37	-0.17

Among the three institutions

The study also focused on comparing the mean values of students from different universities. For four aspects, the p-value of Levene's test was greater than 0.05, indicating no difference between the universities. Hence, the results of an F-test in ANOVA were used. The p-value of the F-test was 0.00 < 0.05. This shows a difference in the means of the three universities. University A had the highest mean scores, followed by University B and University C.

Table 7. F-test results in ANOVA of mean scores of students in three universities for aspects of STEAM education

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Professional qualities and ethics embodied in STEAM educational activities					
Between Groups	10.07	2	5.03	21.63	0.00
Within Groups	138.98	597	0.23		
Total	149.05	599			
Knowledge and skills in organizing STEAM educational activities for children					
Between Groups	19.75	2	9.88	27.40	0.00
Within Groups	214.81	596	0.36		
Total	234.56	598			
Assess children's progress through participating in STEAM education activities					
Between Groups	20.19	2	10.10	21.82	0.00
Within Groups	276.29	597	0.46		
Total	296.48	599			
Building a safe and friendly STEAM education environment					
Between Groups	28.04	2	14.02	35.58	0.00
Within Groups	235.24	597	0.39		
Total	263.29	599			

As for the aspect "developing a STEAM education plan for learners of different grades by school year," the p-value of Levene's test was 0.01 < 0.05. This also indicates a difference among universities. Hence, the results of Welch's test in the "robust tests of equality of means table" were used. The p-value of Welch's test was 0.00 < 0.05. This indicates a difference in the mean values for "developing a STEAM education plan for learners of different grades by school year" among universities. Again, University A had the highest mean score, followed by University B and University C.

Table 8. Sig test Welch results in ANOVA of mean scores of students in three universities for an aspect of STEAM education

Robust Tests of Equality of Means				
Developing a STEAM education plan for learners of different grades by school year				
	Statistica	df1	df2	Sig.
Welch	21.67	2	397.39	0.00
a. Asymptotically F distributed.				

4. Discussion

STEAM education plays an increasingly important role in helping learners to become suitable laborers in the context of the ongoing Fourth Industrial Revolution. Education at all levels, from preschool to university, needs to equip students with age-appropriate integrated knowledge and skills that allow them to solve complicated practical problems. Moreover, training and retraining that help teachers implement STEAM education are necessary to develop the professional

competence of those who work at all levels of education, including the preschool level; teacher education institutions share responsibility in this sphere (Tran et al., 2017).

The results of this study, which explored the competence of students majoring in early childhood education at teacher education universities in Vietnam in terms of implementing STEAM education based on self-assessment, show that they rated themselves as meeting most or all of the requirements of STEAM education for children. They did not judge themselves to be unsatisfactory or slightly satisfactory on any items. Of the 31 items surveyed, the participants said they were "meeting all of the requirements of STEAM education for preschool learners" on five. The item with the highest mean (3.66) was "being able to collaborate with children's parents or guardians during STEAM educational activities" (which addressed the aspect of "being able to build a safe and friendly STEAM education environment"). The items with the next highest means were "having a sense of responsibility" (3.53), "being exemplary" (3.47), "being fair in assessing children" (3.41), and "being professional" (3.31). Four of the five items with the highest mean scores were related to the aspect of "professional qualities and ethics embodied in STEAM educational activities."

Of the remaining 26 items, for which students claimed to "meet the majority of the requirements of STEAM education for preschool learners," the items with the lowest means were "being able to research STEAM education materials written in foreign languages (books, scientific articles, educational programs, educational models)" (2.69), "being able to propose initiatives to leaders for adjusting the policies and guidelines on the organization of STEAM education activities" (2.70), "being able to propose new theories of STEAM education to children" (2.80), and "being able to review, edit, and perfect STEAM education programs for children" (2.89). It is worth noting that all of these items were related to the aspect of "knowledge and skills in organizing STEAM educational activities for children."

Generally, the students considered themselves to meet all of the requirements of items related to "professional qualities and ethics embodied in STEAM educational activities," while they rated themselves as "meeting the majority of the requirements of STEAM education for preschool learners" for many items concerning "knowledge and skills in organizing STEAM educational activities for children." Some of these items had the lowest means of all items on the survey. In addition, the items for which students considered themselves to "meet all of the requirements of STEAM education for preschool learners" represented a small proportion (5 out of 31 items) of the total items. Four out of five of these items related to the aspect of "professional qualities and ethics of teachers".

Although there have been no similar studies on prospective early childhood teachers for comparison, these findings seem to differ from the results of other relevant studies concerning current early childhood teachers. For example, research by Tran et al. (2019) showed that teachers in Vietnam lack STEAM education skills and are limited in their ability to assess students' learning outcomes. This creates a significant gap between learning and practice. Therefore, learners face many difficulties in applying theory and transforming operating principles into products that are applicable in real life. In addition, based on a survey of preschool teachers in 10 cities and provinces across Vietnam, Bui et al. (2022) indicated that the competence of teachers in implementing STEAM activities or projects for preschoolers is only moderate (with an approximate mean of 3.2 out of 5). Similarly, from the results of a survey on the competence of teachers in the implementation of STEAM education activities for preschool children (5 to 6 years old) in Tuyen Quang Province, Vu (2022) concluded that the teachers' competence was merely average. Nguyen et al. (2022) and Tran (2021) also shared a similar view that STEAM games are rarely applied in teaching preschool children in Vietnam to strengthen instruction during school hours.

Although the paper's findings show that students believed that they meet the requirements of all items addressed in the survey (completely or mostly), further improvements are needed so that students can develop their competence, especially when it comes to the knowledge and skills needed to organize STEAM educational activities for children. This is especially important in light of the knowledge that what students learn may be difficult to apply to real work environments, as shared by Vu (2022). One reason that there are barriers is that the students are new to STEAM education and lack opportunities to experience and practice. Tran et al. (2019) said that it is necessary to pay more attention to the quality of teachers at all levels of education in order to effectively implement STEAM education activities. This opinion and the results of this research should be considered by university

leaders and faculty when determining which aspects of training should be prioritized and improved to help students become more competent in terms of STEAM education.

In addition, comparing the mean scores of several different groups shows that the mean scores of the fourth-year students were higher than those of the third-year students in all aspects. This could be explained by the fact that fourth-year students have had internship time at school while third-year students have not, so they have had more opportunities to practice and apply what they have learned. With the help of lecturers, internship instructors, preschool teachers, and peers, they can gradually develop their competence. As for the participant universities, the results of the ANOVA test show that University A had the highest mean scores, followed by University B and C. To convincingly explain this result, more research is needed in the future, which can also help the universities in this study and institutions with similar circumstances to develop.

5. Conclusion

STEAM education in general and for preschool children in particular – Is receiving increasing attention from training institutions and society due to its role in developing modern learners. In Vietnam, specifically, the legal conditions for conducting STEAM education and the respect it receives in society are adequate. The core issue is that the education and training sector needs to promote the preparation of human resources to implement STEAM education, especially in early childhood education. To ensure that teachers are competent and can meet the practical requirements of schools, the training they receive at teacher education universities is key. The results of this research show that the students at three teacher education universities who participated in the survey rated themselves as meeting most or all of the requirements of STEAM education for preschool learners. Compared to some relevant studies on STEAM education in Vietnam, this result seems to paint a positive picture of STEAM education for preschool children. However, universities and other stakeholders also need to promote the effectiveness of training so that students can further develop their competence to develop STEAM education for preschool children, especially in terms of knowledge and skills in organizing STEAM educational activities for children.

Since the findings are the result of students' self-assessments, more studies are needed to get opinions from other stakeholders, such as lecturers and employers, to provide a more comprehensive view of early childhood education students' competence. Furthermore, the individuals participating in the study were students from three key universities in Vietnam with a long tradition of training preschool teachers, so the research results cannot fully reflect the diverse picture of students' competence in this aspect. Therefore, studies including more participants are needed in the future. Moreover, some findings from this research are in need of more investigation to obtain persuasive explanations.

6. Limitations

Due to the conditions of time, funding and accessibility, the research can only focus on three universities in Vietnam; therefore, the findings cannot fully represent the general picture of the competence of early childhood education students at teacher education universities in Vietnam in terms of implementing STEAM education. In addition, the limitation of the study also comes from the quantitative method used, which is impossible to deeply exploit many aspects related to the topic and explain the information from the survey results. These are also suggestions for further research in the future.

7. Acknowledgements

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Competency-Based Learning: An Approach Integrating the Domains of Complex Thinking Competency in a Group of Mexican Students

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Abstract

One characteristic of competency-based education is the integration of knowledge, attitudes, and skills that enable individuals to make better decisions and face the challenges of their professional demands. Given this, universities must develop training models that contribute to this integration; otherwise, they cannot ensure that their students are perceived as genuinely competent. Therefore, this article aims to report in depth how the acquisition and development of the competency of complex thinking were configured in a group of students at a Mexican university with a competency-based educational model to corroborate the integral development of necessary cognition, attitudes, and skills considering the gender variable. Based on a multivariate descriptive statistical analysis, this study sought to identify particular characteristics of the sample to understand the acquisition process and student perception of their competency and sub-competencies considering the development of their various components, knowledge, and domains. In conclusion, although the results show that a moderately balanced perception of development has been achieved, there are still areas of opportunity in some aspects, as in the case of the procedural component, especially among female students. In general, the population does not perceive that the knowledge and attitudes they have developed allow them to develop useful processes or skills in professional practice, which may affect their confidence to lead projects or even enter the labor market once they graduate.

Keywords: professional education, educational innovation, future of education, complex thinking, educational gender gap, higher education.

1. Introduction

Discussing competencies in the field of education considers approaching it precisely, as the notion can be so broad that it is not always understood correctly. Competencies involve identifying

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attributes of a person's efficient performance in a process or problem requiring attention, considering both knowledge and how it is configured in viable and appropriate actions and processes for decision-making (Vázquez-Parra et al., 2022). According to Tobón (2010), competency-based education implies meaningful learning for students, guiding them towards an education that integrates theory and practice in the same cognitive process.

Social factors such as globalization and the incursion into Industry 4.0 have meant that training new professionals requires going beyond theoretical knowledge. Therefore, universities and higher education institutions must rethink traditional education, developing competency-based training models that generate broad, flexible, professional profiles where the knowledge acquired is reconfigured to meet various realities and needs. For Le Boterf (2000), competencies are combinatory knowledge, in which the focus is not on knowledge but the learner, enabling specialized knowledge to be mobilized in the multiple situations the individual faces.

For universities, the graduates' professional profiles must become more flexible, valuing the capacity to adapt to different situations, which increases their potential to face future challenges. Therefore, competency training becomes relevant as it allows professionals to have a repertoire of skills, knowledge, and abilities to apply to different contexts and work situations (Yao, Tuliao, 2019). However, this attractive approach is also complex since the multidimensional nature of competencies implies that their training process should consider all their cognitive, attitudinal and procedural elements if the aim is indeed to develop these capacities in future professionals (Sá, Serpa, 2018).

Thus, a competent individual can mobilize various elements to face a challenge, and educational institutions must integrate these components. Based on the above, this article aims to report in depth how the acquisition and development of the competency of complex thinking were configured in a group of students at a Mexican university with a competency-based educational model to corroborate the integral development of necessary cognition, attitudes, and skills considering the gender variable. The competency of complex thinking was selected since it is a general competency with the initial characteristic of involving a systematic collaboration of elements and sub-competencies (systemic thinking, critical thinking, scientific thinking and innovative thinking), which makes identifying the components more feasible. Based on a multivariate descriptive statistical analysis, this study sought to identify particular characteristics of the sample to understand the acquisition process and student perception of their competency and sub-competencies performance considering the development of its various components, knowledge, and domains.

1.1. Competencies and their components

The study of competencies in education implies considering two different approaches. On the one hand, one must consider the linguistic contribution of Chomsky, who linked this notion to the verbal capacity of individuals to combine their knowledge of languages and capacity for expression, which enables them to produce and recognize language (Wargadinata et al., 2021). On the other hand, entrepreneurial training focuses on constructing know-how based on cognitive elements that develop as part of a training process (Handrianto et al., 2021). In both cases, competencies imply the interaction of components that enable a person to develop a specific capacity to respond to a need, integrating their skills and intellect.

Although the notion of competencies had already been used in the educational area, especially in the field of personnel training since the 1930s, it would not be until the 1970s that competency-based training would take on a functional focus, paying attention to the relevance of developing knowledge, attitudes, and skills as the fundamental pillars of any competent person's optimal performance (Martínez Casanovas et al., 2022). For Parveen, Nazir and Zamir (2021), competencies require the development of certain aptitudes that influence how people think and behave in one situation and another, which impacts the development of their skills. In this same sense, Glaser (2021) had already considered that knowledge was not enough to fully achieve competency since people's disposition and conduct also impact the correct performance of an activity. The latter had already been pointed out by Lasnier (2000), who indicated that competency is the complex knowledge resulting from integrating capacities and skills (cognitive, affective, psychomotor or social) and knowledge, which must interact effectively to address specific situations.

Thus, three knowledge or other domains can be proposed that all competencies share (Vázquez-Parra et al., 2023):

- Attitudinal domain refers to those values, attitudes, and principles that regulate human action and are necessary in a complex world. It refers specifically to the self.

- Conceptual domain is the minimum knowledge an individual requires to know how to carry out a process. It refers specifically to knowing.

- Procedural domain comprises the abilities, skills, techniques, strategies, and procedures that allow the practical implementation of knowledge in specific situations. It refers to know-how.

Although an essential feature of any competency is the relationship between its cognitive and skills elements, the attitudinal factor cannot be excluded because competencies effectively involve applying knowledge in the development of processes while requiring values and principles for effective task performance in a specific environment (Woodcock et al., 2021). Thus, a competency's relevance does not lie just in acquiring knowledge or developing skills but also in integrating elements from a sense that the individual has in a specific situation (Ramos et al., 2021). Therefore, it is necessary to adopt an orientation that focuses to a large extent on the individual, which is a necessity for educational institutions wishing to develop competency-based training programs.

1.2. Complex thinking competency

In addition to considering components or types of domains or knowledge, competency-based learning should consider three levels (Kulik et al., 2020). The first focuses on acquiring indispensable intellectual skills, which may have been acquired in previous educational stages, such as those related to language, logic, or mathematical thinking. On a second level, generic competencies of professional life are considered, referring to cognitive skills and processes that every professional should have, i.e., transversal competencies such as social intelligence, complex thinking, and communication. Finally, on a third level, specific competencies must be considered, directly related to acquiring skills and processes specific to each profession. Under this "level" approach, the formation of competencies in various domains does not necessarily occur in a single educational stage. So, universities must not lose sight of these moments when training their students, as it is in these stages that the skills that underlie professional training are acquired and developed (Rasulova, 2020).

As pointed out, the competency of complex thinking is one of the generic or transversal competencies that in recent decades has aroused greater interest on the part of educational studies, as it is considered to be a competency that is extremely valuable in the face of the global, diverse, fluid, and flexible realities faced by today's professionals (Tobón, Luna-Nemecio, 2021). The competency of complex thinking is the ability of an individual to implement integrative reasoning that allows them to analyze and synthesize information to face challenges, solve problems, or make decisions during their lives. Complex thinking or reasoning considers quantitative, qualitative, algorithmic, analogical, contextual, combinatorial, fuzzy, imaginative, provisional, heuristic, and ethical analyses (Tecnologico de Monterrey, 2019).

It is noteworthy that the importance of complex thinking as a professional competency lies in the capacity of people to understand the phenomena of their reality integratively, considering the dynamics and interaction among all its elements, going beyond the sum of its parts (Silva Pacheco, Iturra Herrera, 2021). In addition, complex thinking is a relevant general competency for any professional, as it enables them to develop a strategic, systemic and interdisciplinary vision in their analysis and rational choice processes (Morin, 1990).

Just like competencies in general that have different components or domains, the competency of complex thinking comprises four related sub-competencies with particular elements that broaden the perspective of each situation when it is analyzed: systemic thinking, scientific thinking, critical thinking, and innovative thinking (Cruz-Sandoval et al., 2023a; Vázquez-Parra et al., 2023).

Systems thinking is the ability to analyze problems integrating inter- and transdisciplinary vision, understanding the dynamics of the factors and elements that comprise it (Nagahi et al., 2019). On the other hand, scientific reasoning is based on objective, validated, and standardized methods that can be implemented as routes for analyzing the environment, seeking to ensure that decisions are made within a framework of arguments and concrete evidence (Koerber, Osterhaus, 2019). On the other hand, critical thinking allows people to evaluate reality and existing information, discerning what is not said or what can be stated differently (Cui et al., 2021). Finally, innovative thinking considers mental processes of search and discovery that allow the person to

situate the problem and visualize it from different angles and perspectives (critical thinking) to come up with original and feasible solutions (Zhou, 2021).

1.3. Complex thinking and gender

According to Antonio, Chang, Hakuta, Kenny, Levin and Milen (2004), people's characteristics such as race, gender, age, and social or economic status can influence how skills or competencies are perceived in a challenging situation, with the environment being a determining factor when assessing the ability to solve a problem. However, beyond perception, personal factors can influence acquiring and developing a competency. If the training environment is not ideal or is biased, it would be natural for skills to develop in a particular direction and not another. For Arredondo-Trapero, Vázquez-Parra, and Velázquez-Sánchez (2019), there is no significant difference between men and women regarding their ability to develop scientific thinking. However, there are still differences in access to resources and support to enter areas related to science and technology for gender reasons. This generates uncertainty among women when they practice the knowledge acquired in their training.

Thus, although universities may provide equal opportunities for their students, it does not prevent the social environment or cultural patterns from influencing the acquisition and development of competencies. At the end of the day, future graduates' performance and work practice occur in social environments beyond the safety of the classroom. In this sense, Janusz, Jósefik, and Peräkylä (2018) point out that female students tend to develop a systemic vision of reality better than men since, in patriarchal environments (such as Latin America), they are attributed care and attention tasks usually rooted in the cultural imaginary that end up influencing their professional skills and their interactions with colleagues and staff in management tasks. The same happens with critical thinking, which according to Onditi and Odera (2021), also shows women's superior development when they have to rethink their actions, decisions, and work due to the constant questioning of a hegemonic environment that is primarily male-dominated. For Marmo (2017), women's process of gender self-construction leads them to develop a more critical sense than their male counterparts, which may influence their perception of their knowledge, skills, and achievements.

The above is not intended to indicate a generalized gap in the development of competencies between men and women, but, at least in the case of complex thinking, differences can be attributed to how the level of achievement of its sub-competencies is displayed and perceived (Cruz-Sandoval et al., 2023b). Thus, this article seeks to delve into how acquiring and developing the competency of complex thinking and its sub-competencies were configured in a group of students at a Mexican university, which in recent years had deployed a competency-based training model, intending to describe how this training process is configured based on its components or domains. The aim is to identify whether there are differences between male and female students in perceiving their level of achievement, which, in the long run, may influence their ability to face professional challenges.

2. Materials and methods

A convenience sample of 195 students in a technological university in Mexico that has adopted a competency-based educational model included 120 males and 75 females. Students from different disciplinary areas and semesters were considered. The study was conducted between February and April 2022 with a convenience sample of students taking general education courses. Participants ranged in age from 18 to 23 years old. A self-administered questionnaire answered via Google Forms was administered and answered voluntarily by the students.

Table 1. Participant data by gender

Men		Women		Total	
N	%	n	%	n	%
				195	100
26	47	29	53	55	28
10	38	16	62	26	14
84	74	30	26	114	58

2.1. Instrument and data analysis

The eComplexity instrument aims to measure the perception of the participants' level of mastery of reasoning-for-complexity and its sub-competencies. It is an instrument that has been validated theoretically and statistically by a team of experts in the field (Castillo-Martínez et al., 2021). The instrument comprises 25 items divided into four sub-competencies: systemic, scientific, innovative, and critical thinking. Each of these four sub-competencies was further divided into three areas: knowledge, skills, and attitudes or values. Its implementation is self-applicable, and each item is assessed using a five-level Likert scale.

As for data processing, a multivariate descriptive analysis was carried out using the computer software R (R Core Team, 2017) and Rstudio (RStudio Team, 2022).

First, arithmetic means and standard deviations were calculated to determine the students' perception of each sub-competency of complex thinking by gender. To complement this analysis, we performed a boxplot analysis (also known as a box and whiskers diagram). This analysis allowed us to know how the means of the students' perception of the sub-competencies were dispersed and the symmetry and outliers of their responses (Williamson, 1989). We also conducted a principal component analysis (PCA). This analysis allowed us to know the behavior of our observations of the students, avoiding collinearity problems of our variables. This was done by expressing the data's maximum variability in a new set of independent and uncorrelated components according to the original variables. In this sense, as many principal components as variables would be analyzed (Cruz-Sandoval et al., 2023). Subsequently, a Biplot analysis was performed to complement the PCA. This analysis allowed us to know more graphically the behavior of our observations (students) using the components that captured the maximum variability of our data (Gabriel, 1971). Thus, a Biplot of form α = 1 was performed, allowing us to illustrate better the behavior of the observations (Cruz-Sandoval et al., 2023). Finally, a BoxPlot analysis was performed for each sub-competency domain area (attitudes or values, knowledge, and skills). Finally, a statistical significance analysis was performed through the t-test on the difference in mean values of the perception of complex thinking sub-competencies between men and women.

3. Results

Table 2 shows the sample population's total means and standard deviations, considering the gender variable in the students' perception of performance in developing the competency and sub-competencies of complex thinking. The results showed that women had a higher perception regarding the development of this competency in general and in each sub-competency, highlighting critical thinking and systems thinking (mean of 4.19 and 4.16, respectively). Overall, it was shown that the sample perceived a higher development of the sub-competencies of systemic and critical thinking (4.13 and 4.08) and a lower perception of scientific thinking (3.61).

Table 2. Means and standard deviations of the complex thinking competency and sub-competencies, men and women

	Men		Women		Total	
	Means	StD	Means	StD	Means	StD
Complex Thinking	3.87	0.56	4.00	0.67	3.92	0.61
Scientific Thinking	3.54	0.62	3.72	0.74	3.61	0.67
Critical Thinking	4.01	0.48	4.19	0.64	4.08	0.55
Innovative Thinking	3.82	0.50	3.94	0.64	3.87	0.56
Systemic Thinking	4.11	0.47	4.16	0.57	4.13	0.51

For a broader picture, Figure 1 shows the boxplot analysis of the complex thinking competency and sub-competencies by gender. In it, we can observe the outliers and the dispersion of students in each sub-competency. This figure shows that more females perceived themselves to have developed the sub-competencies than males. Also, it can be observed that women had a

behavior of extremes, i.e., women perceived themselves as very low in the sub-competencies while others perceived themselves as very high (first and fourth quartiles). On the other hand, the values for men's perceptions show a more balanced behavior, primarily concentrated in the second and third quartiles.
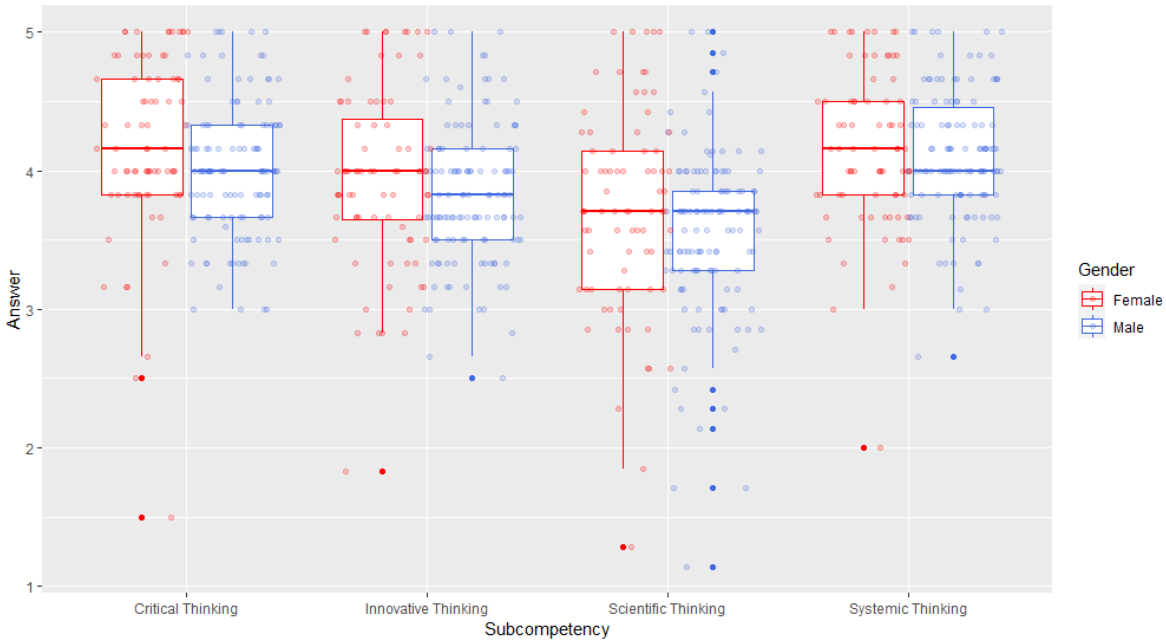
Fig. 1. Boxplots of the complex thinking competency and sub-competencies, men and women

Regarding principal component analysis (PCA), we observed that the Principal Component one (PC1) and Principal Component two (PC2), together explained 85 % of the total variability in our data (Table 3). PC1 explained 73 %, while PC2 captured 11 %. Likewise, we observed that PC1 positively correlated with critical thinking and innovative thinking. In this sense, PC1 would explain students' perception of their ability to evaluate reality and existing information, discerning what is not said and what can be stated differently. Likewise, this component could explain students' perception of their ability to propose original and feasible solutions to different problems. On the other hand, PC2 had a high correlation with the sub-competency of scientific thinking. This component explains the students' perception of their ability to propose solutions within a framework of objective, validated, and standardized methods, seeking to make decisions with concrete arguments and evidence.

Table 3. Principal Component Analysis Matrix. Complex thinking sub-competencies, men and women

	PC1	PC2	PC3	PC4
Scientific Thinking	0.47	-0.77	0.05	0.41
Critical Thinking	0.51	0.20	0.77	-0.31
Innovative Thinking	0.51	-0.06	-0.58	-0.62
Systemic Thinking	0.49	0.59	-0.24	0.57
Standard Deviation	1.71	0.69	0.55	0.52
Proportion of Variance	0.73	0.11	0.07	0.07
Cumulative Proportion	0.73	0.85	0.93	1.00

Figure 2 shows the analysis of the Biplot graph. This graph allows us to understand better our students' behavior concerning the sub-competencies in the components that capture the maximum variability. The figure color-codes the students' gender. It shows the different sub-competencies of

complex thinking. This graph illustrates that the sub-competencies coming out of the vertex very close to each other are the most correlated, and the sub-competencies farther apart are not correlated.

In this sense, the sub-competencies of systemic and scientific thinking were opposite. However, critical thinking and innovative thinking had some correlation. Since the intention was to observe the students' behavior, the Biplot presented here corresponds to a Bipot of form ($\alpha = 1$). It can be observed that the behavior of men is more centered (except for some outliers), while women's behavior is more dispersed. Likewise, we see that a small group of women had a higher perception of their complex thinking than men. That is, the women's perception of systemic, scientific, innovative, and critical thinking was higher than men's.
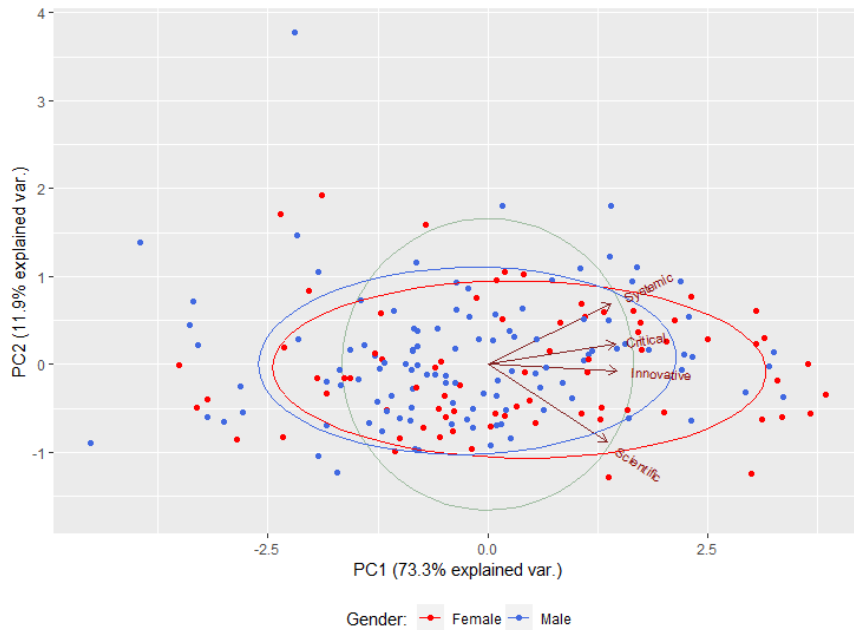
Fig. 2. Biplot. Complex thinking and its sub-competencies, men and women. Biplot of form ($\alpha = 1$)

On the other hand, Table 4 shows the arithmetic mean and standard deviation of each domain area by sub-competency. In this sense, one can observe that concerning Scientific Thinking, the domain with the highest mean value corresponded to attitudes or values in men and women, being attitudinal (3.95 and 3.90, respectively). Similar behavior in the knowledge domain presented itself in the other sub-competencies (higher in systemic thinking). That is to say, the highest average value of attitudinal being was obtained compared to knowledge and knowing how to do. On the other hand, the lowest mean values in women and men stand out in the three dominant areas of the sub-competency of critical thinking.

Table 4. Means and standard deviations of sub-competencies and their domains for men and women

			Men	Women
Sub-competency	Domain/knowledge	Item	Means	StD
Scientific Thinking	Knowledge	7,8,9	3.49	0.93
Scientific Thinking	Skills	10,11,12	3.45	0.90
Scientific Thinking	Attitudes or Values	13	3.95	0.88
Critical Thinking	Knowledge	14,15	4.06	0.71
Critical Thinking	Skills	16,17	3.89	0.78
Critical Thinking	Attitudes or Values	18,19	4.08	0.85
Innovative Thinking	Knowledge	20,21	3.81	0.72
Innovative Thinking	Skills	22,23,24	3.81	0.79
Innovative Thinking	Attitudes or Values	25	3.93	0.72
Systemic Thinking	Knowledge	1,2	4.03	0.68
Systemic Thinking	Skills	3,4	4.03	0.83
Systemic Thinking	Attitudes or Values	5,6	4.26	0.73

Figure 3 shows the Boxplot analysis of each domain of the scientific thinking sub-competency. The mean values of the students' perception in the dominant areas indicate that men had consistent minimum values for attitudes or values and skills, while women presented minimum values in knowledge (men perceive themselves to be higher in knowledge). Likewise, Figure 3 indicates that women had fewer attitudes, values, and skills variations. In other words, women had a higher perception in these last two domains than men.
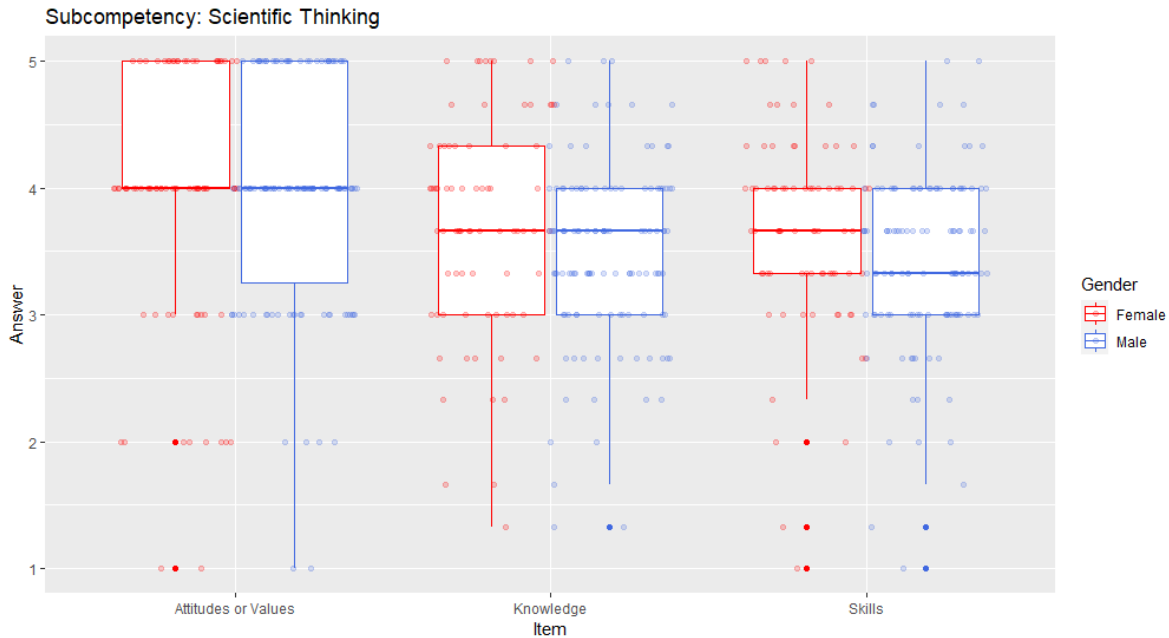
Fig. 3. Boxplots of the scientific thinking sub-competency and its domains for men and women

On the other hand, Figure 4 shows the domains of the critical thinking sub-competency, where one can observe that the women's perception was higher in attitudes and values, having the highest consistent minimum value in the first quartile. Similarly, women perceived themselves better in knowledge compared to men. Regarding skills, women perceived themselves as less capable, presenting the lowest consistent value in the analysis.
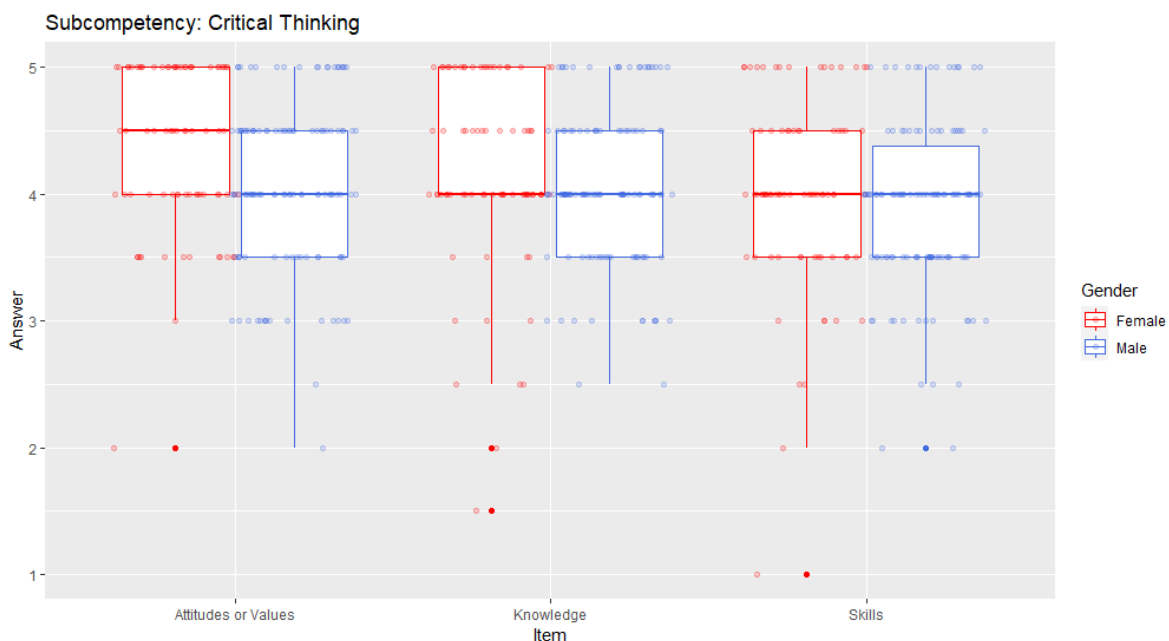
Fig. 4. Boxplots of critical thinking sub-competency and its domains, men and women

Concerning Figure 5, the boxplot analysis of innovative thinking and its domains indicates that women perceived themselves to be higher in skills, while men perceived themselves better in attitudes and values and knowledge. Likewise, the medians of the means obtained for students' perception in this sub-competency produced similar values in the three domains of this sub-competency.
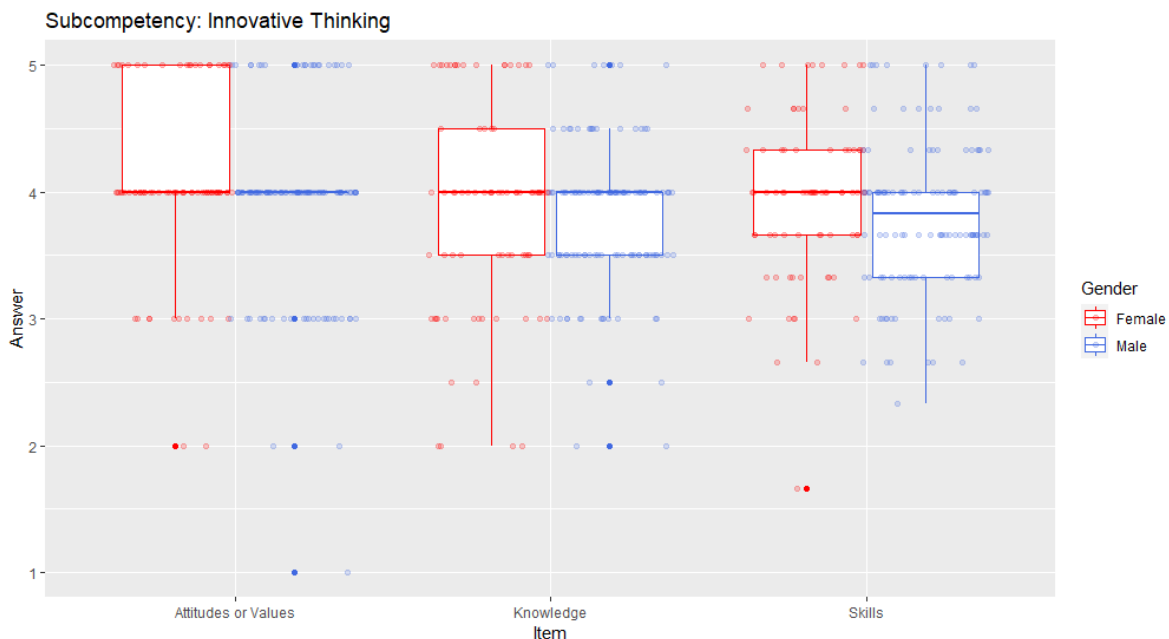
Fig. 5. Boxplots of the innovative thinking sub-competency and its domains of men and women

Figure 6 shows the boxplot analysis of systems thinking and its domains. Although the medians of the mean values of students' perceptions in this sub-competency were very similar, women perceived themselves better in attitudes or values and skills. On the other hand, men perceived themselves better in the knowledge domain of this sub-competency.
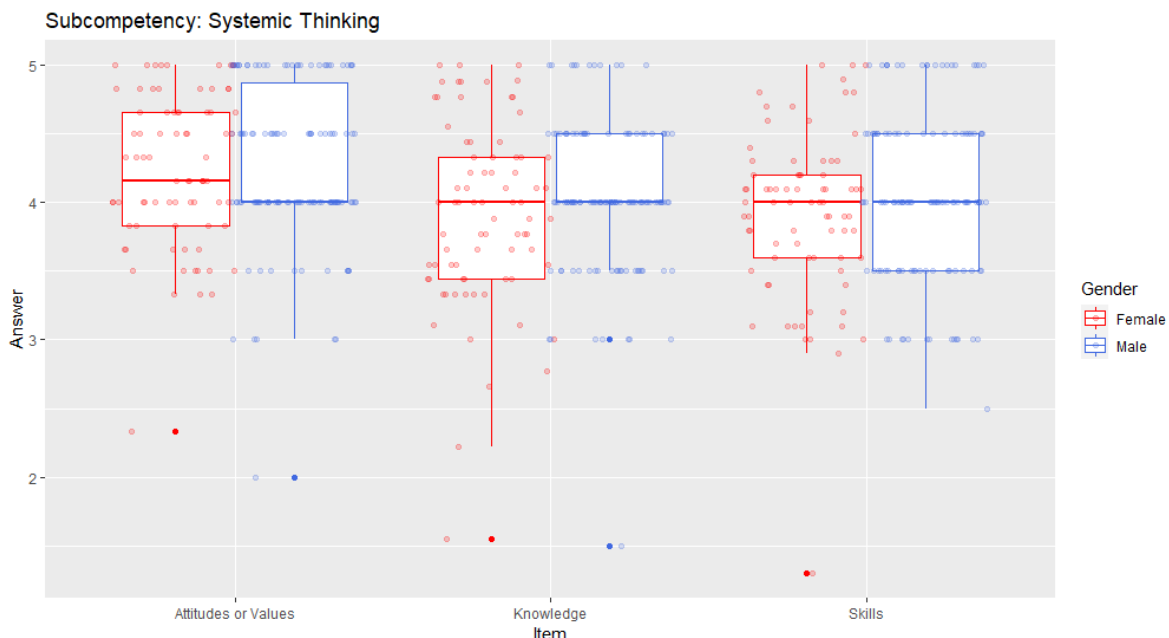
Fig. 6. Boxplots of the systems thinking sub-competency and its domains for males and females

Finally, Table 5 shows the analysis of the significant differences in the mean values of the perceived achievement of complex thinking and its competencies between men and women. Mainly, the table shows significant differences in the sub-competency of critical thinking. This

could be due to the fact that women present better attitudes and values than their male peers as explained above.

Table 5. Results of significant differences between men and women in the perception of achievement of complex thinking sub-competencies (t student)

	t	df	p-value
Scientific Thinking	-1.8219	142.13	0.07057
Critical Thinking	-2.1859	130.25	0.03061
Innovative Thinking	-1.3688	136.03	0.1733
Systemic Thinking	-0.55668	138.38	0.5786

4. Discussion

Most notable in this study is the differences in how the level of achievement of the complex thinking competency was perceived between men and women. In general, we note that the average of the perception of achievement of the competency (Table 1) shows that women achieved a higher average (4.00) than men (3.87) and that this is repeated in all the sub-competencies: critical thinking (4.19-4.01), innovative thinking (3.94-3.82), systems thinking (4.16-4.11), and even scientific thinking (3.72-3.54), which is in line with previous studies of the theoretical framework (Cruz-Sandoval et al., 2023a; Di Tullio, 2019; Heybach, Pickup, 2017; Tabo et al., 2021).

The above forced us to delve deeper into the results, carrying out a Boxplot graph that allowed us to analyze each sub-competency in greater detail. As can be seen in Figure 1, the higher means are confirmed in the group of women in critical thinking, innovative thinking, and systems thinking; however, in scientific thinking, although the mean is higher in the group of women (3.54-3.72), so is the standard deviation (0.62-0.74), indicating that the apparent difference is not statistically significant. An additional point of this sub-competency is a greater tendency for women's responses to be more dispersed in both high and low perception, so, although the mean was higher than that of men, the total balanced out in the end. This can also be seen in Figure 2, which shows that the women gave the most dispersed responses, providing the highest and lowest indicators. In contrast, men had results closer to the average. In a previous study conducted with this population, Vázquez-Parra, Castillo-Martínez, Ramírez-Montoya & Amézquita-Zamora (2022) identified that, although the means made it seem that there was a better perception by the group of women, the standard deviation balanced the results, concluding that there was no statistically significant difference between the two genders.

However, considering that this study was applied in a university that had adopted a training model to develop competencies, it aimed to delve deeper into the mastery levels of each sub-competency, seeking to verify, as Tobón (2010) pointed out, whether significant learning that integrates attitudes, knowledge, and skills actually occurred.

First, Figure 3 shows the students' perception in the domains of the sub-competency of scientific thinking. The data for the group of women showed a more positive trend than the males, especially in the cognitive aspect (3.49-3.72). At the level of attitudes, men outperformed women (3.95-3.90), but the standard deviation compensated for this. Another noteworthy mention is that the domain related to skills and processes yields the lowest data in both populations (3.45-3.68), especially in the male population (3.45), which makes us question that, at least in this sub-competency, there was an imbalance in the integration of this type of thinking. In general, the perception of the sample population, both men and women, was that they had sufficient knowledge and attitudes to use objective, valid, and standardized methodologies. However, at least the men in the sample negatively perceived their ability to put these attitudes and knowledge into practice.

Regarding critical thinking (Figure 4), women exhibited a clear positive tendency in all three aspects (Table 4), with the highest data in the attitudinal aspect (4.08-4.36) and the lowest in the skills and processes part (3.89-4.03). It is essential to mention that men's means (3.95, 4.06, 4.08) showed a better balance than women's (4.18, 4.03, 4.36), which allows us to appreciate a more even development of their three domains. It is important to consider that among women, there was a lower development in the skills aspect (4.03), which reveals a problem when it comes to putting knowledge and attitudes into practice.

A different situation was found with innovative thinking (Figure 5), where there was a very balanced development in the three domains for both men and women. Although the attitudinal

part produced the highest scores (3.93-4.09), they were very close to the cognitive scores (3.81-3.86) and the skills domain (3.81-3.96). In contrast to the previous sub-competencies, here the skills scores were higher than the cognitive part in the female group (3.96-3.86), giving the same results in the male group (3.81-3.81). At least in innovative thinking, it is clear that integration among the three skills was achieved, resulting in significant learning (Tobón, 2010). Finally, systems thinking (Figure 6) showed a balance between the cognitive and skills aspects of the participants' learning processes, both for men (4.03-4.03) and women (4.01-4.09), with better results in the skills and processes part. However, following the general trend, attitudes and values produced the highest results (4.26-4.37). In the case of women, it is interesting that the means reflected a higher positive attitude than men in this sub-competency, which may respond to the attributes that are culturally assigned to them in a region such as Latin America (Janusz et al., 2018).

Thus, based on the above, we can point out a tendency in the four sub-competencies to have more positive results in the attitudinal aspect, with women generally producing the highest data. Only in scientific thinking did men perceive themselves to have a better attitude than women, which may respond to the confidence and support usually given to men in regions such as Latin America in science-related areas (Arredondo et al., 2019). In terms of scientific and critical thinking, there was a negative trend in how the skills aspect is being developed, in contrast to knowledge and attitudes, which shows a lack of integration of knowledge or domains in these sub-competencies.

5. Conclusion

An essential feature of competency-based training lies in the need to integrate knowledge, attitudes, and skills to achieve significant learning. As pointed out in the theoretical framework, the contemporary world demands that new professionals understand the problems and have sufficient skills and attitudes to face them, make decisions, and develop feasible solutions.

Therefore, the present study sought to describe how a group of students training in a Mexican university using a competency-based educational model perceived the level of development of complex thinking, its sub-competencies, knowledge, or domains. The intention was to identify whether the training process contributed to acquiring and integrating competencies or whether it continued to replicate training primarily focused on acquiring knowledge.

In conclusion, although the results showed that a moderately balanced student perception of development was achieved, there are still areas of opportunity procedurally, especially among female students. In general, the population did not perceive that the knowledge and attitudes they developed allow them to develop valuable processes or skills for professional practice, which may affect their confidence to lead projects or even enter the labor market once they graduate. In the specific case of women, this lack of integration may contribute to the low presence of women in professions with a highly applied profile, segregating them to more administrative positions, usually with lower development rates. In operational professions, it is not enough to be knowledgeable; it is necessary to be perceived as competent.

We acknowledge the study limitations of the small sample size and the fact that it was only carried out in one educational institution. However, we consider that the results yielded significant data that can be replicated in other settings and larger populations. We also understand that it may be a limitation that the instrument focused on perception and not so much on the level of performance. However, perception is a determining factor in forming competencies, considering that even if the students have the competency, they may be limited if their perception is biased or pessimistic about what they know or how to do.

In practical terms, we are confident that these results open up the possibility of new lines of research focused on competency training and providing an initial platform for public policies and educational programs for professional development. It is not enough to state that one wants to develop practical professional skills for life; it is necessary to ensure that the model adopted achieves the comprehensive training that characterizes competencies.

6. Conflict of interest

All co-authors have seen and agree with the contents of the manuscript and there is no financial interest to report.

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Learning Personalisation and Observed Learner's Self-Regulation Abilities

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Abstract

The purpose of this article is to analyse the consistency of learning personalisation as a concept and the main characteristics that define it. Several studies focus the scope of analysis on the relevance of both teacher and student roles in the process of personalising learning. Key literature highlights three dominant components of teachers' personalising actions: attention to uniqueness, curriculum flexibility and mentoring. At the same time, the research done on the subject often refers to personalisation as a crucial dimension for promoting learner autonomy and self-regulation. The learning process, owned and driven by the learner, is treated as a result of managing a personal way of making decisions in the academic sphere. Therefore, this study focuses on the learner's ability to manage their own learning process and the sense of agency for personal and academic improvement. These aspects are outlined by several elements such as his or her self-awareness, the freedom of choice given to them and the sense of autonomy they enjoy in the traditional classroom environment. In this research, teachers' pedagogical activities were explored through a questionnaire to identify their commitment to different aspects of personalisation in their teaching. The students' activities indicating self-regulation were examined using the teachers' ratings. The results of a regression analysis showed that the three highlighted components of personalisation by the teachers in the classroom predicted students observed self-regulation.

Keywords: learning personalisation, sense of agency, observed self-regulation.

1. Introduction

The term personalisation of learning nowadays represents a concept that has become a key element in the development of an innovative approach to education, advocating it as the aspect that would guarantee learning quality improvement as declares UNESCO International Bureau of Education (International Bureau of Education, 2017). This focus has been the triggering element for the diversity of implementations and conceptualisations of the term. Therefore, different

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applications have emerged under the term personalisation (using this name generically), with origins in diverse moments of history, geographical and socio-cultural contexts and responding to different theoretical currents as it can be noticed in the study of Mincu (Mincu, 2013).

Due to such this diversity of definitions and uses, the term is deprived of a structured framework. Although it could bring beneficial benefits to education, personalisation of learning is used as a synonym for many other models of innovation. Therefore, such concepts like individualised, adapted and differentiated learning, are frequently used as synonyms for personalisation (Pérez-Guerrero, 2022). The fact is that all these strategies which are considered as synonyms, have personalising aspects, as they address the learner's needs. However, personalisation is an inherent aspect of education and inseparable from learning, then many different teaching methods and pedagogical conceptions include it as an innovation.

In the last years, several researchers have referred to this aspect (Bernacki et al., 2021; Zhang et al., 2020; Pacual, 2020) and elaborated thorough analyses with systematic studies aiming to crystallise the meaning of the concept. Still, research is needed to understand and specify the use of the concept. Therefore, this study has focused on the main aspects of a personalising activity in the classroom and the effects it can have on the autonomous development of learners.

Two different perspectives on personalisation

The literature about the subject accentuates two different points of view: a functionalist and a humanist approach to learning and to education. Especially, the study made by Mincu (2013) refers to this distinction. The idea of the learner, the teacher, and their job together is the core of one perspective or another. This analytical dichotomisation, into functionalist and humanist approaches, refers that the one focuses on the development of institutions and systems, while the other stresses the educational process in a person-related or person-referenced sense (Pérez-Guerrero, 2022).

On the one hand, the functionalist perspective is based on a social approach to education, where schools must fulfil the function of providing society with proper citizens who will carry on economic progress (Camps-Bansell, 2018). Educational institutions are structures for formation and instruction aiming to give the most successful means for academic achievement. In these terms, the focus is the relevance of learners' voices and choices and the application of learning strategies. From this approach, schools constantly move by the flow of innovations and state policy requirements. Lastly, this perspective leads to an endless exploration of new methods that should guarantee the perfect educational model in a practical way (Chiosso, 2012).

The functionalist approach of personalisation is connected to a severe critique, accused of marketisation of education. Many authors (Hartley, 2008; Fielding, 2012; Ginsburg, 2012; Bragg, 2014) have argued that the intention to personalise the learning process does not respond to a pedagogical attitude but to a strategy of customisation of services that is characteristic of our times (Pérez-Guerrero, 2022). A description of the personalisation of learning based on these principles, places education as a product of the consumerist mainstream of contemporary societies. Consequently, educational systems are linked to marketing theories, tagging learners as customers and the learning processes as activities given to their individual needs and interests (Hartley, 2008). In this conception, the learner turns into a user and the personalisation into a user-centric pedagogy. Therefore, tailoring, customising, co-production of knowledge and learner's choice are terms that characterise a functionalist approach to education.

Several researchers argue that personalisation of education cannot be a synonym for customisation in learning (Bray, McClaskey, 2014; Pérez-Guerrero, 2022). The analogy of this pedagogical model with *marketisation* theories establishes the priority of giving the learner a product according to his/her needs and interests. Then, it is emphasised, that more than adapting the product to the consumer, he/she receives the possibility of choosing what he wants, enhancing his/her active participation in the learning process. From there, personalisation is understood as a renewed individualisation of education (Pérez-Guerrero, Ruiz, 2020). However, in the natural educational context, the learning processes are delivered in groups, reinforcing the learner's agency by the aptitudes of reflection and metacognition, concerning others. Thus, the customisation should be done by the learner rather than by the teachers or the school. The teachers are guides and counsellors in the trajectory that every learner chooses. Therefore, the adaptation rises mainly from the learner and his interest and motivations instead of a program applied from above.

On the other hand, the humanist approach remains the focus on the holistic view of the learner as a person. Humanist approach to personalised learning allows to connect the personal world of the learner and the way he or she shapes the learning process. The importance to attend the learner in his or her uniqueness as well as the facilitation of the relationship with the learning, community is crucial in personalised learning (Camps-Bansell, 2018). The pedagogue Garcia-Hoz (1992) summarizes the concept of personalised education as the proficiency of attention to the individual characteristics of each student and the awareness of learning motivation. He appreciated as an important work to help the learner to achieve the fundamental habits of the human person, which are expressed in conscious, free, and responsible actions (Garcia-Hoz, 1992). Likewise, the pedagogue affirmed that an individualised concern gives the ensure of success of the educational activity.

A person-centred approach of personalisation of learning supports the idea of educating the whole person and the personal development of each learner. The learner must develop cognitive abilities and at the same time, other dimensions of his personality which lead him or her to better academic achievements. Education is not reduced to procedures and techniques and the teacher's work consists neither in controlling them nor in shaping them in a predetermined way, but in fostering and promoting their personal condition. In this way, it is encouraged their capacity to choose, to make decisions and to act with responsibility. Consequently, the goals of education do not address just knowledge, but furthermore, the needs to develop other dimensions of the personality as the affections, the will, the behaviour, and socialisation. The deepest sense of personalisation is to turn learning into an element of personal training through the acceptance of responsibilities by the learner as an original and creative being, with the ability to govern themselves, establish relationships with others and find the meaning of life.

Main attributes for personalised learning

A detailed literature review has been carried out to clarify the main common features highlighted by different scholars. For this purpose, a large number of publications about the topic were gathered. The principal source of the search was the EBSCO provider of research databases, focusing on educational platforms. The first search launched, where thousands of publications were shown, included the words personalised or personalized learning and personalisation. Consequently, the quest was reduced by the following criteria: a) full-text texts, b) academic journals, and c) two peer-reviewed sources. After these filters, the selection rounded about 200-300 articles and books. After that, a new feature was dismissed: the word 'web', referring to e-learning conception. The aim of the research focuses on the core definition of personalised learning (PL), and ICT is just one more strategy or method in the PL pedagogy model and publication centred on that attribute could reduce the analysis of the meaning. As a result, the search was narrowed up to around 60 publications.

The most repeated features related to the term according to teachers' activities in the classroom are attention to the individual needs and interests of the learner, flexibility of curriculum and mentoring.

Attention to learner's uniqueness. Personalisation will always be linked to the individualisation and uniqueness of the person. For this reason, all the literature on the term stresses the importance of attending to the individuality of each learner. This often refers to their unique and unrepeatable way of studying, learning, and developing. The recognition of this uniqueness requires a consequent support which cannot be separated from guidance. It is to identify, understand, accept, and promote diversity, helping with difficulties and promoting the talents of each student. This requires from the teacher attention, openness, and respect for each student's way of being. The scholar Van-Manen (Van-Manen, 1999), who developed the idea of pedagogical sensibility, defines *tact* as a suitable way of knowing and understanding the singularity of the learner. The teacher can cultivate that sensibility and tact by reflecting on questions such as:

'In what 'respect does this child differ from me and from others? How can this child be different? How does this child want to be different? What can I do to assist the child in realizing his or her uniqueness?' (Van-Manen, 1999)

Researchers who have contributed to the field agree that learner's uniqueness refers to the fact that each one has a particular experience with a particular mindset and that is relevant in the moment of incorporating and creating knowledge (Liu, He, 2012; Calderero-Hernández et al., 2014; Deakin-Crick, 2012; Ospina, 2014). The learning pathway always is individual and at the same time, different to the others. The context, the activities that we develop, the use of diverse

resources and opportunities to learn, the people with whom we interact and the person with whom we learn and from who we learn, the interest we generate and the learning we achieve are factors which construct that singular learning pathway (Coll, 2017). Therefore, the focus is much more on progress rather than on achievement, and there is a clear intention to adequate the way of teaching to the learner's pace and develop aptitudes in a flexible way. Consequently, the flexible curriculum and flexible grouping are means of personalisation which are inherent to the concept.

The flexibility of the curriculum. The feature of flexibility is related to adaptability to the classroom pace and needs. Naturally, the curriculum is outlined by specific standards defining common goals for the learners. At the same time, these standards should accommodate the levels of performance of vastly different learners, which arise different demands in the intellectual domain (Tourón, 2009). Consequently, following a standardised and rigid curriculum could not collaborate with personalisation and thereby it is worth creating teaching dynamics that adapt to the groups' pace while intending to fulfil the requirements of school standards.

The recognition that the individual is the cause and origin of his or her actions should characterise the entire development of the school curriculum. Assuming that the learner is the agent, actor, and author of his or her actions in the learning process means that the teacher must know how to plan and carry out the curriculum under this consideration because it commits to accepting the learners' actions with all its consequences (Bernal-Guerrero, 1996). It is the acceptance of the student's activities with the creativity and originality of a unique being. This requires a dynamic, flexible way, moving forward and backwards when necessary, detecting deficiencies and establishing the appropriate aids on an ongoing basis.

Mentoring. Adaptability by the teacher is crucial, but more important is that the learner communicates his/her needs, interests, and helps to identify the ways of fulfilling them. Regarding this fundamental aspect, the development of the teacher's labour by asking, helping to reflect, and giving advice is what we could call *mentoring*. This activity includes two principal objects. Firstly, to know the learners and, what they think about themselves, and their situation, providing the help and the guidance they consider necessary. Secondly, orientation can help the student to know oneself and take responsibility for one's decisions, which implicates academic development and improvement (Carbajo-López, 2004).

Mentoring is the attribute which reveals three main aspects of education: interaction, communication, and orientation. Interaction is the dimension which reminds the importance of open interplay between the teacher and the learner and among different members of the learning community. Bulger (2016) highlights the importance of the social dimension of learning, threatened by some personalisation models with a hyperbolic mindset of individualisation (Bulger, 2016). In these terms, the aspect of relatedness with others, needed by the students, is underestimated. Otherwise, a learning context conscious of the importance of relatedness promotes interpersonal relations between members representing the most relevant factor for personalisation.

Encounters, talks, and dialogues are principal issues in education because there are the means to communicate and transfer the own world to the other. Interpersonal communication is revealed as essential for personalisation itself (Bernal-Guerrero, 1996) because, it is important for the learner to communicate his or her own needs as well as for the teacher to be open to listen to them. Moreover, by enhancing the relationship between teacher and learner, their nature is reinforced, and consequently, the motivation to learn is higher since reality turns more significant as far as it is in connection with interpersonal relationships (Orón-Semper, Lizasoain-Iriso, 2022).

As indicated above, aspects such as attention to the uniqueness of the learner, flexibility of curriculum and mentoring are dimensions repeatedly mentioned in the literature related to the term personalisation. Finally, learner autonomy, promoted by many current pedagogical currents, is seen as a central theme. The personalisation of education and learning is an element that enhances and supports student's learning ownership. Within a framework of learner-centred pedagogical models, this characteristic makes the learner the master of his or her learning process, and furthermore, the owner of his or her life trajectory.

Personalisation, autonomy, and self-regulation

Much of the literature on personalised learning has emphasised in addition, the importance of learners' autonomy, which is a prerequisite of (autonomous) self-regulation (Reeve et al., 2007). Ferrer (2012), associating autonomy with the concept of independence, argues that there is an increasing need for independent learners, capable of managing their learning process. This author

still remarks on the importance of individualisation and socialisation in this (Ferrer, 2012). Similarly, the study of Prain et al. (2013), assert that teachers' activity should provide a context where students can develop their capacities to become independent learners. They see this aspect as relevant for increasing the sense of agency in a nested agency model of personalisation (Prain et al., 2013). Bray & McClaskey (2014), highlight the relevance of the active participation of the learner for motivation increasing. They argue that the more the student is aware of his or her learning, the more motivation increase, and in that aspect, personalisation is crucial (Bray, McClaskey, 2014). Coll (2017) highlights among the main dimensions of personalisation of learning, the learner's decision, and control over the learning process (Coll, 2017). Hence, self-management addresses the learner's ability to conduct their own learning, the desire for improvement and the ability to focus on academic goals (Waldrip et al., 2016). The learner's engagement and ownership of the learning process arise from the personal aptitude to drive their lives and their acts.

The concept of agency is closely related to learning since learning takes place in a context of actions (Castañeda-Figueiras et al., 2016). Hence, self-regulation is the regulatory action that a person exercises at different moments of his or her learning process (Castañeda-Figueiras et al., 2016). Specifically, Castañeda-Figueiras et al. (2016) speaks of academic agency as the set of self-regulatory, motivational, and attributional components that enables the student to play an active role in his or her learning. In other words, it is the relationship between the factors involved and the activating and inhibiting mechanisms of agency (Castañeda-Figueiras et al. 2016). Foregoing, the active engagement of the learner in the learning process can be fostered, as well as the self-regulatory components. In both cases, the role of the teacher and his pedagogical task are crucial to facilitate such elements.

Coll (2017) stresses the importance of the learner being the communicator of one's needs. Needs are not only identified from the teacher, but the learner helps to identify them and to define and control how to satisfy them according to his or her personal interests and choices. Personalisation from outside may not really adapt to what the learner needs. That is why it is important that the learner identifies his or her needs and expresses them, therefore, the reflection of the learner is so relevant for the personalisation of his or her own learning. To the extent that he knows himself, he will know his optimal way of learning and will be able to direct his actions on that basis.

Along these lines, personalised learning is the mean of enabling the student to access learning scenarios that allow him or her to put into practice all the individual and social potentials, fostering the individual's own characteristics: uniqueness, autonomy, and openness (Arteaga, Calderero, 2014). The learner, as a person is a reflective being, capable of making decisions and drawing a personal cognitive path. The frequently mentioned concepts of choice and voice in the bibliography related to PL, are characteristics of the student's agency which makes them get more involved in the learning process.

2. Methodology

In this study it was argued that sense of learners' autonomy is facilitated through an emerging personalising activity by the teacher. Based on the literature review it have been defined some attributes that characterise personalised learning. There has been highlighted three of them in relation with the aspect of learner's ability to manage their learning process: attention to learners uniqueness, interaction between teachers and learners through mentoring and flexibility of curriculum as essential properties of personalisation in the classroom.

Basing on this theoretical framework, the aim of this study was to assess the extent to which different personalisation components relates. Therefore, this research sought to address the following questions:

- How are the main attributes of personalisation related to each other?
- To which extent teachers self-reported attention to uniqueness, flexibility and mentoring predict their rating of learners' autonomous self-regulation?

Participants

The sample consisted of 359 participants who voluntary participated in the study. There were 319 female and 40 male teachers whose mean age is 49, while the average of experience is 24 years. The 65 percent work in gymnasiums and the rest, at elementary schools. Most of the teachers had university studies (223 participants) including a 62 percent of the total. The origin of the

participants was around a 50 % from the biggest cities of the country, and around a 36 % from smaller towns. It was shown only an 11 % from rural regions. It represented a broad variety of participants in this study.

Measurement
A questionnaire designed by the authors was used, to test the factors that describe different dimensions of emerged personalisation uses in the classroom. The questions were based on the conceptual framework explained earlier. The questionnaire included a broad spectrum of questions to identify the Lithuanian teachers' familiarity with the concept of personalised learning, uses of personalisation and perceptions of learners' ability to manage their learning processes. In this paper, we will present an analysis of the elements related to the uses of personalisation in the classroom and the relationship between these elements among each other.

After a thorough analysis of the concept, the highlighted features referring to personalisation are attention to the learner´s uniqueness, flexibility of curriculum, mentoring and learners' ability to manage their learning and are used as variables for the analysis. Explaining teachers' attention and concern to learners' individual uniqueness, there are included aspects as learning pace, difficulties, learners' context and at the same time, the pedagogical reflection. The factors predicting mentoring refers to the action of the teacher interacting and talking with learners about their character traits, their interests and learning styles, personal improvement and strengths and weaknesses in the learning process. The last one shows the level of internalisation of the teacher about her or his own pedagogical activity and the impact in the individuality of the students. Flexibility of curriculum is predicted by two diverse kinds of factors. Ones are related to adaptability and others to differentiation. There are included, flexibility of curriculum, adaptation to likes, interests and mood, and differentiation of activities for learners with unique needs. Lastly, the variable "autonomous self-regulation" is explained by three elements: reflection on strengths and failures, asking for advice aiming to improve in learning and independent decision of learning strategies.

The mentioned questionnaire was delivered among teachers working in Lithuanian schools. All the questionnaire questions utilised a 5-point Likert scale from never to always referring the frequency of the activities and situations. The questions and the results of the frequencies are seen in the Appendix.

Data analysis
Firstly, descriptive data were generated for all variables and reliability was calculated using Cronbach's alpha. Secondly, a Pearson correlation analysis was conducted to assess the strength of correlation between variables. Finally, regression analysis was used to predict the value of the variables concerning uniqueness, mentoring and flexibility explaining the learners' autonomy. Data were analysed using the SPSS 28.0 statistical package.

3. Results
Descriptives
Descriptive statistics are presented in the Table 1 including Cronbach's Alpha, means, standard deviation and skewness and kurtosis. Cronbach's Alpha shows an acceptable level of reliability with coefficients. The low skewness and kurtosis values show that the distributions of the variables are approximately normal.

The first research question was about the relationship between the main attributes of personalisation. For this purpose, the correlation between about them was tested to obtain the strength of the relations and the possibility of prediction. The results are shown in Table 2 and reflects the significance of correlation between the variables at a .000 level between independent variables, and <.001 with the dependent variable.

The positive middle size correlations between variables affirms the theoretical statement that attention of uniqueness, flexibility of curriculum, mentoring and autonomy are related dimensions of personalisation, according to the self-reported teacher's questionnaire of this study.

Further analysis was concerned to the specific relation between three dimensions of personalisation connected to teachers' activities and the fourth mentioned feature, which is connected to learners' actions. It is, that the second research question focusses on the attention of learners' uniqueness, flexibility of curriculum and mentoring in relation with the autonomy of the learner through self-regulation activities. Therefore, teachers' practices are treated as independent

variables and predictors of learner's autonomy, as dependent variable. Regression analysis was used to predict the strength of the effect of the correlated variables. There was no multicollinearity between the elements of the model (VIF's varied between 1.743 to 1.521). The overall regression was statistically significant (R^2 = .342, t F (3,355) =61.50, p < .001). The predictors are presented in the Table 3.

Table 1. Descriptives of the variables

	Cronbach's Alpha	Mean	Std. Deviation	Skewness	Kurtosis
Flexibility	.794	22.0585	3.20691	.057	.100
Mentoring	.796	14.1170	2.51425	-.171	.541
Uniqueness	.788	9.6490	2.20722	-.357	.621
Autonomous self-regulation	.662	16.0724	1.83371	-.189	.161

Table 2. Coefficients of correlation between variables

		Aut. self-regulation	Flexibility	Mentoring	Uniqueness
Pearson Correlation	Flexibility	.516***	1.000	.593***	.506***
	Mentoring	.513***	.593***	1.000	.537***
	Uniqueness	.417***	.506***	.537***	1.000

Notes:*** = p< .001, N= 359

Table 3. Regression coefficients and significance of the predictors

	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	1.518	.651		2.333	.020
Flexibility	.166	.032	.291	5.225	<.001
Mentoring	.201	.041	.275	4.842	<.001
Uniqueness	.101	.044	122	2.301	.022

Notes: Dependent Variable: Self-regulation activities

The teachers' self-report scales flexibility, uniqueness and mentoring predicted teachers' ratings of students' autonomous self-regulation and explained 34 % of its variation.

4. Discussion

As it was considered before, the literature alluding the issue of personalisation of learning, often relate the concept to the development of the autonomous learners (Reeve et al., 2007; Ferrer, 2012; Prain et al., 2013; Bray, McClaskey, 2014; Coll, 2017; Waldrip et al., 2016; Arteaga, Calderero, 2014). On the one hand, the main attributes of the concept demonstrate a concise vision of what is meant by personalisation in the classroom: attention to the needs of the learner (Liu, He, 2012; Calderero-Hernández et al., 2014; Deakin-Crick, 2012; Ospina, 2014), flexibility (Prain et al., 2013; Tourón, 2009; Bernal-Guerrero, 1996; Deed et al., 2014) and guidance through individual

mentoring (Bernal-Guerrero, 1996; Carbajo-López, 2004). On the other hand, the note of learner autonomy is not clearly justified and leads to several controversies in its definition (Ferrer, 2012). For this reason, the present study was able to test the relationship between these dimensions, although in an indirect way.

Autonomy, not as independence, rather as the ability to make decisions that allow one to regulate one's own learning in order to bring it closer to a certain goal, within the specific conditions that form the learning communitarian-context (Monereo, 2001), is the perspective chosen for this study. In this paper, learner autonomy has been analysed through three aspects: self-knowledge, choice and the sense of personal agency in oneself improvement. These three aspects can summarise three determining actions of the autonomous learner, manifested in activities of self-regulation in learning.

A strong relationship between teachers' self-reported personalisation and learner's ability to manage their learning processes shown in this study, supports earlier findings reported in the literature. Kucirkova (2021), who developed the idea of agentic personalisation, suggested the identification of five '*as*' in this topic: autonomy, attachment, authenticity, aesthetics, and authorship (Kucirkova, 2021). It reflects that personalisation it is not merely an innovative view of education, but it responds to a key element to understand the relevance of the learner's sense of agency for the own learning process. In accordance, multiple regression analysis in this research revealed that this dimension has a positive correlation with the abilities of self-regulation of the learner through teachers' perception. It validates the idea that a model of personalisation includes teachers' activity that has an impact on learners' ownership of learning. At the same time, it affirms that autonomy, achieved through personalisation, is a learner and a teacher activity matter.

At the theoretical level, the three attributes highlighted for personalised learning, are closely related to the aspects analysed in reference to self-regulation. Firstly, attention to the learner's unique needs and his or her unique background is connected to the ability of learner's self-knowledge. Reflexivity for self-knowledge is the process through which the learner can be aware of his/her unique way of engagement in different contexts (Archer, Maccarini, 2013) and specially in the learning order. As mentioned above, the learner needs to know him/herself to be able to communicate his/her needs and interests to the teacher. At the same time, the teacher cannot adapt the curriculum to the learner's needs without knowing them through the learner's voice. In other words, attention to the uniqueness of the learner must be based on the learner's knowledge of him/herself, and this is developed as well as the teacher gives importance to this aspect. If the teacher is indifferent to the uniqueness, the student tends to massifying him/herself and does not assume the importance of self-knowing and its communication. In practice this has been reflected through the question about self-reflection on strengths and difficulties in learning. Assessment, therefore, must have a reflective aspect which helps the learner to think about and discover ways in which he/she can reinforce his/her learning (Coll, 2015).

Secondly, the flexibility of the curriculum by the teacher has been analysed. This aspect is directly related to the question about the feasibility of choice in the way of studying. Adaptability and flexibility create an environment of choice and freedom that allows the learner to feel more in control of his or her learning. The autonomous self-regulated abilities are developed in consecutive syntheses of choices, which are consolidated when these options are into an integrated system (Rico, Hernández, 2021). In a climate of choice, the learner is at the same time forced to make decisions about his or her actions, without offloading the responsibility onto the teacher. For this to happen, the teacher needs to enable such a climate by creating activities that give room for choice. A free environment does not mean a class without norms or rules; on the contrary, it is a regulated atmosphere, with clear conditions and activities, but at the same time giving room for choices in the ways of doing according to a personal way of doing. Considering this aspect of learning is fundamental in order to achieve a meaningful and therefore, a long-lasting learning.

Thirdly, personal mentoring represents a key variable in the teacher's personalisation activity. It is the way to come into direct contact with each individual student and to dialogue, ask questions and give advice. It is the most effective way to reach the student and to help him/her in his/her learning process. At the same time, it is the way in which the learner can not only receive individual attention but is also recognised in his or her role as an agent. Archer (2013) develops the idea of communicative reflexivity which take place in thinking and talking with others for the achievement of new ideas. Through personal dialogue with the learner, a process of reflection on one's own learning and the setting of goals for improvement can take place. The teacher's advice on

an individual level can be decisive for a pupil to choose the right path of academic improvement. In this way, he/she is also compelled to reflect and decide what steps to take in order to make progress on a certain academic plan. This is how he or she sets up a personal improvement project in the studies for which he or she feels responsible and feels that must decide for himself or herself. It is a way of becoming aware of one's own agentive ability, of the importance of being the author of one's own path of improvement in learning. Taking control of their studies in an effective way requires the support of the teacher, and for this, dialogue, and interpersonal communication between them is necessary.

The present study is limited by the fact that it is based only on teachers' self-reports about personalisation experience in teaching actions. Thus, the autonomous self-regulation abilities of the learners are measure by the same teachers and it is possible that the results might be biased. Finally, all variables are based on data collection through one self-report teacher's questionnaire at one time point. This limitation means that study findings need to be interpreted cautiously and in future studies other data collection methods such as observations and student questionnaires in addition to the teacher questionnaire could add the validity to the results.

5. Conclusion

The study of the concept of personalised learning has shown that the term has its own defining attributes. Some specific dimensions, repeated in several references, reflect the idea of the term, differentiating it from other innovative currents in education. Therefore, three aspects have been highlighted as the main defining features of personalisation: attention to learner's uniqueness, mentoring, the flexibility of curriculum. The remarked attributes can be divided into two major scopes: the teacher's and the learner's actions for personalisation. This differentiation concerns the agentive dynamism of personalisation. In other words, as many authors affirm, personalisation has a double management from the teacher and the learner. It is needed that the learner itself identify their own needs to communicate to reinforce adaptability. At the same time, his or her autonomous activities regarding reflection, decision making, and resolutions are key points of self-regulation learning and personalisation.

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Appendix
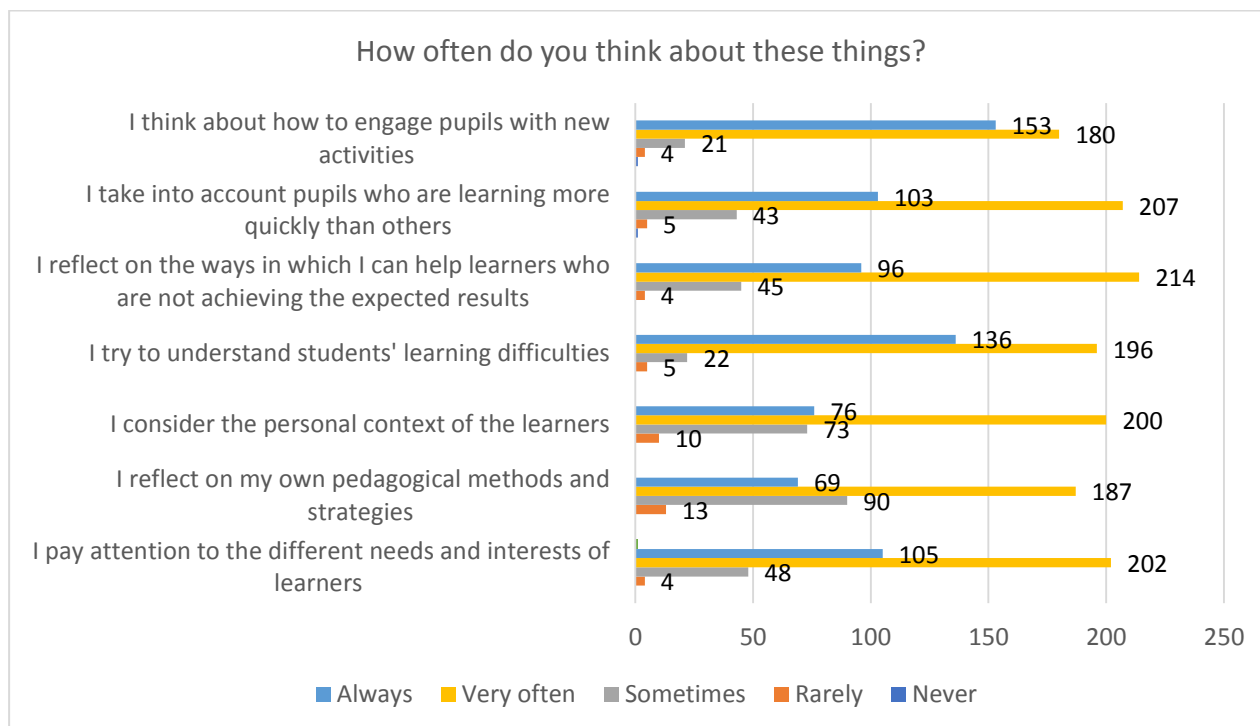
Fig. 1. Subscale uniqueness
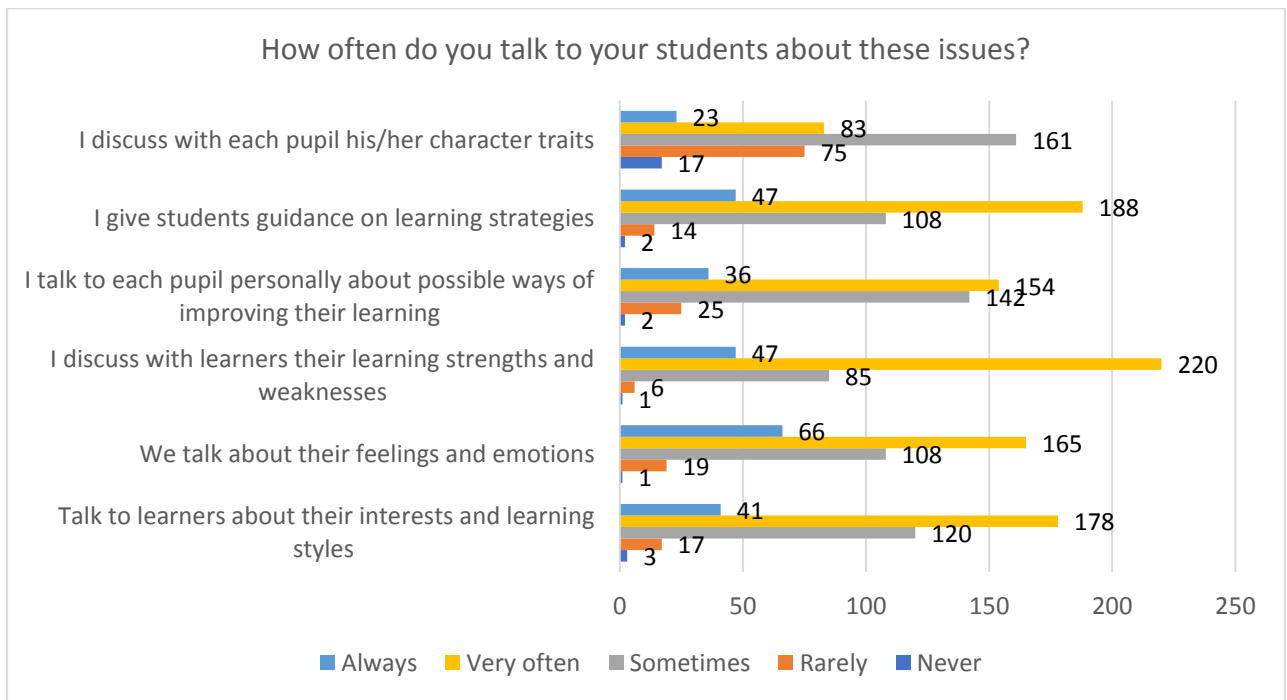
Fig. 2. Subscale mentoring
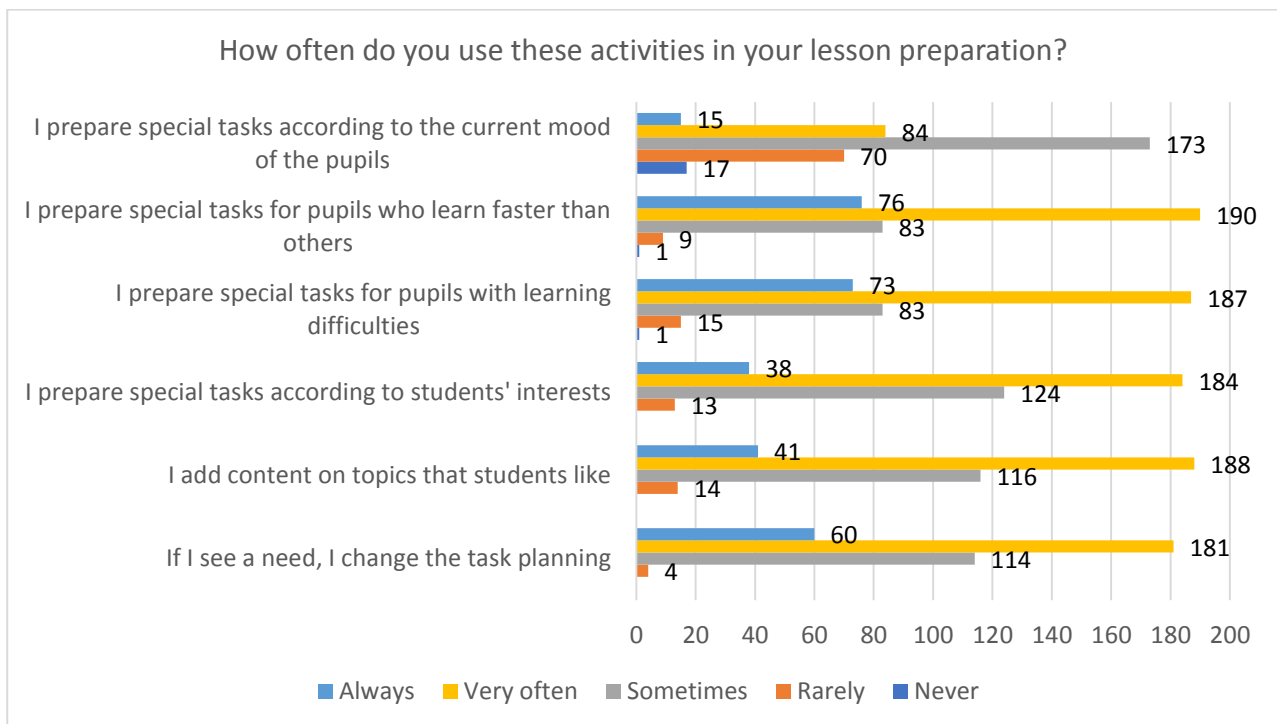
Fig. 3. Subscale Flexibility
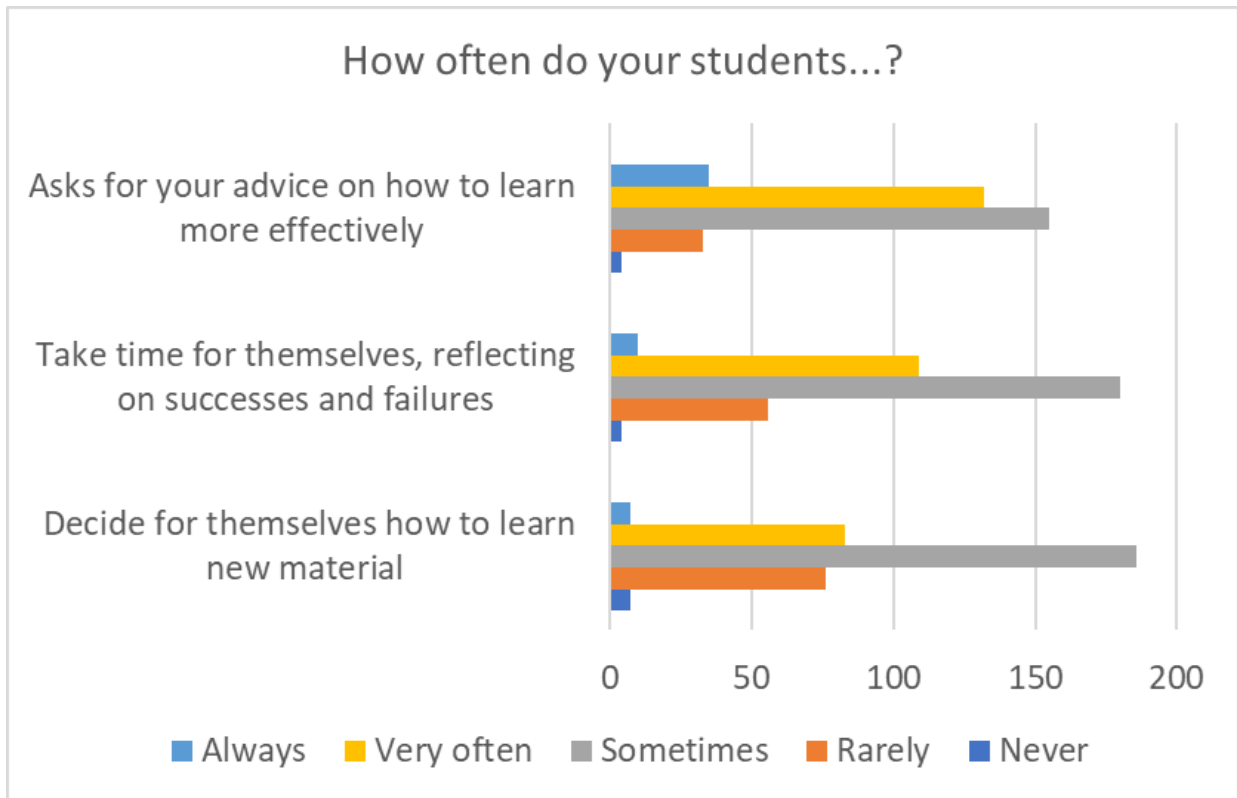
Fig. 4. Subscale Students' self-regulation activities

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Methodological Aspects of Content – Based Strategies in Classroom Managerial Activity

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Abstract

The cardinal changes in the socio-economic situation that have taken place in recent decades, the intensive development of market relations and integration processes have also affected the sphere of higher education, since, like many countries of the world, they find themselves in a situation of intense competition, which imposes special responsibility on managerial activity and requires current and future teachers of universities to master such an area of scientific knowledge and management practice in education. For pedagogical science, it is relevant to comprehend educational management as an interdisciplinary multidimensional phenomenon, identify the pedagogical aspects of this phenomenon, and comprehend the concepts and strategies of educational management in domestic and foreign pedagogy. The pedagogical component of this phenomenon is associated with the content and methods of organizing the educational process, with the transmission and formation of collective and individual knowledge. At the same time, these processes are carried out in organizations of various types: schools and universities, enterprises, public organizations. The implementation of the control function involves: monitoring progress and attendance, identifying possible problems for each student. The control of activity is understood as the realization of self-control of the class teacher, the student team and each student as an individual This research paper describes the problems of the methodological aspects of content-based strategies in classroom managerial activity and specifics of the designated technology, the advantages of its implementation in higher educational science, comparing the difficulties that the academic staff of the university may face when implementing it. The paper examines the contradictions faced by teachers in specific aim and teachers of specialized disciplines, and gives a critical assessment of how well curricula and programs meet the needs of teachers and students. The appropriate sides and disadvantages of using the technology of CBS in the organization of classes in order to help teachers effectively plan their activities are also

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investigated. In conclusion, the author argues that an integrated interdisciplinary mode to teaching profile-oriented disciplines based on the described technology is a powerful platform necessary for the training of highly qualified specialists in a specific field.

Keywords: CBS, interdisciplinarity, professional, integration, professional training, purposes.

1. Introduction

Lessons in teaching foreign languages students with integration a subject content make it possible to link into a single whole all the knowledge and skills obtained in various academic disciplines and are a source of motivation for the educational process in a foreign language (Chinasilova, 2021).

The issue of CLI has become particularly popular in recent years, since the requirements for the language training of students in higher education are increasing, and traditional teaching only general foreign language (General English), starting from the 1st year, does not contribute to the dynamic development of speech skills and the increment of the system of language knowledge, does not give the required results. In this regard, there is a need to improve the learning process, the use of other approaches that would bring language training to a qualitatively new level.

For effective use of the CLI approach and its implementation in bachelor's degree curricula, it is necessary to address first of all the concept of this term, consider the theoretical basis of CLI, component composition and existing models of its implementation in the curriculum (Bissenbayeva, 2020).

There are also many researches which have been done in teaching foreign languages. The analyses for the previous works have been done, but still some gaps in enhancement of CLIL usage in applied linguistics. So this research will present new angles in CLIL and make teaching process more motivated and interesting, specifically this research present new set of techniques for improvement of teaching process. The focus is being done for the communicative skills and oral mastering in content based learning. Where students can apply their subject matter knowledge in producing the language (Abdikerimova, 2020).

For example, in the set dedicated to education and methodology aspects "Family and Friends" published by Oxford University Press, which I use as the main textbook in English lessons, vivid examples of interdisciplinary language integration are given: Dolphin Dreams and Flocke (cognition of the world), World Records (geography), National dishes (cultural studies), The Vikings and Papyrus (history), M-400 Skycar (technology).

2. Materials and methods

For the purposes of this study, a questionnaire was developed to assess the student's satisfaction and attitude to the applied CLIL. The questionnaire consists of 20 questions related to the CLIL of students of the specialties "Calculation and design of buildings and structures" and "Technology of industrial and civil construction" of the International Educational Corporation. The questionnaire is anonymous and is aimed at evaluating and enhancement of the quality in educational process. The questionnaire includes 19 closed questions measuring the reaction of students on a typical 5-level Likert scale covering the range: strongly disagree; I disagree; I find it difficult to answer; I agree; I completely agree with one open question in which students were asked to list the advantages and problems of studying academic subjects in English. The questions were selected for having determined the students' opinion about the level of application of the CLIL teaching method and its impact on the level of acquired theoretical knowledge and practical skills.

The study was conducted among 156 students majoring in "Foreign language" and "Interpreters" of the Humanitarian faculty. The outcomes of the case study showed that the vast majority of students 70 % believe that the content of various topics studied in the CLIL course fully corresponds to the set of specifically oriented engineering disciplines studied in Kazakh/Russian. To some extent, 8 % of students agreed, 5 % found it difficult to answer clearly, probably in the shortage of basic knowledge of general English, and 17 % consider compliance not at the proper level.

However, the process of such adaptation involves quite large-scale efforts because of situations that following a lot of obstacles in the way of application this technique is used in our country. To eliminate the obstacles, it is necessary:

1) approve the CLIL approach at the university management level;

2) establish interaction between employers, who are customers of educational services, and the university in the joint development of a training plan based on real-world tasks and problems-in a particular professional field;

3) create a team of developers of the CLI methodologies at the level of university;

4) organize retraining of subject teachers interested in applying the CLIL approach in their professional activities;

5) create conditions for improving the level of students and teachers;

6) establish a mechanism for interaction between teachers and lei-subject specialists and linguists to work together on the development of courses/modules involving the use of CLIL-methodology. Nevertheless, despite the scale of the event-

While implementing the CLI oriented approach in the sphere of education in university, possibly to be observed that these efforts will pay off with a result that assumes a higher level of training of specialists.

The predominant number of students with a stable level speaks about the positive dynamics of the forming of the being enhanced of skills to communication among learners of the fourth grade.

Thus, the comparison of diagnostics at the ascertaining and control stages of experimental search work and qualitative analysis showed a positive dynamic of the formation of dialogical skills and general communicative skills of students, that is, communicative skills.

Table 1. Distribution of learners by levels of formation of communicative skills

Stages/Levels	Elementary	Unstable	Stable
Stating	24 %	32 %	44 %
Final	8 %	28 %	64 %

As a result, during the conducted diagnostics in order to identify the level of abilities in communication being formed of learners at the final stage of the experimental search work, it is clear that the number of children with a stable level of formation of communicative skills increased by 20 %, and the number of learners with an initial level decreased by 16 % the formation of communicative skills; the amount of students with an unstable level decreased by 4 %.

3. Results

CLIL technology requires significant efforts to organize collaboration and collaboration, and in this sense represent a professional task for both language teachers and teachers of specialized disciplines. Therefore, it is highly necessary to focus of the university administration to what personnel needs they may face in the future and how it will be possible to provide the university with such personnel (Meyer, 2016).

In order to be coincided to the standards of the teaching staff in improving foreign language skills, Kazakh National University offers courses to improve foreign language communicative competence for the teaching staff, aimed at training teachers and supporting them in their desire to develop themselves and their professional qualifications.

Substituting the data into formulas (1) and (2), we obtain that n ..=0.58. Comparing the obtained value of the student's t-test with the tabular tKpHT = 2.01 (the number of degrees of freedom is 154 = 75 + 81-2), we conclude that the null hypothesis is not rejected and both samples belong to the same general population, i.e. they are homogeneous for a confidence level of 0.05 (probability 5%), which was to be proved. Let's carry out a similar statistical analysis for the second part of the test. To do this, we put forward the following hypotheses: BUT - the differences in the level of preparedness of students in mathematics are not significantly enough.

We will use Student's t-test for models that are independent, but first we need to check the conditions for its application.

The first condition is met, since the measurements were carried out on a ratio scale, the second condition is also met, since the compared samples are distributed according to the normal law (in the CG: mode = 6 b., median = 6 b., mean value = 7.11 b.; in the EG: mode = 6 b., median = 7 b., mean value = 7.49 b.) All conditions are met, therefore, Student's t-test is applicable in the second part of the test.

Carrying out similar calculations, we obtain that t3Mn = 1.44. Comparing this value with the tabular tKfJHT = 2.01 (the number of degrees of freedom is 154 = 75 + 81-2), we conclude that the

null hypothesis is not rejected and both samples belong to the same general population, i.e. they are homogeneous for the confidence level 0.05 (probability 5 %), which was to be proved.

Thus, the input testing showed the homogeneity and balance of the samples.

A necessary condition for teaching natural sciences in a foreign language is a certain level of knowledge of a foreign language. Comparative data of the outcomes of the beginning part of the test of the entrance test demonstrated that most of the group possessing levels B1 and B2 (52 students) and above C1 and C2 (14 students), which indicates their ability to understand the main questions in various situations (when applying for a job, at school, on vacation, etc.), communicate with native speakers, speak on interesting and understandable topics, describe your experiences and events, dreams, hopes, ambitions, and also argue your opinions and plans. So, the ascertaining stage of experimental work revealed: 1) homogeneity and balance of samples in the CG and the EG; 2) the initial states of knowledge in mathematics and English of the students among the Contr. G and the Exp. G can be coincided with the appropriate level of 0,05; 3) a high level of development among students of the department of Russian and foreign philology in the direction of "Pedagogical education", profile "Foreign language (English) and a second foreign language" of basic communication skills of daily communicating in English, which is a necessary condition for teaching the subjects in a non-native language. However, it is not sufficient.

At the formative stage (2021), a pedagogical experiment was conducted, which consisted in testing the effectiveness of the modelling of teaching in a foreign language at a university based on an CLI approach.

During this stage, students from the EG were trained in the discipline in English in the basis of CLI approach.

In the frame of the controlling stage of the conducted experiment for the students of the CG and the EG, consisting of three parts. Each part was designed to test the formation of one of the components: cognitive, academic or linguistic.

The performance-evaluative component includes diagnostic materials for identifying the level of skills of a subject foreign language competency (sub-threshold, threshold, advanced) in accordance with the criteria and indicators.

Statistical data processing, conducted for using a by-sided Student's t-test for models which are independent, showed the homogeneity and balance of the models used in this experiment both in terms of the level of foreign language proficiency levels (temp = 0.99, tcrit = 2.01, temp < tcrit, zero hypothesis H0, the samples are homogeneous for a confidence level of 0.05), and in terms of the level of basic knowledge, skills in mathematics (temp = 0.76, tcrit = 2.01, temp < tcrit, the null hypothesis H0 is accepted, the samples are homogeneous for confidence level 0.05).

Control (CG) and experimental groups (EG) were separated. The amounts of students in the EG was 81 people, in it the discipline "Fundamentals of Mathematical Information Processing" was taught English, while in the CG, were of 75 students, the subjects were taught in Russian.

A quantitative comparative analysis of the level of competence among learners at the CS of the experiment is represented in Table 2.

Table 2. The level of formation of competence among learners at the CS of the experiment (%)

levels	cognitive		academic		language	
	KГ	EG	KG	EG	KG	EG
Before	31,0	4,9	34,6	2,5	13,3	12,3
thread hold	59,2	65,4	42,7	32,1	49,3	33,3
high	9,8	29,7	22,7	65,4	37,4	54,4

Comparison of the results of students performing tasks from the developed fund of assessment tools allows us to conclude that, in total, the amount of students with threshold and elevated levels of formation of the cognitive, academic and linguistic components of the competence in the experimental group exceeds the quantity of students in the control group.

The effectiveness of experimental learning was established using a statistical assessment of the reliability of differences in the results of students completing tasks from the first, second, third parts of the bases in evaluational tools.

Table 3. Empirical Student's t-test values for each of components of language competence

COMPONENT OF SUBJECT FL COMPETENCE	t-CRITERION OF STUDENT
cognitive	$T_{emp} = 3,16$, $t^\wedge = 2,01$
academic	$T_{emp} = 2,43$, $t^\wedge = 2,01$
language	$T_{emp} = 2,06$, $-^\wedge = 2,01$

As can be seen from Table 3, the empirical value of Student's t-test for each of the components of language competence exceeds critical. Thus, there is reason to accept the alternative hypothesis (H1) that the difference in the results of assignments by students due not to random factors.

The positive dynamics of the development of the components is due to the fact that teaching subject knowledge in a foreign language was built in accordance with the principles and strategies of CLI, the cognitive activity of students was conducted in combination with speech activity, and the assimilation of subject matter occurred in simultaneous with mastering the tools of its expression in FL.

4. Discussion

The analysis of the level of general communication skills showed 32 % of respondents with a stable level of formation of general communication skills, 68 % – with an unstable level. There is no data on students of the fourth grade with an elementary level formation of general communicative skills.

Table 4. Indicators for assessing the formation of general communication skills

Level formation of skills	Understanding (tasks 2-10)	Playback (task 11)	General communication skills
Stable	14-16 points	4 points	17-20 points
Unstable	5-13 points	2-3 points	7-16 points
Elementary	0-4 points	0-1 score	0-6 points

Analysis of the level of formation of dialogical skills showed 56 % of respondents with a stable level of formation of dialogical speech, 20 % of fourth grade students showed an unstable level of dialogical skills, 24 % have an initial level.

The general level of formation of communicative universal educational actions consists of the sum of the points of general communicative skills and dialogical skills of students. Communicative skills are developed at a stable level among students who scored a total of 25 to 27.5 points. The unstable level of formation of communicative skills among students of the fourth grade is estimated at 20-25 points. Students with an initial level of formation of communicative skills scored less than 20 points.

The analysis of the formation of communicative universal educational actions among fourth grade students showed that 44 % of respondents have a stable level of formation of communicative UDS, 32 % of fourth grade students demonstrated an unstable level the formation of communicative UDS, 24 % – the initial level of formation of communicative UDS.

Thus, we see that most students have sufficiently developed dialogical skills, as well as a stable level of formation of dialogical skills. Based on the analysis, it is possible to see the absence of students with an initial level of formation of general communicative skills. However, the majority of students have an unstable level of formation of general communicative skills. It can be concluded that the communicative UDS are formed at a stable level in almost half of the students.

Next, we see a small difference in the percentage ratio between fourth-grade students with unstable and initial levels of formation of communicative skills.
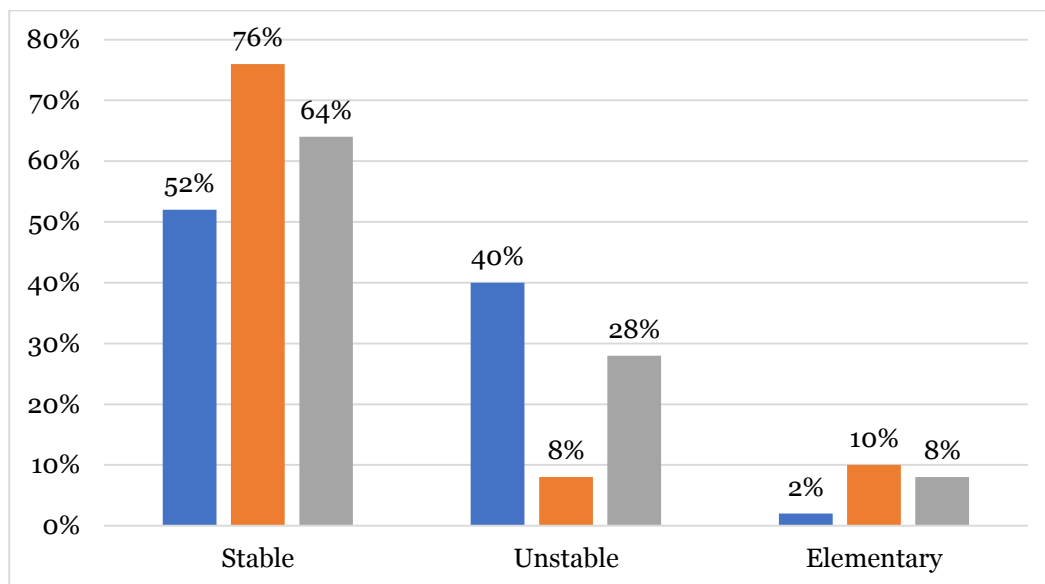
Fig. 1. The results of the formation of general communicative skills and the ability to build a dialogical speech

Comparison of quantitative results of diagnostics carried out at the ascertaining and control stages of experimental search work, as well as qualitative analysis showed positive dynamics of the formation of general communicative skills and dialogic skills.

There were 16 % more students with a stable level of formation of general communicative skills at the control stage of experimental search work, and 20 % more students with a stable level of development of dialogical skills. Table 5 shows the distribution of fourth grade students by levels of formation of communicative UMS in percentage ratio.

A qualitative analysis of the results suggests that some students have increased the level of ability to read the text with understanding, namely, the ability to find information given in an implicit form (determining the topic and the main idea of the text), to explain the meaning of a word based on the text. Also, students have grown the ability to express thoughts in writing in compliance with the rules of logic, the correct presentation of facts. These skills belong to the general communicative skills. Also, at the final at the stage, students showed the best results of formation to build speech in accordance with the content of the task and follow logic in the construction of speech, which refers to dialogical skills. Seven students scored at least 4 more points at the control stage compared to the ascertaining one (Elizaveta R., Lesha K., Sofia M., Daria Zh, Roman K, Mikhail K., Arkady D.).

The study does not claim to be an exhaustive description of the problem under study, but gives grounds to outline some further prospects in this direction.

5. Conclusion

To sum up, learning languages today is the education of the young generation which opens the way for free swimming in space, looks into the secrets of world science, and its own a need that allows them to demonstrate their abilities. Teaching languages is a modern requirement.

Its implementation is the duty of teachers. That is why there is no stop to modern teachers it is necessary to search and master opportunities without missing.

To fully master the knowledge, to develop students' ability to think, to speak freely, teaching to express one's thoughts openly and fully, broadening one's thinking is the main goal of education. We should educate each student in such a way that he can acquire knowledge and skills according to his ability

Whenever possible, all types of speaking activity should be included in the classroom (CLI), however, the peculiarity of this teaching method (CLI) is that it takes up most of the teaching time. However, the teacher can plan the lesson, some material can be presented in the form of audio-

text, and the material can be understood through dialogue and conversation through inquiry methods of teaching. Audition can be combined with subscription (filling in tables, drawing up a diagram, correcting defects). When choosing learning materials, you should choose original texts of different styles that correspond to the age characteristics and the level of language preparation of students. You can also use audio and video materials. Learning material should achieve two goals: subject and language. Texts are divided into small parts and include illustrations, diagrams, maps, etc. if accompanied, it is well accepted.

CLI is conventionally divided into 2: hard CLI and soft CLI. Hard CLI means that any school subject is conducted in English (only the student's English level should be L2). In the course of such training, students can study geography, literature, biology, physics, and even physical education through a foreign language. English language teachers use the soft CLI method, their task is to teach a foreign language using the topics of other subjects.

Thus, teaching in English according to the CLI method provides meta-disciplinary connections and allows to achieve practical results in the development of new educational standard principles, in particular, develops cultural awareness, internationalization, language competence, not only readiness for study, but also the ability to apply new knowledge in life. and, accordingly, leads to raising the vital evidence, aiming at success, and finally achieving the main goal – forming the professional competence of future graduates, increasing their mobility and ability to adapt to rapidly changing life conditions.

To sum up, in order to fully acquire knowledge, the main goal of education is to develop students' ability to think, to speak freely, to express their thoughts openly and fully, and to expand their horizons. In order to achieve this goal, "CLI" is an effective method of implementing the Lingual Education Program in connection with the updated teaching process.

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Career Guidance Process Improvement as a Tool for Development of Potential of Youth

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Abstract

The development of any society is impossible without the development of the potential of young people who represent its future. Mastering all the necessary knowledge for life in modern society, the formation of spiritual and moral aspects of personality – all these are the cornerstones of the education system in the past, present and future. However, over the past two hundred years, unprecedented changes have taken place in society: the transition from a class (caste) system, which predetermined a person's future, his occupation and course of life, to industrial and post-industrial one has led to the fact that all young people in developing and developed countries are facing the issue: what to be? Family, society, origin do not predetermine the person's fate any more, and his free choice comes first. However, how to make it?

That is why such a direction in educational practice as career guidance has been developing for more than hundred years, combining elements of training, enlightenment, psychological diagnostics and even entertainment. The world of professions is introduced to children from an early age, moving from light game forms to serious lectures, master classes, industrial excursions, internships, etc. Thus, a certain experience of professional orientation has already been accumulated both in the world and in Russia. The authors of this study aimed to study the essence of professional orientation, describe some world and Russian practices, and identify the effectiveness of career guidance using a sociological survey of students of Moscow universities.

The conducted research has shown that the attention paid to the career guidance is still insufficient both at the state and at the level of individual educational organizations: schools and universities. The authors have developed a system of career guidance activities at school, based on the age of the target audience and the list of career guidance activities for universities too. The practical significance of these recommendations is to increase the effectiveness of career guidance at school and university, motivation growth and involvement of young people in the process of education and mastering of an interesting chosen profession.

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1. Introduction

In the modern world, a constant inflow of new qualified personnel is important for organizations, which will ensure their development and promotion on competitive markets. Economic development is impossible without qualified, engaged specialists, who are prepared by higher educational institutions, and even earlier by schools. The task of the school is to introduce students to the world of professions, to help teenagers in self-knowledge and self-determination. The task of universities is to attract keen and conscious applicants who are ready to make efforts in mastering the profession and to realize themselves further as a specialist in practice. The researchers from Samara State University of Railways consider that the common goal of arranging career guidance work joins both schools and universities (Arkhipova i dr., 2022).

Today the development of the higher education system is characterized by an increasing role of universities in the formation of readiness for professional self-determination and the upcoming work of applicants. Higher educational institutions that conduct career guidance work with applicants help them to make decision to choose future profession and to become highly qualified specialists in the desired field, thereby they form competent human resources for the country's economy.

If you review the role of career guidance in the modern world, you can observe that it affects not only the choice of a particular person in favor of a particular profession. Its role is much bigger than it might seem at first. Professional orientation helps to form future highly qualified specialists. That is why the personnel potential of individual economic entities and society as a whole depends on the career guidance work performed effectively. The more purposefully and consciously young people make their choice among many modern professions, the more motivated and qualitatively they will perform their job functions in the future, which will have a positive impact on the productivity of the organization, as well as on the growth of its competitiveness. As N.A. Sinelnikova notes, young people faced the problem of professional self-determination for almost the entire history, what is more significant than modern civilization, and in the 20th century methodological approaches to career guidance work, designed to help students and applicants make the right choice, began to take shape both in Russia and abroad (Sinel'nikova, 2021).

In addition, effective career guidance can be used as a method of regulating the offer of work force on the labor market and to solve issues related to the country's economy. Competent assistance in choosing a profession allows you to distribute the labor force across the sectors of the economy equally, what decreases the overall unemployment rate in the country, the staff turnover in organizations, emotional burnout of employees, loss of interest in the work performed. It will contribute to the increase of labor productivity and staff motivation, the improvement of product quality, what, undoubtedly, will have a positive impact on the economy as a whole (Tereshchenko, Tikhomirova, 2022).

The following functions can be defined that career guidance work performs:

1. Economic, which main essence is to improve the quality of staff, their qualifications, level of education, work experience, as well as, to increase professional activity and productivity;

2. Social, by which career guidance contributes to the acquisition of socially significant values, norms, knowledge, allowing a person to become a valuable member of society;

3. Psychological and pedagogical, that is the detection, formation and development of individual abilities of a person;

4. Medical and physiological, which, namely, take into account the characteristics of the human body, its health, as well as, physiological abilities and characteristics while performing career guidance work (Boldina, Deeva, 2012).

As S.A. Tereshchenko and T.V. Tikhomirova underline that the system of career guidance established in the middle of the 20th century was destroyed due to the collapse of the USSR in the CIS countries (Syzdykova, 2018). In this regard, the accumulated experience of career guidance work in schools and universities was mostly lost, and the unified career guidance program for young people ceased to exist. The lack of state funding and the unified program in the 90s led to the fact that career guidance began to receive extremely little attention in educational institutions of general, secondary and higher education. In the future, various disparate career guidance programs began to appear in various educational institutions and regions.

The current systems of career guidance work do not fully meet the needs of applicants in obtaining information about available specialties, professions and opportunities for further

employment. Thereby, they do not contribute to increase of interest in entrance, preparing the individual for changing environmental conditions and adaptation to them, as well as, conscious choice of profession and professional self-determination, as a result, the applicants do not have a sufficient understanding of the existing professions and, consequently, of the possibilities of realizing and unlocking their potential.

The consequence of such a career guidance system may be the problem of student recruitment, uneven formation of a contingent for each individual specialty, which over time may attract a number of negative consequences not only at the university level or individual organizations, but also on the economy of the whole country. For example, this may lead to an increase in the unemployment rate due to the unequal distribution of human resources.

Besides, one of the most important factors that determine the success of achieving various socio-economic goals both at the level of individual organizations and at the non-public level in Russian society is the system of professional orientation.

For this reason, the study of the formation of an effective career guidance system and the qualitative performance of career guidance work with applicants are important and relevant today, as they allow ensuring the competitiveness of graduates of higher educational institutions on the labor market and themselves on the market of educational services.

2. Materials and methods

Choosing your future specialty is one of the most important choices in a person's life, which is able to determine his entire future fate. It is considered that all the reasons, motivating a person to choose a particular profession, are divided into two large groups, which are presented graphically in Figure 1.
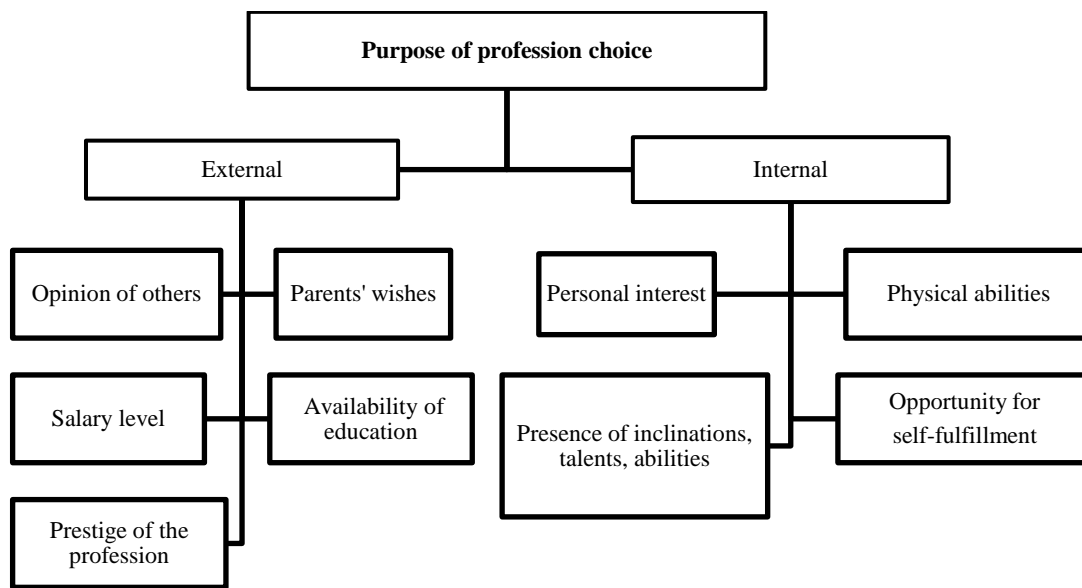
Fig. 1. Purpose of Profession Choice
Source: compiled by the author

The external reasons for choosing a specialty include the prestige of a particular profession, the opinion of other people. The choice very often is made under pressure from parents and their ideas about a good profession for their child. Also, when choosing a profession, most people look at the level of salary in a particular area, the availability of education (its cost, the presence of educational institutions nearby where you can get an interesting profession, a competition for one place among applicants, and so on). Internal reasons include a personal interest of the person and his desire to fulfil himself in a particular profession, physical capacities (physical data, hearing, voice, etc. are important for a number of professions), as well as the presence of other abilities and talents. It is worth noting that interest can and should be the main criterion for choosing a future profession.

According to experts, interest in a particular profession can be direct and indirect. Direct interest is manifested in the desire to develop in the chosen direction, study the relevant disciplines, etc. The indirect one is caused by the external attributes of the profession: prestige,

social status, remuneration of labour, etc. (Arkhipova i dr., 2022). It is the interest indicated in this case which influences the choice of profession.

Today, the world provides a wide range of professions – from "classical" professions to remote employment in its completely diverse forms. Choosing a suitable specialty for yourself is not an easy task, for which solving it is necessary, first, to understand yourself, your capabilities and desires. Professional orientation helps substantially to do this, so it is obvious that it should begin at the early age.

The definition of career guidance first appeared in the United States at the beginning of the 20th century. Its founder is considered the American researcher Frank Parsons, who founded the "Bureau for the Choice of Professions" in Boston in 1908 to help people decide and find a suitable profession for them. The first career guidance services began to appear in France in the 20s of the same century, when the law about the creation of specialized career guidance centers was published (Tolstoguzov, 2015).

Today, there is a huge number of organizations engaged in career guidance activities in the world: schools, higher educational institutions, direct employer companies, employment centers, specialized career guidance centers, etc. In many foreign countries, the system of career guidance in educational institutions is much more effective than in Russia. Therefore, depending on their education policy, as well as the regulatory framework, career guidance activities are conducted by using a wide variety of methods and approaches that can be called advanced.

For example, in the USA the main work on career guidance among applicants is carried out not by universities, as most often happens in Russia, but by specialized professional consultants in schools and colleges. Based on the results of career guidance, consultants make up a personal dossier for each student, and the graduate receives recommendations for further admission and employment. Such dossiers contain information about grades, disciplines passed, character traits, skills and interests that are obtained because of testing. In this regard, universities in the USA do not perform exhibitions, open days and other similar events, but work immediately with those who go purposefully to them to study.

In addition, career guidance centers are established for young people studying at colleges and universities based on the educational institutions that subsequently employ graduates. However, US universities also have their own professional career services, professional advisers, as well as consultants who develop individual plans for further employment of students. That is why in the USA, such a concept as "professional orientation" is being gradually replaced by the term "career development", which includes the interaction of career guidance and further employment.

Thus, the career guidance work of students in the USA is carried out by representatives of schools and colleges from the very beginning of their studies, and the activities of specialized career guidance workers are aimed more not at choosing an educational institution, but at informing about career opportunities and potential employment (Papkova, Bagrova, 2017).

In Europe, the system of vocational guidance for students works somewhat differently. France, for example, is recognized as a leader in career guidance. In this country, the system of support for professional self-determination of students is conducted at the state level and controlled by several ministries. The National Education and Career Information Bureau is responsible for providing information on career opportunities.

The network of specialized career guidance centers is also widespread in France. Vocational guidance in schools is provided by the Center for Professional Information and Orientation (CPIO). Employees of this service coordinate career guidance work, develop career guidance programs for students, supervise the work of teachers, and participate in career guidance events. In the CPIO, the main work on career guidance and professional diagnostics is carried out based on psychological tests and special devices to determine the psychological characteristics and characteristics of students.

Career guidance centers are also widespread and there are more than 500 throughout the country. They interact actively with various social institutions: employment agencies, associations, and so on. Career guidance services are established in every state university and in most private ones. In addition, university graduates are supported by the Association of Assistance to University Graduates in Employment, which arranges conferences, meetings with professionals, company presentations, trial interviews, creates job search structures, and provides individual consultations.

To ensure an individual approach, each student must attend state vocational guidance centers. The result of career guidance work is to obtain a certificate of career guidance for

graduates, which contains a list of the professions indicated and contraindicated to him. It should also be noted that no graduate of an educational institution could be employed in the future without providing this certificate.

Thus, career development in France occupies an important place in the educational sphere and has a well-established system that is regulated at the legislative level and gives a high level of productivity due to the interaction of various structures and specialists.

The Danish career guidance system is based on the concept of open education of young people, in which much attention is paid to the practice of high school students, their participation in various volunteer work, social projects. The program of open youth education does not have clearly defined deadlines, classes begin as soon as the appropriate groups are formed and conducted on the basis of one of the 460 educational institutions that are accredited by the Ministry of Education accordingly. Upon completion of education, graduates receive diplomas that contain information about their education and academic performance, as well as letters of recommendation for further study or starting a career. In addition to open youth education, there are municipal schools in Denmark that provide support for young people, starting from secondary school, ending with vocational and technical educational institutions and production enterprises.

In Germany, Professional orientation begins with primary school and is included in different subjects. The main goal of German career guidance is to help students develop the ability to choose a professional activity independently that will meet their individual characteristics and the requirements of the labour market. In high school, students choose to study one of three areas: social sphere, technology, economics, are acquainted with the main professions in the chosen direction, get their first knowledge and skills. Moreover, at graduation they should already identify the profession they want to pursue in the future, and begin to select places for professional education based on their existing knowledge.

In Asian countries, the system of career guidance is also radically different. In Japan, career guidance begins in grades 6-8. They pass the "F-test" test developed by the Professor Sh. Fukuyama, which allows to evaluate the ability of schoolchildren to choose a profession methodically, and participate in various career guidance events that will help them choose a profession. Test exams at the end of secondary school, which are similar in structure to the Russian EGE (Unified State Exam), allow ranking Japanese high school students. Students who have passed tests for high scores continue education in high schools and preparing for university. Those students who receive average scores choose technical colleges. Such students who have shown poor results go to low-rated schools specializing, for example, in home economics or agriculture, without prospects of obtaining secondary technical or higher education. In Japan, the career guidance system is firmly integrated into the school education process and is actively used already in elementary school. The philosophy of choosing a profession is associated with a deep introspection by the student and the determination of his entire life path (Zemlyanukhina, Kuznetsov, 2017).

In China, career guidance work is mostly focused on preparing students to continue their studies abroad, including in Russian universities. The foreign orientation of Chinese schoolchildren is primarily caused by the shortage of places in higher educational institutions of the country and high requirements for applicants at admission. Admission to a university is a serious achievement for a high school graduate: the competition for some universities reaches an average of 250 people per place. It is also common in China that skilled workers at enterprises train schoolchildren. They teach children the basics of working professions. These skills and abilities are necessary for students to get jobs in enterprises.

If we talk about the post-Soviet area, then the unified system of vocational guidance work, built in the middle of the 20th century, was lost, as a result, the problems of professional development and formation of young people have been ignored for many years. Only in the last 1.5 decades, CIS countries have begun to pay attention to career guidance at school, which is typical not only for Russia, but also for the Republic of Kazakhstan (Syzdykova, 2018), Kyrgyzstan (Abdyrakunova, 2019) and other states in the area.

The comparative Table 1 based on the data provided above has been compiled and illustrates approaches to career guidance for applicants in different countries.

Table 1. Approaches to Career Guidance by Enlarged Groups

Countries (Regions)	Career Guidance Programs	Participation and Control by State	Duration of Career Guidance Support	The Role of Universities in Career Guidance
USA	«Guidance», «Academy X», «From School to Job»	Decentralized system	From the kindergarten to the graduation	Absent
Western Europe	Lessons on choosing a profession, dual education system, temporary employment programs, "Science of the Profession", "Where to Step on the Life Ladder"	Regulated by law, controlled by ministries	During school education (in Finland and Denmark from grade 1, in Germany, Austria, Norway – from grade 8, in the UK – starting from secondary school, in the Netherlands – in high school)	Conducting consultations, providing employment
Japan	Diagnostics according to Sh. Fukuyama, access courses "Duke", training programs on working professions	The state supports talented youth, provides benefits and opportunities	During the school period, most often in high school	Absent
China	Mastering professions in schools. Learning foreign languages. Lessons on the philosophy of choosing a profession	The state regulates the activities of educational institutions, including career guidance	During school education	Absent
Russia	Lack of a single career guidance program, "Ticket to the Future", "We are Together", "Talents of the Future", "Humanitarian Technologies", "Verbatoria", "Successful Teenager", "Orientprof"	It is confined by the availability of employment services, the allocation of grants, competitions and career guidance projects	From high school to graduation from university	Active career guidance of schoolchildren, conducting field events, consultations, collaboration with schools, employment of graduates
Kazakhstan	Lack of a single career guidance program. The course "Fundamentals of Entrepreneurship and Business" in schools	The state pays significant attention to the restoration of comprehensive career guidance, promotion of occupational specialties. Allocation of grants for higher education	High school classes	Dual training, practical training, assistance in employment

Source: compiled by the author

In Russia, professional orientation and professional career development are not considered as a single process. Schools pay insufficient attention to the implementation of career guidance activities. Such events represent most often assistance to schoolchildren in choosing universities and directions. It is considered that, having entered a higher educational institution, a person has already passed the stage of professional self-determination and made his professional choice.

A significant part of the students of educational institutions makes their choice insufficiently independently and consciously. Their decision is mostly influenced by various factors, such as the opinion of parents and friends, the subjects and results of the EGE (Unified State Exam),

the availability of a large number of budget places in a certain specialty, and so on. The consequence of this is a decrease in the number of students studying at universities after admission, as, after having realized their mistake in choosing a specialty, most students leave or continue their studies, but in the future, after graduation, they do not work in their specialty. As M.A. Maltseva underlines, applicants develop frustration and a sense of fatality of the choice made (Maltseva, 2019).

As a rule, the career guidance work is carried out by representatives of organizations and higher educational institutions in Russia. They arrange career days, where they tell about current specialties and jobs, educational exhibitions, open days, and so on. However, it is important to note that not all higher education institutions are engaged in career development and employment of graduates. As a rule, universities only provide students with the opportunity to undergo practical training, and then after graduation, everyone chooses the path of their professional formation and development independently (Mingazova, Volchkova, 2019).

Besides, in addition to the methods listed above, some universities of Moscow are developing and implementing new, modern methods for career guidance, which help applicants and students in their professional formation and development very effectively.

For example, at the Financial University under the Government of the Russian Federation, career guidance events for schools, applicants and students are held in the Laboratory of Career Guidance "Talents of the Future", the head of which is E.Y. Pryazhnikova. The Specialized Testing and Development Center "Humanitarian Technologies" under the scientific supervision of A.G. Shmelev has been opened at the Lomonosov Moscow State University, where personal testing and consultations on choosing the most suitable profession are conducted for those who wish. The National Research University Higher School of Economics has its own Career Guidance School "We Are Together", where students are assisted to decide on the choice of the future direction of study through communication with students, as well as participation in business games, daily immersion in the atmosphere of the university and acquaintance in practice with various educational programs. The Table 2 shows the main methods of career guidance work of the listed universities.

Table 2. Advanced Methods of Career Guidance Activities of Moscow Universities

University Name/Career Guidance Unit	Purpose	Methods
Financial University under the Government of the Russian Federation/ Laboratory of Career Guidance "Talents of the Future"	Development and implementation of modern approaches and methods of socio-psychological assistance in professional self-determination and professional development to different educational age groups (schoolchildren, applicants, students of vocational education, students, undergraduates and postgraduates), as well as identification of general and special abilities and talents of students as professionally important qualities in order to promote professional self-determination, disclosure of potential and attracting endowed youth from Russia and abroad to the educational programs of the Financial University	– vocational education and information; – professional psychodiagnostics: individual and group research, online testing "START-testing"; – professional consulting, psychological assistance through personal and online consultations; – professional selection: development of an individual employment trajectory; – professional adaptation and activation of the process of entering the professional environment профессиональная; – conducting career guidance activities: University Saturdays, University Days, Olympiads and competitions, holidays of Generation Z, festivals "Hope of the Future", camps of the Financial University and etc. (Sait Finuniversiteta, 2023)

Lomonosov Moscow State University/ Specialized Testing and Development Center "Humanitarian Technologies"	Assistance in making aware decisions while choosing a profession and career development for people of all ages.	– getting advice from professional psychologists based on the results of testing, where participants receive a list of recommended professions, universities and faculties, information about the demand for professions, as well as recommendations on additional educational programs and trainings; – the opportunity of acquiring programs that develop abilities and professional skills, such as "Career Guidance 360", "Professyans", "Professional Holidays", "Turnkey Career guidance", "Online Proflectory" (webinar containing professional lectures for parents) (Sait MGU…)
National Research University Higher School of Economics/ Career Guidance School "We Are Together"	Assistance to schoolchildren in choosing the future direction of education through communication with students and participation in business games, as well as acquaintance with various educational programs in practice.	– business games and quests in the areas of training; – master classes and lectures about professions; – assistance in preparing for EGE (Unified State Exam) and participation in Olympiads on specialized subjects, as well as passing creative exams for individual specialties; – Project activity that helps to immerse yourself in the world of the profession (Sait NIU VShE).

Source: compiled by the author

In various regions of Russia, universities are also developing modern methods of vocational guidance for applicants. For example, a regional network model of professional tests has been created in the Vologda Oblast (Region), implemented jointly with institutions of secondary and vocational education, centers of additional vocational education and with employers. The complex of samples of various directions is combined into a network cycle, while each student during his studies in grades 8-11 can pass up to 10-15 different samples, choosing them from an extensive set. Such an innovative model of vocational guidance allows going beyond schools, employment services and provides continuous career guidance for schoolchildren.

In the Irkutsk Oblast (Region), a monitoring system has been developed to assess the effectiveness of supporting professional self-determination of students at various levels of education: for preschool children, schoolchildren, graduates and students of higher educational institutions. Such a system will allow monitoring and improving subsequently the effectiveness of career guidance activities (Blinov, 2017).

Based on the above, it can be stated that in modern conditions school graduates face a quite wide range of professions, among which it is difficult to choose one for further professional training for young people due to a number of factors that prevent the right professional choice. In this regard, it can be assumed that the system of vocational guidance in Russia has not been built in proper way and still has a fragmented character. Family, friends, salary levels and other «indirect» reasons often influence career decisions for most applicants and, as a result, they gain a profession that does not directly correlate with their desires, opportunities, abilities and interests. Therefore, it should be highlighted that the professional choice of many young people has been made incorrectly, in particular due to insufficient consistency in the professional orientation of young people. Based on these statements, a number of hypotheses-consequences can be determined:

Hypothesis-corollary 1: it can be expected that the issues of career guidance in the system of students' value orientations are quite relevant at the present.

Hypothesis-corollary 2: it can be assumed that the role of social institutions (media, Internet, school, family, etc.) has much less influence on the final decision on professional choice than one's own unreasonable opinion.

Hypothesis-corollary 3: it can be expected that the attitude of young people toward making a decision about their future profession is not serious enough.

Hypothesis-consequence 4: it can be assumed that the real mechanisms and tools of career guidance do not work effectively enough, only superficially.

Hypothesis-corollary 5: it can be expected that there are respondents who do not make a professional choice at all, choosing a university simply to get a diploma, to study "for someone" or for a company simply because society requires it.

Hypothesis-consequence 6: it can be assumed that young people have not formed an adequate understanding of the role and place of career guidance in the life of society as a whole.

Hypothesis-corollary 7: it can be assumed that there is no proper engagement of the state in the lives of young people at present what prevents building a career guidance system functioning effectively in our country.

Further, the authors conducted a sociological survey of students of the capital's universities. Based on its results it is possible to identify a number of obstacles, which prevent developing career guidance, the reasons of their occurrence and, possibly, some "keys" to solving these issues. The 382 students of the Financial University, the State University of Management, the Moscow Aviation Institute and the Lomonosov Moscow State University took part in the survey. In order to receive answers that are not differentiated by specialty all students, involved into the survey, study in the same specialty under code 03.38.03. The respondents were in the age between 18 and 23, the vast majority were women – 82 %. The survey was conducted in online format by using Google forms, the results were also processed online in Google services.

3. Results

Let us consider the results obtained, which characterize the problems related to professional choice of young people. Mostly, the reasons for choosing a profession were such reasons for respondents, as the following:
- "I made personal deliberate decision" – 50 %;
- "The activity within this profession is quite interesting" – 42 %;
- "I have abilities for this profession" – 40 %.

The attention here should be paid not to the percentage ratio but to the frequency of choosing an answer, since this question is open and allows you to choose several answers at the same time (relevant for all questions with multiple choice).

The most unpopular responses were:
- "The opinion of teachers and schools influenced on the choice significantly";
- "This profession is a childhood dream";
- "I chose this profession to the generic occupation (parents have the same profession";
- "Representatives of this profession bring obvious benefits to society";
- "People of this profession are respected in society";
- "Most of all I know exactly about this profession";
- "This profession will benefit specific people whom I would like to help".

Only 1-3 people chose these options. It is worth highlighting that this "unpopularity" does not characterize the problematic side of this issue to a greater extent, as despite the importance of any profession, doctors, teachers, scientists, pilots and the others remain the most respected and useful in the society. That is why the survey was conducted within students studying one profession – an HR (personnel management) specialist. It should also be noted that this profession is quite new and is only gaining popularity and demand in the society, therefore, the continuation of the generic occupation is not relevant for this area.

When assessing the information that students had about their future profession at the time of its choice, 52 % of respondents had heard something insignificant, and 16 % had absolutely no information about this profession (Figure 2).
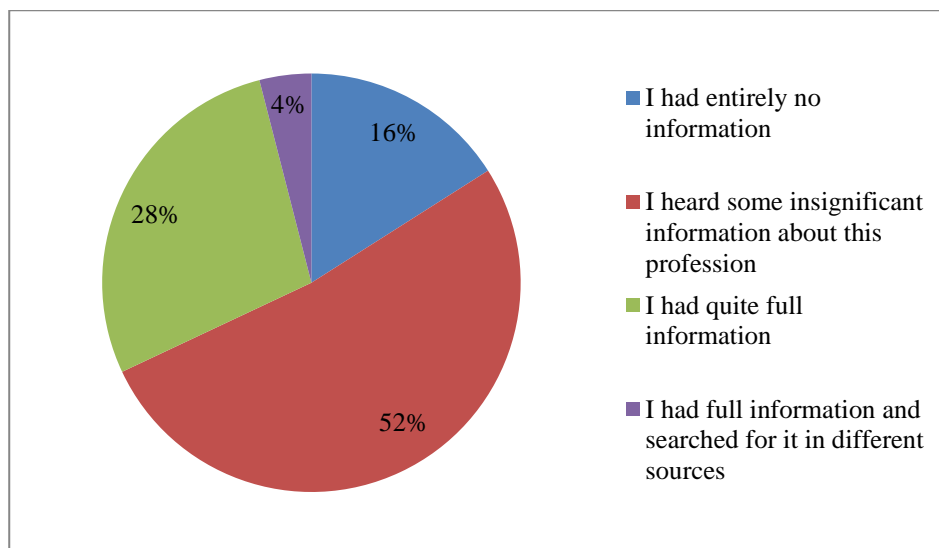
Fig. 2. Degree of Respondents' Knowledge about the Profession Chosen, %

All this indicates a lack of awareness by young people about the world of professions. The famous professor E.A. Klimov studied this issue in Soviet period and created a questionnaire "Awareness of the World of Professions", which help determine the level of awareness. However, it is impossible to say about a complete lack of awareness, as a number of respondents replied that they knew about the profession from various sources, among which the following were highlighted: the media – 60 %, school and specialized lectures given there – 12 %, family – 40 %, tours to the enterprises' sites – 8 %, their personal experience – 20 % and career guidance centers – 16 %. It turns out that only a small part of the respondents attended tours to the enterprises' sites and applied to the career guidance centers, while the bulk of them learned information about their future profession from the Internet and from their family (relatives).

To the question, "Have you researched the structure of the labor market before making your final decision?" The 58 % of respondents said no, what may indicate that young people are not serious enough about their future employment. In this case, the question arises how a professional choice is possible without knowledge of the structure of the labor market, the demand for this profession, the average salary level, etc.

The next question concerned the choice of educational institution. The prestige and demand for graduates of the university are priority factors when choosing a place of study. In average, about 30 % chose this university on the advice of relatives/friends/acquaintances, because the educational organization has extensive relations with other educational organizations, as well as interacts with a wide range of employers and owns a very qualified teaching staff. Based on this, it can be noted once more that the influence of the opinion of social institutions is especially significant when choosing a profession and a university. Almost no one noted that it is easy to enter this university or he chose only this university from the entire list of universities. Therefore, it can be emphasized that it is quite difficult to be enrolled in the Financial University under the Government of Russian Federation, having just the desire without making much effort.

When asked about career guidance, 40 % answered that they were obliged to take a career guidance test at school and 44 % did not apply anywhere at all and did not pass anything. Only 5 % of respondents chose the answer "Yes, I applied to a career guidance center operating on a budget basis" and 12 % chose the answer "Yes, I applied to a career guidance center providing paid services" and less than 5 % applied to a school psychologist on their own initiative. Thus, the survey results indicate an insignificant degree of desire for self-determination and self-development among young people (Figure 3).
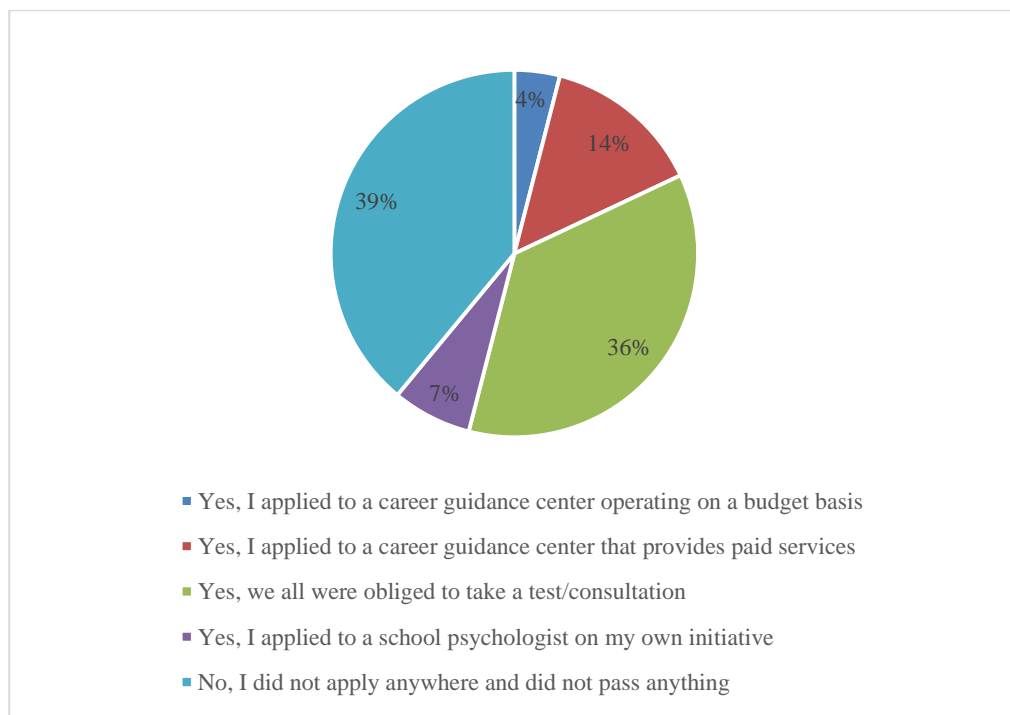
Fig. 3. Allocation of Answers to the Question about Seeking Help for Career Guidance

Social institutions pay little attention to the importance of career guidance and its problems because of what the relevance of career guidance is underestimated significantly and there is a large gap in the awareness of the importance of career guidance for the society both in general and for a particular person. At the same time, it is important to note that 43.3 % of those respondents, who applied to specialized career guidance centers and/or passed some diagnostics techniques determining a person's abilities, report that the results obtained did not coincide with their final choice of profession. That outcome may indicate a low efficiency of the career guidance activities and a formal approach to their performance in the field.

The next question was about when to conduct a consultation at the university. The majority of respondents indicated that consultations should be held during the Open Days, and many even added their own answers, which highlighted the fact that career guidance is most important at school. It turns out that respondents are convinced that it is impossible to change their profession after entering an educational organization. Such opinion may indicate a stereotype that still persists and means a profession is chosen once and for lifetime and that, it is unacceptable to make a mistake in this choice, admit it and correct it in the future.

To the question, "Do you plan to work in your specialty?" the 30 % of respondents answered in the affirmative, 24 % answered in the negative, and 46 % find it difficult to answer. In the theory of career guidance, specialists determine the following possible situations of choosing a profession:

1 – choosing a profession as an implementation of abilities and interests formed correctly;

2 – choosing a profession as a test of one's strength, accumulation of professional experience and based on this make a decision on the professional definition later (Pryazhnikov, Pryazhnikova, 2013).

Thus, it is obvious that most students find themselves in the second situation of choosing a profession described above. As a result, due to lack of experience, awareness of the profession, in short, in conditions of the inefficient career guidance system, students are forced to make a final choice based on their personal experience, losing both time and promising opportunities in career advancement, spending time irrationally, and most importantly here – without addressing to specialists for help, what the results of the previous question confirm.

In conclusion, the next open question was proposed, "Do you think if there are serious problems in Russia related to career guidance? If so, which ones?". The majority of respondents say that problems really exist:

- "This activity is not developed";
- "People do not know simply about the existence of some professions";

- "It does not exist and it is not carried out at the proper level";
- "Just to be with a diploma";
- "The career guidance is not systematized";
- "Attitude as to a formal procedure. Using simple techniques. No information to schoolchildren about various professions and the situation on the labor market";
- "The lack of a comprehensive career guidance system at the state or at least local level".

However, there are also those who answered that there are no problems in general or "there are no serious problems, unless it is worth talking more about career guidance". To summarize these answers, it should be underlined that young people are aware of the main problems of this area, but do not make a big deal to more deeper problems, do not see the integrity and complexity of the issues.

To summarize the results of the conducted sociological survey, it can be concluded that the hypotheses and hypotheses-corollary raised at the initial stage have been confirmed in practice. The system of career guidance in Russia retains its fragmented, unsystematic characteristics, and young people make their professional choice often unreasonably relying on objective and subjective factors. Unfortunately, in addition to the issue of the incorrect influence of various factors, the root problem highlighted in the hypothesis was confirmed. The attitude of young people to making a decision about their future profession is not serious enough, and young people have no formed understanding of the role and place of career guidance in the life of society as a whole. The state is required to be properly involved in the lives of young people in order to build a career guidance system really functioning in our country.

Earlier, in Kazakhstan, a study of career guidance was conducted by the method of mass sociological research of the youth and by the method of focus groups with experts in the same way as in the study performed by the authors of this article. As a result, researchers from Kazakhstan obtained comparable results on the insufficiency and unsystematic nature of career guidance in their state (Ashimkhanova, Kaldybayeva, 2016).

4. Discussion

Solving of the identified problems of career guidance is becoming more relevant and obvious in Russian practice. These problems should, first of all, be fixed by building and improving the state personnel policy. All activities must solve the most acute problem in the economy of our country – establishment of a balance between the quantity of trained personnel and the quantity required by industry and at the regional level. Certainly, the dissatisfaction with the needs of the national economy and the spheres of the national economy in talented students and graduates leads to the alignment of the potential contribution of these national talents to contribute to the country's economy and stagnation in the future, which, of course, leads to a decrease in the efficiency of functioning as a whole.

The Figure 4 shows the stages of career guidance at school and presents possible tools that should be used comprehensively at each stage of career guidance. It should be emphasized that the proposed stages, as well as the goals and a set of tools developed for each of them, correspond to modern trends in pedagogy, digitalization and philosophical understanding of youth self-determination within the framework of subject-oriented (industrial) education (Alekhina et al., 2020).

As E.M. Tokareva notes, while career guidance it is important to pay attention to an individual approach and take into account all factors of professional self-determination of young people (Tokareva, 2019). That is why the authors highlight among the tools of career guidance the following: individual consultations that should be conducted both for a student/an applicant and for his parents, who influence largely the choice that the applicant will make upon admission finally.

It is necessary to improve the system of awareness by young people about the world of the profession that is relevant for both schoolchildren and students. It is required to build a system of public information about the trends of the labor market, the needs of employers and educational opportunities, which would be broadcast in schools, educational organizations of vocational education (secondary and higher), employment services. This information should be brought not only to children and adolescents, but also to their parents, as well as the adults who faced the consequences of their incorrect choice of profession.

Elementary School (grades 1-4)

- Formation of the initial vision of the world of work; understanding of its role in the life of a person and society; familiarity with the world of professions; setting the choice of profession, and, first of all, the importance and significance of this choice.

- *Tools*: thematic extracurricular activities; visiting theme parks; role-playing, didactic games; conversations; contests; socially useful work; excursions to enterprises (for example, where parents work); family holidays, consultations, testing, classes, trainings, etc.

Middle School (grades 5-7)

- Expanding knowledge about the world of professions; providing an opportunity to take the first steps towards choosing an interesting profession for yourself; formation of socially significant motives for choosing a profession and a conscious interest in the problem of choosing a profession; actualization of the problem of self-knowledge and self-education, identification and development of professional interests, formation of self-concept; obtaining initial experience in various fields of activity: medicine, agricultural, business, etc.

- *Tools*: business, career guidance, psychological games; thematic extracurricular activities; visiting theme parks; more serious and extended excursions at enterprises' sites; special sections and clubs; organization of talent contests or research works; consultations, testing, classes, trainings.

Middle School (grades 8-9)

- Active diagnostic work of a school psychologist (ongoing study of the student's personality in order to adjust professional intentions and ways of further education); even more expansion of the range of professions; preparing students for a conscious choice of profession and the way to continue; studying the requirements of the labor market; developing the qualities necessary to master the chosen profession and adequate self-assessment of professionally important qualities; creating conditions for an active test of strength in various types of work, as close as possible to professional.

- *Tools*: lessons of conscious choice of profession; optional classes; individual and group consultations on the choice of a particular profession; professional tests; lectures conducted by representatives of organizations; excursions to enterprises and universities, "Open Days"; consultations, testing, classes, trainings.

High School (grades 10-11)

- Professional self-determination is carried out on the basis of in-depth study of those subjects in which students have a steady interest and abilities; the main attention is paid to the formation of professionally important qualities in the chosen type of activity, assessment and correction of professional plans; familiarity with the ways of achieving results in professional activity, self-preparation for the chosen profession; providing with the prospect of employment, professional growth and methods of adaptation to socio-industrial working conditions in the chosen profession.

- *Tools*: consultations, testing, classes, trainings; presentations of leading universities of the city; excursions to open days at enterprises' and universities' sites; active work with career guidance organizations.
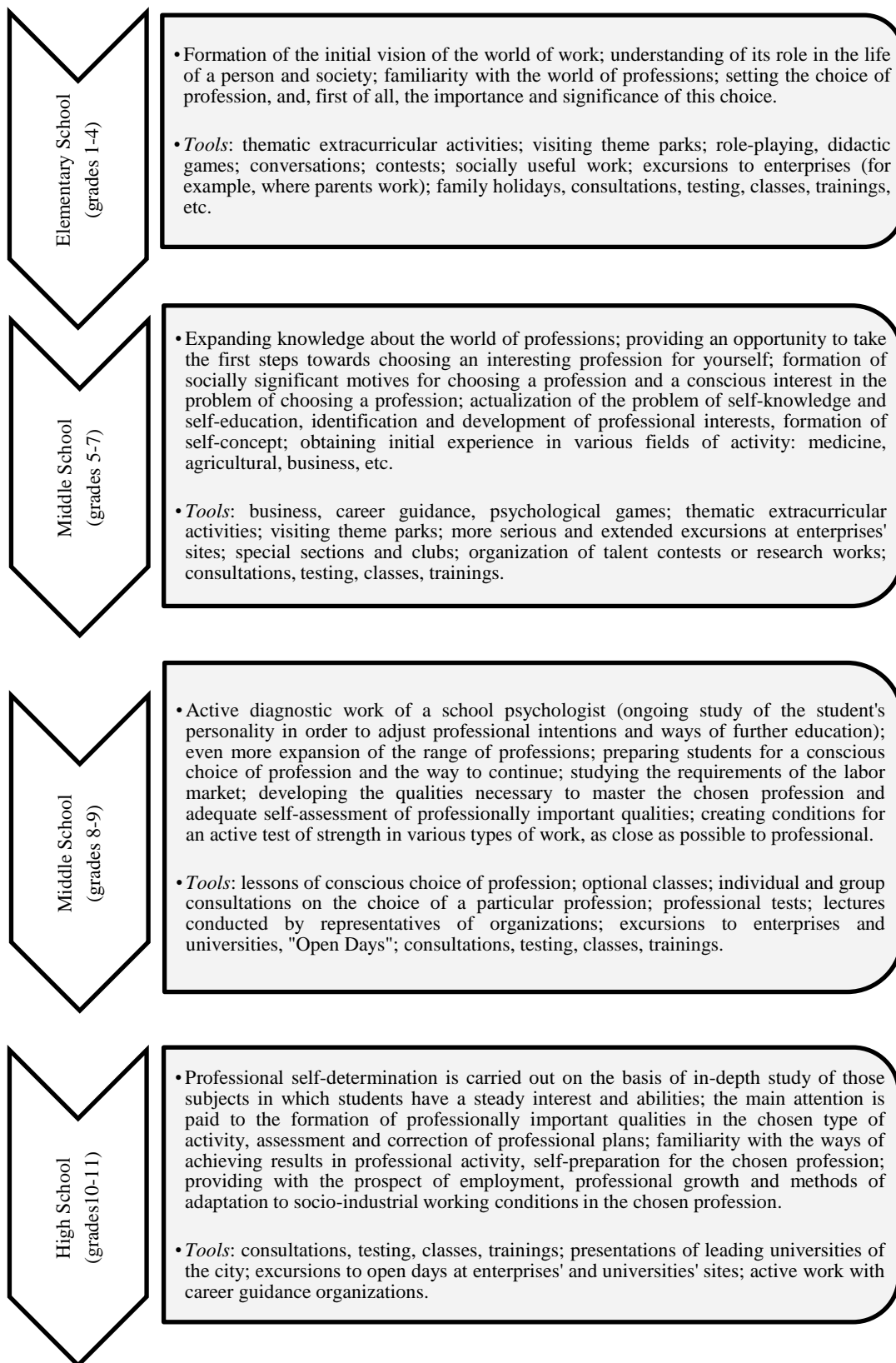
Fig. 4. Main Stages of Career Guidance at School
Source: compiled by the author

At the same time, the key point in building a system of career guidance is the formation of a high level of motivation by young people in choosing a profession and a high level of awareness in this choice, understanding its strategic importance for the future life of an individual. To ensure the

effectiveness of the career guidance system, it is important to take into account the characteristics of the younger generation and use the tools and formats of information delivery that are most interesting to them. It is worth highlighting among them, such as mentoring, internships, theme parks, a gap year, as well as digitalization tools and social networks.

Today, modern technologies are used almost in all areas of our life, and career guidance is not an exception. Informing about educational services includes a number of measures to promote both websites, portals and general information in the net. Online advertising has big differences from advertising and marketing by using traditional tools such as newspaper, radio, TV, etc., So for example, instead of talking about advertising services thematic training is aimed in social networks at discussing topics attracting the consumer, in our case, people who needs consultations on career guidance.

Gamification is another form in which game involvement is used. This is a new trend that gives you an opportunity to model your future by engaging you in the process of work during the game. This method is easy to understand and it is entirely accessible to "digital people". Consultants can use any tools - online services, game simulations for training and other information technologies. Gamification means creating a system in which the success of the game depends on the skills of the participants and knowledge that can be transferred to the real world.

Visualization and gamification are the most understandable and popular tools among young people. In this regard, it becomes relevant to implement career guidance projects in a virtual environment, examples of which already exist in domestic practice (Virtual Career Guidance…, 2023).

In addition to improving career guidance at school, it is important to improve continuously this area in higher education institutions that will attract highly motivated applicants knowledgeable about their future profession. The authors have developed an action plan for the academic year presented on the Gantt chart (Figure 5).

Fig. 5. Action Plan to Career Guidance for University Applicants
Source: compiled by the author

Thus, based on the results of the theoretical study of the problems of modern career guidance in Russia, also the empirical study, the recommendations and proposals for the development of the career guidance system were made. That is one of the key elements of the development of the potential of young people, since the formation of the labor potential of the whole society, the activity and involvement of young professionals in the labor activity depend on the right choice of a future profession.

The theoretical and practical results obtained are comparable with previously conducted studies of career guidance in schools and universities. So, the concept of career guidance of schoolchildren developed by the authors, consisting of four stages, can be compared to the system of vocational guidance work in schools of the Astrakhan city described by N.A. Bukhtoyarova, O.N. Romanova (Blinov, 2017). The program suggested by the authors of this article is broader and begins already in elementary school that can give young people more advantages in the future, since they immerse themselves in the world of professions from an early age and learn their features in a game format.

In their work, Yu. Tarasova, V. Andreev and others described the applied career guidance tool they developed – a software product based on a neural network that allows you to determine the type of professional orientation of the subject (Petrov, Tsyganenko, 2022). Of course, such a software product can be used not only in universities, but also in schools to assist in the self-knowledge of young people and some automation of this process. Although, as the authors note, the work of the software product does not exclude the work of an expert. Such software can be

useful not only in universities, but also in schools at the fourth stage of the career guidance program developed by the authors of this article (Figure 4).

I. Petrov and K. Tsyganenko concluded in their study that the early career guidance work in educational institutions of general education in Russia is insufficient. The authors of this study propose to implement a career guidance system starting from the 1st grade of school, in order to eliminate the disadvantage identified by researchers from Tobolsk (Mingazova, Volchkova, 2019).

5. Conclusion

The authors have conducted a study of the essence of career guidance and international practices that currently exist. They have reviewed the modern experience of implementing career guidance programs at the level of various countries and nations and researched the methods and directions of career guidance activities while working with school students and those entering higher education institutions. Thus, it can be concluded that career guidance activities are carried out by using various approaches in different countries. Many universities in foreign countries do not conduct career guidance work with applicants, as they do in Russia. Career guidance work in such countries is performed either by schools, starting from the early years of students, or by other specialized centers, thanks to which applicants enter existent universities to the desired directions purposefully and consciously, after which they are employed by the enterprises in order to work in the chosen specialty. In Russia, universities pay significant attention to career guidance activities, which establish specialized schools, laboratories or centers, where, thanks to advanced methods, they help schoolchildren and students make the right choice of the path of professional formation and development.

At the next stage of the study, a sociological survey of students of Moscow universities was conducted, which discovered insufficient coverage of young people with career guidance activities. In addition, the survey results indicate a lack of awareness of respondents about the world of professions, the labor market and the chosen direction of training in particular. All this indicates that insufficient attention is paid to career guidance at the present stage in the educational system, although this is a key moment in the development of the potential of youth, its implementation in socially useful activities wage labor or entrepreneurship. Unfortunately, the modern system of general education prepares students purposefully to pass certain exams (USE), but does not prepare them for a conscious choice of profession and self-realization in it.

To fix these issues, the authors have developed a system of career guidance for the school divided into 4 stages depending on the age of the students. In addition to the school system of vocational guidance, educational organizations of higher education should also be involved in this process, since they are interested in attracting motivated and informed applicants who are ready to make efforts in the learning process and be engaged in the educational process. The authors have proposed a number of events arranged by time and frequency throughout the year.

Thus, the development of the potential of young people is impossible without helping young people to make a choice of their future profession. Such work is important at the state level and the educational organizations of all levels should pay proper attention to the career guidance accordingly.

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Effects of Implementing Critical Thinking on Developing Students' Abilities for Independent Learning in Primary Schools

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Abstract

Preparing students for independent learning and creating lifelong learning habits are the main objectives of the contemporary school. In this research, we present the opinions of the students and their teachers about how the primary school prepares them for independent learning and for higher levels of education. Initially, the topic of this paper is treated in the theoretical aspect, where scientific arguments are given for the importance of independent work of students in their intellectual formation and psycho-social development. The implementation of critical thinking as an alternative for reforming our schools is based on progressive theory, which organizes the lesson with the student at the center. From this viewpoint, we want to present our findings on the effects of implementing contemporary learning strategies of critical thinking in preparing students for independent learning. The opinions of students and teachers, which we compare and analyze in this paper, were obtained from two school environments. From schools that have reformed their pedagogical practice through contemporary teaching methodology and from school environments that still work mainly according to traditional and conservative methodology.

Keywords: interactive learning, student-centered, independent work, learning tasks, learning habits.

1. Introduction

In the past, teaching in Kosovo's schools has not given importance to students' learning and their intellectual development. In the last twenty years, our educational system has begun to reform many aspects of this educational process. In this journey of efforts, the program of critical thinking is being successfully applied as an alternative reform that suits our socio-economic conditions. Trained teachers in the critical thinking program have changed the concept of the student and his role in learning. In reformed schools according to the philosophy of critical thinking, students are engaged in task solution, data analysis, educational discussions debates,

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and other research projects. The social-constructivist learning theory underlying the discovery learning model considers learning as a constructive and collaborative process (Hariyanto et al., 2022). Through this approach, students are much better prepared for independent learning and education at higher educational levels. Engaging students in problem-based learning tasks and other school activities develops their creative skills and life skills. The mindset of operating schools where the student is at the center of the class forms intellectual work habits and independent learning skills. Through active and interactive learning, students apply theoretical knowledge in practice, form positive attitudes, develop creative imagination, various interests, finding solutions to problems and culture and other environmental, hygienic and social habits. In this paper, we deal with the effects of the implementation of teaching strategies of critical thinking in increasing the quality and productivity of students' independent work. Through questionnaires, we obtained the opinions of students and teachers from schools in which contemporary teaching strategies are applied, and from schools that work according to traditional teaching methodology. Questions addressed to students and their teachers seek the opinions of these research subjects on preparing students for independent learning and lifelong learning. The idea of the research is to address this topic from the perspective of students and their teachers who are trained for critical thinking. The scientific terms that must be clarified in this paper are:

Critical thinking is a program initiated by American and Canadian educational theorists to reform the educational system of countries emerging from the socialist system. These educational systems inherited from the educational system of the former Soviet Union were full of deficiencies and elements of the Herbartian school. These schools had low learning outcomes, theoretical overloads in teaching, rote learning and frequent dropouts by students. In order to reform this outdated pedagogical practice, the critical thinking program was committed to a teaching that centered on the student and his interests. This international program for reforming their educational systems was borrowed by many countries. Kosovo joined this project in 2000 and also organized numerous trainings for the preparation of teachers for teaching according to contemporary teaching strategies. The critical thinking program has significantly improved many aspects of teaching and learning in our schools. Traditionally, critical thinking is conceptualised as skills and dispositions necessary for engagement in higher order thinking to generate knowledge for problem solving and decision making (An Le, Hockey, 2021). The critical thinking program has also improved the quality of students' learning. Trained teachers in critical thinking better prepare their students for research work by developing different interests and intellectual orientations. Learning takes place when learners actively construct meaning by building on existing knowledge and experience (Shroff et al., 2021). The students of these teachers in their academic journey are more experienced and more ready to learn from the book without the presence and obligation of the teachers and their parents.

Contemporary schools are those schools that work according to active learning strategies where the student is at the center of attention during the organization of learning activities. Contemporary schools organize the learning of knowledge and learning experiences through interactive research projects and tasks that require the conscious activity of students. Similarly, collaborative classrooms promote peer learning and foster a better acquisition of knowledge (Simo-Gil et al., 2018). This educational philosophy connects the teaching theory with the practice and daily life of the students. Through discussions and debates in the classroom, students' progressive social attitudes and their critical and creative thinking are developed.

Traditional school: we consider schools that still carry out teaching through passive and conventional teaching methods. These schools do not take into account the experiences, prior knowledge and interests of the students. The students of these schools are not stimulated to discuss and give their opinions. Teachers are positioned to teach to the test, so that skill development is limited (Mc Guinness, Taysum, 2020). They are also not active and cooperative among themselves in acquiring knowledge and school experiences. This philosophical approach with elements of the old medieval school realizes formal and superficial learning which hardly prepares the students for independent learning and for higher educational levels.

At school, learning is an intellectual process and a learning activity for students. In order to be quality and effective, this intellectual activity and process students must learn from the teacher and be supported at the same time by the family and the school community. So it is the human, pedagogical, and legal duty of teachers to teach their students an effective learning strategy that develops their critical and creative thinking. If your goal is to help students think better, then you

must continually and systematically teach them effective ways of thinking (Orlich, Harder, 1995). In schools with teachers trained in Critical Thinking the aim is to achieve a high quality of active, and interactive learning. In this context, increasing the quality of learning and increasing school productivity are goals of school reform to follow technological developments and other labor market demands. The main idea of these reforms was that school learning should resemble – far more than is usually realized – the actual processes by which human beings come to understand their environment, culture and their social background (Elmore, 2011). In the schools where the Critical Thinking program is implemented, students engage in learning material according to their intellectual abilities and interests. Here students are not burdened with excessive learning data and facts that need to be learned and memorized. Through this program they apply theoretical knowledge and deepen their understanding, analysis and evaluation of teaching material. Even teaching assignments, in principle, are creative and require the engagement of students' thinking. They mobilize the learner to achieve and actively gain knowledge and learning experiences. Critical awareness of their own cognitional process will enable learners to manage their problem-solving more effectively because they have now affirmed the method by which they come to know: they have learned how they learn and proactively participated in the process (Connolly, Cosgrove, 2022). If we consider the teaching objectives by Benjamin Bloom's taxonomy, then we must say that students of Critical Thinking schools are not satisfied with just knowing and understanding the teaching content. As well as knowing and understanding these contents, they need to go even further in acquiring this teaching material. Learning is more than just getting and processing the information teachers and books convey to students. Students must actively participate in broadening their own knowledge (Woolfolk, 2011).

Through the learning activities they should acquire knowledge in the level of implementation, analysis, discussion and evaluation of views and topics that are dealt in the classes. To achieve this standard of learning, students need to get knowledge from different sources, to compare them with each other and with their experience and foreknowledge. In this way of knowing students are required to be data seekers, analysts and evaluators of contents and critical and argumentative in creative discussions and writing. These are learning activities that students develop in team work with the members of the working groups. When children are more involved in joint problem-solving, they use their experiences in the subsequent child-alone problem-solving tasks (Stern, Hertel, 2022). From these active and highly mobilizing activities students derive their opinions and learning outcomes, which they present and defend through classroom discussion. They often analyze texts and write evaluative reports and various argumentative essays to complete their assignments and teaching tasks. These activities also require a high degree of mobilization of students' attention, analysis and creative abilities. To do this, students need through active reading to analyze, derive the text message and the course of events from the view point of a cause-consequence perspective. This learning strategy and progress is also active learning that develops intellectual skills for permanent and independent learning and other skills needed to nose and solve problems. The community of inquiry is therefore not just a "learning environment" for students to develop their collaborative problem-solving skills, and acquire a know-how considered useful, or even indispensable, in the job market (Santi, 2019). Writing compositions and essays is also a common teaching practice whereby students argue their thoughts and opinions on specific topics. The above mentioned learning activities are active and interactive between students and their teachers. They are coordinated and directed by the teachers of the various subjects. Interactive learning and group discussion illuminates and highlights different aspects of the learning unit. Through questions, personal experiences and thought-provoking sifting problems, useful conclusions can be drawn for education and training of future generations. Interactive learning in group work achieves shared successes, but also develops individual skills and responsibilities. Although they work together and help each other, the truth is that group members must demonstrate learning independently; they are considered individually responsible for the level of learning, often through individual testing or other assessments (Brooke, Parker, 2004). Through the strategy of the Critical Thinking training program, students with different levels of skills and different learning styles and methods benefit. Learning in the Critical Thinking program activates the various ways of cognition. Students according to the techniques and strategies of this program must read and listen actively and critically, go out into the field to observe changes, to find and collect learning materials and facts. They also measure length, weight, and volume for evidence and experiments, design projects, and solve learning problems closely related to everyday life.

Planning and executing comprises processes about defining the goals and sub-goals for the problem solution and developing strategies to reach the goals (Dindar et al., 2022). In a nutshell, students actively reading and working in school environments provided valuable knowledge and learning experiences for their future academic life and workplace. The student should be made aware of the subject of education and made to understand his place and role in the profession and the world environment (Dolgova et al., 2019). It is well known that in order to promote brain development, activities must include hands-on engagement, so that children can directly experience such intellectual processes as: information integrity, concepts of concentration, co-operation, creativity, language use and problem solving (Gartrell, 2000).

In conclusion, it is found that student learning in Critical Thinking schools is of a higher quality compared to schools that do not implement this program as an alternative and a possibility of reforming their pedagogical practices. This is because students at these schools acquire teaching knowledge through direct participation in research, teaching experiments and tests, and in debates on specific topics. These learning tasks and problems put the student in situations where they have to do some hard thinking to find solutions and alternatives. By thinking of solutions, the students develop intelligence, creativity, and discover efficient ways to succeed that they can use in other later situations. Therefore, we say that learning gained through active effort and participation becomes a productive property in students' lives. By engaging thinking in active learning and problem solving, students gain skills, positive experiences, and effective intellectual means to deal skillfully in similar academic and life situations. Solving scientific problems, solving business problems and solving mathematical problems use the same critical methods and approaches, but they work in time and with different groups and datasets (Pherson, Pherson, 2013). These learning outcomes are provided and achieved in productive school environments where the school is intended to be a learning organization. Quality is strongly associated with learning (Vargas, 2020). The quality and learning outcomes of these schools are visible and measurable. Whereas, building these school environments requires reforming the philosophical approach to education, quality teacher training and engaging and contributing to all educational factors.

The purpose of this paper is to investigate the effects of the implementation of the critical thinking program in primary schools for preparing students for independent learning and for education at higher educational levels.

While the specific objectives of this research are: (a) to investigate the importance of contemporary teaching for the preparation of students for effective learning in function of the formation of intellectual habits, and (b) Address the role of active and interactive learning for the best possible preparation of students for independent learning throughout their lives.

While, the research questions of this article are:

What are the effects of the application of critical thinking in primary schools for the preparation of students for qualitative and independent learning?

Can critical thinking teaching strategies for preparing students for independent learning be applied in other schools?

Materials and Methods

For the data collection of this research, we used the quantitative method. Through the questionnaires, we obtained the opinions of teachers and students from school environments that realize active and interactive learning according to advanced practices of critical thinking. With the same questionnaire, we also received the opinions of students and teachers from schools that still work with outdated and traditional methodologies. For data collection, two standardized tests were used which we adapted for our research from the research association OUSD (Orange Unified School District) - Elementary School Student Survey. A test for teachers of contemporary and traditional schools and another test for students of these two school environments. We have processed the data collected during the research with the SPSS computer program and in the paper we present and comment on them as percentages through different tables.

For this research we surveyed a total of 851 subjects divided into two groups of subjects. The first group of respondents is made up of teachers, while the second group is made up of students. We conducted the survey with teachers in 21 primary schools, where through questionnaires we received the opinions of 232 teachers divided into two subgroups. In the first subgroup, through the questionnaire, we received the opinions of 121 teachers trained according to the contemporary methodology of critical thinking. While the second subgroup consisted of 113 surveyed teachers who still base their students' learning mainly on formal passive textual readings and

quantitative memorization. The second group of subjects of our research consisted of 517 students from urban and rural school environments divided into two subgroups. The first subgroup consisted of 255 students of primary schools where the methodology of critical thinking is applied and where the students' learning is active and interactive research. While in the second subgroup we surveyed 262 school students who have not yet reform practices for a qualitative learning in order to prepare students for independent learning even after completing their formal education.

The analysis of the statistical data was done through the chi square test, presenting for each table the statistical values of chi-square, p value and the level of significance for each table.

2. Results

Teaching students for independent and permanent learning is an important task and mission of the school. Critical Thinking Schools in this respect unlike traditional schools give students responsibility by engaging them in activities and other learning projects. Interactive group work also serves to prepare students for analysis and for active and critical acquisition of knowledge and learning experiences. Engaged students invest their cognitive potential to learn new knowledge and skills (Loukomies et al., 2022). These and other aspects of this nature teach students ways of knowing and create positive learning habits for them. Whereas traditional schools, which are considered by modern literature as remnants of formal theory, consider the amount of teaching material as an important factor in preparing for independent life and work. In reality, contemporary theory despite these views, the active and interactive acquisition of knowledge and effective ways of teaching of knowing considers as important to prepare students for lifelong learning. For the preparation of students for independent and permanent learning we also received the opinions of students and teachers from both school environments we are comparing. In Table 1 are presented perceptions of students from 20 schools in both school environments how much their active and effective learning methods learn from their teachers, and their opinions were as follows:

Table 1. Students learn methods for active and efficient learning

Categories		School		Total
		Student of CT school	Student of traditional school	
Never	Number	14	22	36
	%	5.5 %	8.4 %	7.0 %
Rarely	Number	56	54	110
	%	22.0 %	20.6 %	21.3 %
Often	Number	135	94	229
	%	52.9 %	35.9 %	44.3 %
Always	Number	44	91	135
	%	17.3 %	34.7	26.1
No answer	Number	6	1	7
	%	2.4 %	0.4 %	1.4 %
Total	Number	255	262	517
	%	100.0 %	100.0 %	100.0 %

The chi-square statistic is 28.9997. The p-value is < 0.00001. The result is significant at $p < .05$.

The percentages of students' opinions surveyed for both groups of schools are mixed and not very distinct. Compared with each other for the four options offered for declaration do not reflect significant differences. From the students' point of view, the teachers of both schools almost equally teach the students' efficient methods of learning. For this straightforward question the percentages of differences in student statements do not give us the facts to say that this or that school environment teaches students more logical and efficient learning methods. Whereas, in the other statements provided in the survey that shows aspects of students' preparation and independence in the process of active and logical learning, the differences between the opinions of the students from the schools of these school environments are more emphasized and significant from the research of our point of view.

The survey we asked students to state how much the school is preparing them for independent learning and for high school. These statements, expressed in tables and percentages, are as follow in Table 2.

Table 2. The school prepares students for independent learning

Categories		School		Total
		Student of CT School	Student of Traditional School	
Never	Number	10	16	26
	%	3.9 %	6.1 %	5.0 %
Rarely	Number	23	38	61
	%	9. %	14.5 %	11.8 %
Often	Number	82	89	171
	%	32.2 %	34.0 %	33.1 %
Always	Number	138	118	256
	%	54.1 %	45.0 %	49.5 %
No answer	Number	2	1	3
	%	0.8 %	0.4 %	0.6 %
Total	Number	255	262	517
	%	100.0 %	100.0 %	100.0 %

The chi-square statistic is 7.1621. The p-value is .127568. The result is not significant at $p < .05$.

For this assertion presented in the survey, differences in the percentages of students' opinions are most distinct among the schools we are comparing. For the first two negative variants (never and rarely) the percentages of students declaring from traditional schools are higher. Therefore, students in these schools in higher percentages declare that their schools do not prepare them for independent and permanent learning. Despite these students, their peers from the Critical Thinking schools for these first two options have lower compliance rates, that means they have less agreement with the view that their schools never or rarely prepare them for independent and permanent learning. The most striking differences are in the fourth version of this assertion. Critical school students here state in higher percentages that their schools always prepare them for independent learning. These findings, taken as a whole, show the superiority of Critical Thinking schools. From the students' point of view, they are more contributing to their preparation for independent and permanent learning. High-achieving students may already have a broader repertoire of learning strategies, whereas low-achieving students may need more step-by-step guidance from a teacher or peer (De Vries et al., 2022). These findings somehow contradict the percentages in the students' opinions given for the preliminary survey assertion that at school we also learn methods for active and effective learning. Although the assertions offered in the students' statement survey were of similar meanings, their opinions from these two school environments did not appear as distinct as in the other cases. However, even these findings sometimes confused and unexpected are interesting and significant. They present aspects of our educational reality that prove that there is still confusion and lack of clarity in our schools about both the philosophical approach and the practical application of new concrete teaching techniques and strategies. Especially influential on these findings are the schools of both school environments that we are comparing. There are schools in Critical Thinking Schools that are still in an unconsolidated phase in implementing this program approach. As with the schools we are considering as more traditional, there are schools which have information on the philosophy of the Critical Thinking training program, but for the circumstances we have dealt with in the theoretical chapter they have not started with their implementation yet. These schools in both school environments need all-round professional support to follow the path of success and reform.

We also received teachers' opinions on the impact of the Critical Thinking training program on preparing students for independent learning. In our research survey we asked teachers to declare students organizing interactive small group work. The group form of teaching work in contemporary teaching and in the Critical Thinking training program is considered as a teaching modality with interactive features and effects of active learning. In small groups, students learn from each other knowledge, experience and effective ways of knowing, while also developing communication and critical thinking skills. Therefore, for this assertion the opinions of teachers surveyed from both school environments are given as a percentage in Table 3.

Table 3. Teacher organize students in small working groups

Categories		Training		Total
		Teacher of Critical Thinking School	Teacher of Traditional School	
Less than once a month	Number	2	5	7
	%	1.7%	4.4 %	3.0%
At least once a month	Number	13	4	17
	%	10.7%	3.5 %	7.3 %
At least once a week	Number	48	42	90
	%	39.7%	37.2 %	38.5 %
At least once during the class	Number	56	62	118
	%	46.3%	54.9 %	50.4 %
No answer	Number	2	0	2
	%	1.7%	0.0 %	0.9 %
Total	Number	121	113	234
	%	100.0%	100 %	100.0 %

The chi-square statistic is 6.7318. The p-value is .150759. The result is not significant at $p < .05$.

It is interesting and important in this case to see for which version of the statement the highest percentages are. Traditional school teachers have higher percentages of the first and the last version. They stated in higher percentages that they organize students in group work less than once a month and for the other polarity of this assertion at least once during class. Whereas, their colleagues from Critical Thinking schools have higher percentages of versions at least once a month and at least once a week. Looking at the modalities of the organization of teaching and the nature of the teaching units that are elaborated during the lesson, the opinions of the Critical Thinking teachers seem to us to be more constructive and realistic. The processing of each lesson does not fit into the small group of teaching work. In the teaching of Critical Thinking, as a contemporary teaching, modalities and other methodological procedures are also applied that effectively accomplish the lesson and fulfill the educational objectives and competencies. So, the above percentages also indicate the frequency of student organization in group work. Teaching of Critical Thinking in this respect is more time-balanced. The percentages of these schools indicate that these learning environments are more flexible in organizing different forms and modes of learning. The results of the research show that cooperative learning in pairs and groups contributes more positively to students' motivation for school achievement than traditional teaching (Štemberger, 2013). Depending on the nature of the topics elaborated during the class, this teaching also organizes various interactive students' activities.

In our survey, we asked teachers to state even one statement about the findings of the point we are addressing. The assertion stated by the surveyed teachers and the percentage of their opinions from both school environments are as follows in Table 4.

Table 4. Despite hard work, it's impossible to enable all my students to learning

Categories		Training		Total
		Teacher of CT School	Teacher of Traditional School	
Do not agree at all	Number	13	15	28
	%	10.7 %	3.3 %	12.0 %
Do not agree fully	Number	11	13	24
	%	9.1 %	11.5 %	10.3 %
Partly agree	Number	59	48	107
	%	48.8 %	42.5 %	45.7 %
Fully agree	Number	38	37	75

	%	31.4 %	32.7 %	32.1 %
Total	Number	121	113	234
	%	100.0 %	100.0 %	100.0 %

The chi-square statistic is 1.1816. The p-value is .757427. The result is not significant at p < .05.

In this table the views of the teachers given in percentage are not very distinct. However, traditional school teachers have a higher percentage of disagreement than those of Critical Thinking schools in claiming that, despite their hard work, they are failing in enabling all their students to learn. In spite of this, their peers from the most reformed schools applying Critical Thinking teaching techniques and strategies have shown a lower dose of compliance with the above statement. They seem to be more reserved about their success in enabling students to develop effective and logical learning. Fulfilling the function and development goals of the school to enable students to learn effectively is one of the most important and difficult tasks to accomplish. Therefore, given this fact, even these percentages of teachers' opinions from the two surveyed school environments should be analyzed and interpreted in relation to factors and other psycho-pedagogical circumstances of the concrete schools. The above percentages give the impression that teachers of Critical Thinking schools are more cautious in assessing the above assertion. In fact, even the assertion itself is complex and determinative in giving opinions. In our opinion it is more than a reality that with modern teaching methodology and with serious professional and human efforts it is almost impossible to prepare all students for independent learning and efficient learning methods. So, overall, in terms of didactic aspects influencing students' preparation for independent and effective learning from the point of view of students and teachers, we did not find significant differences between these two school environments. This is to a certain extent understandable, because despite the different philosophical approaches that follow these different school environments, nevertheless they work under the same teaching conditions and standards. As such, long-term positive changes in the formation of intellectual learning habits are more difficult to observe.

3. Discussion

Today, in the modern world, preparing students for independent learning throughout their lives is a societal imperative and the primary mission of schools as educational institutions. For the achievement of these social objectives, mobilization and institutional professionalism and commitment and strong national support are required. In this paper, we dealt with the effects of the implementation of the critical thinking program in the preparation of students for qualitative and independent learning. Through schools, in educational policy-making centers, as well as in scientific publications, this issue has become a topic of professional discussion. The importance of preparing students for independent learning has been greatly increased by the concern about the departure of students from the book and their excessive connection with technology and social networks.

In the schools, among the teachers, the topic of discussion in the first place is the concept of quality learning and independent learning of students. The critical thinking program has brought freshness and new qualities to the students' learning. During training for Critically Thinking, teachers receive concrete scientific explanations for this educational aspect. According to the psycho-didactic literature and the guidelines of this reform program, the quality of learning is the direct involvement of students in the acquisition of knowledge through the analysis, comparison and evaluation of arguments and teaching situations. Cognitive activation aims to foster students' higher-order thinking, for e.g., using complex problem-solving tasks (Thommen et al., 2021).

Teaching strategies and techniques present problematic tasks to students which the teacher presents as requests that require creative solutions. During the efforts to find solutions and achieve results, students exchange experiences and develop initiatives, interests, findings and critical thinking and creative skills. Learning through theoretical analysis, teaching debates and practical, research work in school laboratories and workplaces is quality learning in function of the development of productive generations in society. Participants of action learning are encouraged to solve their work problems by reflecting on their past practice and observing their professional peers in action (Alimuddin et al., 2021). As a result of these educational commitments, cultured behavior in society and nature, articulate speech, clear and progressive thoughts, qualitative discussions and interests and desire to study are cultivated. Students' independent work is

developed in textbooks and workbooks through solving tasks and performing various experiments. Teachers discuss the use of the most appropriate teaching strategies for specific subjects in order to make students independent for active and research-based learning.

Teachers trained for critical thinking in their pedagogical practice make an important contribution to the preparation of students for quality learning. Training students for efficient learning is a professional and human duty of teachers, and inevitably also discussion and exchange of experiences between them. According to the teachers and based on the literature, the students really need to be guided how to learn qualitatively. Teachers, as the individuals directly involved with learners, play a key role in achieving the goals of education and are critical in shaping educational activities (Danişma et al., 2018). Schools reformed according to the philosophy of critical thinking through active learning methodology realize independent learning at higher levels compared to traditional schools. This is because the educational requirements addressed to the students are higher with an analytical and evaluative character. While schools with traditional pedagogic practice in the teaching of students are satisfied only with knowledge and understanding of teaching materials which are the two lowest levels in Bloom's taxonomy. So the debate between teachers about the independent and efficient learning of students is understandable and productive. Positive experiences are discussed and exchanged for the art and mastery of teaching for the realization of a more efficient teaching of students in order to prepare them to travel successfully in their academic development.

4. Conclusion

From the theoretical treatment of the paper, we saw that the independent work of students is important and has multiple positive impacts on the formation of their personality. The contemporary literature of psycho-pedagogical scientific disciplines instructs that during education, students are active participants in the path of their intellectual and human development. From this viewpoint, we say that it is very important for students to prepare for independent and quality learning for a successful academic and professional journey. Knowledge and experience gained through participation in learning activities is more easily remembered and becomes the intellectual property of students for use in their post-school life. Authentic learning experiences, being transformative, will ensure that learners are better equipped to solve real-world sustainability problems even outside their classrooms (Taimur, Onuki, 2022). From the operation of the school with this approach, the students benefit from positive lifestyles and school experiences which are embedded in their daily routine. Independent and quality learning creates work habits interests and the desire to achieve educational results. Through the independent work carried out at school and at home, the student creates for himself a lesson schedule and other responsibilities towards school obligations, which in reality are particles of effort in the path of personal development.

In this paper, we wrote about the effects of the implementation of teaching strategies of critical thinking in the preparation of students for independent learning. For this topic, we took and compared the opinions of students and teachers from schools that work according to these strategies and from schools that still work according to traditional pedagogical practice.

The findings of this research show that reformed school environments give more importance to the independent and qualitative learning of students. The philosophical approach of these schools is what creates greater space and opportunities for students to develop intellectual work habits, different initiatives and research interests and culture. The teachers of these schools, in the role of student instructors, also give appropriate and concrete instructions for efficient learning. This modality of education is a constructive and progressive instruction of learning through work and activity. The student on the path of acquiring knowledge and positive school experiences is observed, guided and simultaneously evaluated for his learning efforts. Engagement refers to becoming absorbed in and focused on activities and tasks. Perseverance refers to keep striving towards one's goals, even in the face of obstacles. Optimism reflects hopefulness and confidence about the future (Holzer et al., 2022). Through interactive group learning, students feel more relaxed and optimistic at school and are better prepared for following levels of education.

Despite this advanced pedagogical practice, traditional schools have a more conservative approach to students and their learning. These schools develop teaching based mainly on verbal-textual methods. The teachers of these schools, aiming to implement the curriculum loaded with useless information, narrow the possibility of the students to develop their creative potential. As a

consequence of this outdated pedagogical approach, the acquisition of knowledge by the students of these schools is superficial and formal. This mindset of organizing schools for students does not plan group and interactive learning because the flow of the lesson dictates campaign learning work with the teacher at the center. Students here are in the role of passive receivers of information and then forced to mechanically learn theories and information that are not applicable in real life practice. In conclusion, the research findings prove that schools that work according to teaching strategies of critical thinking better prepare their students for lifelong independent learning. This good educational practice should serve as a success story for other schools that still have dilemmas in accepting and implementing proven professional innovations.

5. Declaration of Competing Interest

6. Funding

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The Impact of Sustainable Education Practices on Food Consumption Behaviours – An Experimental Study of Agrarian School's Students in Hungary

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Abstract

Hungary has a long agricultural tradition, but in recent years it has become more and more innovative, opening up to digital and sustainable trends. These trends include school-based independent farms and point-of-sale systems. While not all of the 61 vocational secondary schools in the new umbrella organisation (Agricultural Training Centres) set up by the Ministry of Agriculture are farms, our sample includes three institutions that are engaged in this type of activity. In our sampling procedure, the selection of the study population was determined by the proximity of the school to the area within our reach (max. 100 km, but in a different county) and by our personal knowledge of the head of the institution, whose willing and supportive cooperation formed the basis of our research. The 210 students in our non-representative sample were from a Jász-Nagykun-Szolnok county institution, 114 from a Bács-Kiskun county institution and 36 from a Csongrád county institution, making a total of 360 students. In the context of multifunctionality and sustainable education, there are many educational and pedagogical goals for such a self-driven phenomenon. Based on our empirical researches, we believe that the education system has an important role and responsibility in educating our young people to become conscious and environmentally friendly consumers, and in this spirit we have developed a proposal for an action plan (Student Enterprise Project) that could complement the agricultural practice activities in a way that is sustainable and self-development-oriented, and of course in a form that can be adapted to school.

Keywords: secondary school students, food consumption behaviour, agricultural vocational education, sustainable education, school farming, Hungary.

1. Introduction

According to various world organisations (UN, UNESCO, WHO), education is one of the most effective ways to develop the attitudes and skills of individuals to become sustainable consumers in an organised framework. The UN General Assembly launched the Decade of Education for

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Sustainable Development (DESD) in 2002. The aim was to integrate the concept and approach of sustainable development at all levels of education systems, contributing to the development of basic education, raising public awareness and the commitment of the labour market to sustainability (UNESCO, 2014; UN, 2002). At the same time, project-based sustainability has also become more and more prominent in public education in Hungary. Various alternatives and "eco-schools" have emerged in the pedagogy of sustainability in Hungary and Europe, with an important mission of sustainability education (Szeberényi, Varga-Nagy, 2017), as advocated and supported by UNESCO. In response to these new social, economic, environmental, socio-cultural demands, vocational education and training itself, and with it the institutional network of vocational education and training, has undergone a huge change in the recent past (Borbély-Pecze, 2016; Csákó, 2016). The ISCED classification of the Hungarian education system has remained basically unchanged: as a tradition of more than 50 years, upper-secondary education (ISCED 3) typically starts from grade 9 in Hungary, after completing the 8-grade single-structure educational phase (i.e. primary and lower secondary, ISCED 1 and 2). Most commonly, it involves 4 grades, less commonly 5, 3 or 2 grades. Based on the VET 4.0 strategy adopted by the government in 2019, the institutional structure of the initial vocational education and training changed from the school year of 2020/2021. Nowadays there are two types of schools in the new school-based vocational education system. Technicum based on economic feedbacks, instead of the upper secondary vocational school, the name „technicum" was introduced. This name is clearer, for many; it symbolizes quality vocational training even nowadays, this word may be more attractive to parents and students. As the name indicates, its graduates will be technicans. The uniform organization, the duality of training and the stronger connection to higher education justifies the change. The duration of the training in the technicum is 5 years. After the first two years of providing sectoral knowledge, dual training takes place in the second cycle. During the practical training period, the apprenticeship contract transforms into an employment contract, which provides the student the opportunity for income during the training. Students take their upper secondary school leaving examination from the four compulsory basic subjects, and the vocational examination of the technical vocational qualification will be their fifth subject. Thus, after a successful exam at the end of the grade 13, students receive two certificates of education; the upper secondary school leaving examination certificate and the certificate of the technical qualification. The knowledge, skills acquired in the technicums create an opportunity for graduates with good results to continue their studies in a similar sector in higher education taking into account the results of their vocational examination. The name of the other type of school is vocational school. The duration of the training in the vocational school is 3 years. After the first year of providing sectoral knowledge, dual training takes place in the next two years mainly within the framework of an employment contract. After graduation, the opportunity to obtain the upper secondary school leaving examination certificate or even the certificate of the technical qualification is open here as well. In addition to the two new types of institutions, several programmes were introduced in 2020 with the aim to support career choices, vocational training and access to upper secondary education (EC, 2021a).

Vocational education and training (VET) are expected to be designed for creating learning outcomes which meet the needs for skills and competences in the labour market (Markowitsch-Hefler, 2018). As a result, individual nation states are striving to meet new types of social, technological and labour market demands (Hoidn, Vít, 2021; Bolli et al., 2019). In Hungary, the Vocational Training 4.0 Strategy summarises the guidelines that put the world of dual, transparent and interoperable agricultural vocational training, which offers a career, into this modern vision. These expectations are also basic requirements, which are of course implemented in a way that takes into account the specificities of the agricultural economy (agriculture, horticulture, forestry, food industry). In the autumn of 2018, the Ministry of Agriculture still had 47 agricultural vocational training institutions and 65 places of work, where nearly 70 percent of the students were studying. In the context of the vocational training reform and strategy, and taking into account the specificities, from summer 2020 the Ministry-maintained institutions (which increased to 61 by 2020) were organised on a regional basis into 5 agricultural training centres (Central Hungary, Great Plain, Southern, Northern, Little Plain). As a result of a higher degree of integration than the industrial training centres, an average of 12-13 institutions was classified under the agricultural training centres that were created. The new Vocational Training Act maintains the institutions as separate legal entities, but the main management powers have been transferred to the heads of the

administrative centres of the five centres created. Legislators and administrators believe that this new institutional structure will be better able to meet the needs of the renewed vocational training. The first of the three main requirements for vocational training in agriculture is that theoretical and practical vocational trainers should have up-to-date knowledge and be able to keep up with technological developments in the sector (digitalisation, robotics, precision farming, etc.). At the same time, it is also important to create an attractive environment for students (training rooms, workshops/farms, sports and leisure facilities that offer an attractive alternative for young people who choose a career) and to offer an attractive career path (students should have a competitive qualification, skills and knowledge required by the economy, which will provide a secure existence and competitive income on completion of the technical school) (Csákó, 2016). In our opinion, the farming, autonomous agro-activist schools and educational institutions generating and participating in modern projects that respond to the needs of their environment are excellent pragmatic marketing elements of this triple expectation system, combining well the inviting future potential of agricultural education (Szekeres et al., 2020).

The focus of our study is, therefore, the activity of self-sustainable management and its impact on young people. Our aim was, on the one hand, to investigate the motivation to participate in school farming, whether it is a positive experience, what students like about it, whether they consume the food produced in school. We also wanted to know if and how their attitudes towards food, eating habits, food purchasing preferences and lifestyle characteristics are influenced by working in a school farm. Another important area of impact was the effect of farming on career socialisation: whether farming helps them to better understand and learn their profession.

Based on the reviewed literature, we assumed that introducing students to self-management in their schools can have a strong impact on both professional and individual socialisation processes. In our opinion, students who gain experience in such activities, either in farming or in food production, are involved in experiential learning processes rich in success experiences, which, presumably, can lead to a more conscious and positive attitude towards food consumption. On this basis, our questionnaire study aimed to test the following two hypotheses:

Hypothesis 1: Self-production activities at school (together with sales) have a positive impact on young people's personal development, individual and career socialisation: the acquisition of experience is a very important catalyst.

Hypothesis 2: Young farmers have more health-conscious eating habits, food purchasing preferences and different lifestyle traits than non-farmers.

1.1. International good examples of practice-oriented agricultural vocational schools

In our study, the school farming activity process plays an important role, because the projects and joint practices in schools provide an excellent opportunity for the personal and professional development of young people. For this reason, we were curious to find effective "good practices" in the international "educational market" of agricultural vocational training (Hoidn, Vít, 2021; Bolli et al., 2019; Locke, Maton, 2019; Niemi, Jahnukainen, 2019; Ümarik, Goodson, 2018; Markowitsch, Hefler, 2018). However, in order to look at these practical activities, it is necessary to be aware of the framework of interpretation: the definition of the European levels of vocational education and training (ISCED). After positioning them in the classification system, we will turn to the type of institutions in the education system of a given Member State (Bauer, Gessler, 2017; Locke, Maton, 2019; Bonoli, Wilson, 2019; Lassnigg, 2017) and then to the specific project activities of a given secondary school. Three countries are used as reference countries in our study: Denmark, Austria and Germany (Hoidn, Vít, 2021; Schlögl et al., 2020; Atzmüller, Knecht, 2017; Durazzi, Geyer, 2019; Di Maioet al., 2019; Lassnigg, 2017; Schmid, 2020). These countries have exemplary agricultural vocational training models, and we wanted to review their good practices because their examples are an excellent representation of agricultural practices and complex farming activities that are based on tradition, but at the same time up-to-date, sustainable and innovative knowledge content.

1.1.1. Denmark

The VET programmes are divided into three tracks: one for young people called erhvervsuddannelse (EUD), one for adults over the age of 25 called erhvervsuddannelse for voksne (EUV) and one called erhvervsfaglig studentereksamen (EUX) which is a vocational education combined with general upper secondary courses (Norden, 2022; EC, 2021b; Bonoli, Wilson, 2019; Di Maio et al., 2019). In Denmark, we would like to highlight two important institutions, Morsø and Asmildkloster, which are prolific examples. Morsø Agricultural Secondary School has great

farming. It has a farm with own beef, rabbits, goats, horses, chickens and some kind of exotics animal. In-house evaluation of crops have some types of vegetables, e.g.: potato, carrot, beetroot, pumpkin, tomato, cucumber, leek, onion, furthermore growing of cabbages, salads and herbs. The school has a vineyard with 900 vine-planting, apple orchards with 6,000 apple trees, with kind of varieties of apple of different origins, glasshouse. It has a land for grazing or cultivation of wheat, barley, meal, lupine, horse bean. Morsø Handelsgymnasium earned 1st and 2nd price in regional entrepreneurial fair. It was an innovation race with 62 teams, whose were organised among North-Jytlands students (Morso Agricultural..., 2022). In Asmildkloster Landshule, & Academy of Agricure Busines yearly 100 skilled farmers are graduating, and 425 students are on their way. The school has international cooperation, which are vocational education and training in agriculture and related education. It has the various inputs EUD, EUX, EUV, Students, as well as Agricultural Leadership. Asmildkloster Agricultural School is strengthening development and growth in Danish agriculture through international cooperation (Asmildkloster's website, 2022).

1.1.2. Austria

The network of agricultural vocational training institutions is very efficient and market-sensitive in Austria. (Hoidn, Vít, 2021; Bauer, Gessler, 2017; Becker et al., 2020; Hautz, Thoma, 2021; Hautz, 2020; Schlögl et al., 2020). Based on the specificities of the Austrian education system, Vocational upper secondary education in agriculture can be implemented in the following types of institutions in the country (Atzmüller, Knecht, 2017; Durazzi, Geyer, 2019; Lassnigg, 2017, Schmid, 2020).

- Part-time vocational school – in tandem with company-based vocational training (dual system) (years 10 to max. 13).

- School of intermediate vocational education and training (= school of intermediate VET) (years 9 to max. 12).

- College of higher vocational education and training (= college of higher VET**)** (years 9 to 13, ISCED 3/5).

- Vocational education and training programmes (=VET programmes) in healthcare professions (1-3 years) (EC, 2021c).

The 11 institutions concerned in Austria are located within this institutional network framework.

Among the countless good practices, three schools are highlighted below. A Francisco Josephinum Wieselburg trains farmers, agricultural and food technologists and agricultural computer scientists. They research, test and evaluate in the fields of agricultural engineering, digital farming, energetic use of biomass and in food and biotechnology. In addition to education, the Francisco Josephinum has a high-performance research facility in three departments (Josephinum's website, 2022).

Project: Good practise as a seminar for internal market (cow, sheep's and/or goat's milk).

The progressing of raw milk of cow, sheep, and/ or goat:

- Hygiene operation of diaries.
- Principles of manufacture of cheese.

The following products can be used in the form of best practice models of and manufacture:

- Yoghurt, fruit yoghurt, yoghurt drinks.
- Cottage cheese and dairy spread.
- Soft and Sliced cheese.
- Production of cheese.

HBLA und Bundesamt Klosterneuburg, Wein- und Obstbau considered themselves as a holistic educational place, where the students receive comprehensive training with the most advanced technical learning and the most modern approaches. There are important upgrading professional skills as well as strength of social skills. In this content it is essential to personal liability, independency, and ability for team work. Priority task of the school is detailed knowledge of the theoretical and practical aspects of growing of vine and fruit-growing (Weinobst's website, 2022). Elixhausen, Salzburg, HBLA Urspung have been educating young people across Austria. The primary aims are to encourage students to be inquiring, tolerant and positive individuals with an independent mind and strong skills in the field of agriculture and environmental engineering. The educational concept is based on non-progressive teaching and takes a holistic approach allowing us to combine the numerous fields of interest in agriculture, environmental engineering and science. The school has a CSI FOOD project which is investigating the science behind food

production and quality assurance of end products. They wanted to explore a specific application in this area and decided on the quality control of beer: microorganisms are a necessary part of the brewing process, but they can also ruin the beer; careful control of microorganisms is therefore crucial. They approached Stieglbrauerei to Salzburg, where are the largest private brewery in Austria. In combination with the HybriScanD Beer assay (Sigma-Aldrich), a rapid molecular test using photometric detection, they could set up a molecular system for the detection of microorganisms in beer that is now evaluated by Stiegl HBLA Ursprung's website, 2022.

1.1.3. Germany

Young adults in Germany with a vocational qualification have a particularly strong advantage in the labour market: 88 % of 25- to 34-year-olds with upper-secondary or post-secondary non-tertiary vocational qualification are employed compared to 61 % of those with a general qualification and 88 % of those with tertiary education (Hoidn, Vít, 2021). These placement rates make the German institutional system one of the strongest and most efficient vocational education and training systems in Europe, which can be described as a very complex system with a wide variety of different types of training. The *Berufsoberschule* provides two years of full-time education and leads to the *Fachgebundene Hochschulreife* (qualification entitling holder to study particular subjects at a higher education institution). Pupils can obtain the *Allgemeine Hochschulreife* by proving their proficiency in a second foreign language. The Fachoberschulerequires a *Mittlerer Schulabschluss* and leads as a rule in a two-year course of study up to the *Fachhochschulreife*, i.e. the higher education entrance qualification for the *Fachhochschule*. It equips its pupils with general and specialised theoretical and practical knowledge and skills. The Länder may also establish a grade 13, after successful completion of which pupils can obtain the *Fachgebundene Hochschulreife* and, under certain conditions, the *Allgemeine Hochschulreife* (EC, 2022a).

In Staatliche Berufsschule München probably the farming is one of the most varied and the most interesting work. When the modern farmer is able to lead economically the firm, he/she has got comprehensive view of arable and livestock farming, but in field of marketing, work planning and administration. It is definitely necessary to have well-built theoretical training, what started at the vocational school and it is deepened at technikum. The farming training has 3 years. The first year of the training is continuing with full-time vocational training year (BGJ). The students attend to at vocational school on four days of the week, at one day they spend on traineeships. At the second and third year of the training period the students are on firm training. The students attend to the school at one day per week (Staatliche Berufsschule München's website, 2022).

BBS Lingen also has a preparatory level and the students learn in a dual system. A "Hauptschule" (general school) is a secondary school in Germany and Austria, starting after 4 years of elementary schooling, which offers Lower Secondary Education (level 2) according to the International Standard Classification of Education. Realschule is another kind of secondary school in Germany and Austria. There are many excursions, especially agricultural sector. The school has got many international relationships (BBS Lingen's website, 2022).

2. Materials and methods

Out of 61 schools of five Agricultural Vocational Training Centres operating in Hungary, a questionnaire survey was conducted in three schools of three Vocational Training Centres between 23 November and 13 December 2020. Two of the schools surveyed were awarded the title of Eco-School by the Hungarian Ministry of Education and Culture and the Ministry of Environment and Water. Eco-schools aim to promote environmental education. Environmental education and sustainability play a key role in the local curriculum and pedagogical programme of the school, which strives to operate in the most environmentally friendly way, working with pupils, parents and local communities to investigate and solve local environmental problems. It provides extra-curricular learning opportunities for pupils, such as projects, forest school, field trips.

Due to the pandemic situation, we conducted online education, so we distributed our online questionnaire to our target secondary school students through the heads of the three schools. As the practical field of our questionnaire survey, we chose agricultural vocational secondary schools (which requested anonymity) that we knew to have self-sufficient farming, production, processing and sales units. It was important for us to include schools that were spatially close (within a 100 km radius), but located in different counties and known to us. The total number of questionnaires evaluated was 360. We had 114 students from Jász-Nagykun-Szolnok county,

114 from Bács-Kiskun county and 36 from Csongrád county who completed our questionnaire in an evaluable way. The questionnaire was completed voluntarily and anonymously. The survey is not representative, all grades were sampled. The questionnaire consisted of 21 closed and seven open questions. For the scaled questions, we used both even and odd Likert scale scores (1-4, 1-3).

To process the questionnaire database, the statistical software package IBM SPSS Statistics 20 was used. In addition to the general descriptive nature of the results, we used cross tabulation analysis to explore the dependency relationships between the individual criteria. According to H0, there is no correlation between the variables under study. If H0 is rejected in the analysis, a significant relationship was identified. The existence of a relationship was tested using Pearson's Chi-square. If the significance level of the indicator (Asymp.Sig. (2-sided)) is below the accepted 0.05 % in the social sciences, there is a relationship between the variables under study. To test the strength of the relationship, Cramer's V, Gamma and Eta association coefficients were used.

The strength of the relationships was interpreted as follows:
- 0 - 0.199: weak relationship
- 0.200 - 0.399: moderately strong relationship
- 0.400 - … : strong relationship.

Principal components and cluster analysis were used to identify the types of students' consumers based on their food purchasing behaviour. On a Likert scale of 1 to 3 (1-Not at all important, … 3-Very important), the students surveyed rated the extent to which the eleven aspects we provided to play a role in their food purchasing decisions. Principal component analysis was used to reduce the number of variables to filter out multicollinearity between variables and cluster analysis was performed with the factors constructed. The conditions for sorting our variables into factors were performed using the Correlation Matrix, Anti-image Matrix, Measure of Sampling Adequacy, Kaiser-Meyer-Olkin Measure of Sampling criterion, and Bartlett's Test of Sphericity. We used the Varimax rotation for the factor weight matrix rotation and the K-means method for the cluster analysis, and then performed the characterization of the three groups of students along our research questions and hypotheses (Sajtos, Mitev, 2007).

2.1. General demographic characteristics of the sample
65 % of the students surveyed were girls and 35 % were boys. 40 % of the students were aged between 14 and 16, 28 % were aged between 17 and 18, 24 % were aged between 18 and 19 and 8 % were aged 19 and above. Nearly half of the students surveyed live in urban areas (54 %) and half in rural areas (46 %). 81% live at home with their family, only 19 % are in college and 1 % live in rented accommodation. In terms of their monthly pocket money/spending money, 23 % have an average of less than 5,000 HUF, 21 % 5,001 − 10,000 HUF, 18 % 10,001 − 15,000 HUF, 24 % 15,001 − 30,000 HUF and 14 % more than 30,000 HUF (1 EUR = 357 HUF).

3. Results
The majority of students surveyed had negative opinions about the eating habits of their peers, using terms such as unhealthy, bad, self-destructive, fatty, excessive. They eat out most often, with almost half of the pupils surveyed eating daily at the school canteen and buying food from the school canteen. They prefer both familiar and new flavours, but 30 % of them prefer the familiar flavours specifically.

33 % of the students questioned are actively involved in the management activities of their school. 36 % of students and their families regularly buy food produced at school. Schools typically sell raw ingredients (vegetables, fruit, meat), but some of them also have processing plants that produce and sell processed and bakery products. The food purchased is consumed as bought by 37 % of respondents, 52 % use it as a raw material for their main/cooked meals and 11 % use the fruit and vegetables purchased to make jams/preserves/juices/creams.

The family's eating habits are a determining factor for students. Their responses indicate that healthy eating is important to them, and they are likely to rate their family's overall eating habits as healthy. It is important to note that 44 % of the respondents' families grow their own fruit and vegetables, and 12 % also grow for sale. In this way, the family is also passing on important patterns to the pupils, which is reinforced by the complex experience of environmental education and farming activities at school.

In their answers to the open questions, they highlighted the community-building role of school farming, the possibility to put into practice what they had learned in theory, and the love of nature and the profession, as well as the possibility to learn about consumer awareness and the

communal experience of spending time outdoors effectively. According to 77 % of the students surveyed, by participating in school farming, they gain a better understanding of what they have learned in theory, as they can see specific activities, plant development and gain their own experience. In response to some of the open questions in the questionnaire on this topic, students' answers to the question on what they personally find most helpful about this activity: "Well, I get to understand things better and the way I see it, it sticks and everything is much easier." "I can see the task and it is even explained." "It's easier to do the activity afterwards, e.g. weaving a cake." "We can learn our trade in a 'protected' environment on the school's own farm, with our own teachers." "I learn a lot of new skills on the apprenticeship that I will need in life." "We don't just talk about it; we do it and it's easier to understand." "I see how to do a job and I get used to the job, which will come in handy later." 65 % of the students surveyed said that activities with their peers had an important community-building role in their lives and that they had made many friends as a result. A specifically community-building, complementary programme related to farming activities is carried out in nearly half of the schools surveyed. Where no such programmes exist, it is common for students to meet and make friends outside school with other students they have met through joint activities. Of course, in many schools, the TSE activity is compulsory and not optional, so it is not surprising that there are also less motivated students. 57 % of the students who responded are very proud to be involved in the production of local food and do their best to promote it. It is also worth highlighting that 61 % of them say that this activity has given them a great deal of love for the profession they are learning and that they feel very good about working with their teachers and creating value. They see it as a creative exercise and admit that in many cases they are not only listened to but also able to put their ideas into practice.

We also asked how the students thought the food products produced in their school could be improved. They mentioned, for example, that the range of products could be extended to include more products, even if it costs more work and that the work invested pays off. In view of the specific pandemic situation, there were also those who thought that the possibility of ordering online could increase the number of customers. They also saw the possibility of organising "sales" and offering various customer discounts. The organisation of professional programmes, open days and contacts with farmers and companies were considered important. Of course, many students consider the current farming system to be adequate. Only 28 % of students said that it was a conscious decision, as they had always wanted to study at the school they had chosen. On the advice of their family, 42 % chose a vocational school with an agricultural profile. Only 10 % said they had no other choice. This shows how important it is to make the students of the school like the profession they are being taught. The Hungarian vocational schools surveyed are making good progress in this area.

3.1. Typification of students according to their food purchasing behaviour

On a scale of 1 to 3, students were asked to rate how important the aspects listed in Table 1 were to them when making their own food purchases. Principal component analysis based on the averages of the responses received revealed the three groups of factors (factors) identified in Table 1. The importance of the variables within the factors is similar, i.e. respondents who consider health consciousness to be a significant aspect of their purchase, for example, also tend to consider it important that the product they buy is environmentally friendly, comes from organic farming, is of Hungarian origin and is locally produced.

Table 1. Principal component analysis with Varimax rotation

Factors that influence food purchasing	Factor 1	Factor 2	Factor 3
Food should be of Hungarian origin	.833	-.057	.065
The packaging should be environmentally friendly	.771	.193	.040
The product must be locally produced	.713	.257	.022
It should come from organic farming (chemical-free, natural, etc.)	.627	.048	.207
Health consciousness	.599	.378	.187
Awareness of the shop	.048	.778	.255

Recommendation from family and friends	.138	.776	.064
Everything should be available in one place	.146	.649	-.056
Awareness of the food brand	.471	.485	.277
Price	.089	.051	.826
Quality	.178	.153	.802
(KMO=0.802; explained variance 59,6 %)			

For the responding students, three types of consumers were identified based on the factors influencing their food purchasing behaviour during the cluster analysis. The characterisation of each group of students according to the factors is shown in Figure 1.

The first cluster is the "Comfortable Brand Cluster (1)", which includes 105 respondents. Students belonging to this cluster like to buy everything in one place, they care about the store and brand awareness and they give their opinion to the reference persons. The second consumer type is the "Price and Quality-oriented Cluster (2)", which includes 138 respondents. Price and quality are the main food purchasing criteria in the food purchasing behaviour of this segment. The third type of consumer (117 respondents) is the "Hybrid Postmodern Cluster (3)", because in addition to the importance of having everything in one place, they also value Hungarian origin, health consciousness and environmental friendliness. They are value for money and stick to established brands and products. Essentially a combination of the first two clusters.
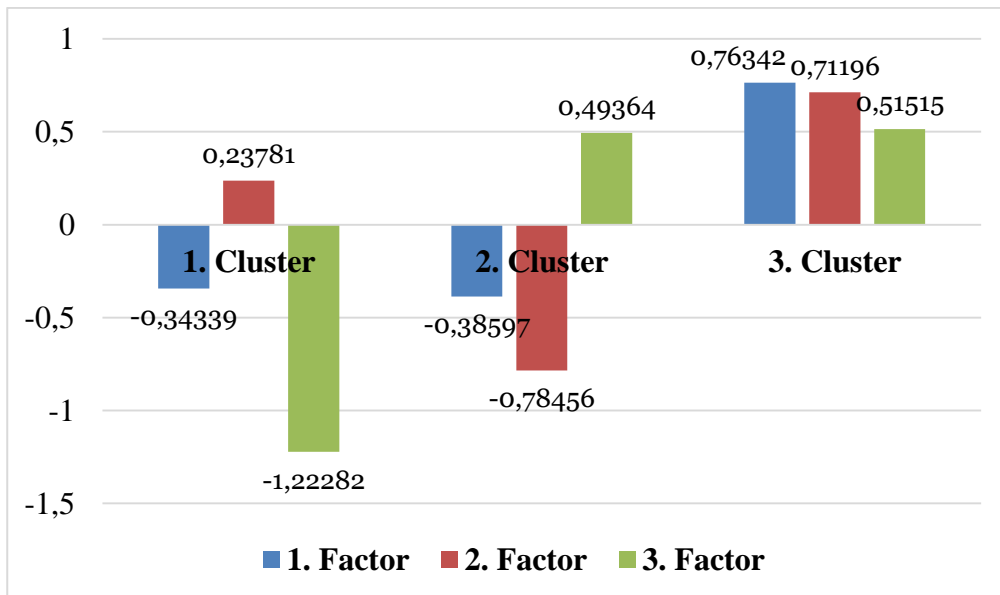
Fig. 1. Characterisation of student clusters by factors

No statistically verifiable correlation was found between students' membership in particular clusters and their demographic characteristics, but our studies suggest that students' lifestyle characteristics influence the type of food buyer they are.

4. Discussion
Within the framework of the EU Green Deal and the Digital age, a profound metamorphosis is taking place within the entire European economy. The significance of the skill set demanded by contemporary agriculture should not be underestimated. These were the inaugural remarks delivered by Wolfgang Burtscher, Director for agriculture and rural development at the European Commission, during his speech at the esteemed event titled 'Farming got talent!', held on the 24th of November, 2022, in Brussels. The overarching objective of the occasion was to emphasise the importance of vocational education and training, as well as to identify the obstacles and effective strategies for cultivating the appropriate competencies necessary for facilitating the transition to a sustainable and resilient agricultural sector within the European Union.

More precisely, the primary objectives of the event were as follows:

1. To identify the requisite skill transformations in the European Union's agricultural sector in order to effectively address the challenges arising from the concurrent green and digital transition.

2. To exchange successful instances of vocational education and training pertaining to sustainable and resilient farming within the European Union while also identifying the encountered challenges.

3. To explore the available tools aimed at supporting the implementation of high-quality vocational education and training programs and fostering synergies (EC, 2022b).

Furthermore, it emphasises the need for extensive and superior research concerning the long-term impacts of school-based food and nutrition education (SFNE), which is an integral part of the 2030 Agenda for Sustainable Development. This research should surpass mere nutritional outcomes and encompass investigations into the most cost-effective combinations of SFNE with other interventions. It also calls for a deeper comprehension of the on-the-ground situation regarding SFNE in different countries, as well as the implementation of formative research to design interventions that are tailored to the specific needs and contexts. (FAO, 2020)

According to the Food and Agriculture Organization (FAO, 2020), SFNE is defined as a series of coherent and progressive sequences of educational activities supported by the environment, which aim to facilitate enduring improvements in the dietary and other food-related practices, as well as in the perspectives and knowledge, of schoolchildren. Additionally, SFNE intends to enhance their capacity to adapt and respond to external changes while enabling them to disseminate their acquired knowledge to others.

The outcomes derived from our questionnaire revealed that 33 % of the surveyed students actively engage in farming activities within their educational institution, whereas the remaining students only partake in such classroom activities sporadically. It is worth noting that the Council of the European Union, recognising the pivotal role of work-based learning and apprenticeship, has set a target for 60 % of vocational education and training (VET) learners in the European Union to undergo work-based learning by 2025. This objective holds particular significance within the agricultural sector, where experiential learning through practical demonstrations emerges as one of the most efficacious means of assimilating new technologies and practices (EC, 2022b). Furthermore, the motivation to partake in these activities exhibits variation among the students. Those who willingly participate in optional farming programs tend to associate farming with a clearly defined positive motivation. For them, farming at school transcends being a mere obligatory task; rather, it is perceived as an immersive process that fosters community building and experiential learning. They take pride in contributing to local food production and strive to advocate for it. They feel good about working with their teachers to create value, to use their creativity and, in some cases, to put their ideas into practice. It is important for them to be able to combine theoretical knowledge with practical experience. Their respect and passion for nature and their profession were clearly evident in their answers. A positive result of our research is that even among the less motivated students, more of them think that school-based farming activities help them to understand and learn the profession they are studying. Drawing upon these findings, we substantiate our initial hypothesis, which posits that school-based self-production activities, coupled with sales, exert a positive influence on the personal development, individual growth, and career socialisation of young individuals. It is evident that experiential learning serves as a significant catalyst in this regard, although further confirmation is warranted.

Across the globe, school-based food and nutrition education (SFNE) is increasingly acknowledged as a pivotal strategy within a comprehensive set of interventions aimed at enhancing the dietary patterns, nutrition, and overall well-being of schoolchildren and adolescents. In line with the recommendations put forth by the Second International Conference on Nutrition (ICN2, 2014) and the United Nations Decade of Action on Nutrition (2016–2025) Work Programme, and motivated by the insights garnered from over three decades of work in this domain, the Food and Agriculture Organization (FAO) embarked on a three-year undertaking to establish the groundwork for SFNE. The objective was to unlock its full potential and effectively address the prevailing challenges in low- and middle-income countries (LMICs) (FAO, 2020). Recent estimations indicate that poor dietary choices now constitute the primary risk factor for the global burden of disease (GBD..., 2018). Globally, 149 million children under the age of five suffer from stunted growth, 49.5 million experience wasting, 40 million grapple with overweight issues, and a significant number face micronutrient deficiencies (FAO et al., 2019). In many cases, these

nutritional issues persist into school-age, particularly in LMICs, where children enter and continue their education while grappling with malnutrition. Consequently, their cognitive and physical potential, as well as overall development, become compromised (Grantham-McGregor et al., 2007; Bundy et al., 2017). It has been observed that there is no significant correlation between students' demographic characteristics (such as gender, age, type of residence, and personal spending capacity) and their food-purchasing behaviour. However, variances in food consumption patterns between males and females do exist in Western cultures. For instance, women tend to consume smaller portions, lighter meals, and delicacies such as vegetables and fruits (O'Doherty-Holm, 1999). Nonetheless, lifestyle characteristics have been found to significantly influence the identified clusters of grocery shopping behaviour.

According to the average of the answers (1 – not at all important... 4 – very important), respect for traditions, travelling and holidays, and belonging to a community are not very important in the lives of students belonging to the "Comfortable Brand Cluster (1)". However, for students in the "Price and Quality-oriented Cluster (2)" and the "Hybrid Postmodern Cluster (3)", these lifestyle characteristics are more important. For all three clusters, the need to party and live a fast-paced life, to follow fashion and trends, the economy, power, religious faith and the opinions of others are not important in their lives. Our study also confirmed that the family was an important reference group in young people's lives and that the LOHAS consumer type mentioned in the literature has emerged, especially for students belonging to the "Hybrid Postmodern Cluster (3)". In contrast to previous domestic research, the food purchasing decisions of the students questioned tended not to be influenced by the opinions of others (with the exception of family and close friends). The part of our second hypothesis concerning the differences in style traits between farming and non-farming students is only partially confirmed, as there are minimal differences between the means of the responses based on the importance of each style trait.

However, research indicates that students who participate in hands-on garden classroom programs exhibit greater concern and awareness regarding resource conservation and allocation compared to non-participants. Moreover, these student garden participants express more positive attitudes towards nature, gardening, and environmental issues (Skelly-Zajicek, 1998; Lohr-Pearson-Mims, 2005). Furthermore, our second hypothesis posited that students involved in school-based farming activities would display healthier eating habits, and this supposition was confirmed through cross-tabulation analysis. The strength of the relationship, as indicated by the Eta correlation coefficients of 0.323, is moderate. Among non-participating students, 20 % do not consider healthy eating important at all, while 44.4 % perceive it as relatively unimportant on a Likert scale of 1 to 4. In contrast, among students actively engaged in school farming, 27.3 % deem healthy eating somewhat important, and 36.4 % consider it highly important. A systematic literature review conducted by Prescott et al. in 2020 summarises and evaluates studies on student outcomes associated with farm-to-school-related activities up to September 1, 2017. The review consistently demonstrates positive impacts on food and nutrition-related knowledge, with many studies suggesting a positive association between farm-to-school-related activities and healthy food selection during school meals, nutrition self-efficacy, and willingness to try fruits and vegetables. However, the impact of farm-to-school activities on fruit and vegetable consumption and preferences remains uncertain (Prescott et al., 2020).

Additionally, students who partake in school garden programs exhibit significant improvements in self-understanding and cooperation to achieve group goals. Their participation is linked to enhanced self-esteem, a better understanding of personal responsibility, improved relationships, and increased involvement with parents and other family members (Alexander-Hendren, 1998). Notably, school garden involvement has also been shown to benefit children with learning disabilities by improving nonverbal communication skills, fostering positive attitudes towards order, and increasing engagement in cooperative tasks (Sarver, 1985). Our research findings highlight the positive impact of school-based farming on personal development, individual growth, and career socialisation. Consequently, we emphasise the importance of schools with an agricultural focus developing or modifying programs to accommodate less motivated students. Traditional classroom activities often involve passive learning, where children engage in reading aloud and listening to their teachers. However, activities conducted in an outdoor garden classroom bring abstract concepts to life through active, hands-on learning. School garden programs utilise various gardening tasks, such as planning, planting, nurturing, and harvesting, to demonstrate the principles of cultivation. In this dynamic learning environment, plants, insects,

birds, and weather all become active participants in the educational process. As a result, children become more engaged, attentive, and motivated to learn.

Furthermore, while school gardens promote creativity, they also provide a structured framework that benefits students academically. Research indicates that students who participate in a garden-based science curriculum, in addition to traditional classroom instruction, achieve significantly higher scores on science achievement tests compared to students in a control group solely exposed to traditional classroom-based learning. This enhanced academic performance associated with garden-based learning is observed in both boys and girls equally (Klemmer et al., 2005).

When addressing less motivated students, it is advisable to use a communication and motivational strategy that takes into account their lifestyle characteristics and food consumption behaviour. The latter is considered important because it is in the light of these characteristics that various school programmes can make an effective attempt to develop health-conscious and environmentally aware food consumption behaviour.

Based on our research experience and findings, we have developed a generic and adaptable concept for the creation of student enterprises. The current state of the EU agri-food sector's workforce reveals a prevalence of low-skilled individuals, with approximately 68 % of farm managers relying solely on practical experience, while only 22 % of younger managers possess full agricultural training. This highlights a significant qualification gap within the industry.

- Over 40 % of the agricultural workforce in the EU is either underqualified or overqualified, indicating a mismatch between qualifications and job requirements that surpasses similar disparities in other economic sectors. The reluctance of the adult agri-food workforce to engage in lifelong learning exacerbates this issue, resulting in low participation rates in vocational education and training programs.

- The structural transformations occurring in EU farms, coupled with the imperatives presented by the twin green and digital transition, necessitate a reevaluation of the demanded skill sets. Digital literacy, environmental management, and entrepreneurship are emerging as pivotal competencies. Consequently, education systems, training requirements, and informal learning opportunities must be adjusted to bridge these skill gaps.

- However, various barriers to learning, such as costs, time constraints, accessibility, inclusiveness, and infrastructure limitations, must be carefully considered when formulating a comprehensive policy mix that can enhance the attractiveness and responsiveness of agriculture-related vocational education and training. These measures are crucial for meeting both the short-term and long-term needs of the sector (EC, 2022b). During the presentations, a diverse range of teaching and learning approaches embedded within the context of EU agriculture and rural areas were showcased. Each presentation underscored the pivotal role that vocational education and vocational schools could play in enabling a more intelligent and sustainable agricultural sector (EC, 2022b).

Our primary aim is to foster the development of young people engaged in agricultural vocational training by cultivating their attitudes towards health consciousness, environmental awareness and becoming informed consumers of food. Moreover, we strive to enhance their individual and career sociability. This pedagogical initiative, known as the "School Farm," lies at the heart of our project design. The integration of farms or professional workshops within agricultural schools in France exemplifies the significant advantages associated with such an approach. These facilities offer valuable practical experiences to students while also serving as spaces for local professionals to experiment and develop their knowledge and skills. It provides farmers with opportunities to learn novel techniques and practices, including the application of research findings (EC, 2022b). While school gardens and garden-based learning are not novel concepts within American education, they have garnered considerable popularity and attention in recent years (Hirschi, 2015). The United States Department of Agriculture's 2015 Farm-to-School Census revealed a substantial increase in the number of school gardens, with 7,101 recorded in school districts across the country, compared to 2,401 recorded in 2013 (USDA, 2015). Positioned within the broader frameworks of alternative food networks (Goodman, DuPuis, 2002) and place-based education (Sobel, 2004), school gardens manifest in various forms and serve diverse objectives (Cramer et al., 2019).

In order to establish enduring healthy eating habits, children and adolescents require regular access to nutritious foods, positive influences from caregivers and peers, as well as the development of skills and motivation. Schools play a vital role in this process, as key moments both

within and outside the classroom present opportunities for young individuals to learn about the functioning of food systems and to acquire the skills necessary for improving their dietary choices (FAO, 2022).

The pedagogical potential of garden-based education in enhancing academic outcomes has been extensively documented (Graham et al., 2005; Passy, 2014). Furthermore, empirical evidence demonstrates the positive and measurable impacts of school gardens on increasing fruit and vegetable consumption and promoting physical activity levels (Berezowitz et al., 2015; Blair, 2009; Lautenschlager, Smith, 2007).

Additionally, school gardens serve as sites of potential resistance against the erosion of knowledge and skills related to food production, preparation, and consumption—a phenomenon known as food system deskilling (Carlsson, Williams, 2008; Howes et al., 2009; Stone, 2007; Cramer et al., 2019).

During our previous research (Bakos, 2019), we had the opportunity to engage in discussions with several farmers who expressed their greatest challenge as the lack of knowledge concerning the legal environment, as well as basic economic, financial, and business skills. Hence, the secondary objective of our project is to equip students with professional knowledge pertaining to agricultural cultivation and processing, along with entrepreneurial skills that will facilitate their entry into the labour market. Additionally, the project aims to foster the development of students' social competencies. To achieve this overarching vision, new paradigms are required, surpassing the transmission of basic and generic nutrition information solely within the confines of the classroom. Instead, hands-on learning, skill development, the utilisation of various media and technologies, and opportunities to engage with food in real-life settings such as canteens, markets, playgrounds, homes, and communities should be promoted (FAO, 2023).

A brief summary of the "School Farm" project:

- Competences to be developed: entrepreneurial, social, logical, personal development, science, etc.

- Target group: students in Grades 10-13

Depending on the specific project idea, 5 to 10 students may be involved. The groups would be mixed along demographic characteristics (gender, age, social background, etc.) The positions needed to run the project-like "student enterprises" would be filled by the students with the help of the teacher, taking into account their individual ideas and abilities.

- Framework for implementation: the student enterprises' project-based pedagogical activities would take place in the framework of vocational training and apprenticeship courses.

- Duration: the student enterprises will be mainly engaged in agricultural production and marketing activities, and therefore the student enterprise project will cover a full year, from planning to implementation.

- Person to assist in its implementation: preferably a teacher with experience in project pedagogy, both theoretical and practical.

- The student enterprise project process:

Once the necessary institutional and parental approvals and support have been obtained and the student teams have been established, the project tasks and associated educational and curricular objectives of the student enterprise project are set out in the Table 2. Each step is coordinated with the students by the teachers who sponsor the programme, but at each level, experts from the teaching staff or from the market can be called in to provide advice and support.

Table 2. Educational and curricular objectives of the "School Farm" project

S/N	Project task	Educational objective	Curricular objective
1.	The name of the enterprise, the scope of its activities.	Encouraging creativity Developing cooperation Developing assertive communication Develop decision-making skills	Economic and legal basic knowledge Communication + Subjects related to problem solving
2.	Developing a detailed business plan for the enterprise:	Strategic planning development Operational planning	Economic and legal basic knowledge Communication

	- Executive summary - Description and vision of the enterprise - Definition of the market - Description of products and services - Operating plan (business plan) - Organisational structure and management - Marketing and sales plan - Description of the financial plan - Annexes	development Putting theoretical expertise into practice Stimulating creativity Developing collaboration Developing assertive communication Developing decision-making skills Recognising and managing responsibility and risk	Agricultural knowledge + Subjects related to the assignment
3.	Presenting the business plan	Encouraging creativity Developing communication and presentation skills	Communication Marketing + Subjects related to the assignment
4.	Running the enterprise	Practising professional skills Developing cooperation Developing assertive communication Develop decision-making skills Recognising and managing responsibility and risk	Communication Agricultural knowledge + Subjects related to the assignment
5.	Discussion and presentation of results and experiences.	Encouraging creativity Developing communication and presentation skills	Communication Marketing + Subjects related to the assignment

Evaluating of the work done in the student enterprise:

The students are in constant communication with their colleagues in the programme, who provide evaluation and feedback to the students after the completion of each project task and help them move to the next level.

The programme described in the study is still to be implemented, but its design, precisely with a view to future attitude development, offers the possibility of differentiated levels of task implementation. In our programme design, it is possible to emphasise the individual steps and tasks, depending on whether or not the student has already been involved in an independent production project task.

Our publication is, therefore, a preliminary study with the aim of exploring the relevance of this type of programming: specifically, the impact that participation in farming processes can have on learners' consumer attitudes.

In this sense, the "Student Enterprise" programme we have proposed can be seen as a strong catalyst. Our planned programme builds strongly on the development of an intrinsic motivational set: in the practical project, the personality of the students is shaped and turned towards a promising, balanced, future conscious consumer behaviour through their own positive experiences. This experience of farming, which has excellent complex professional and pedagogical objectives, could be complemented in the future by an action plan we have designed, the sustainable "Student Enterprise" project, which will place the practical activities of schools with an agricultural profile in a broader context. A broader adaptation of the programme to schools in the future is also planned.

5. Conclusion

In our study, we provided an overview of the food purchasing and consumption characteristics of young people studying in Hungarian agricultural secondary schools. The results show that the educational system has an important role and responsibility in educating our young

people to become conscious consumers. Self-managed schools have a positive impact on students' consumer behaviour, they help them to understand and learn their profession and they have a strong community-building function. It is also found that children from farming families have a stronger motivation and commitment to agricultural occupations and careers and that parental patterns of socialisation are reflected in their behaviour. Vocational education and training are currently undergoing reform in Hungary. In its Vocational Education and Training 4.0 Strategy (2019), the Ministry of Innovation and Technology has set out priorities (infrastructure development, high-quality, modernly equipped sectoral basic training workshops, creation of conditions for dual training, development of educational technologies, scholarship schemes for teachers and students, career paths, etc.) that can make the operating conditions of the schools under review even more efficient, sustainable learning and teaching processes in all aspects, and the output of professionals who respond to labour market needs. From a content point of view, we consider it important to give more emphasis to project-based pedagogical methods in the curriculum design of schools, and therefore we have prepared a simple and adaptable student enterprise design called "School Farm".

The project elements summarised in the Table 2 can be interpreted as part of a whole system, but also as separate elements, modules. We consider it important to mention that the development of the competences behind the steps is one of our most important objectives, because the good action patterns, skills and abilities that can be integrated into the personality of the students will not only be useful in the world of learning and work, but will also be able to have an impact on the way of life of adults and to develop a certain value approach in our young adults. Among other things, the secondary and tertiary socialisation patterns we offer can be linked to the eating preferences of the home and family in a plastic way to help achieve a positive, healthy and conscious eating behaviour in the future. However, the socio-demographic distribution of our sample is heterogeneous, so the strength of these parenting patterns is influenced by multiple factors and not in the same direction and intensity.

We do not consider the possibility of dropping out as a relevant variable in the assessment of the effectiveness and efficiency of our programme design: in our opinion, the presence in the programme, the learning by doing, has an important role in the development of the "germs" of healthy and conscious eating behaviour, the essence of which is the experience of success through independent practice and empirical experience. We consider this process to be the most important, experiential learning, on which it is conceivable that further socialisation patterns can be more strongly built if the learner is in the agricultural sector, but we believe that this direction can also be developed in the case of career leavers, since the patterns of life management (daily meals, shopping habits, product preference, etc.) are present in the learners' lives in the context of daily routine, independent of the nature of their work.

The idea of student enterprise would also orient students towards autonomy and proactivity, and of course, not only those who are already involved in this type of process.

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Teaching Vocational Oriented Foreign Language Reading to Future Oil Field Specialists

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Abstract

This article is aimed at considering the issue of teaching vocational oriented foreign language reading to engineering students (oil industry students in particular). Such reading skills are substantiated to be essential for future specialists. The concept of vocational oriented foreign language reading is introduced; some aspects of teaching this type of reading to enhance the efficiency of the learning process are explored, the feasibility of using authentic, vocational oriented foreign language text and developed exercises to them in the educational process is analyzed. In the course of the study, we used the following methods: conducting a survey, testing, quantitative and qualitative analysis of the data obtained, statistic data processing. Data processing and graphical representation were carried out using computer programs SPSS 17.0 (IBM) and Microsoft Office Excel 2017. The article covers a review of experimental training vocational oriented foreign language reading, as well as the results of this work, which show that vocational oriented foreign language reading makes the process of learning to read vocational texts more effective, leads students to better grasp of material in a foreign language and allows to increase students' motivation of foreign language learning. The outcome of the experimental learning included not only improvement of the skills of future oil field specialists in reading and understanding texts, but also revealed a number of problems in the educational process. Thus, our findings have implications for further research.

Keywords foreign language teaching, foreign language command, reading, vocational oriented reading.

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1. Introduction

The processes of integration and globalization that have taken place in the world economy during the last decade, have a significant impact on all the national spheres from changes in the operating conditions of industrial enterprises and resulting from these changes of the labor market requirements to creating global knowledge economy, which implies internationalization of universities and other higher education institutions and the curricula they offer (Litvinenko et al., 2022). Such international organizations as UNESCO, the Council of Europe, the European Union and conducted international Conferences on education, have concluded special international agreements on mutual recognition of diplomas, developed and implemented programs to assist Eastern European students to join already established educational system. Promoting the achievement of the strategic goal declared as universal education for the sustainable development of countries and society, UNESCO seeked to create conditions for the formation of special competencies, views and values, necessary for learners (future specialists) to improve and strengthen international cooperation. Thus, employment of the most advanced foreign technologies by Russian oil companies resulted in new requirements to industry specialists for foreign language command, that is, a vocational oriented foreign language (Dashkina et al., 2022). This component has become an essential skill for a university graduate. A specialist demonstrating poor vocational oriented foreign language skills is not able to communicate with foreign colleagues, cannot either operate, maintain expensive equipment properly or handle documentation, i.e. demonstrates poor performance. In this regard, the current labor market is demanding for specialists with a good command of vocational foreign language. Acquiring these skills enables to perform proper operation of oil-and-gas equipment, which in its turn both reduces expenses for its maintenance, and facilitates implementation of innovations. Accordingly, the question arises – how to improve foreign language command and eliminate the discrepancy between its inadequate level that many graduates have nowadays and social order requirements to specialists imposed by the industry and the government. In our opinion, teaching a vocational oriented language through vocational oriented reading, can effectively contribute to solving this problem (Larionova, 2016).

The requirements to the oil field specialist are set by the Federal State Educational Standard (FSES) and assume the development of communicative foreign language competence (Bgantseva et al., 2019). This competence can be defined as the learners' ability to interact effectively in specific communicative situations and their ability to arrange communication, considering socio-cultural norms of behavior and communicative relevance of the message (Chuvileva, Murzo, 2021). Researchers' opinions on which competences are included in its body are divergent. But in most cases the following will stand out: language, speech, socio-cultural compensatory, educational and cognitive competences. We consider the speech competence as a priority competence as through it professional tasks are solved. Speech competence implies "the development of communicative skills in four main types of speech activity (speaking, listening, reading and writing)" (Zhidkova, Bobysheva, 2022). FSES provides for possessing a certain set of knowledge and skills as foreign language command: the skills of creating and editing professional texts; the skills of finding, processing and analyzing information; the skills of reviewing technical documentation; being aware of international practices and international standards; being able to analyze the state and prospects of industry abroad; knowing the rules of business correspondence and business negotiations; being aware of the language of standard requests, being able to draw up applications for equipment and so on (Prikaz Minobrnauki Rossii..., 2015). Therefore, we believe that the communicative foreign language competence should also comprise professional competence. And we consider it as the learner's ability to mobilize a system of cross-cutting vocationally significant skills (particular operational skills) and personal qualities required for effective professional problem solving. At the same time, the psychological basis of vocational competence is the learner's commitment to continuous improvement of his/her educational level (Rubtsova et al., 2021). Vocational orientation increases relevance of the acquired knowledge and skills. However, there is also the reverse process: a deep awareness of the urgent need for the studied material intensifies the emotional background of its perception, stimulates cognitive activity. When using a foreign language to acquire new vocationally relevant knowledge and to deepen his/her professional experience, a student improves his/her ability not only to solve professional problems, but also to understand better the status his/her profession takes in society (Gerasimova et al., 2022).

Reading is a receptive type of speech aimed at extracting, perceiving, understanding information; it forms the basis for the development of productive skills and abilities to produce

foreign speech (speaking, writing). As any other type of activity reading comprises motive, purpose, conditions, and outcome. The motive here is communication by means of printing; the purpose-obtaining information (Sveshnikova et al., 2022). Conditions include acquiring the graphic system of the foreign language and techniques for obtaining information (Pushmina, 2021). The outcome reflects the degree of understanding information (accuracy and depth may vary). The main aim is to teach students techniques to obtain information required for solving a specific problem (Matskevich, 2019). Those techniques correspond to the types of reading offered by the standard classification: browsing, searching, extensive and analytical reading. The classification is based on communicative goals, determining the depth and accuracy degree when perceiving the text (Tabueva, 2014). Browsing type of reading provides general understanding of the text and answers the question whether it is worth reading in detail. This type of reading assumes the abilities:

- to define the theme;
- to see the most important points;
- to break the text into logical parts;
- to determine the author's main idea.

Searching type of reading is devoted to finding required information in a short time. Essential abilities here are:

- to see the logical structure of the text;
- to select and handle the necessary pieces of information.

Extensive reading, the most common one, is aimed at total coverage of content of a newspaper article, a book etc. This type of reading suggests that the reader should have the skills of

- defining the theme;
- comprehension of context;
- prediction of a possible sequel;
- evaluating the text read.

Analytical reading is based on a comprehensive and accurate understanding of all the content and critical thinking. Information gained from the text is supposed to be memorized and then used in other types of activities (for preparing reports, course papers etc.). Readers require the skills:

- to perceive and interpret linguistic means adequately;
- to obtain complete information;
- to comprehend obtained information.

Vocational oriented reading is a complex type of speech, due to informative needs of future specialists, aimed at perception and comprehension of a foreign text, learning vocationally significant vocabulary, communication in the vocational sphere. Problems of teaching reading were regularly considered by researchers (Tabueva, 2014). But still we face the problems which should be taken into account when arranging the process of teaching. These include:

- limited amount of curriculum hours allocated to the subject and the high requirements imposed by FSES;
- growing information flow, which demands that future specialists develop the skills of vocationally oriented reading to solve professional problems, and low level of these skills development among undergraduates;
- lack of adequate support materials that would reflect the specifics of interdisciplinary students' training;
- mixing students of different specialties in one training group.

Therefore, the problem of teaching students – future oil and gas specialists to perceive and understand foreign vocationally oriented texts to satisfy their informational needs in obtaining new knowledge and solving professional problems, has not been settled yet.

Textual material, being a part of the educational content, represents the subject content of foreign vocational-oriented communication (Boyko et al., 2022). The text is a communicative unit of educational material, possessing unity of meaning and speech, characterized by a certain completeness of content, the author's attitude to the message (Murzo et al., 2019). The educational foreign text is defined by researchers as a component of the system of a textbook on a discipline, specially selected, aimed at a certain year and direction of training student, subject to the level of their language command, focused on comprehension and assimilation of information, has a structural and language organization (Root, 2022). Such texts are usually characterized by the following features:

- completeness (appears as content meaningfulness, drawing conclusions, evaluation);
- in formativeness (suggests the information to be relevant for the reader);
- coherence (implies the interdependence of all text elements);
- integrity (correlation of the text with one object that forms its message)
- consistency (enables the reader to draw on his or her background knowledge to interpret texts);
- pragmatism (the characteristic that encourages various types of the reader's response – passive/perception or active/action).

Vocational oriented texts are aimed at broadening the professional outlook, demonstrating the features of intercultural communication, solving project problems, conducting research. From the point of view of mastering foreign language skills these texts introduce "ready speech and composition forms" of a certain speech register, style, genre (Timkina, 2017). The task facing the teacher is to teach vocational oriented reading, namely, to teach how to translate texts on specialty both with and without dictionaries; to foster the ability to perform this type of activity to solve professional problems.

As the practice of working in a non-language university shows, the work with a bilingual dictionary often causes significant difficulties. This happens because students' skill to use a bilingual dictionary is often quite low (Tokareva, Evdokimov, 2022). The main mistake is choosing the wrong meaning of the word when translating (the choice of meaning occurs out of context) (Skornyakova, Vinogradova, 2021). The teacher's task is to explain the ways of working with the dictionary, strategies for choosing the meaning of a word.

When organizing the training process for future specialists, the specifics of students should be considered. It is customary to attribute to the features of adult students, firstly, the previous experience of language learning (often negative) (Koltsova, Boyko, 2022). Reading special texts can be complicated by ignorance or misunderstanding of the linguistic phenomena inherent in a foreign language (Pushmina, Karter, 2021). Therefore, the teacher's task is to minimize grammatical, lexical and phonetic difficulties as much as possible (Yang, 2018). Secondly, high motivation for learning. This category of students is deeply aware of the reasons for learning, the scope of application of the knowledge received what predetermines their strong wish to obtain practical knowledge and skills that can help solve vocational problems and achieve particular goals. Therefore, future specialists are willingly involved in the process of training vocational oriented reading, only if it meets and satisfies their professional needs (Grigoryeva et al., 2015). Therefore, the process of teaching vocational oriented reading is effective providing that the text is informative, relevant, with highly specialized terminology included. Thirdly, adult thinking patterns. If we compare memories of an average school student and adult, we will find out that an adult's memory is less voluminous. Besides an adult tires out faster, and he is hard to concentrate for long periods of time. Meanwhile, the adult's thinking abilities are well developed. For that very reason, the process of adult training requires much greater clarity and thoroughness in the definition of concepts, structuring of course content, its systematic presentation. Another important feature of the adult to be taken into account while organizing the teaching process is the zone of proximal development. It is the gap between what a learner has mastered and what they can potentially master with support and assistance. The psychological difference between adults and children is that adults can create the conditions for themselves to overcome difficulties. They are capable of setting the zone of their own proximal development and building a professional trajectory. Moreover, when the adult accepts assistance, unlike children, he or she cooperates with the one assisting, instead of shifting his or her duties to him or her. The future specialist needs to learn how to work with texts independently. The text should contain grammatical and lexical structures of the studied language to match the knowledge level of the students. The teacher supervises the independent activity of the student, seeks to form the skills and abilities necessary for reading (Andreeva, 2015). Consideration of these features makes it possible to maximize the effect of teaching by including the strongest points of adult learners into training process.

A system of criteria for selecting texts for educational purposes has developed in the methodology of teaching a foreign language in higher education. The fundamental criteria for selecting vocational oriented educational texts are: authenticity, professional-informative value, genre diversity, presence of sociocultural markers, consideration of the level of language and professional training, and problem orientation (Timkina, 2017). We consider authenticity as original non-adapted texts, not pursuing educational goals, created by native speakers.

Professional-informative value is the information (content, speech), relating to general professional or narrow professional activity field. Genre diversity implies the use of texts of different genres, for example, reference materials, graphic images, scientific and popular texts, scientific papers, legislation, technical documentation, etc. Sociocultural markers (sociocultural realities, patterns of speech behavior) include elements of a foreign-language culture in the general professional or narrow professional sphere. Consideration of the level of language and professional training: the text may contain general scientific or highly specialized terminology, simpler or more complex grammar structures, etc. Problem orientation is associated with the solution of reproductive, productive or creative tasks while reading the text. Educational texts are usually followed by specially arranged assignments. Pre-text exercises are aimed at relieving learners' language and speech difficulties. Besides they may provide a comprehensive review of lexical and grammatical material previously acquired. Text exercises proper to dividing material into semantic parts, identifying the key idea of the text, finding the information required, rephrasing and etc. Post-text exercises are targeted at checking understanding, identifying the text's cognitive value and preparing learners for speaking or writing.

Based on the above, we assume that vocational reading will be more effective if the following conditions are met:
- the use of authentic vocational texts;
- relevance of the texts, their saturation with specialized terminology;
- specially arranged text assignments;
- teaching students techniques to obtain information required for solving a specific problem;
- resolving professional problems when reading.

2. Materials and methods

The experiment was carried out on the basis of St. Petersburg Mining University. Pedagogical experiment including the ascertaining, forming and control stages was conducted. The study involved 42 second-year oil students. 20 of them formed the control group, 22 formed the experimental group. At different experimental stages the following methods were used: conducting a survey, testing, quantitative and qualitative analysis of the data obtained, statistic data processing. Data processing and graphical representation were carried out using computer programs SPSS 17.0 (IBM) and Microsoft Office Excel 2017.

3. Findings
Ascertaining stage.

The ascertaining stage included a survey to identify the patterns of vocational texts use during language lessons. The questionnaire contained three groups of questions, which allowed to reveal the level of vocational vocabulary acquisition; frequency of using vocational oriented texts during language lessons; motivation (of students) to use vocational oriented texts for learning the language. Quantitative and qualitative analysis of the survey data showed that 68 % of future oil field specialists have low vocabulary level in their specialty. 44 % noted the lack of practice and 41 % – considerable difficulties in reading foreign language vocational oriented texts, all of them having admitted the purposefulness of such texts, as they are saturated with vocabulary that is vocationally relevant. 52 % replied that performing tasks based on authentic, vocational oriented texts would increase their motivation for learning a foreign language (reading in particular).

The results obtained during the ascertaining stage were taken into account when composing the training tasks for the forming stage.

Forming stage.

At the second stage, during the formative experiment, the initial level of students' reading skills of vocational oriented texts was tested. As a diagnostic test, students were asked to study a small excerpt from some vocational oriented texts (Cocchi, Mazzeo, 2022), for example "The Role of Natural Gas in the Energy Transition Phase" and others. This is an authentic text designed for future specialists in this field, dedicated to their professional activities and saturated with various vocational terms.

After reading the text, students were asked to answer a number of questions to the text, which were supposed to control the understanding of the text during reading:
a) perception of language means;
b) extracting information from the text;

c) comprehension of the extracted information.

According to the test results (Figure 1), a general low level of students' skills in reading foreign language vocational oriented texts was revealed: a) perception of language means: control group – X = 2,4, experimental group – X = 2,82; b) extraction of information from the text: control group – X = 4,6, experimental group – X = 4,41; c) comprehension of extracted information: control group – X = 3,6, experimental group – X = 3,23. Thus, the level of knowledge should be considered insufficient.
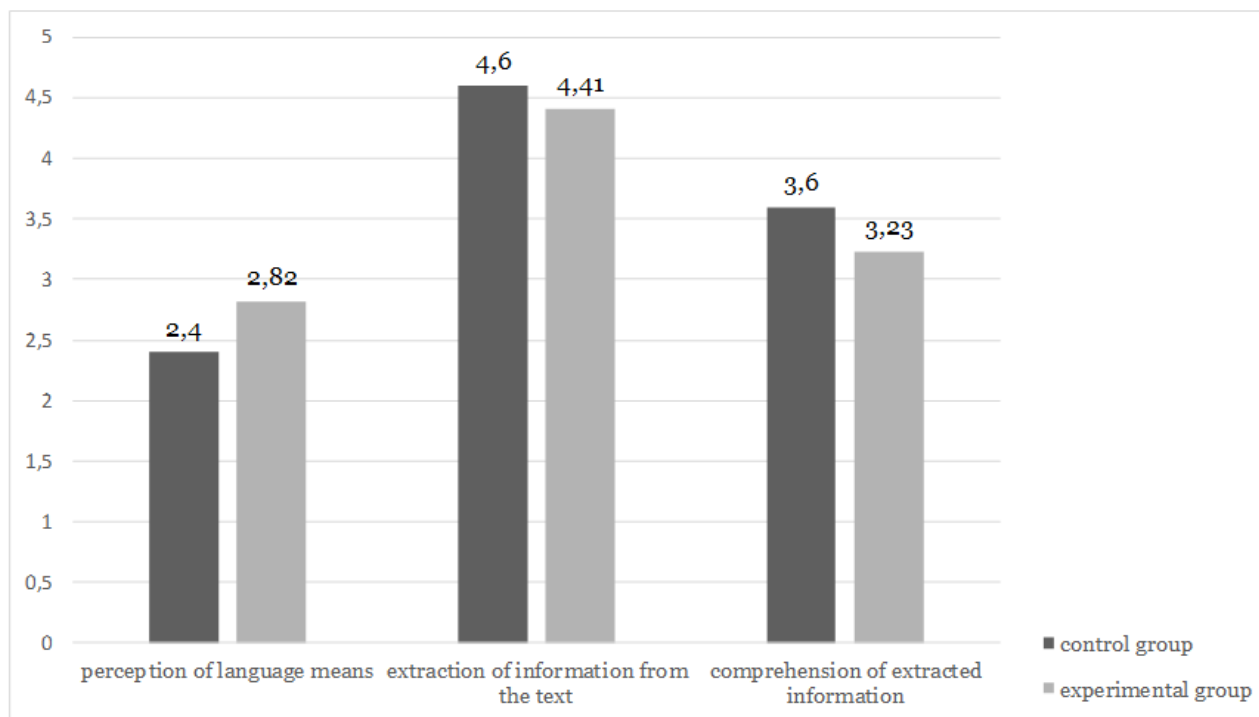
Fig. 1. Results of diagnostic test

In the control group, textbook "English for oil workers" (Serikbai, 2009) and some additional articles were used (Dvoynikov et al., 2022; Shatalova et al., 2022; Yurak et al., 2020; Ulanov, Skorobogatko, 2022). The articles and the texts of this textbook give an idea of the most important aspects of the oil industry and provide material for mastering oil field terminology. Though these texts are vocational oriented, they all are not authentic. In addition, the number of exercises to the text is insufficient to improve the reading skills of foreign language vocational oriented texts.

The experimental group used vocational oriented texts with developed sets of exercises. Each set of developed tasks consists of three stages: pre-text, text and post-text. As an example, let's consider one of the texts and a set of exercises for it. "Oil & Gas business Relevant Technologies" (Amorin, 2021) is an authentic scientific text from a foreign journal in the oil and gas field.

Pre-text assignments contain questions aimed at predicting the content of the text and appealing to the general scientific knowledge of students. For example: "What key challenges is oil and gas industry facing right now?"; "Is the need for large-scale, cutting-edge innovation in oil and gas industry high? If yes, why?»; «What technologies are at the forefront of today's evolving oil and gas sector?»; «Why are oil and gas companies investing in renewables supporting the global energy transition to a greener, cleaner future?».

Meanwhile, these questions don't concern the content of the text in order to avoid repetitions. From the assignment, students can find out not only the main subject of the text, but also identify the style of the declared material, the key features of the style of the presented text, according to which students will be able to determine vocational oriented texts in the future.

Next, students proceed to text exercises, which contain the following main tasks: to define terms in the text, to find definitions for them; to find in the text synonyms to the words proposed in the exercise; to correctly use these words while filling in gaps in sentences; to title paragraphs of the text, etc.

As an example, let's consider one of the text exercises. The methodology of teaching a foreign language has accumulated a large arsenal of various means, techniques and ways of revealing the content of incomprehensible and obscure words, including terms. Using such methods and techniques, you can make reading vocational oriented texts not only understandable, but also fascinating. One of these methods is the use of definitions. Definition is a unique logical and linguistic phenomenon in which language and thinking interact, improving each other. The definition can be called a kind of "bridge of mutual understanding", since it connects old knowledge with new, participates in the transfer of experience from generation to generation, helps communication of specialists in all fields of knowledge, contributes to the effectiveness and success of human cognitive activity. The simplest, most stable and logically rigorous type of concept deployment is the definition. The more actively operational memory is involved in the course of semantic processing of information and the higher the mental activity in identifying the features of linguistic phenomena functioning, the more linguistic information settles in permanent memory. This technique is most often used in writing, as a rule, at the stage of introducing a new vocabulary. For example (Table 1):

Table 1. Exercise. Complete definitions 1-9 with words and phrases taken from the text

enterprise producing intelligence	mature basin	pH scale
business intelligence platform	apace	marketing analytics
carbonic acid gas	workhorse	gas sweetening

1.   ... - at a fast speed
2.   ... is technology that helps businesses gather, understand, and visualize their data.
3.   ... is business intelligence for production management, aimed at analyzing contextualized production data to extract actionable knowledge and drive business results.
4.   ... is the practice of using data to evaluate the effectiveness and success of marketing activities. It allows you to gather deeper consumer insights, optimize your marketing objectives, and get a better return on investment.
5.   ... have well-known reservoirs and well-defined geologic characteristics.
6.   ... measures how acidic or basic a substance is.
7.   a machine, piece of equipment, or vehicle that you can trust to work well and that you can use to do a lot of work.
8.   ... is the process of removing Hydrogen Sulfides, Carbon Dioxide, and Mercaptans from natural gas to make it suitable for transport and sale.
9.   ... is a heavy odorless colorless gas formed during respiration and by the decomposition of organic substances; absorbed from the air by plants in photosynthesis.

So, the exercise presented above was used to semanticize lexical units, train rapid correlation of concepts and their definitions.

Post-text exercises complete the work with foreign language vocational oriented text. Their purpose is to control the degree of students' understanding of the studied text. Post-text exercises can be offered in the form of: building a logical sequence of the text; building a logical chain of action development; searching in the text for answers to questions by underlining or voicing; answers to questions about the content of the text; a brief or detailed retelling of the text with mandatory additional task; test tasks.

As an example, let's consider one of the post-text exercises. The ability to make an abstract and perform an abstract translation is of great practical importance for future specialists as one of the ways of semantic analysis of the content of foreign scientific and technical literature. Knowledge of the rules for abstract's writing contributes to the ability to adequately extract the main provisions of the source on the topic of research and formalize them in accordance with the requirements of regulatory documents.

Writing an abstract is the final stage of working with the text and is carried out independently or in pairs, depending on the level of foreign language proficiency in the study group. Since students have never had to write abstracts to vocational oriented articles before, the teacher gives them recommendations: what the volume, what language features should be observed,

for example, to state the main points very clearly and concisely, avoid repetition, observe the unity of terms and definitions, etc. Then the teacher offers useful phrases (presented in the exercise) that will help to convey the content of the article more accurately (Table 2):

Table 2. Exercise. Write an abstract to the text according to the following structure

	The Scheme of Annotation of the Article/Text	Useful phrases
1	The title of the article, the author, where and when it was published.	1.The title of the article is …/The headline of the article, I have read, is…/The article is headlined… 2. The article is written by…/The author of the article is … 3. The article was published in …/The text was printed in…/The text was taken from…
2	The main idea of the article.	The main idea of the text is…/The keynote of the article is…/The article is devoted to…/The purpose of the article is to give the reader some information about…
3	The contents of the text (some facts, names, figures).	The author starts by telling the reader that …/The author writes (states, declares, stresses, thinks, points out) that…/It is stated in the article that…/Further the author reports that…/The article goes on to say that…/The article describes (reports on, informs of, comments on) that…
4	The author's conclusion and your opinion of the article.	In conclusion…/The author comes to the conclusion that…/As far as I can judge…/ It should be noted (mentioned, observed, pointed out) that…/I found the article interesting (important, serious, dull, too hard to understand, rather useful) for …/The article is of great value (of no value) for me.

As a result of the work done, it turned out that writing an abstract for vocational oriented text is a complex and painstaking work that requires certain knowledge of vocabulary in the specialty and skills to work with vocational oriented text. This work, being very time-consuming, arouses a certain interest among students. The accumulated vocabulary will be useful to them in their further professional activities, will help not only in reading articles, but also in communicating with foreign colleagues and participating in international projects and conferences.

Control stage.

Finally, a control stage was carried out in order to verify the effectiveness of the developed set of exercises. Repeated testing was carried out (using the same parameters as before).

To assess the type of distribution of features, the indicators of asymmetry and kurtosis characterizing the shape of the distribution curve were used. The values are represented as M±SD, where M is the sample mean and SD is the sample standard deviation.

Since the distribution of features corresponds to the normal law, and the variances are equal, the Student's t-test was used to compare the averages. The Student's paired t-test was used to compare related samples. The equality of variances was evaluated by Fischer's F-criterion.

The differences were considered statistically significant at $p < 0.05$, where p is the probability of a first–kind error when testing the null hypothesis. In all cases, two-sided versions of the criteria were used (Table 3).

Table 3. Statistical characteristics in control and experimental groups according to the results of diagnostic and repeated testing

Statistical characteristics	Perception of language means			Extraction of information from the text			Comprehension of extracted information		
	Diagnostic testing	Repeated testing	Mean difference	Diagnostic testing	Repeated testing	Mean difference	Diagnostic testing	Repeated testing	Mean difference
Control group(n=20)									
M	2,40	5,20	117 %	4,60	6,60	43 %	3,60	6,40	78 %
SD	0,75	0,41	-46 %	2,91	1,10	-62 %	2,37	3,07	29 %
P1-2	<0,001			0,014			0,005		
Pf1-2	0,011			<0,001			0,270		
Experimental group (n=22)									
M	2,82	7,00	148 %	4,41	8,18	86 %	3,23	7,82	142 %
SD	1,71	1,02	-40 %	2,30	0,96	-58 %	1,41	1,22	-14 %
P1-2	<0,001			<0,001			<0,001		
Pf1-2	0,023			<0,001			0,510		
Pc-e	0,306	<0,001	-	0,814	<0,001	-	0,545	0,065	-

Note: P1-2 is the statistical significance of the difference in averages between the diagnostic and repeated test; Pf1-2 is the statistical significance of the difference in variances between the diagnostic and repeated test according to the Fisher criterion; Pc-e is the statistical significance of the difference in averages between the control and experimental groups.

Statistical analysis of the data showed that at the initial testing stage, the averages of control and experimental groups in all three aspects did not differ statistically significantly ($P_{c-e} > 0.05$).

Mean values of the retesting results in all three aspects increased statistically significantly ($P_{1-2} < 0.05$), both in the control and in the experimental group.

At the same time, at the stage of repeated testing, the average value for "Perception of language means" in the experimental group became statistically significant ($P_{c-e} < 0.001$) by 1.35 times more than in the control group. The average value for "Extracting information from text" in the experimental group was statistically significantly 1.24 times higher than in the control group. The average value for "Comprehension of extracted information" had a statistically insignificant tendency to prevail in the experimental group by 1.22 times ($P_{c-e} = 0.065$).

The variance in the control group for "Perception of language means" decreased by 46 % ($P_{f1-2} = 0.011$), for "Extraction of information from text" decreased by 62 % ($P_{f1-2} < 0.001$), for "Comprehension of extracted information" had a statistically insignificant tendency to increase by 29 % ($P_{f1-2} = 0.270$).

The variance in the experimental group for "Perception of language means" decreased by 40 % ($P_{f1-2} = 0.023$), for "Extraction of information from text" decreased by 58 % ($P_{f1-2} < 0.001$), for "Comprehension of extracted information" had a statistically insignificant tendency to decrease by 14 % ($P_{f1-2} = 0.510$). A decrease in variance (SD squared) indicates a decrease in variability, variability of the studied features.

5. Discussion
The results obtained by the authors are consistent with the results of the study by S.V. Krupskaya, L.R. Nurtdinova (Krutskaya, Nurtdinova, 2016): improving skills of vocational oriented reading is one of the pivotal tools when learning a foreign language. This is due to the demand for reading during professional growth and development: we agree with O.A. Larionova (Larionova, 2016) that future specialists in the oil field are currently following new technologies and most often turn to reading texts in a foreign language.

Although we agree with the opinion of E.N. Nikonova, K.M. Yakhyaeva (Nikonova, Yakhyaeva, 2020) that learning to read vocational oriented foreign language texts implies students' understanding of oral and written texts, we also note the complexity of a vocational oriented text for oral perception. If future oil field specialists attend a conference where they listen to speeches in a language that is not native to them, they are more likely to turn to the written version of the report or article for a deeper understanding of the problem. This is also due to another additional factor: many speakers at such conferences are not native English speakers themselves and speak English with a fairly noticeable accent, which does not detract from their achievements, but makes their speeches difficult to perceive by ear.

As a result of the combination of the above factors, improving reading skills of vocational oriented texts is crucial for future oil field specialists' professional development the in relation to learning a foreign language. Thus, we agree with Y. Timkina (Timkina, 2017) that a teacher should pay special attention to the selection of texts, taking into account both the initial training of students, their specialization, and numerous factors of diversification – various initial conditions for language acquisition and working conditions of future specialists in the oil field.

Teaching process of future oil field specialists should take into account their emotional comfort and needs. Reading vocational oriented texts in English had a positive effect on the psychological climate in the group: students were more interested in mastering texts, there was a tendency to mutual assistance which is consistent with the results of studies by O.L. Mohova (Mohova, 2016), Y.V. Borisova, A.Y. Maevskaya, E.R. Skornyakova (Borisova et al., 2020).

Our research showed that usage of authentic vocational oriented texts and sets of exercises developed for them can improve quality and effectiveness of vocational oriented language learning, since, comparing the data obtained during the diagnostic and control tests, we can see that the number of positive ratings has increased in both groups, but in experimental group this increase is more significant.

The experiment made it possible to improve the skills of future oil field specialists in reading and understanding texts, and at the same time revealed a number of problems. The study of texts showed that the difference in the initial level of language proficiency forces us to resort to collective reading, which is not very popular when reading the text in real life. The question of the admissibility of the use of electronic translators and dictionaries by students remains debatable. In general, the issue should be resolved positively rather than negatively: as experiments with various texts have shown, students easily understand the difference between translations made by an electronic translator and translations made by a person, and quite agree with the idea that without knowledge of the foreign language, it is hardly possible to understand the specifics of the text and the construction used. These revealed problems will become part of further research.

6. Conclusion

Reading with the aim of a complete and accurate understanding of the information contained in a foreign language text is an integral part of future oil field specialists' professional growth due to the fact that this specialty is at the international level, facilitating the exchange of professional experience among specialists from different countries. Electronic text translation is not able to provide 100 % of future oil field specialists needs in the analysis of new research in their specialty. In addition, electronic translation will not help in speaking at conferences and in oral communication with foreign colleagues. Thus, students are motivated to develop and improve skills for reading vocational oriented texts. Also, our study has revealed that teaching reading of vocational oriented texts is rarely used in foreign language classes at a non-linguistic university and students have difficulties in learning to read vocational oriented texts in a foreign language.

Experimental training was conducted using authentic, vocational oriented texts and exercises to them. The analysis of the experimental data proved that the use of specially developed exercises for teaching reading vocational oriented texts will lead students to better grasp of material in a foreign language and makes the process of learning to read vocational texts more effective. In addition, teaching how to read vocational oriented texts allows to increase students' motivation of foreign language learning. Therefore, teaching reading texts related to students' future profession improves their professional competence.

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Distance Learning during the COVID-19 Pandemic: Stress Factors for Female School and University Teachers in Kazakhstan and Kyrgyzstan

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Abstract

According to international studies, teachers experience more stress than representatives of other professions and are included in the group of occupations with a high presence of stress factors. This is due to the hard work of teachers in terms of high responsibility, motivational and personal involvement in pedagogical work, as well as significant participation in communication with school children or students that determine the stressful nature of the teacher's activity. Difficulties were especially noticeable when teachers switched to distance education in the context of the COVID-19 pandemic. This study examines the predictors of stress affecting the mental health of female teachers in schools and universities in Central Asia (Kazakhstan and Kyrgyzstan) during distance (online) learning at the time of the pandemic. In addition, according to the results of the study, it was found that in the conditions of COVID-19, the impact of the level of material and technical security/access on mental health is important when female teachers have a good social climate at work. The study also confirmed that the impact on mental health is most noticeable when female teachers are more actively involved in the decision-making process with specific organizational goals in accordance with a participatory management policy, and female teachers often receive feedback about their work. Female teachers at universities and schools were surveyed using a random stratified sampling method, and an anonymous online survey was conducted. Responses from school and university women teachers/lecturers were collected in Google Forms, which subsequently led to a comparative analysis of stress factors affecting their mental health. A total of 748 female teachers took part in the survey. Empirical research is based on a quantitative research method and uses a survey data collection methodology. Stress factors among female educators were tested by T-test analysis using SPSS.22 software.

Keywords: Pandemic, Covid-19, distance (online) learning, anxiety, depression, stress, women teachers, Kazakhstan, Kyrgyzstan.

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1. Introduction

The COVID-19 pandemic has adversely affected individuals' mental health in almost every region of the world (Holmes et al., 2020). According to numerous studies, education has been identified as an industry most affected by the coronavirus pandemic, and mental health consequences have been dire (Lee, 2020). In April 2020 there were school closures in almost 196 countries because of the COVID-19 pandemic, and this situation subsequently affected nearly 1.6 billion students worldwide (UNESCO, 2021). Further research indicates that about 40 million children around the world who were about to start school have missed out on important early childhood education because of the pandemic (UNICEF, 2020). In higher education, some universities have suspended their work indefinitely due to the lack of information technology (IT) infrastructure for both students and teachers.

Many studies have focused on the mental wellbeing of students as they faced COVID-19 educational disruptions (Lee, 2020; Shah et al., 2020). However, disruptions in schooling have caused serious psychological problems among educators as well. Poor mental wellbeing among teachers has spillover effects: it can result in negative externalities for their families, their students, and the profession at large. Given the importance of educators' wellbeing, both for their own sake and for the sake of their studies and communities, we examine stressors among female educators in Kazakhstan and Kyrgyzstan during remote online teaching environments in the wake of COVID-19. There are not many studies on teachers' mental health in Kazakhstan or Kyrgyzstan. Teachers and their wellbeing play important role in the development of the region, especially given teacher shortages in Kyrgyzstan (Steiner-Khamsi, Teleshaliyev, 2020). The lack of studies in transition economies shows the unequal conditions the pandemic has imposed on developing countries as opposed to developed countries.

This interdisciplinary research brings together gender, psychological, and educational issues in the context of digitalization and COVID-19. The aim of this study is not only to study the stress factors affecting the mental health of female teachers at schools and universities in the pre-pandemic and after-pandemic periods, but also to develop policy recommendations for the administration of schools and universities, as well as defining educational policies to improve the problems of professional burnout, dissatisfaction and inefficiency in the context of COVID-19. We pay particular attention to the experience of women educators as part of efforts to empower women in Kazakhstan and Kyrgyzstan, who are often considered socially vulnerable groups. Based on this, the study addresses an important and timely issue, focusing on various aspects of distance learning, paying particular attention to people's mental health, including professional burnout and labor productivity.

Ultimately, through quantitative analyses of these primary survey data, we find that the relationship between stressors and the mental health of female school/university teachers during COVID-19 varies from urban to rural areas, and overall can be mitigated through improvements in logistical/technological support and through administrative support and a positive work climate. Thus, the scientific research is aimed at solving three research questions: 1) to determine whether the relationship between stress factors and the mental health of female teachers in urban and rural areas differs, and how the level of material and technical security/access mitigates this relationship; 2) to identify whether the relationship between organizational climate factors and the mental health of female teachers in urban and rural areas differs and how the material and technical security/access mitigates this relationship; and 3) to establish whether organizational climate factors (social climate, participation and clarity of goals or feedback on work results) eliminate stress and whether they have a positive impact on mental health.

2. Literature review

Several researchers have examined student's mental health in the onslaught of the COVID-19 pandemic and the swift switch to remote learning. These have included studies on students' stress (Pajarianto et al., 2020), loss of learning ability (Dorn et al., 2020), limitations in distance learning (Alvares, 2020), psychological stress (Besser et al., 2020; Zhou, 2020) or technostress (Zeeshan et al., 2020), and online migration (Watermeyer et al., 2020; Aveginou, Moros, 2020). However, very few have specifically studied the mental health of educators during COVID-19, especially in the context of transition economies. Some researchers have examined teachers' methods of coping with anxiety (Talidong, Toquero, 2020), while others have studied teacher productivity during the

distance learning period (Purwanto et.al, 2020) and electronic readiness and teacher perception of distance learning (Spinelli et al., 2020).

However, special attention is paid to the mental health of teachers during COVID-19: not only does stress affect teachers' short- and long-term health, but also their students' academic and psychological outcomes (Harding et al, 2019). Further, in regions where teacher shortages were already prevalent, the pandemic may have exacerbated the issue: the risk of experiencing professional burnout was especially high during the pandemic, especially with isolation and the need for rapid retraining (Petrakova et al., 2021).

Previous research on educators' mental health shows that their stress factors commonly include: student fighting (Finlay-Jones, 1986; Hastings, Bham, 2003), student destructiveness and indifference (Ingersoll, 2001; Shirom et al., 2009), unsupportive administrations (Schonfeld, Santiago, 1994), heavy workload (Guglielmi, Tatrow, 1998), and excessive emotional involvement with students, colleagues, parents of students (Kokkinen et al., 2014; Schonfeld et al., 2010). A great deal of COVID-specific research on teachers' stress focuses on stress associated with online teaching (MacIntyre et al., 2020, Košir et al., 2020, Pressley et al., 2021, Klapporoth et al., 2020). Despite the growing number of educators teaching entirely online, the literature remains limited in studies about factors contributing to their stress and job satisfaction, and such studies are largely confined to wealthy countries.

Some research has shown that teachers who perceived additional support from a supervisor felt less stressed in a distance learning environment, while teachers who reported taking care of their own children felt more stressed (Košir et al., 2020). However, increased stress made worse by fear of contracting COVID-19 and related turmoil often induces anxiety-related behaviors (Besser et al., 2020, Oducado et al., 2021).

Ultimately, of these studies on education in the context of the global pandemic, focus is on the challenges faced by school teachers (Hadar et al., 2020; Purwanto et al., 2020), university departments (Zeeshan et al., 2020; Talidong, Toquero, 2020; Ramakanta, Sonali, 2020) and students or children (Alvares, 2020), while the university administration/management issues are largely not considered as stressors for teachers. One study does examine the role of administrative support (e.g. support from school principals), but finds this varies by cultural attitudes. This subject requires additional study, which we aim to address herein in the context of Kazakhstan and Kyrgyzstan.

Finally, our study focuses on the experiences of female educators. Studies have found that COVID-19 brought higher rates of stress to female teachers relative to male (Oducado et al., 2021). In the context of Central Asia in particular, there is a lack of gender-focused research on stress factors among female school and university teachers during the COVID-19 pandemic. In response to existing theoretical and practical gaps, this study attempts to provide empirical evidence and up-to-date data on mental health, professional burnout and labor productivity among female teachers in the region.

3. Materials and methods
Procedure Sample and Participant Selection

Respondents of the survey: Female teachers of schools and universities involved in distance learning.

The survey questions ask teachers about their experiences with anxiety and depression as well as their experiences with school-related technology, administrative support, and leadership. The survey was conducted starting from August to November 2020, when schools were mandated to take on remote instruction, and contained questions related to respondents' experiences before and during the pandemic. The project uses stratified random sampling: self-completion forms of questionnaires were randomly distributed among female teachers at schools and universities in Kazakhstan and Kyrgyzstan. Research among school and university teachers has been facilitated through official contacts and assistance from state educational administrations and embassies. Questionnaires were developed in Kazakh and Russian languages. A pilot test of the research method was conducted with 10 university and 5 high school teachers to assess the clarity and coherence of the survey questions. Starting from August 2020 to November 2020, 850 respondents were contacted remotely and 752 completed questionnaires were received, indicating 88.5 % response rate. The target audience was reached by official letters distributing a link to the online survey through various channels such as the Ministry of Education and Science of the Republic of Kazakhstan, education management agencies at the local or regional levels, UNESCO regional

offices and Kazakhstan and Kyrgyzstan embassies. After selection of completed questionnaires, 748 valid cases were identified and stored for further analysis. The sample is almost equally representative of both urban (46 %) and rural areas (54 %). The target audience is represented by school and university teachers of secondary education.

These studies were analyzed by SPSS statistics (SPSS-22), paired sample t-test, independent sample test, Pearson correlation analysis, and moderation regression analysis. The results were interpreted in the form of statistical tables. The study was designed as an empirical quantitative study using area stratified random sampling based on a survey using the following scales:

1) Scale of perceived stress – a scale consisting of 10 questions, the task of which is to determine how stressful people consider the previous month of their life. It was designed to assess the level of perceived stress, that is, the subjective perception of the level of tension in a situation (Cohen et al., 1983; Cohen, Williamson, 1988).

2) The Symptom Checklist-90 Scales (SCL 90-R) for measuring anxiety and depression is a relatively concise self-report psychometric tool (questionnaire) published by the Clinical Assessment Division of the Pearson Assessment & Information Group. It is designed to assess a wide range of psychological problems and symptoms of psychopathology (Deregatis, 1977; González de Rivera et al., 1989).

3) Quality-work-competence (QWC version) to measure employees' perceptions of the psychological climate (Deregatis, 1977; González de Rivera et al., 1989).

The data were collected using a self-administered online questionnaire. The survey questionnaire consisted of 5 sections such as: Demographic Profile; Perceived Stress Scale; Anxiety Depression (SCL-90-R) Scale; Quality of Work-Competence Scale (QWC); Material and Technical Security/Access level.

And in each section, there is a category of questions that serve as measurements of the tested variables formulated on the basis of the psychometric Likert scale and consists of five positions (1 – strongly disagree, 5 – strongly agree).

Stress factors were measured across 3 dimensions: perceived stress, anxiety, depression.

Organizational climate factors were measured across 4 dimensions: social climate, participatory management, clarity of purpose, performance feedback.

The research tool were designed to measure each element of the measurement of stress factors and organizational climate (the survey instrument was designed to measure each item dimension of Stress and Organizational Climate factors). Namely, the certainty of perceived stress and clarity of purpose was measured by 4 points, the measurement of anxiety – by 6 points, depression – by 10 points, social climate – by 5 points, and aspects of management with participation and feedback on the results were measured by 3 points (perceived stress and goal clarity were measured by 4 items, anxiety dimension by 6 items, depression by 10 items, social climate by 5 items, and participatory management and performance feedback dimensions were measured by 3 items).

In order to check the reliability of the scales used in the survey questionnaire, a reliability analysis was carried out: the Cronbach's alpha reliability coefficient for all blocks of the research instrument was in the range of 8.861 – 0.904 (Cronbach's alpha > 0.7). Since this indicator exceeds 7.0, which is the lowest acceptable reliability indicator, the scales adopted in the study are considered reliable.

4. Results

The study contains the data on demographic characteristics of respondents in Kazakhstan and Kyrgyzstan, i.e. with data on the age of participants: 23 % of respondents were aged 18-30 years (23.3 %), 27.9 % – 31-40 years, 25.3 % – 41-50 years and 20.6 % – 51-60 years. Only a few participants were over 60 years old (2.9 %).

Indicators relating to long-term work experience or seniority were also relatively balanced. Approximately, 21 % of the participants had less than 5 years of work experience, and 17 % had 6-10 years of work experience. Others had work experience of 11-15 years (13.8 %), 16-20 years (12.0 %), 21-25 years (11.2 %), 26-30 years (10.8 %) and more than 30 years (14 %). As for qualifications, half of the sample had secondary education (45.9 %), while others had bachelor's degrees (20.5 %) and master's degrees (21.0 %). PhD level (4.3 %), assistant professors (1.2 %), associate professor (2.8 %) and professors (4.4 %) were significantly less represented in the sample.

Table 1. Demographic characteristics of respondents (descriptive statistics)

	n	%
Age		
18-30 years old	174	23.3
31-40 years old	209	27.9
41-50 years old	189	25.3
51-60 years old	154	20.6
over 60 years old	22	2.9
Years of teaching experience		
under 5	157	21
6-10	128	17.1
11-15	103	13.8
16 -20	90	12.0
21-25	84	11.2
26 – 30	81	10.8
over 30	105	14.0
Individual qualification		
School teacher	343	45.9
Bachelor level	153	20.5
Master's level	157	21.0
PhD level	32	4.3
Assistant Professor	9	1.2
Associate Professor	21	2.8
Full Professor	33	4.4
Level of education that educators teach		
Secondary education	465	62.2
Undergraduate	253	33.8
Graduate	30	4.0
Subject area that educators teach		
Social sciences	90	12.0
STEM	223	29.8
Arts and Humanities	417	55.7
Business and Economics	18	2.4
Living area		
Urban	355	47.5
Rural	393	52.5
Family environment		
I live with family	686	91.7
I live alone	48	6.4
I live with my friends/roommates	14	1.9
Number of children		
No children	108	14.4
1	160	21.4
2	214	28.6
3	151	20.2
4	59	7.9
5	35	4.7
more than 5	21	2.8
Working space at home		
I work in a shared room	164	29.9
I work in a separate room	498	66.6
I have no special place to work	86	11.5
Family income		
I am the sole earner	199	26.6
Other family members also contribute financially	549	73.4

The majority of participants taught at the secondary education level (62.2 %), while a smaller number taught at the undergraduate (33.8 %) and graduate (4.0 %) levels. As for the subject area in which the respondents participated, the largest group was arts and humanities (55.7 %), followed by STEM (29.8 %), social sciences (12.0 %) and finally Business and economics (2.4 %).

The sample is almost equally representative of both urban (46.0 %) and rural (54 %) teachers. Almost all participants lived with their families (91.7 %), and only a few lived alone (6.4 %) or with their friends or roommates (1.9 %). As for the number of children, the majority of participants had one child and two or three children (21.4 %, 28.6 % and 20.2 %, respectively). A smaller number had no children (14.4 %) or four, five or more than five children (7.9 %, 4.7 % and 2.8 %, respectively). A smaller number had no children (14.4 %) or four, five or more than five children (7.9 %, 4.7 % and 2.8 %, respectively). Working space at home – 66.6% of these specialists had a separate room for work, while the rest of the participants worked in a common room

(29.9 %) or did not have a special place to work (11.5 %). Finally, the majority of the sample had family members (others) contributing financially (73.4 %), while only 26.6 % were the sole breadwinners. Descriptive statistics are given in Table 1.

We use several independent randomized T-tests to examine stress factors among female school and university teachers in Kazakhstan and Kyrgyzstan during a remote online environment in the context of COVID-19. As shown in Table 2, T-test results show that a significant difference was found between anxiety and depression on one scale before the pandemic and during the pandemic. With respect to anxiety and depression as separate scales, significant differences were also found both between pre-pandemic anxiety and anxiety during the pandemic; and between depression before the pandemic and depression during the pandemic. These results suggest that female teachers felt more overwhelmed and anxious during the pandemic than before the pandemic. With regard to anxiety and depression as separate scales, significant differences were also found between pre-pandemic anxiety and anxiety during the pandemic and between depression before the pandemic and depression during the pandemic.

Table 2. Paired Samples T-Test (SCL, anxiety, depression): before and during the pandemic

Variables	Mean	SD	Mean	SD	t-value	Sig (2-tailed)
Anxiety & Depression	1.12	0.61	1.38	0.74	-15.03	0.000*
Anxiety	1.42	0.69	1.74	0.85	-15.68	0.000*
Depression	0.93	0.63	1.15	0.74	-13.12	0.000*

*$p<0.05$

Independent sample T-tests were also used to compare anxiety and depression scores in urban and rural areas, as shown in Table 3. Although no significant differences were found in pre-pandemic anxiety scores between urban and rural residents, significant differences were found between the same two groups, urban and rural areas, in anxiety during the pandemic.

The results suggest that during the pandemic, teachers living in cities reported higher levels of anxiety compared to teachers living in rural areas. Similarly, significant differences were found: (a) between urban and rural areas for pre-pandemic depression; (b) between urban and rural areas in relation to depression during the pandemic; (c) between urban and rural areas for anxiety and depression as a single pre-pandemic scale; (d) between urban and rural areas for anxiety and depression as a single scale during the pandemic. These results suggest that urban women teachers experienced higher levels of depression compared to their rural counterparts. To sum up, urban teachers felt more anxious and overwhelmed during the pandemic than teachers from rural areas.

As illustrated in Table 3, the results show that both before and during the pandemic, female teachers living in urban areas were more anxious and depressed than rural teachers.

Additionally, despite a low sample of respondents from Kyrgyzstan, results of comparative cross-country analysis in Kazakhstan and Kyrgyzstan (SCL, anxiety, depression) reveal significant differences between the two countries on all scales. As shown in Table 4, these differences exist across (a) scores for anxiety and depression as a single pre-pandemic scale; (b) anxiety and depression scores as a single scale during the pandemic; (c) pandemic anxiety scores; (d) pre-pandemic depression scores; (e) points for depression during the pandemic for residents of Kazakhstan and Kyrgyzstan. The results show that women teachers in Kyrgyzstan experienced higher levels of anxiety and depression compared to female teachers in Kazakhstan both before and during the pandemic. Thus, it was found that female teachers in Kyrgyzstan during the pandemic were more likely to experience a feeling of stress, anxiety, emotional burnout compared to female teachers in Kazakhstan. Differences in the identification of anxiety and depression were also revealed, female teachers in Kyrgyzstan more often than female teachers in Kazakhstan felt in a state of anxiety and depression. When determining the levels of stress in women teachers, they are also influenced by the characteristics in their regions of residence. When comparing urban and

rural areas, more differences were found. That is, women teachers from both countries living in the city experienced frequent and high levels of stress during the pandemic, while those who lived in rural areas experienced lower levels of stress.

Table 3. Independent Samples T-Test (SCL, anxiety, depression): Urban and rural areas

Variables	Women teachers from rural areas		Women teachers from urban areas		t-value	Sig (2-tailed)
	Mean	SD	Mean	SD		
Anxiety & Depression (before the pandemic)	1.17	0.61	1.07	0.61	2.14	**0.033***
Anxiety & Depression (during the pandemic)	1.51	0.76	1.25	0.70	4.83	**0.000***
Anxiety (before the pandemic)	1.46	0.67	1.39	0.71	1.47	**0.143**
Anxiety (during the pandemic)	1.91	0.87	1.59	0.81	5.13	**0.000***
Depression (before the pandemic)	0.88	0.62	0.99	0.64	2.33	**0.020***
Depression (during the pandemic)	1.05	0.71	1.27	0.76	4.14	**0.000***

*$p<0.05$

Table 4. Comparative Cross-Country Analysis between Kazakhstan and Kyrgyzstan (SCL, anxiety, depression)

Variables	The case of Kazakhstan		The case of Kyrgyzstan		t-value	Sig (2-tailed)
	Mean	SD	Mean	SD		
Anxiety & Depression (before the pandemic)	1.10	0.61	1.55	0.59	-3.48	**0.001***
Anxiety & Depression (during the pandemic)	1.35	0.73	2.07	0.68	-4.62	**0.000***
Anxiety (before the pandemic)	1.41	0.69	1.71	0.56	-2.04	**0.042***
Anxiety (during the pandemic)	1.72	0.85	2.41	0.79	-3.83	**0.000***

Similar to comparative cross-country analysis, levels of anxiety and depression were found to differ between female teachers in rural and urban areas. Teachers in rural areas reported lower levels of anxiety and depression compared to teachers in urban areas. The same trend was observed

with the level of depression before the pandemic. Teachers in urban areas reported higher levels of depression before the pandemic than teachers in rural areas.

The organizational climate scale consisted of four items (subscales): (a) Social climate, (b) Participatory management, (c) Clarity of goals, and (d) Feedback on performance. Participants had to read each item and choose one of five options for each statement: "strongly disagree", "disagree", "neither agree nor disagree", "agree", "totally agree". Examples of social climate statements include the following statements: "There is a pleasant atmosphere at my workplace", "There is unity and good relations between my colleagues". To compare the estimates of the social climate for residents of urban and rural areas, the t-test of independent samples was used.

In addition, the results of independent samples t-tests were used to compare the estimates of residents of rural and urban areas (Table 5). As a result, there was no significant difference in the social climate between urban residents (t (872), p = 384) and (M = 2.38, SD = 0.82) and rural residents (t (874), p = 382) and (M = 2.43, SD = 0.86). Similarly, there were significant differences between the participation rates of urban residents t = 2.084, p = 0.38, M = 2.17, SD = 0.87, and rural residents t = 2.082, p = 0.38, M = 2.30, SD = 0.86. The indicators of the four goals and the clarity of the goal for urban residents are t = -2958, p = 003 and M = 2.23, SD = 0.83, for rural residents t = -2958, p = 003 and M = 2.41, SD = 0.83. A comparison of respondents' feedback indicators with performance results showed that there is also a difference between urban residents t = - 2524, p = 012 and M = 2.25, SD = 0.87 and rural residents t = - 2519, p = 012 and M = 2.41, SD = 0.84.

Table 5. Independent samples t-test for the social climate scale: urban and rural areas

Variables	Urban areas		Rural areas			Sig (2-tailed)
	Mean	SD	Mean	SD	t-value	
Social Climate	2.38	0.82	2.43	0.86	-0.872	0.384

*p<0.05

Results of the t-test of independent samples (SCL, participatory management): Urban and rural areas. The results show that there is a significant difference in the degree of participation in management between urban and rural female teachers. Insofar as it is established that the P-value is equal to P = 0.038, while (alpha < 0.05) deviations are considered significantly different, as shown in Table 6. The results show that the participation of female teachers in the decision-making process was higher than in rural areas compared to the residents of urban areas.

Table 6. Independent samples t-test for the scale of participatory management: Urban and rural areas

Variables	Urban areas		Rural areas			Sig (2-tailed)
	Mean	SD	Mean	SD	t-value	
Participation	2.17	0.87	2.30	0.86	-2.084	0.038*

*p<0.05

Results of independent t-test samples (SCL, clarity of purpose): Urban and rural areas. The results show that there is a significant difference in the clarity of the goal scale between urban and rural female teachers. Since the found value of p is equal to p = 0.003 (alpha < 0.5), it is assumed that the deviations differ significantly, as shown in Table 7. This means that the village school administration provides more support in terms of clarity of goals than the city administration. Schools, which means that rural female teachers work in more favorable conditions than their urban counterparts. These results confirm and complement the research data presented in the literature review.

Table 7. T-test of independent samples on the scale of objective clarity: Urban and rural areas

| Variables | Urban areas | | Rural areas | | | |
	Mean	SD	Mean	SD	t-value	Sig (2-tailed)
Goals Clarity	2.23	0.83	2.41	0.83	-2.958	**0.003***

*p<0.05

Independent samples of T-test results (SCL, performance feedback): Urban and rural areas. Since the calculated value α = 0.05, the p value for performance feedback is p = 0.012, so the result shows that the deviations differ significantly, as shown in Table 8. These results indicate that female teachers in rural areas receive more feedback about their work from management than female teachers who live and work in urban areas.

Table 8. Independent samples t-test for performance feedback scale: Urban and rural areas

| Variables | Urban areas | | Rural areas | | | |
	Mean	SD	Mean	SD	t-value	Sig (2-tailed)
Performance feedback	2.25	0.87	2.41	0.84	-2.524	**0.012***

*p<0.05

An independent sample of the T-test was used for residents of Kazakhstan and Kyrgyzstan to compare assessments on four scales (social climate, participation, clarity of goals and objectives, as well as feedback on the results of work). The results revealed significant differences between the two countries on all scales, as shown in Table 8:

(a) Social climate: t = -,398, p = ,691
T = -,390, p= ,701

(b) Participation: t = -.905, p = .366
T = -,882, p= ,387

(c) Clarity of objectives: t= -.005, p= .996
T =005, p= .996

(d) Performance feedback: t = 551, p = .609
T =449, p = .658

An independent sample T-test did not reveal a significant difference on the feedback scale between Kazakhstan and Kyrgyzstan. The deviations do not differ significantly, as shown in the Table 9. These results indicate that female teachers in Kazakhstan and Kyrgyzstan equally perceive feedback on academic performance from school administrators.

What we can see is that a comparison of female teachers' Performance-Competence scores (QWC) also showed differences between urban and rural areas, suggesting that teachers in rural areas had more favorable conditions in this regard. Although the assessments on the subscale of professional climate factors did not differ significantly between the two groups, an analysis of the participation of the management on the subscales, clarity of goals and objectives and feedback on the results showed significant differences between rural and urban areas. Compared to female teachers working in cities, female teachers in rural areas felt more involved in the decision-making process, felt that the goals in their workplace were clearer, and reported receiving better and more frequent feedback on performance. Thus, it can be concluded that the leadership of rural educational institutions provides greater support in terms of ensuring broader participation in the academic decision-making process, creating conditions for clarity of goals and quality, as well as regular feedback on the results of work than the leadership of urban educational institutions. However, it was reported that the level of material and technical security/access in urban areas is higher. Teachers in rural areas felt that their workplaces were less equipped to support online education compared to schools located in cities.

Table 9. Group statistics on four scales (QWC) for residents of Kazakhstan and Kyrgyzstan

	Your country	Mean	Std. Deviation	Std. Error Mean
Social_Climate	Kazakhstan	2,4066	,84804	,03156
	Kyrgyzstan	2,4783	,86705	,18079
Participation	Kazakhstan	2,2392	,86866	,03233
	Kyrgyzstan	2,4058	,89305	,18621
Goal_objectives_clarity	Kazakhstan	2,3251	,83628	,03112
	Kyrgyzstan	2,3261	,83746	,17462
Performance_feedback	Kazakhstan	2,3398	,85825	,03194
	Kyrgyzstan	2,2464	,98585	,20556

In order to study the relationship between stress factors and the level of material and technical security/access, the reliability of the level of material and technical security/access was first tested (Table 10). The 10-point scale was found to be reliable. Cronbach's alpha was 0.895.

Table 10. Cronbach's alpha results for the Level of Material and Technical Security/Access

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.895	.895	10

The correlation coefficient of the product and the Pearson's Product Moment correlation was calculated to assess the relationship between two variables – the level of material and technical security/access and anxiety and depression (SCL-90-R) (Table 11). The latter was analyzed both as a single scale (SCL-90-R) and as two separate scales: (a) anxiety and (b) depression. During the pandemic, there was a moderate negative correlation between the level of material and technical security/access and anxiety and depression (SCL-90-R) (r = -0.103**, n = 748, p < .005). When considering anxiety and depression separately, no correlation was found between the level of material and technical security/access and anxiety during the pandemic (r = -0.068, n = 748, p < .063), and a moderate negative correlation was found between the level of material and technical security/access and depression during the pandemic (r = -0.116**, n = 748, p < .001).

In general, this means that the higher the level of material and technical security/access of teachers, the lower the level of depression of teachers. However, changes in the level of material and technical security/access were not associated with teachers' concern during the pandemic.

Table 11. Pearson's Product Moment correlation coefficient

	Anxiety and depression (SCL-90-R) during the pandemic	Anxiety during the pandemic	Depression during the pandemic
Level of Material and Technical Security/Access	-,103**	-,068	-,116**

**. Correlation is significant at the .01 level

In order to compare the scores for level of material and technical security for the residents of urban and rural areas, independent sample T-tests were used. The result suggests that the variances of two groups are significantly different: The results suggest that the level of material and technical security of female teachers was lower in rural areas (M = 1.87, SD = 0.78) compared to the teachers of urban areas (M = 2.22, SD = 0.76) as shown in the Table 12.

Table 12. Independent Samples T-test for the Level of Material and Technical Security: Urban and Rural Areas

Variables	Urban		Rural			
	Mean	SD	Mean	SD	t-value	Sig (2-ailed)
Level of Material and Technical Security	2.22	0.76	1.87	0.78	6.15	**0.000***

*p<0.05

We use the same method to compare the scores of the level of material and technical security scale between Kazakhstan and Kyrgyzstan. The results revealed that there is no significant difference found between Kazakhstan and Kyrgyzstan women teachers. As p-value found is p = 0.251 (alpha > 0.05), it is considered that the variances are not significantly different as shown in the Table 13. The results show that female teachers in both countries had similar perceptions of the level of material and technical provision of their schools.

Table 13. Comparative Cross-Country Analysis between Kazakhstan and Kyrgyzstan (SCL, Level of Material and Technical Security)

Variables	Kazakhstan		Kyrgyzstan			
	Mean	SD	Mean	SD	t-value	Sig (2-tailed)
Level of Material and Technical Security	2.04	0.79	1.85	0.94	1.149	**0.251**

*p<0.05

To assess the relationship between stress factors and the level of material and technical security, the correlation coefficient of the product and the Pearson's Product Moment correlation was calculated (Table 14). There was a moderate negative correlation between level of material and technical security and anxiety and depression during the pandemic. When looking at anxiety and depression separately, no correlation was found between level of material and technical security and anxiety during a pandemic, and a moderate negative correlation was found between level of material and technical security and depression during a pandemic. In general, this means that the higher the level of material and technical security of teachers, the lower the level of depression among teachers. However, the changes in the level of material and technical security were not related to teachers' concerns during the pandemic. In other words, the more equipped the teachers felt the school was, the less depressed they felt. And the less equipped the school was perceived to be, the more depressed the teachers felt.

In Table 14, we can see that the higher the level of material and technical security of educational institutions, the lower the level of depression among female teachers.

Table 14. Correlations between Stress Factors and the Level of Material and Technical Security

Variables		Level of Material and Technical Security	SCL (Anxiety & Depression) during the pandemic	SCL (Anxiety) during the pandemic	SCL (Depression) during the pandemic
Level of Material and Technical Security	Pearson Correlation	1	-.103**	-.068	-.116**
	Sig. (2-tailed)		.005	.063	.001
	N	748	748	748	748
SCL (Anxiety & Depression) during the pandemic	Pearson Correlation	-.103**	1	.913**	.960**
	Sig. (2-tailed)	.005		.000	.000
	N	748	748	748	748
SCL (Anxiety) during the pandemic	Pearson Correlation	-.068	.913**	1	.763**
	Sig. (2-tailed)	.063	.000		.000
	N	748	748	748	748
SCL (Depression) during the pandemic	Pearson Correlation	-.116**	.960**	.763**	1
	Sig. (2-tailed)	.001	.000	.000	
	N	748	748	748	748

Notes: ** Correlation is significant at the 0.01 level (2-tailed).

Correlations between organizational climate factors and the level of material and technical security/access

To assess the relationship between organizational climatic factors and the level of material and technical security/access, the Pearson's Product Moment correlation coefficient was carried out. The result shows that there was a strong and positive correlation between these two variables, and the relationship was directly proportional ($r = 0.591$, $n = 748$, $p = 0.000$), as shown in Table 15. This means that the higher the level of material and technical security/access of female teachers in the conditions of COVID-19, the better the organizational climate in educational institutions.

Table 15. Correlations between organizational climate factors and the level of material and technical security/access

Variables		Organizational Climate Factors	Material & Technical Security
Organizational Climate Factors	Pearson Correlation	1	0.591**
	Sig. (2-tailed)		0.000
	N	748	748
Material Technical Security	Pearson Correlation	0.591**	1
	Sig. (2-tailed)	0.000	
	N	748	748

Notes: **. Correlation is significant at the 0.01 level (2-tailed).

5. Discussion

The main objective of this study is to develop strategic recommendations for the leadership of universities and schools in Central Asia and policy makers in the field of education. Currently, the Ministries of Kazakhstan, heads of schools and universities are actively working on issues related to students (pupils) and teachers, paying special attention to online and offline education in the context of COVID-19. In this regard, this study addresses an urgent topic and generates empirical data to facilitate decision-making on distance learning (particularly aspects of distance learning such as the mental health of female teachers). Given our results, we recommend improving technological infrastructures (especially in rural areas) and support for teachers (educational institutions in cities), as well as improving their ability to participate meaningfully in organizational decisions. This will help reduce female teachers' stress, ultimately improving their working conditions and, ultimately, student outcomes. In addition, this study aims to provide tools to improve the lives and working conditions of women working as educators in Kazakhstan and Kyrgyzstan. Due to its interdisciplinary focus and theoretical and practical implications in terms of gender, education and psychology, the study fills gaps in research in the Central Asian context (including both in Kazakhstan and Kyrgyzstan).

The results of the study show that both before the pandemic and during the pandemic, anxiety and depression were more severe in urban female teachers than anxiety and depression in teachers living in rural areas. The question arises why teachers in urban areas may be exposed to a higher level of stress than teachers in rural areas. According to researchers Çifçi and Demir, teachers living in urban areas may have fewer opportunities for physical activity compared to people living in rural areas, so they experience higher levels of stress (Çifçi, Demir, 2020).

Researchers looking for the causes of motivational deprivation of teachers, as a rule, focus on institutional factors. For example, based on a study conducted in 2015–2016, D.L. Konstantinovsky, M.A. Pinskaya and R.S. Zvyagintsev concluded that external stress factors cause deformation of the teacher's professional position. The authors refer to these conditions the social context, the characteristics of the territory, the contingent of students, and the high workload not related to teaching, as well as the actual lack of opportunities to participate in administrative decision-making (Konstantinovskiy i dr., 2019).

Earlier studies on urban teachers' problems and stresses show their areas of dissatisfaction are often related to physical harassment, large classes, and lack of close relationships with students (Cook, 1978; Dedrick et al., 1981; Kaiser, Polczynski, 1982).

Authors Trentham and Blackburn, in their survey found that both rural and urban teachers are fairly satisfied with their jobs and very satisfied with their locations (Trentham, Blackburn, 1980). However, there is an evidence that rural and urban teachers' expectations and attitudes relative to work are different. Rural teachers draw more satisfaction from their students and peers. On the other hand, urban teachers were happy to have good facilities and the opportunities for social and cultural development of the urban setting (Trentham, Blackburn, 1980).

Previous study by Shubhra Ojh shows strong relationship was found between job stress, job dissatisfaction and emotional exhaustion. Rural teachers were less stressed than their urban counterparts (Shubhra Ojh, 2016). Author Shubhra Ojh's results are similar to the results by Abel and Sewell (1999). Their study indicates that urban teachers have greater stress (Abel, Sewell, 1999). And also, there is a clear relationship between urban teachers' stress and burnout as a result of having difficult classes, problem students, poor classroom climate, poor working conditions, shortage of resources, lack of recognition and inordinate demands on time leading to burnout (Abel, Sewell, 1999). The factors behind the burnout in the study by the authors Abel and Sewell include: overwhelming workload, discipline problems, low pay, little respect, lack of administrative support and the clerical workload. Author Haberman (2004) in his study also found that stress is greater in urban schools than rural ones.

6. Conclusion

Thus, the results of the study showed that providing an organizational environment and ensuring teachers' access to logistical security and technological resources during distance learning leads to a decrease in perceived stress among female teachers.

Overall, the study concludes that this unprecedented situation has forced teachers to reflect on what can be learned from this crisis and how their views on education have changed. Many called for changes to the curriculum, examination procedures and reporting, wondering if the

education system needed to prioritize differently in the future. For many teachers, this has reinforced their belief in the strength, adaptability, and importance of the teaching profession.

7. Limitations

This study has limitations related to the scope of the study and sample size. The data was collected by using self-administered questionnaires, and information bias could not be eliminated (oversimplification of social reality). The arbitrary design of questionnaires and multiple-choice questions with pre-conceived categories represents a biased and simple view of reality. The use of closed questionnaires and pre-coded forms can derive evasive or deliberately wrong answer. So, there can be problems related to validity and reliability of results.

Also, in this research, online survey method was implemented due to the lack of time, and COVID-19-related lockdowns. Constraints to using surveys to gather data include inflexibility and lack of potential depth. Survey information in this study considers only the surface of the research field and does not make a deeper thrust into it.

To prevent bias in the data, external investigators were recruited to improve the validity and reliability of the interpretation of the results.

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Comparative Analysis of Self-Assessment of Life Quality Among Medical University Students

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Abstract

Purpose of research: Conduct a comparative evaluation of the quality of life based on physical and psychological health of medical university students. Methods and materials of research: quality of life, health-related, were studied using questionnaires the SF-36 questionnaire from 333 students 1 and 5 courses, (1 year – 133 respondents, the average age 18.02 + 0.5, 5 year – 200 students, average age 22.4+0.8;). Results: The Level of physical functioning of 5th year students was significantly higher (PF 97.7+_10.8) than that of first year students (PF 81.5+_24.86) p < 0.001. Decrease of role physical functioning at students of 1 course (RF 70.11+-29.7) against (RF 88.21+-23.19) at respondents of 5 course is established. Average pain intensity and General health have proved to be lower (BP 82,83-+17,56; GH 69.85-+15.03) compared with those of senior students (BP 87.57-+16.12; GH 79.37-+15.95), p < 0.001. The novelty of the research: An assessment of the gender characteristics of the self-assessment of the quality of life of students showed that female 5th-year students, compared with men, showed statistically significant high values of the variable of role-based physical functioning due to physical condition (p < 0.03), while among the interviewed first-year students, the components of physical and psychological components of health did not demonstrate a significant dependence on gender (p > 0.05).

Keywords: life quality, students, health, respondents, gender differences, correlation.

1. Introduction

One of the priority directions of the development of modern society is the protection of the health of citizens. Today public health is assessed not by the prevalence of infectious epidemics, but by the quality of life of the population. An individual's good health and well-being in life reflect the satisfaction of his needs and adaptation in the physical, psychological and social spheres of life (Kausova, 2004; 2006; Novik, Ionova, 2007; Belousova et al., 2023).

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In recent years, there has been an increase in interest in the problems of the quality of life of student youth (Aleshkov et al., 2022; Moreva, Skitnevskaya, 2023). The quality of life of students can be impacted by a variety of factors, including academic stress, financial difficulties, social isolation, and health issues (Zaitseva, Krikunov, 2022; Babina et al., 2022). These problems can have a negative effect on students' well-being and academic performance, leading to lower levels of engagement, motivation, and achievement. Academic stress, for example, can result from a high workload, unrealistic expectations, and lack of support, leading to anxiety, depression, and burnout (Batrymbetova, 2007; Medik, 2004). the quality of life of student youth is closely linked to their mental health. Addressing the challenges that affect their well-being, such as academic and social pressures, is critical for promoting their mental health and academic success (Batrymbetova, 2007; Aghajanyan, Radysh, 2009; Baklykova, 2010). Fascination in the student environment with high-tech means for teaching and entertainment (computers, mobile phones, etc.) leads to physical inactivity, fatigue, visual impairment, which are additional risk factors (Berdiev i dr., 2017).

Analysis of the scientific literature on the problem of student health shows that during their studies at the university, the health of students does not improve, and a number of authors note its deterioration (Baklykova, 2010; Proskuryakova, 2007; Shagina, 2010). This is often attributed to factors such as academic pressure, lack of exercise, poor diet, sleep deprivation, and high levels of stress. Medical university students may be particularly vulnerable to these health risks, given the demanding nature of their studies and the pressure to perform well in their academic and clinical work (Kaliyev et al., 2023; Sakenov et al., 2023). Working capacity of student youth, many issues remain unresolved and require a detailed assessment of the state of health of students.

Purpose of research

The purpose of this research is to conduct a comparative evaluation of the quality of life based on physical and psychological health of 1st and 5th-year medical students at the NAO ZKMU named after M. Ospanov Medical University.

2. Materials and methods

The quality of life related to health was studied in a comparative aspect using a questionnaire method based on the use of the international validated questionnaire "MOS SF-36 Health Status Survey", which allows assessing the physical, psychological and social well-being of a person (Ware et al., 1993; Salek, Luscombe, 1992).

The 36 questions of the SF-36 questionnaire form eight scales: physical functioning (PF); role-based functioning due to physical condition (RP); pain intensity (BP). general health (GH), vital activity (VT), social functioning (SF), role-based functioning due to emotional state (RE), mental health (MH). The scales form two indicators: PH ("physical component of health") and MH ("psychological component of health"):

The physical component of health (PH), is a broad term that refers to the various factors of an individual's physical well-being. This includes the individual's physical functioning – their capacity to perform everyday tasks and activities; role-based functioning due to one's physical condition – this in its turn reflects how well an individual can perform their roles in life, such as work or familial responsibilities, based on their physical health. Other key aspects of PH include the intensity of pain experienced by an individual and their overall perception of their health condition.

The psychological component of health (MH), focuses on the mental and emotional aspects of well-being. Mental health is a crucial part of this component, encompassing conditions like depression, anxiety, and other psychological disorders. It also includes role-based functioning due to emotional state, which refers to how an individual's emotional health impacts their ability to fulfill their social roles. Furthermore, social functioning is a critical part of MH, highlighting how well an individual interacts with others and fits into their social environment. Lastly, life activity refers to the individual's ability to engage in activities that make life meaningful and fulfilling.

These eight indicators are significant for a comprehensive assessment of an individual's health. They provide a holistic view of the person's well-being, taking into account both their physical and mental health (Table 1).

These 8 scales represent composite health characteristics, including function and dysfunction, stress and well-being, objective and subjective assessments, positive and negative self-assessments of overall health.

Table 1. The scales are grouped into two indicators

Physical health — PH	Mental Health — MH
physical functioning;	mental health;
role-based functioning due to physical condition;	role-based functioning due to emotional state;
pain intensity;	social functioning;
general state of health.	vital activity.
physical functioning;	mental health;

The values of the scale indicators can be from 0 to 100 points. 100 points indicate the greatest well-being, 0 points indicate the maximum restriction of vital activity according to the corresponding indicator. Therefore, the higher the scale values, the better the score on the selected scale.

Statistical processing of the results of the study was carried out using the program Statistica version 10.0. The following indicators were calculated: sample size, average value, minimum, maximum, standard deviation. Quantitative variables in two independent groups were compared nonparametrically using the Mann-Whitney U test. $P<0.05$ was taken as the level of statistical significance. The correlation of variables was analyzed using Spearman's method (r). The relationship between the indicators was estimated as strong at $r>0.7$, medium strength – at r from 0.3 to 0.7, weak – at $r < 0.3$.

The study was conducted on the basis of a non-commercial Joint-Stock Company of the West Kazakhstan Medical University named after Marat Ospanov.

333 1st and 5th year students took part in the survey, including 133 first-year respondents (average age 18.02 +_ 0.5] and 200 5th year students.

Among the surveyed 1st year students, 82 % were girls, 18 % were boys, 72 % and 28 % were 5th year students. The quality of self-completion of the SF-36 questionnaire by respondents met the generally accepted requirements for the analysis of quality of life indicators.

3. Results

The respondents of the two study groups showed statistically significant differences on all scales of physical and psychological components of health. Among the components of the physical component of health in the group of 5th-year students surveyed, the variable of physical functioning was the highest (94.1+10.8). ($p < 0.01$) When analyzing the variables of role functioning due to physical condition, pain intensity and general health, a decrease in the scores of general health (79.4+15.9) was noted, characterizing the student's self-assessment of his condition at the moment.The overall indicator of the physical component of health was 54.8 + 4.9 points.

The study of the indicator of the psychological component of health, along with higher values of emotional role (87.2+27.1) and social functioning (80.1+18.6) revealed a decrease in the variables of vital activity (64.5+15.7) and mental health (73.2+13.7). The overall indicator of the psychological component of health was at the level of 48.6 +4.9 points ($p < 0.01$).

In the group of 1st year students, the average values of indicators of both physical and psychological components of health showed a significant decrease in the components of both indicators in comparison with the data of 5th year students in the range of 8-18 points. This was especially evident in relation to the variables: physical (81.1+24.9) and role functioning related to physical condition (70.1+29.7), general health (69.1+15.9), role emotional state (63.6+37.0), social functioning (75.1+22.2) and mental health (65.3+16.5). $p < 0.01$.

Table 2. Indicators of students' quality of life variables

1 year of study		5 year of study			
variable	M +/-SD	variable	M+/- SD	P	
Physical activity (PF)	81,5+/-24,86	PF	94,07+/-10,80	0,001	
Role limitations due to physical problems (RP)	70,11+/-29,70	RP	88,20+/-23,19	0,001	
Physical pain (BP)	82,83+/-17,56	BR	87,51+/-16,12	0,015	
Perception of the general state of health (GH)	69,05+/-15,93	GH	79,37+/-15,95	0,001	

PH1	50,97+/-6,36	PH1	54,79+/-4,86	0,001
Energy/inability (VT)	56,80+/-15,39	VT	64,48+/-15,70	0,001
Social functioning (SF)	75,07+/-22,17	SF	80,14+/-18,60	0,05
Role limitations due to emotional problems (RE)	63,64+/-37,04	RE	87,23+/-27,06	0,001
Mental health (MH)	65,29+/-18,53	MH	73,24+/-13,71	0,001
MH1	44,08+/-8,69	MH1	48,56+/-7,40	0,001
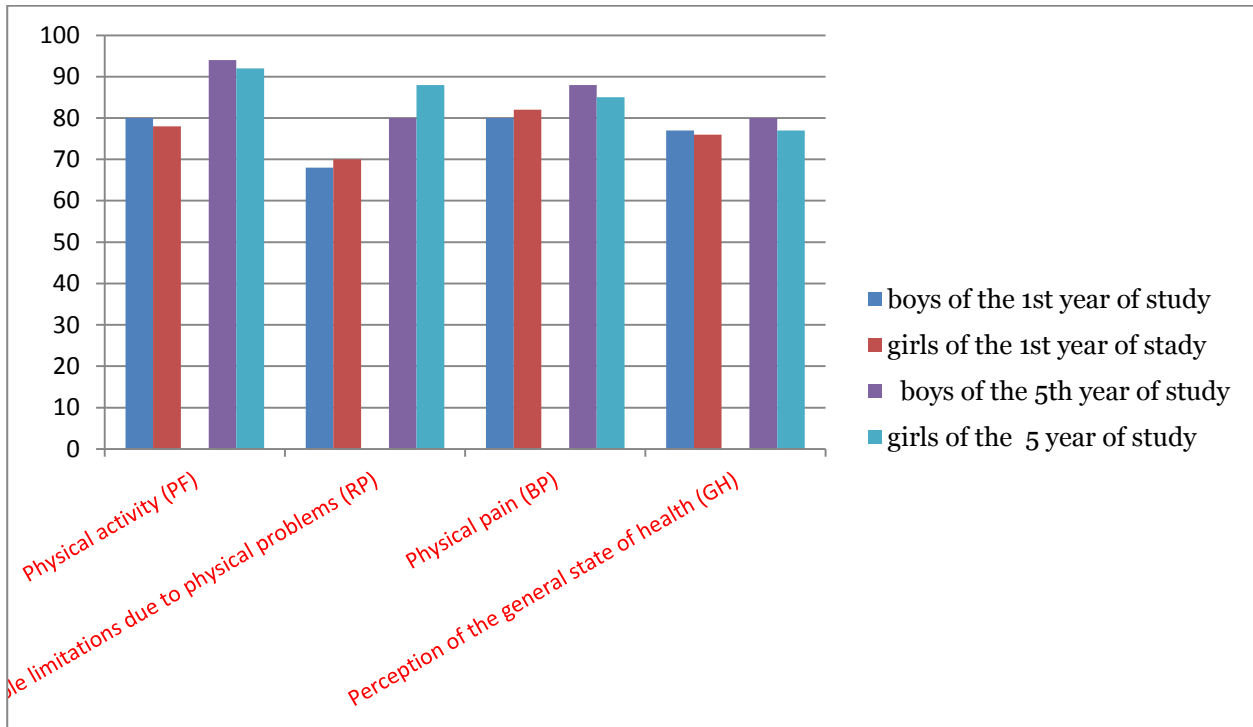
a) The physical component of health
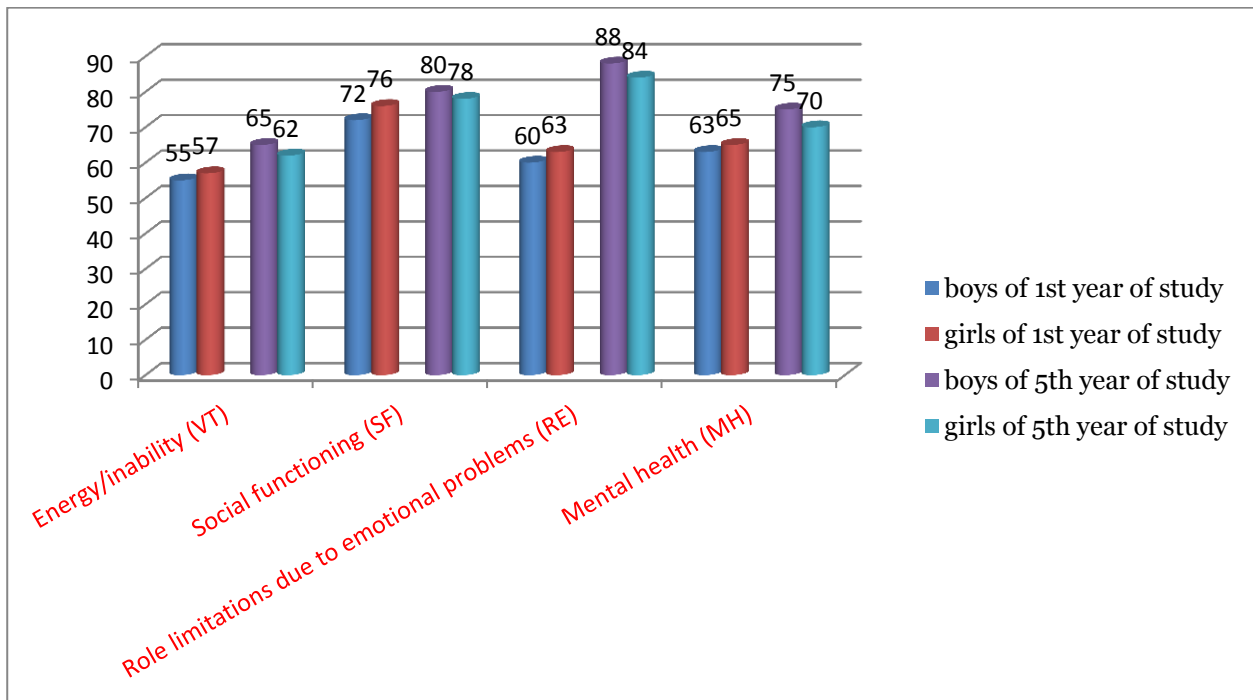
b) Psychological component of health

Fig. 1. Indicators of physical and mental health of 1st and 5th year students by gender differences

When assessing the gender characteristics of the self-assessment of the quality of life of medical university students among the first-year students surveyed, the components of the physical and psychological components of health did not undergo significant deviations (p > 0.05). It should be noted that female 5th-year students, in comparison with male, have higher values of the variable of role-based physical functioning due to physical condition (RP 90.4+21.7 and 82.6+ 26.1. These differences were statistically significant (p < 0.03). Consequently, girls of the 5th year, unlike men, do not experience the limitations of daily role-playing activities due to physical condition. According to the general health scale, respondents' self-assessment of their health had only a tendency to sexual differences (p = 0.08). Other indicators of physical and psychological components of health did not show significant differences by gender.

4. Discussion

The results obtained on the study of quality of life indicators in the group of 1st year students prove the existence of differences in the compared indicators of physical and psychological health between the respondents of the 1st and 5th courses. The average values of the variables in the surveyed first-year students were significantly lower than the data of the assessment of the quality of life of undergraduates.

The detection of a decrease in the self-esteem of the physical component of health in 1st year students indicates some limitation of their physical activity and the fulfillment of the scope of their daily duties. According to various authors, the decrease in the physical component of health in the initial period of study at a medical university is due to the need to adapt to new living conditions, high mental and psychological stress, frequent violations of the diet, work and rest, which are accompanied by a significant strain on the adaptive capabilities of the body and a decrease in the quality of life (Feizuldayeva et al., 2018; Berdiev et al., 2017; Shagina, 2010; Tishchenko et al., 2011).

The 5th-year students surveyed subjectively rate their physical and role functioning highly, which is currently not limited by the state of health. An increase in the values of the indicator indicates the ability to perform more physical activity and the absence of health problems that limit daily activities. These data differ from some of the results of earlier scientific research on the study of the quality of life of medical students, demonstrating a decrease in the quality of life as they move to senior courses. what is associated with the development of various chronic diseases in senior students (Gorbach i dr., 2007; Grebnyak, Grebnyak, Mashinistov, 2007; Zelezinskaya i dr., 2005; Kovyneva, 2006; Koichubekov, 2014; Kretova i dr., 2014).

During the analysis of the total measurements of the variables of the psychological component of health, statistically significant differences in health-related quality of life indicators were revealed. 5th year students showed higher indicators of social functioning (SF 80.14+-18.60), role-based functioning due to emotional state (RF 87.23+-27.06), mental health (MN 73.24+-13.71) and vital activity (VT 64.5+15.7) p < 0.001. At the same time, among the first-year respondents, the proportion of people with low self-esteem of these variables of the psychological component of health significantly prevailed (SF 75.1+-22.17; RF 63.69+-37.04; MN 65.3+37.04; VT 56.8+15.4, respectively).

A comparison of the components of the psychological component of health proves that first-year students do not feel full of strength and energy, are limited in social contacts, performing daily work due to a decrease in physical and emotional health. Low indicators may indicate the presence of feelings of anxiety, depression, fatigue, psychological distress and a decrease in the quality of life (Tretyakova et al., 2023). It is quite natural to assume that a decrease in the quality of life will negatively affect the educational process and the acquisition of professional skills by first-year students (Latyshevskaya i dr., 2009; Mukhanova, 2013; Sadvakasov i dr., 2015; Semenova, Vasilevskaya, 2015; Shilovskaya, 2004; Shkarin, 1991; Frank et al., 2006).

When analyzing correlational relationships in a group of first-year students, a direct correlation was found between the variables of physical functioning and the physical component of health (r = 0.75; p = 0.007). This relationship between variables for 1st year students is positive and suggests an improvement in the indicator of the physical component of health with an increase in physical functioning.

In the group of 5th year students, there is a strong correlation between the mental health variable and the integral indicator of the psychological component of health (r = 0.81). Therefore, the less pronounced the feeling of anxiety and depression, mental distress, the higher the psychological comfort and quality of life.

5. Conclusion

The quality of life of medical university students is an important area of study that can provide insights into the well-being of future healthcare professionals. In the study, authors conclude that:

1. The analysis of the results of the research on the SF 36 questionnaire indicates a significant decrease in the values of the components of the physical and psychological components of health in 1st-year students in comparison with the indicators of 5th-year students of the medical university (p < 0.01).

2. When assessing the gender characteristics of self-assessment of the quality of life, 5th-year female students in comparison with male showed statistically significant high values of the variable of role-based physical functioning due to physical condition (p < 0.03), while among the interviewed first-year students, the components of the physical and psychological components of health did not demonstrate a significant dependence on gender (p > 0.05).

3. A direct correlation was established between the variables of physical functioning and the physical component of health in the group of first-year respondents and a strong direct relationship between the variable of mental health and the integral indicator of the psychological component of health in undergraduates (r = 0.81).

4. The research results obtained by us indicate the need for further in-depth study of the quality of life of medical university students using physiological and hygienic methods of health assessment to obtain information about the features of the quality of life of medical university students. Such methods can provide a more comprehensive understanding of the health status and needs of medical students and inform strategies to improve their quality of life.

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The Strategic Influence of Social Factors on Self-Perceived Happiness of Spanish University Students

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Abstract

The notion of happiness has been the subject of debate and study for centuries. It has been demonstrated that happiness has a significant influence on the individual achievements and professional goals, a fact that should be taken into consideration in all stages of education, including university studies. The aim of this study is to measure the individual level of happiness of undergraduate students and their relationships with specific aspects that can impact in their happiness, such as family, friends, the university and money. The study made use of the Oxford Happiness Questionnaire (OHQ), as well as items from the Multidimensional Inventory of Students Quality of Life (MIS-QOL), on a sample of 375 undergraduate students in Spain. Structural equation model (SEM) methodology was used to corroborate the significant personal and social causalities of happiness identified in previous studies. The results of the study were (i) the factor which most influences happiness is the perceived quality of relationships with family, followed by (ii) the perceived quality of relationships with friends, and (iii) university students who ascribe greater importance to money have lower levels of happiness. The conclusions support the implementation of practical applications that restore the humanistic spirit of university curricula.

Keywords: happiness, university, family, friends, money, OHQ, strategy.

1. Introduction

The individual happiness has been a subject of study in literature since the great philosophers of Ancient Greece to the present day (Sellés et al., 2018) given the evident interest in all human beings in achieving it (Vargas, Callata, 2021). Broadly speaking, for Plato, happiness was associated with goodness, in acting morally; for Socrates, happiness represented the ultimate good (Ortiz,

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2019) while for Aristotle happiness was the supreme good that gives meaning to the individual (Vargas, Callata, 2021). Kant (1946) observed that people do not know how to be happy because happiness may be found in different ways. Alarcón (2006) defines happiness as the state of full subjective satisfaction of an individual.

The study of happiness continues to be a recurrent theme in current literature (McBride, 2010; Vargas, Callata, 2021). There are numerous studies which affirm that happiness depends on a number of factors conditioned by the individual circumstances of the person (Clemente et al., 2000), such as age, gender, place of origin, family, marital status education, health, religion, income or self-conception (Sellés et al., 2018; Ortiz, 2019). For example, many researchers affirm that those who are younger and those who are older consider themselves more happy (López, 2018; Benatuil, 2003); that women are more happy than men (Francis, 1999); that family satisfaction is associated with greater happiness (Rollán et al., 2005), thus, those who are married are more happy than those who are divorced, single or widowed (Grover, Helliwell, 2019); in developed countries, education level is associated with a greater perception of happiness (Argyle, 1999); it has also been found that income level does not have a direct influence on happiness providing one's basic necessities are met (Cuong, 2021). All of these factors can be grouped within two broad notions of happiness: eudaimonic, associated with wisdom, and hedonic, associated with the pleasures of life (Arias et al., 2016).

Apart from the definition, study and understanding of happiness there is also a great deal of interest in its measurement. Quantifying happiness helps give it a value which can be used to compare relevant factors in achieving it. There are a number of methods and systems to quantify happiness. Among the earliest, dating from 1985, is The Satisfaction with Life Scale (Diener et al., 1985) followed by The World Health Organisation Quality of Life Assessment (WHOQOL) (The Whoqol Group, 1998), The Subjective Happiness Scale (SHS) (Lyubomirsky, Lepper, 1999) and The Full Life Versus The Empty Life (Peterson et al., 2005), among others.

Today, happiness, understood as a mood or affective state, is generally considered in important factor for individuals to achieve their personal, professional or material goals (Salazar et al., 2016; De Pablos, González, 2012). The university experience is a key period in personal and professional development (Vargas, Callata, 2021), and it is necessary to understand the factors which may impact the happiness of university students (Bisquerra, 2005). This work aims to explore the emotional plane of university students in order to analyse the variables which influence their happiness and so suggest education policies that go beyond mere education or training for a future job.

According to González-Quiñones et al. (2020), harmonious family relationships reflect a trend similar to that of happiness, so family is a determining cause in the perception of happiness, a feeling considered as a health referent. Also, in Latin America, the relationship between family function an happiness coincides in several studies, an example being found by Arias et al. (2016) in Peru. In addition, Denegri et al. (2015) says another central element that makes adults satisfied with life is Friendship.

Numerous studies have been written about the relationship between money and happiness. Bearing in mind that Western society is based on the welfare society and that certain resources are essential for this, Muresan et al. (2020) finds that happiness increases with individual income up to a threshold of 27,913 euros per year in European countries, but not beyond this threshold. If one considers that the study presented here was carried out in Spain with a group of students with family incomes above the indicated threshold (since they are university students), a negative relationship between the importance given to money and happiness can be suggested.

All this leads to the following hypotheses:

H1: students' perception of their relationships with family and friends impacts their self-perceived happiness.

H2. the importance university students ascribe to money has a negative impact on their self-perceived happiness.

To test these hypotheses, this study begins with an analysis of research into happiness and, specifically, the aspects young people associate with happiness and its measurement. We will then explain the methodology used in the study, the instrument, the results and offer final conclusions.

2. Theoretical framework

There are a number of articles which analyse the possible relations between some of these factors (family, friends, university) and happiness. However, the novelty of this study lies in its analysis of the causal interrelation between different factors not only in terms of happiness but also between family, university and friends. Additionally, a separate analysis was made (as binary variables: 1 = it is important, 0= it is not important) of the impact on self-perceived happiness considering the importance students ascribe to money, family and friends, revealing how conceding a great deal of importance to money can have a negative impact on personal happiness.

2.1. Concepts associated with happiness according to young people

Young people have a hedonist concept of happiness, associating it with love, friendship, joy and the family (Sellés et al., 2018). Other aspects associated with the happiness of young people are the possibility to communicate their ideas and feelings (Sánchez de Gallardo, Pirela de Faría, 2017), belonging to organisations which favour social contacts (Taylor, 2007), or to have unique moments and experiences (Mogilner, Norton, 2016).

In the West, in countries such as the United States or the United Kingdom, young people associate happiness with material things; while in the East, for example in China, happiness is associated with spiritual or psychological aspects (Lu, Gilmour, 2004); while in Turkey, research shows positive association between personal growth and materialism, also affirming that materialism reduces feelings of wellbeing (Karabati, Cemalcilar, 2010). In the case of Spain, studies have found that young people associate happiness with marriage, to be studying, a certain level of income and to live independently (Ahn et al., 2012).

In the university context, various studies have found that the perception of happiness among students is associated with their emotional resources (Gutiérrez et al., 2013), especially their ties with family, friends and their partner (Mercado, 2014). Other studies associate student happiness with academic success (Vargas, Callata, 2021) and the prospect of completing their studies (Caballero, Sánchez, 2018). There is also research (Al-Naggar et al., 2010) which identifies money as principal source of happiness, followed by positive relationships with friends and family, as well as stability and good health. Regarding the link between money and happiness, there are studies (Cuong, 2021) that state that when people's basic needs are met, there is no directly proportional relationship between the two. Even more recent research in China shows no significant relationship for university students either (Zhou, Palaroan, 2023). In another analysis in China (Hu, 2023), a non-simple linear relationship between income and happiness was found, including for university students, while the negative influence that economic materialism has on the perception of self-perceived well-being and happiness has also been demonstrated (Ahmed et al., 2023). There are also experiments that reveal that when people find time to spend with friends and family and less time working, greater happiness results. Trying to make money involves working more and socializing less, which (although productive) does not increase happiness (Mogilner, 2010). Another study with university students who valued time over money showed they chose more intrinsically rewarding activities and felt happier a year after graduation. These results show that the tendency to value time over money predicts not only everyday consumer choices but also important life decisions (Whillans et al., 2019).

Other studies (Mangeloja, Hirvonen, 2007) have found that the most important aspects in the degree of happiness of university students are: social relations, resources and the educational environment, the achievement of personal goals and extracurricular activities. Another study, conducted with students throughout their university career, identified a pattern characterised by a high degree of positive affect ("chronic happiness") and the concurrence of brief episodes of negative affect (Barker et al., 2016). But the situation in other places highlights the importance of other aspects to be considered. In Pakistan, for example, where terrorism is a fact of daily life, university students feel motivated to study and they feel happy because of their positive academic environment, the behaviour of their teachers, new learning-teaching technologies and good university facilities. Findings also show that students are pleased with their learning facilities and look to education as a way to mitigate the effects of terrorism and have a positive influence on the psychology of the population (Shafiq et al., 2012).

Regarding the aspects that students value in the university experience there are a number of different perspectives, among them those aspects students associate with personal growth, such as: personal participation in the learning process, self-realisation, that is, the deployment of their personal skills and abilities, and social integration into the university community. A relation has

been detected between student self-realisation and their ambition to learn, determination, the coherence of their personal attitudes and living with purpose (Shutenko, 2015). In Argentina, a study found that the majority of students positively rated the educational practices outside the classroom, the development of innovative proposals for the presentation of curricular content and classes with invited specialists (Melgar, Elisondo, 2017). Similar conclusions were found in a study conducted in the UK, where students preferred interactive and group activities, identifying the qualities of a good teacher to be "ability to teach" followed by "accessibility" (Sander et al., 2010).

As for the motivations in choosing a university, a study in Malaysia found that students valued the aptness of the study program according to their personalities, professional opportunities and interest in the curriculum (Misran et al., 2012). Another study in the UK revealed that students from families with no history of university education have no interest in universities charging high fees (Dunnet et al., 2012). As in China, when the choice of a university is closely associated with the income level of their families. Data shows that the probability of entering the top universities is much higher for students from high-income families than those with low income (Sheng, 2016).

2.2. Measuring happiness

One of the earliest tools devised to measure happiness is The Satisfaction with Life Scale (SWLS) (Diener et al., 1985). The SWLS is limited in its focus for evaluating global life satisfaction and does not incorporate related notions of positive affect or loneliness. A later tool was The World Health Organisation Quality of Life Assessment (WHOQOL) (The Whoqol Group, 1998). The WHOQOL evaluates the self-perception of people about their lives in relation to the culture and value systems in which they live and their personal goals, expectations, standards and preoccupations. This tool offers a multidimensional score in 6 domains and 24 subdomains on quality of life. Another measurement tool is The Subjective Happiness Scale (SHS) (Lyubomirsky, Lepper, 1999) which uses a "subjectivist" approach to evaluate happiness. In 2002, the tool used in the present study, the OHQ (Hills, Argyle, 2002) was developed. This is a questionnaire of 24 items using a 6-point Likert-type scale. New versions of this questionnaire are also now available. Moeinaddini et al. (2020) proposed a new scoring system to measure personal happiness after observing that 16 of the 29 items of the OHQ are associated with deficiencies in personal happiness and therefore can be excluded from the model. An interesting approach for future research. Another measurement tool is The Full Life Versus The Empty Life (Peterson et al., 2005) with a three-dimensional approach which analyses three different forms of happiness related to pleasure, commitment and meaning. Other forms of measuring happiness are much simpler, using a single quantitative item (11-point scale, 0-10): "*Do you feel happy in general?*", used by Abdel-Khalek (2006). This author found that "*the single item had a good convergent validity because it was highly and positively correlated with optimism, hope, self-esteem, positive affect, extraversion, and self-ratings of both physical and mental health*".

In addition to these tools for the measurement of happiness there are others centred specifically on a concept intrinsically associated with happiness, that is, life satisfaction. Several authors have endeavoured to measure this aspect among young people. Huebner's (1991) Students' Life Satisfaction Scale (SLSS) is a self-reporting test of seven items designed for use with children between the ages of 8 to 18. Subsequent evolutions were The Multidimensional Students' Life Satisfaction Scale (MSLSS) (Huebner, 1994) and The Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS) (Seligson et al., 2003). There are other versions for adults, The Positive and Negative Affect Scale (PANAS) (Watson et al., 1988), and for children The PANAS-C. (Laurent, 1999) which are brief and useful tools used to differentiate between anxiety and depression. A summary of some of these measurement tools and others oriented towards young people is provided in the compilation "*Youth life satisfaction measures: a review*" (Proctor et al., 2009). The present study provides a general description of each instrument and their normative samples, reliability and validity. These instruments are designed to determine how young people perceive their own lives and happiness.

The proposed subject of analysis is very broad and the search for related literature included each aspect. The principal instrument used in this study was The Oxford Happiness Questionnaire which has been adapted by a number of authors apart from the creators Hills and Argyle (2002) who used it as a compact scale for the measurement of psychological well-being. They were followed by other authors, such Kashdan (2004), also studying the assessment of subjective well-being; Cruise, *et al.* (2006), testing-retesting data over two weeks; Hadinezhad and Zaree (2009), who tested the reliability, validity, and normalisation of the Oxford Happiness Questionnaire;

Robbins *et al.* (2010) analysing undergraduate students in the topic happiness as stable extraversion; an adaptation of the Short Form of the Oxford Happiness Questionnaire into Turkish by Doğan and Çötok (2011) and Dogan and Sapmaz (2012); a Farsi version among college students (Mahmoud et al., 2013); applied to university students in Teheran (Dehshiri et al., 2016); a Indonesian version by Rahmawati *et al.* (2016); a transformation from an ordinal to an interval measure using Rasch analysis (Medvedev et al., 2017); applied to a Russian sample by Golubev and Dorosheva (2017); or Minaei and Hasani (2018), applying Rasch analysis to estimate and improve measurement quality of Oxford Happiness Questionnaire; the application among second year MBBS students (Kamthan et al., 2019); the Chinese version applied in Taiwanese Adolescents: Taiwan Birth Cohort Study (Lung, Shu, 2020) and the Portuguese sample (Galvão et al., 2020); the validation and adaptation of Tamil applicable to patients with type-2 diabetes by To et al. (2020); or more recently, applied to a sample of Iranian military (Mirzaee et al., 2021).

So far, all that literature is directly using the questionnaire, but there is much more indirect literature related to the topic, happiness assessment. Some examples are Steel, Schmidt and Shultz (2008), refining the relationship between personality and subjective well-being; studying college students and community adults (Wei et al., 2010); or children aged 8–12 years (Holder et al., 2010); the analysis of subjective well-being in adolescence (Rodríguez-Fernández et al., 2016); exploring constructs of well-being, happiness and quality of life by Medvedev and Landhuis (2018); studying the link between the teacher happiness and student attitudes by Moskowitz and Dewaele (2019) or in adolescents (Guerra-Bustamante et al., 2019); and analysing quality of life of university students during the COVID-19 pandemic (Abdullah et al., 2020).

Related to the other items used in our questionnaire: family, friends and university, the importance of the MIS-QOL instrument, defined by Szydło et al. (2021), should be highlighted. This study shows a new and broad approach, defining a whole set of constructs that measure the student's quality of life. It is a recent publication. But these themes are not new. They can be found in many articles, but the most recent are: the study of influential factors for happiness of adolescents who use community child centers (Park et al., 2017); the analysis of urban educated Bengali youth (Pramanik, Ray, 2018); the study in Ostrava that relates happiness with family and friends (Malcik, Miklosikova, 2019); and the one carried out in medical students (Daniel-González et al., 2021).

3. Methodology
3.1. Participants
The present study was carried out using a sample of 375 university undergraduate students, of whom 236 (62.9 %) were women and 139 (37.1 %) were men in several public and private universities in Madrid. Some 98 % of participants were 17 to 25 years of age and only 2 % were over the age of 25.

3.2. Ethics
The initial questionnaire was conducted as a Computerised Self-Administered Questionnaire (CSAQ) in which participants can give their answers directly. This technique adequately resolves the issue of missing answers because the computer does not allow participants to advance to the following group of questions if previous questions remain unanswered.

The research was performed in conformity with all ethical standards and participation in the project was entirely voluntary. Being a CSAQ conducted using Google Forms and Microsoft Forms, each participant had to explicitly agree to take part by marking the appropriate response. The questionnaire did not collect any email addresses or personal data which could serve to identify participants. Furthermore, each participant was informed of their right to abandon the research project at any time without any consequences. The questionnaire was based on a secure G-SUITE unit with access limited to the researchers in compliance with the Personal Data Protection Act.

3.3. Instruments
The procedure to create the questionnaire began by defining the objective. In this case, to measure the influence on the perceived happiness of undergraduate students of the importance and quality of relationships with family, friends, the university and money.

The next step, after the review of the literature, was the identification of the two instruments: the Oxford Happiness Questionnaire (OHQ), used to evaluate the perceived happiness of participants and the Inventory of Students Quality of Life (MIS-QOL), to evaluate perceived quality

of relationships with family, friends and the university. These items were included in the questionnaire and 8 additional items were added: age, gender, type of university, scores from the previous academic year, the importance ascribed to relationships with family, friends, the university and money in achieving happiness.

The scales used to create the questionnaire in this study had the following characteristics:

- The Oxford Happiness Questionnaire (OHQ) (Hills, Argyle, 2002) consists of 29 items scored using a 6-point Likert-type scale, from 'totally disagree' (1) to 'totally agree' (6). The original version of the OHQ had a Cronbach's alpha of 0.90. The Spanish version of the OHQ was developed from the original English scale (Tomás-Sábado et al., 2014). To calculate the Level of Happiness the scores from 1 to 6 (marked 'X'), were taken for the 12 items and the sum divided by 6, giving a possible result from 1 to 6, with higher scores corresponding to greater levels of subjective wellbeing. The mean score was approximately 4.30.

- The Multidimensional Inventory of Students Quality of Life (MIS-QOL) (Szydło et al., 2021) consists of 15 dimensions and 100 items scored using a 7-point Likert-type scale, from totally disagree (1) to totally agree (7). In the study by Szydło, the MIS-QOL had a Cronbach's alpha of 0.819, 0.873 and 0.706 respectively for the selected dimensions.

Given the age and activity of the participants (university students aged from 17 to 25), and the need to condense the questionnaire as much as possible, three dimensions were selected which had the greatest impact in the sample and in line with the aims of the study: family, friends and the university, each consisting of 6 items.

3.4. Procedures and stages of the method

Permission to allow students to participate in the study was granted by the research departments of each university. Participation in the study was entirely voluntary. Prior to administering the surveys all participants were fully informed of the purposes of the study.

As a first step, the Level of Happiness was evaluated using the Oxford Happiness Questionnaire (Spanish version by Tomás-Sábado et al., 2014). An inferential and descriptive analysis was made of the sample using SPSS 23.0, searching for relations between gender, age, the importance ascribed to family, friends, the university and money and level of happiness using a Chi-squared test.

The next step was to verify the reliability of the scale of the dimensions quality of family relationships, university and friends using the Cronbach's α coefficient for each of these dimensions. A factor analysis was also conducted to assess consistency and dimensionality of the questionnaire.

Once the questionnaire had been validated, the SEM methodology was applied using the AMOS 23.0 program and modelling a 'Path Diagram' in order to select the relevant relations between the factors and to rule out the hypotheses not supported by empirical evidence.

Models of structural equations are based on the correlations between variables which are symmetrical in the calculation. Thus, using the correlation identify a cause-effect relation also demonstrates the absence of cause and absence of effect; there is no asymmetrical analysis. However, the diagram produced is highly intuitive and easy to construct based on the theoretical suppositions of the problem.

3.5. Characteristics of the SEM methodology

The technique of analysis with structural equations combines factor analysis with linear regression to demonstrate the fit of the observed data with a hypothetical model expressed in a Path Diagram. As a result, the SEM models provide the linear correlation coefficients associated with each relation and a set of indexes that express the degree to which the data fits the proposed model, confirming or refuting its validity.

SEM models incorporate abstract constructs (latent or non-observable variables) and model the relations between multiple predictive variables (independent or exogenous) and criterion variables (dependent or endogenous). Variables may be independent in one relation and dependent in another within the same model.

SEM allows confirmatory modelling (generally based on a previous hypothesis as a causal model). It should be noted that correlations identify relationships but not the sense of causality; this could be a deficiency of the SEM method, so it is essential to analyse previous studies that can specify which elements are cause and which are effect. These models require variable to have certain prior conditions depending on the chosen method to calculate the estimators (non-

collinearity between variables, univariant normality of each variable and multivariant normality of the set of variables, etc.) The most commonly used methods are Maximum Likelihood and Least Squares; the latter method is more relaxed with regards to the normality of variables.

To obtain the model, a first phase of specification is carried out in which the researcher establishes a hypothetical relation between the latent and observed variables. The possible algebraic expressions that relate them are studied and the parameters and measurement errors are estimated (in this case using AMOS-SPSS V23). Finally, the goodness of fit is evaluated. In the case there is not a good fit, new specifications of the model are made (always with the corresponding justifications). When a model with a good fit is obtained the results can be interpreted.

There are various indicators which evaluate the goodness of fit, each measuring different aspects of the model: Absolute, Incremental and Parsimonious. The most used are indicated in the Table 1 below:

Table 1. Most frequently used indices of goodness of fit (Byrne, 2010)

Classification	Fitting Index	Excellent Fit	Suitable Fit
Discrepancy rates	Chi-square ($\chi2$) p-value df=gr.(degrees of freedom)	$0 <= \chi2 <= 2df$ $0.05 < p <= 1.00$	$2df < \chi2 <= 3df$ $0.01 < p <= 0.05$
Incremental adjustment goodness index	CFI (Comparative Fit Index)	$0.97 <= CFI <= 1.00$	$0.95 <= CFI < 0.97$
Index based on population discrepancy	RMSEA (Root Mean Square Error of Approximation)	$0 <= RMSEA <= 0.05$	$0.05 < RMSEA <= 0.08$
Residual Goodness-of-Fit Ratios	RMR (Root Mean Square Residual)	$0 <= RMR <= 0.08$	$.08 < RMR <= 0.10$
Overall Goodness of Fit Indices	GFI (Goodness of Fit Index)	$0.95 <= GFI <= 1.00$	$0.90 <= GFI < 0.95$
	AGFI (Adjusted Goodness of Fit Index)	$0.90 <= AGFI <= 1.0$	$0.85 <= AGFI < 0.90$

4. Results
The following steps were taken to obtain the results:
- Description of the sample and checking representativity.
- Calculation of the level of happiness using the Oxford Happiness Questionnaire.
- Study of the significance of the distribution by quartile of each variable in relation to the level of happiness.
- Verification of the validity (Cronbach's alpha) and reliability (exploratory and confirmatory factor analysis with SEM) of the structure in the factors expressed by the MIS-QOL instrument.
- Analysis of the proposed Path Diagram using SEM according to the relations of dependence and proposed hypotheses.

4.1. Descriptive data and representativity of the sample
It was observed that, although a convenience sample was used (participating students voluntarily completed the test), the sample is well distributed (Table 2) in terms of the values for the variables as all presented a reasonably representative number of participants.

Table 2. Variables, possible values, frequencies and percentages of frequency

		Count	Column N, %
P1_Gender	Man	139	37.1
	Woman	236	62.9
P2_Age	17-20 years	188	50.1
	21-24 years	170	45.3

		25 + years	17	4.5
P3_Academic year		First	114	30.4
		Second	75	20.0
		Third	89	23.7
		Fourth	50	13.3
		Fifth	47	12.5
P91_friends Are friends important to my happiness?		No	68	18.1
		Yes	307	81.9
P92_family Is family important to my happiness?		No	37	9.9
		Yes	338	90.1
P94_university Is the university important to my happiness?		No	290	77.3
		Yes	85	22.7
P96_money Is money important to my happiness?		No	292	77.9
		Yes	83	22.1

The Level of Happiness variable was calculated according to the Oxford Happiness Questionnaire.

A Student's t-test was conducted for each of the variables to check the differences in the distribution of percentages in the different quartiles for the Level of Happiness variable. The results show a level of probability of 0.05 for the variables P92_family and P96_money (variables indicating the importance ascribed to family relationships and money in achieving happiness). The other variables were not found to be significant.

Table 3. Distribution of the frequency of the variables P92 and P93 by quartile of the variable P11 (Level of Happiness)

Variable Name	Values	P11_Happiness Quartile								Pearson Chi-Square Tests	
		Quartile Happ1		Quartile Happ2		Quartile Happ3		Quartile Happ4			
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %		
P92_ family	0	17	45.9 %	13	35.1 %	3	8.1 %	4	10.8 %	Chi-square	17.493
	1	74	21.9 %	83	24.6 %	82	24.3 %	99	29.3 %	Sig.	.001*
P96_ money	0	64	21.9 %	68	23.3 %	70	24.0 %	90	30.8 %	Chi-square	12.155
	1	27	32.5 %	28	33.7 %	15	18.1 %	13	15.7 %	Sig.	.007*

Table 3 shows that the individuals who consider family important have high levels of happiness, with percentages of frequency (fourth quartile = 29.3 %) higher than for those who do not consider family important (fourth quartile = 10.8 %), that is, family-matters → more happiness.

In the case of the importance of money the results show the contrary. The individuals who consider money important have lower levels of happiness, with percentages of frequency (fourth quartile = 15.7 %) lower than for those who do not consider money important (fourth quartile = 30.8 %), that is, money-matter → less happiness.

4.2. Scale suitability (reliability and validity)

Prior to studying the model of relations the suitability (reliability of the scale and validity of the instrument) was checked for the dimensions indicated (quality of family relationships and the university).

Reliability: it was verified that the measurement instrument is precise and offers consistent results. The instrument was tested using Cronbach's alpha and results above 0.80 and below 0.95 are considered correct (Hulin et al., 2001).

In this case, some items showed a degree of discordance with the other items of the dimension, specifically items F1, FR3 and U2, the first two referring to the frequency of contact with family and friends and the third referring to group activities at the university. These three items may be distorted by issues such as the lack of mobility or gatherings due to COVID-19 restrictions. It was therefore decided to eliminate these three items. The Cronbach's alpha of the three dimensions without these items was: family = 0.850, friends = 0.811 and the university = 0.849. Thus, it can be affirmed that the sample is reliable as all factors are above 0.8.

Validity: this indicates the degree to which the test truly measures the constructions for which it was designed. The factor analysis was verified, checking that the grouping of elements in factors coincides with the constructions associated with the MIS-QOL instrument for the three dimensions consisting of 5, 5 and 6 items respectively (with the exclusion of the three items indicated above). A factor analysis using the principal components method and Varimax rotation showed three factors account for 60.1 % of total variance. Table 4 shows the composition of each of these factors. The KMO test (0.864) and Bartlett's sphericity test (chi squared 2666.035, p .000) show the viability of a factor analysis of the scale (Lloret et al., 2014).

Table 4. Breakdown of factors in Factor Analysis

	Component		
	Fac1_Quality Family	Fac2_Quality Friends	Fac3_Quality University
F2_The frequency of contact with your immediate family (telephone, Skype, gatherings, etc.)	0.621		
F3_The level of family acceptance of your partner/lack of partner.	0.708		
F4_The manner of taking decisions together in your family.	0.822		
F5_The level of trust with your immediate family.	0.864		
F6_Family support in difficult situations.	0.817		
FR1_Network of contacts constructed through your friends.		0.772	
FR2_The respect your friends have for your limits.		0.726	
FR4_Number of friends.		0.757	
FR5_The respect your friends have for your principles.		0.727	
FR6_The frequency you have contact with your friends.		0.698	
U1_The educational content is adapted to the needs of the job market.			0.769
U3_The transparency and content of your university's website.			0.766
U4_The opportunities to participate in activities outside of class.			0.598
U5_The academic level of your university.			0.736
U6_The teaching level of your university.			0.846
U7_The accessibility of professors at your university.			0.714
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation.			

a. Rotation converged in 5 iterations.

The confirmatory analysis was conducted with a SEM model of covariances. The results show covariance between dimensions of 0.42 and 0.43. The results for goodness of fit are good (χ^2 = 133.33, p = 0.003, df = 93, CFI = 0.984, RMSEA = 0.035, RMR = 0.075, GFI = 0.958, AGFI=0.937), considering the margins indicated in Table 1; thus, the structure in three dimensions is correct.

4.3. Models of structural equations (Path Diagram of relations)

Once the constructs or dimensions were identified and validated according to the MIS-QOL instrument, a Path Diagram was created to describe the hypothetical model of relations between the dimensions and the level of happiness (Figure 1). According to this model, subjective happiness is predicted by the quality of relationships with family and friends and the university.

Certain conditions must be met for the SEM models, including the non-collinearity between variables, considering that all the bivariate correlations have a Pearson correlation coefficient below 0.5. Thus, the condition of non-collinearity is met. The researchers also verified that the coefficient of partial correlations between non-objective variables (the three dimensions and scores) was significantly equal to zero. This verifies there is no multi-collinearity between the dependent variables.

For this model it was decided to use the Generalised Least Squares method which is not sensitive to the lack of normality of the variables. Good results were found for the indicators of goodness of fit of the model (χ^2 = 158.36, gl = 121, p-value = 0.013, GFI = 0.950, AGFI = 0,96, CFI = 0.923, RMSEA = 0.029, RMR = 0.096). Not included were the dichotomous variables P92, P93, P94 and P96 (importance ascribed to family, friends, the university and money), which required other methods (asymptotic distribution-free) which do not provide a sufficiently good fit. The estimators are all significant at 0.05 probability.

A simplified form of the Path Diagram (without a breakdown of dimensions in items and without error variables) is provided in Figure 1.
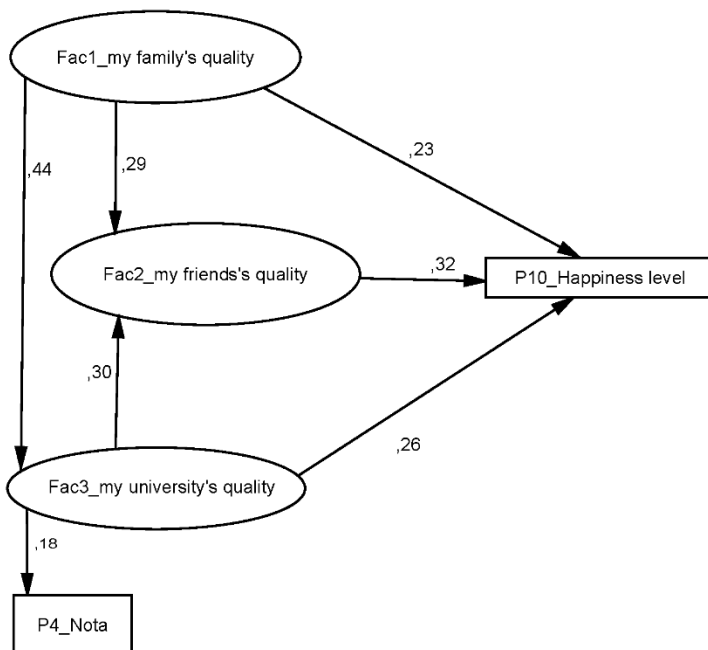
Fig. 1. Path Diagram, Least Squares method, Standardised Total Effects

The figure of the Path Diagram shows the standardized direct effects and by adding the indirect effects the Standardised Total Effects are obtained (Table 5).

From these figures and the levels of effect, both direct and indirect, the following results can be deduced:

- The factor which most impacts levels of perceived happiness among university students is the quality of their relationship with their family (Fac1->P10_ LEVELOFHAPPINESS, effect =

0.441, Table 5), followed by the perceived quality of their university, and their relationship with friends (effect = 0.352 and 0.322, respectively).

- The value that university students ascribe to their relationship with family impacts their perception of happiness (significant Student's t-test, Table 3), in that those who give greater importance to family have higher levels of happiness (Table 3).

- The perceived quality of the university impacts their academic performance (Fac3->P4_Score, effect = 0.184, Table 5).

- The value university students give to money inversely impacts their happiness, given that those who ascribe greater importance to money have lower levels of happiness (Table 3).

- The value that students give to their university, or their friends does not significantly impact their perception of happiness.

- The perceived quality of their relationships with friends influences their perception of their family and university.

Table 5. Standardised Total Effects

↓Receptive variable of the effect	Fac1_Quality Family	Fac2_Qualty Friends	Fac3_Quality University
Fac3_University	0.441	0	0
Fac2_QualityFriends	0.426	0	0.299
P4_Score	0.081	0	0.184
P10_LEVELOFHAPPINESS	0.483	0.322	0.352

5. Discussion

It is critical that the various agents involved in university life are aware of the influence that the emotional level has on the happiness of university students. For this reason, it is essential to design educational strategies that conceive the student as an active agent in their education and where their emotional support network, such as family and friends, is integrated. While it is true that it is difficult to include families in university life, extracurricular activities or events organised by the university itself could help families to get involved so that they can experience the values and philosophy of each centre. As for the network of friends, the university period is usually a period when the circle of friends is widening. It is therefore necessary to weave a link between both circles through, once again, the extracurricular life of the universities, especially in more social and leisure events.

In addition, the perceived quality of the university beyond the different subjects studied and the activities of professors, also contributes to the reputation of the institution. Perhaps this research will help more universities to promote internal work with their stakeholders, and especially with students, to gain in-depth knowledge of their educational and emotional needs so that they can adapt and improve their educational and extracurricular activities.

On the other hand, the relationship detected between the perceived quality of the university and the academic results relates to the demands, effort and improvement expected of university students. This is basically a question of reciprocity: if students perceive that their educational institution strives to be a centre of excellence, in general terms, students will respond to be at the level of the place where they study. In many countries, the place of study can be a determining factor in the selection processes of companies. Therefore, universities and students should have a common goal of building the best university to study at. In fact, many university rankings are aware of this impact and hence their interest in measuring their evolution annually.

Unlike in previous educational stages, the pressure to find a job is one of the main concerns of university students. Moreover, in a context of international crisis marked by rising inflation and wage restraint in many countries, this has added to the pressure felt by university students. Therefore, it is not only a matter of concern to find a job, but a job that reflects in remuneration and status the time and money invested and the highly specialised training received, something that is not the case in many countries. Hence, the importance that university students place on money and what comes with it after their education has a negative influence on their happiness. Although it would not be feasible to regulate salaries according to education at an international level, it would be necessary to work towards a greater adaptation of university education to the needs of the labour market, so that there is a greater correlation between what students expect and the demands of companies.

6. Conclusion

The study of happiness and its measurement are currently an area of intense study, evidence of the interest of academics in further exploring these themes (McBride, 2010; Clemente et al., 2000; Sellés et al., 2018; Ortiz, 2019; Vargas, Callata, 2021), and given their influence on the achievement of personal goals, both internal and external (Salazar et al., 2016; De Pablos, González, 2012). It is important therefore to incorporate the most significant factors and variables which impact perceived happiness (Bisquerra, 2005; Palomera et al., 2017) in all stages of education including at university.

There are a number of factors which determine the perception of happiness among young people, especially family, friends and money (Sellés et al., 2018). Among university students, the quality of their university is also an important factor in their perceived happiness (Chang et al., 2005). These factors determined the choice and application of the methodology based on the OHQ expanded with some items from the MIS-QOL to *measure the impact, ascribed importance and quality of relationships with family, friends, the university and money on the part of university undergraduates.*

This study found that the perception of the quality of relationships with family and the university impacts the perception of relationships with friends. That is, if students have a high or positive perception of their family relations and their university, the perception of the quality of their relationships with friends is also high or positive. This result should be taken with caution since it is a novel finding that has not been directly analysed in other studies, and the significance of the regression does not guarantee causality.

Although university students are in adulthood, the affective foundations continue to be fundamental to their perception of happiness, such as support from family and friends. Thus, the first hypothesis of this work can be confirmed, that is, *students' perception of their relationships with family and friends impacts their self-perceived happiness*. It is important not only to provide a quality education but to address the emotional needs of students. Teachers play an essential role in providing students with support and accompaniment beyond their instrumental role in the classroom. Although universities have a number of positions which attend to students' needs and some universities have assigned tutors, each teacher should open new avenues of communication in order to connect with students. This implies going beyond tutorials and to incorporate into academic curricula courses on communication, conflict resolution, negotiation or artistic expression. The aim is to create more relaxed atmospheres where informal relationships can be established among classmates and with teachers developing more interpersonal support networks.

The numerous crises currently besetting our world, from COVID-19, to climate change, to the fallout from Brexit, are leading many to reconsider what is truly important to them. Perhaps this context is part of the validation of the second hypothesis: *the importance university students ascribe to money has a negative impact on their self-perceived happiness*. These results are in line with previous studies (Ahmed et al., 2023) which have found the negative influence of materialism on self-perceived well-being. Thus, in a context of global instability, with the addition of unstoppable technological change, we need highly ethical professionals who are socially responsible, with capacity for dialogue and empathy. Hence, the courses and content related to corporate social responsibility, debate, and ethics in general, without disregarding the accepted standards of ethics and good conduct of each profession, should be incorporated into the study plans of all university degrees.

In summary, it is necessary to drive further the humanistic spirit of university curricula, for which consideration of the implementation of the following practical applications is recommended:

- To impact perceived happiness, it would be important to emphasise emotional factors on a more individual level, such as personal conversations, extra-curricular activities, mentorship, etc. key aspects in all stages of education including at university.

- To improve connection with the students, seek new avenues of communication, such as monthly meetings, student specific newsletters/group chats on social media.

- Incorporate or enhance courses in the academic curricula in two areas: those that increase interpersonal skills, such as communication, conflict resolution, negotiation or artistic expression, as well as those that explore corporate social responsibility, debate, and ethics in general, without disregarding the accepted standards of ethics and good conduct of each profession.

- Encourage the recruitment and development of highly ethical professionals, who are socially responsible, with capacity for dialogue and empathy.

With regards to the limitations of this study, in terms of the profile of the sample, it would be instructive to conduct studies among university students at a European or international level. In educational terms, the results may point towards the need for a more humanistic orientation of university degree study plans, giving greater importance to factors which increase the happiness of university students and thus build a better society for all. Beyond providing a utilitarian education oriented towards employment, educational authorities should be reminded of the need to regard the university student as a whole person whose educational, ethical, social and affective needs go hand in hand.

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Teachers' Knowledge about Students with Dyslexia and Professional Development

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Abstract

Ensuring a quality educational process requires competent teachers who are able to recognize the individual characteristics of students with dyslexia and provide them with appropriate support. This study on a sample of speech and language therapists (N = 18) and elementary school teachers (N = 431) had the following aims: (1) to determine the content validity of the Teachers' Knowledge about Dyslexia Scale, (2) to explore teachers' knowledge about students with dyslexia, and (3) to determine differences in teachers' knowledge about students with dyslexia according to their participation in different forms of professional development activities (pre-service, in-service, and self-directed learning). The constructed measuring instrument contains 29 statements about etiology, characteristics, and teaching strategies for students with dyslexia. The content validity was verified using the Delphi method in three rounds until a consensus of 90 % was reached by SLT experts. The Teachers' Knowledge about Students with Dyslexia Scale was applied to a sample of Croatian elementary school teachers of first- to eighth-grade students, who had experience in teaching students with dyslexia in the last three years. The results show that most teachers know some specific strategies for teaching students with dyslexia and, to a lesser extent, the causes of dyslexia. Most of the misconceptions regarding students with dyslexia are related to its causes and specific characteristics. A higher level of knowledge about dyslexia is possessed by teachers who have received professional training in teaching students with dyslexia through pre-service, in-service, and self-directed learning. A similar pattern of insufficient deep knowledge of the etiology and symptoms of dyslexia among the teachers was confirmed, clearly indicating the need for significant improvements in teacher competencies in all forms of professional development.

Keywords: knowledge, dyslexia, teachers, elementary school students, Delphi method, teachers' professional development.

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1. Introduction

Dyslexia is a specific disorder in the acquisition of reading and writing skills from the group of neurodevelopmental disorders diagnosed during the elementary school years and includes: "(1) problems with accurate or fluent word recognition, poor decoding and spelling skills, and difficulty with reading comprehension; (2) the presence of difficulties despite proper intellectual abilities, the absence of sensory, other psychological or neurological disorders, psychosocial adverse circumstances, inadequate knowledge of language of academic instruction, or inappropriate instruction; (3) the presence of difficulties for at least six months, despite the use of interventions designed to alleviate those difficulties." (American Psychiatric Association, 2014: 67).

Systematic reviews and meta-analyses have shown that the prevalence of dyslexia in primary school children is around 7 % worldwide, with significantly higher prevalence in boys than in girls (Yang et al., 2022). Research conducted in the Republic of Croatia indicates that around 10 % of school-age children have reading and writing difficulties (Pašiček, Lenček, 1993).

Teachers should have knowledge about etiological factors, characteristics/symptoms, and individualization strategies in order to teach students with dyslexia successfully. Knowledge about etiological factors is crucial for understanding the nature of the difficulties and the impact on the learning and teaching processes of students with dyslexia. There are different theories about the etiology of dyslexia: theory of phonological deficit (Vellutino et al., 2004), theory of deficit in rapid temporal processing (Tallal, 1980), visual (Stein, 2018), cerebellar (Nicolson et al., 2001), and magnocellular theory (Ramus, 2003). Equally, significant research has been conducted to clarify the relationship between various genetic risk factors and deficits present in dyslexia (Francks et al., 2002; Snowling, Melby-Lervåg, 2016).

Within the medical model, the prevailing cognitive theory on the causes of dyslexia, the phonological theory, locates the deficits in the phonological component of language: insufficient phonological representations and problems in phonological processing, storage, retention and retrieval of phonemes (Tallal, 1980; Annett, 1996; Hatcher, Snowling, 2002; Nicolson, Fawcett, 2008), and problems in the acquisition of phonological skills (Elliot, Grigorenko, 2014), i.e., the establishment of connections between graphemes and phonemes that are necessary for the acquisition of reading skills in alphabetic systems (Nicolson et al., 2001; Fletcher et al., 2007; Snowling, Melby-Lervåg, 2016). On the other hand, a more complete picture of dyslexia is obtained when the phonological theory is combined with the magnocellular theory or the double-deficit hypothesis. The double deficit hypothesis assumes the simultaneous presence of a deficit in phonological skills and a slower naming speed (Wolf, Bowers, 2000), while the magnocellular theory unites the propositions of individual theories of auditory, visual magnocellular, and cerebellar/motor deficits and assumes the existence of two direct causes of dyslexia – phonological and visual (Stein, 2019).

For the purpose of a more comprehensive explanation of dyslexia, a causal modeling framework, involving three interconnected levels, was proposed: (1) the biological level (e.g., genetic contributions, neuro-anatomical factors), (2) the cognitive level (e.g., impaired processing mechanisms), and (3) the behavioral level, which moves beyond the well-known problems in reading and writing and has significant variability within and between individuals (Frith, 1999). Within the same model, the influence of environmental factors that can aggravate or ameliorate the condition is also emphasized. From the educational perspective, environmental factors are particularly important because they include quality reading instruction programs, prevention and remediation interventions, trained teachers, and cultural factors, such as differences in the transparency of different orthographies (Frith, 1999; Fletcher et al., 2007).

Although the problems with mastering pre-reading and writing skills are visible in the preschool years (Lenček, Ivšac, 2007), dyslexia is diagnosed at the elementary school age when, despite good skills and effort, the child has difficulties in mastering reading and writing skills and is falling behind their peers in terms of educational outcomes and academic success.

In Croatia, the following symptoms of dyslexia in reading/writing were found: difficulties in mastering phonemic awareness, recognizing and naming graphemes and matching them to the corresponding phonemes, insufficiently developed visual vocabulary, persistent spelling while reading, prolonged reading by joining syllables, pausing, repeating what is read, omitting, adding, and substituting graphemes, phonemes, and whole words, substituting syllables, difficulties in decoding pseudowords saturated with sounds/letters specific to the Croatian Latin alphabet, longer reading and writing time, failure to follow orthographic rules, and difficulties in orientation in the

text (Lenček, Ivšac, 2007; Lenček, 2012). Moreover, children understand what they read better if they read the text several times, and they rely on general knowledge and contextual factors when interpreting the text (Dulčić, Pavičić Dokoza, 2014).

Dyslexia may or may not co-occur with other disorders. Among related difficulties, it is most commonly associated with a writing disorder (dysgraphia), a disorder in the acquisition of mathematical knowledge and skills (dyscalculia), dyspraxia, language, communication, and ADHD disorders, which may alter the course and outcome of the disorder itself (American Psychiatric Association, 2014).

A combination of auditory or visual perceptual difficulties, motor and coordination difficulties, memory difficulties, organizational and sequential difficulties, and difficulties in understanding spatial and temporal concepts may also be present in some individuals with dyslexia (Wadlington et al., 1996; Waterfield, 2002; Alexander-Passe, 2006). Some students with dyslexia can also have difficulties in self-regulatory skills and socio-emotional development, a tendency toward depressive patterns in the self-regulation of learning, a lack of self-control, passivity, low motivation, an increased risk of school failure, a maladaptive attribution style associated with pessimistic attitudes toward future success, and insufficient use of effort (Humphrey, Mullins, 2005; Núñez et al., 2005; Martan et al., 2015a).

On the other hand, students with dyslexia have good cognitive abilities, and some of them develop above-average abilities (Waterfield, 2002). Students with dyslexia face numerous challenges in their daily lives, which are most evident in academic activities at school (Cornoldi et al., 2018). The described diversity and specificity of cognitive functioning points to the existence of strong and weak sides of students with dyslexia. Therefore, one of the fundamental questions of modern education is how teachers can recognize the potential and adapt the educational system to the strengths of different groups of students, including students with dyslexia.

Ensuring the conditions for quality education of all students implies an equal adoption of educational outcomes and realization of potential (Čepić, Kalin, 2017), in which the individualization of the teaching process is extremely important for realizing the maximum potential of students. The application of specific forms of support and adaptations in learning and teaching, evaluation and assessment, as well as an appreciation of difficulties and a consideration of the student's strengths and needs, require a high level of professional competency from teachers. The alignment of teacher competencies with the individual needs and capabilities of students is the basis of a quality educational process (Firth et al., 2013). With timely support from the education system, especially from competent teachers who teach students with dyslexia on a daily basis, the negative consequences of dyslexia can be minimized. These consequences may include socio-emotional difficulties, the risk of dropping out of school, juvenile delinquency problems, unemployment, and social isolation (Frisk, 1999).

In the Croatian educational system, students with dyslexia are taught in inclusive classes in regular schools (Pravilnik o osnovnoškolskom..., 2015) and their teachers have no opportunity to specialize in dyslexia. Teachers are considered insufficiently educated to work with students with dyslexia, while the guidance of speech-and-language therapists is rarely available to them (Martan et al., 2015b). Therefore, there is lack of formal and informal forms of professional development, and it is emphasized that knowledge is acquired mainly through self-directed learning (Martan et al., 2015b; Mullikin et al., 2021). It is important that teachers have knowledge about the cognitive and genetic factors related to dyslexia to understand that visible difficulties in reading, writing, and reading comprehension are related to neurodiversity. Thus, teachers' knowledge of the scientifically based causes of dyslexia affects the understanding of the underlying cognitive processes; it enables the teacher to provide instruction that is focused on the strengths of students with dyslexia and respects their individual learning pace. By contrast, insufficient knowledge about the etiological causes of dyslexia leads teachers to develop their own ideas about the reasons why students with dyslexia are unable to master literacy skills and learning outcomes, which may contradict scientific findings and lead to misconceptions about dyslexia. Indeed, it is well known that teachers in the past have often interpreted students with dyslexia as "lazy" and categorized them among "those who don't try hard enough".

Previous research has shown that there is a wealth of information on the knowledge of teachers related to the causes and symptoms of dyslexia, as well as intervention strategies. For example, the authors Wadlington and Wadlington (2005) created the Dyslexia Belief Index (DBI), which was replicated by Washburn et al., (2013) and Mullikin et al. (2021). The authors Soriano-

Ferrer and Echegaray-Bengoa, (2014) created the Knowledge and Beliefs about Developmental Dyslexia Scale (KBDSS), which was replicated by Soriano-Ferrer et al. (2016), Echegaray-Bengoa et al. (2017), Ramli et al. (2019), Yin et al. (2019), Sümer Dodur, Altindağ Kumaş (2021), and Peltier et al. (2022) created the Dyslexia Knowledge Questionnaire. Teachers' knowledge was most often studied in the form of scales with items that assessed knowledge of various facts about dyslexia or the degree of agreement or disagreement with various claims about dyslexia. The scales most commonly included knowledge of general information about dyslexia, knowledge of the causes and characteristics of dyslexia, and knowledge of the procedures for teaching/treating students with dyslexia and the so-called "myths about dyslexia." (Washburn et al., 2013; Soriano-Ferrer et al., 2016).

The results of recent research show that teachers' knowledge is mainly present in the area of general information about dyslexia, the recognition of the visible features of dyslexia in reading and writing, and basic procedures in teaching students with dyslexia (Wadlington, Wadlington, 2005; Bell et al., 2011; Washburn et al., 2013; Soriano-Ferrer, Echegaray-Bengoa, 2014; Soriano-Ferrer et al., 2016; Echegaray-Bengoa et al., 2017; Washburn et al., 2017; Nadelson et al., 2017; Ramli et al., 2019; Yin et al., 2019; Sümer Dodur, Altindağ Kumaş, 2020; Mullikin et al., 2021; Peltier et al., 2022). Ignorance of the cognitive and genetic factors associated with the causes of dyslexia and the endorsement of beliefs that are inconsistent with contemporary knowledge about dyslexia are indicators of a limitation in the ability to provide quality support to these students (Wadlington, Wadlington, 2005; Washburn et al., 2013; Mullikin et al., 2021).

In the Republic of Croatia, teachers' knowledge about teaching students with dyslexia is poorly researched. An examination of the factor structure of existing scales for assessing teachers' knowledge about dyslexia translated into Croatian (Wadlington, Wadlington, 2005), as well as the newly constructed scales (Martan et al., 2015b; Skočić Mihić et al., 2019), did not reveal the construct validity of the measuring instruments, and the internal-consistency coefficients were low. Although the lack of knowledge about dyslexia among teachers is well known and reported in a variety of cultures and educational settings, each national context develops its unique models for supporting these students due to socio-cultural specificities, especially the characteristics of particular languages and local educational regulations. In this paper, a unique approach to defining the corpus of teachers' knowledge about dyslexia is applied to include the opinions of speech-and-language-therapy experts, who provide treatment for students with dyslexia but also support teachers in the implementation of individualized curricula. The specificity of the Croatian educational context is that, of the two regulated professions working with students with dyslexia in education, the speech-and-language therapy (SLT) profession is the one that acquires specific competencies for working with students with dyslexia in initial education. On the other hand, the teaching profession does not have the opportunity to acquire competencies for working with students with dyslexia in the required courses of initial education, and the relevant materials are scarce and inconsistent in elective courses. In addition, in-service training programs do not enable teachers to acquire competencies for teaching students with dyslexia. Precisely because of the specific national context, which distinguishes the role of the SLT in diagnosing and treating students with dyslexia from the role of the teacher in teaching these students in the classroom, the application of the Delphi method in this study aims primarily to evaluate the content validity of the measuring instrument. At the same time, the use of the Delphi method represents a novelty in the research on teachers' knowledge about dyslexia.

Since determining content validity usually requires obtaining expert opinions, a research design was created that utilized the methodology of the Delphi technique by systematically obtaining expert opinions according to specific protocols. Therefore, the research included two samples of experts. The first sample included SLTs, who are experts in the treatment of students with dyslexia, and who evaluated whether the defined set of teacher knowledge about dyslexia was appropriate, meaningful, and useful. The second sample included teachers, who assessed their knowledge about dyslexia.

The unique position of SLT professionals is that they work individually with students with dyslexia and provide professional support to teachers in developing procedures for individualizing instruction. This dual role allows for a "deeper", more comprehensive and complex approach to defining and filtering the corpus of teacher competencies, which was one of the main motivating factors for this research project.

Thus, the purposes of this study were: (1) to determine the content validity of the Teachers' Knowledge about Students with Dyslexia Scale using the Delphi method, (2) to explore teachers'

knowledge about students with dyslexia, and (3) to determine differences in teachers' knowledge about students with dyslexia according to their participation in different forms of professional development activities (pre-service, in-service and self-directed learning).

2. Materials and methods

To determine the content validity of Teachers' Knowledge about Students with Dyslexia Scale, the Delphi method was used in three rounds. This is a qualitative research method designed as a group communication process based on the process of interviewing and discussion in at least two rounds with participants who are mutually anonymous. The collected data are processed after each round of research and presented to the participants again until a consensus is reached among them on the renewed research topic (Visković, 2016).

Participants

In accordance with the aim of this study, two samples were included: (1) experts (SLTs) who participated in the Delphi method, and (2) elementary school teachers.

Sample 1

The Delphi method involved 18 experts who worked with students with dyslexia. All of them had a Master's degree in Speech and Language therapy (SLT) and more than five years of work experience. It should be noted that, in the Republic of Croatia, SLTs are the only profession trained for the assessment and therapy of students with dyslexia, taking into account the assessments of other professions (especially psychologists) and information about the student's functioning in the school and family environment (Lenček, 2012). The snowball technique was used for sampling in 6 regions of the Republic of Croatia (City of Zagreb, Primorsko-Goranska, Istarska, Varaždinska, Međimurska, and Krapinsko-Zagorska counties), including two criteria: (1) experience in working with students with dyslexia and (2) willingness to provide feedback on the characteristics of these students, especially in the school context. The age range of the participants was 28 to 55 years, and their work experience ranged from 5 to 32 years. Of 18 participants, 1 was male. Fifteen participants were employed in public institutions at the time: early childhood education and care (ECEC) (1), elementary schools (11), higher education (1), and health care (2). Three participants were employed in private speech-and-language-therapy practice. All participants willingly accepted their participation in the Delphi method research aimed at improving educational practices for students with dyslexia. We believe that they were intrinsically professionally motivated and not a single participant withdrew from the research. After all three rounds had been completed, all participants were informed about the results of the Delphi method.

Sample 2

The constructed measuring instrument was applied to a sample of elementary school teachers in the second phase. The stratified sample included 431 elementary school teachers (F = 377(87.5 %)) with experience in teaching students with dyslexia. Teachers were employed in 63 schools in six counties of the Republic of Croatia (Primorsko-Goranska, Istarska, Ličko-Senjska, Varaždinska, Međimurska, and Krapinsko-Zagorska counties). The sample included subject teachers (70.8 %) and classroom teachers (29.2 %) who taught students from first to eight grades. The average age of teachers was 42 years (M(SD) = 42.97(9.24), Min–Max = 25-65) and the average professional experience was 17 years (M(SD)=17.20(10.23); Min–Max=1-44). All teachers worked in inclusive classrooms in regular elementary schools. In the last three years, teachers had taught an average of three students with dyslexia (M(SD) = 3,23(3,33), and about two-thirds of them (73.5 %) had written an individualized curriculum for the students with dyslexia. One-third of the teachers (30.2 %) had topics related to dyslexia during their initial education in various courses, and 44.1 % of them received professional training on dyslexia, most often in individually organized lectures at the school level. Most frequently, teachers acquired competencies about dyslexia through informal learning (65.4 %). Less than one-third of teachers (29.3 %) worked in schools where speech-and-language therapists were also employed.

Teachers' Knowledge about Students with Dyslexia Scale

The measuring instrument was developed in the more comprehensive research about teachers' competencies in the teaching of students with dyslexia (Martan, 2022). Its specificity lies in the selection and modification of a set of teacher knowledge about the causes and characteristics of dyslexia (e.g., Wadlington, Wadlington, 2005; Washburn et al., 2013; Soriano-Ferrer, Echegaray-Bengoa, 2014; Echegaray-Bengoa et al., 2017; Soriano-Ferrer et al., 2016) and knowledge about teaching procedures for students with dyslexia, designed in theory and guidelines

for teachers in the Croatian educational context. In the first phase, an instrument describing teachers' knowledge was constructed on a theoretical basis, and, in the second phase, its content validity was assessed using the Delphi method.

The newly constructed measuring instrument contained 29 items describing teachers' knowledge about dyslexia: (1) etiology (6 items), (2) characteristics (14 items), and (3) teaching strategies (9 items). The response format comprised "True (T)," "False (F)," and "I don't know." Examples of true or false items are as follows. (1) For etiology: "Due to hereditary factors, dyslexia is more common in some families" (T), and "One of the causes of dyslexia is intellectual disability" (F). (2) For characteristics: "One of the characteristics of dyslexia is non-fluent reading" (T), and "One of the characteristics of students with dyslexia is excellent working memory skills" (F). (3) For teaching strategies: "When teaching students with dyslexia, frequent repetition of content in different contexts is recommended" (T), and "When testing the knowledge of students with dyslexia, the students' specific errors in reading and writing should be evaluated" (F).

It was intended for an individual participant's score on the scale to be calculated as the total sum of correct responses, with one point assigned to each theoretically correct response and zero points assigned to each theoretically incorrect response and to the "I don't know" response.

Data collection

The research was conducted in two phases according to the set aims. In the first phase, the research was conducted electronically through e-mail correspondence using the e-Delphi method, while in the second phase, a measurement instrument in paper–pencil format was delivered to elementary school teachers.

Data collection from the first sample of experts was conducted according to the following procedure. The experts were contacted through their email addresses to give their consent to participate in the research. Upon the second contact, the experts received a protocol with a detailed cover letter describing the purpose and procedure of the research, measuring instrument, instructions on how to record their responses, and the approximate date for returning the material. The experts were assured of anonymity. They were asked: (1) to read each of the constructed items in detail, (2) to determine whether it was theoretically true or false, (3) to indicate if it described etiology, characteristics, or teaching strategies for students with dyslexia, (4) to provide suggestions for improving the scale, (5) to suggest the addition or elimination of certain proposed items, and (6) to correct errors or suggest language improvements for the understandability of items that were unclear, confusing, or ambiguous. Items on the scale were evaluated according to two criteria: (1) whether the item was true or false; and (2) whether the item belonged to etiology, characteristics, or teaching strategies. The Delphi-method procedure was conducted in three rounds until a consensus of 90 % was reached for both criteria for each item. If the level of consensus was lower than 90 %, the item was reworded or omitted according to the suggestions. After collecting responses and suggestions from participants, items were revised (eliminated, reworded, or added) and sent out for rereading and adaptation. The three rounds of data collection from experts lasted three months and all participants provided input for all three rounds.

In the second phase, data collection on a stratified sample of elementary school teachers was applied. The sampling procedure included three selection criteria, namely, the county, 30 % of randomly selected schools according to the database of the Ministry of Science and Education of the Republic of Croatia, and the experience in working with students with dyslexia in the last three years. The questionnaires were sent by mail to selected schools, whose principals gave consent for the research to be carried out, with information about the research and instructions to the coordinator for conducting the research at the school; the questionnaires were also returned by mail. The survey was conducted for five months. A total of 890 questionnaires were sent; 450 questionnaires (50.5 %) were returned, and 431 questionnaires (48.4 %) were included in further analysis.

Ethical review and approval for the research was obtained from the Ethics committee for scientific research of the University of Rijeka, Faculty of Humanities and Social Studies. The consent of the Ministry of Science and Education of Republic Croatia to conduct research with elementary school teachers was also obtained.

Statistical analysis

Categorical data were described in terms of frequencies and percentages and continuous data in terms of median and interquartile range. The construct validity of the scale was verified by exploratory factor analysis, and reliability by internal consistency type reliability analysis

(Cronbach's alpha). The normality of distribution was tested with Kolmogorov-Smirnov test. As data deviated from the normal distribution, the nonparametric Mann-Whitney U test was used to determine differences in teachers' knowledge about dyslexia according to participation in different types of professional development activities. Data were analysed using the SPSS 25.0 statistical package.

3. Results

3.1. Content validity verification of the Teachers' Knowledge about Students with Dyslexia Scale

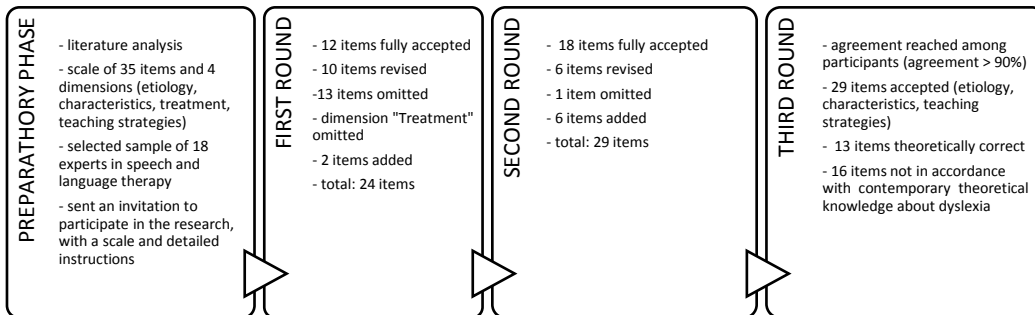The content validity verification process was conducted in three rounds, including the preparatory phase.

PREPARATHORY PHASE
- literature analysis
- scale of 35 items and 4 dimensions (etiology, characteristics, treatment, teaching strategies)
- selected sample of 18 experts in speech and language therapy
- sent an invitation to participate in the research, with a scale and detailed instructions

FIRST ROUND
- 12 items fully accepted
- 10 items revised
- 13 items omitted
- dimension "Treatment" omitted
- 2 items added
- total: 24 items

SECOND ROUND
- 18 items fully accepted
- 6 items revised
- 1 item omitted
- 6 items added
- total: 29 items

THIRD ROUND
- agreement reached among participants (agreement > 90%)
- 29 items accepted (etiology, characteristics, teaching strategies)
- 13 items theoretically correct
- 16 items not in accordance with contemporary theoretical knowledge about dyslexia

Fig. 1. Phases of the Delphi method implementation

In the preparatory phase, based on an analysis of existing instruments and a review of recent literature, a set of items covering relevant facts about: (1) the causes of dyslexia, (2) the characteristics of dyslexia, (3) the treatment of dyslexia, and (4) the teaching strategies for students with dyslexia was created. The selected items considered the characteristics of dyslexia and scientifically relevant facts about dyslexia and teaching students with dyslexia in the Croatian context. The initial version of the scale contained 35 items.

In the first round of the application of the Delphi method, participants were sent a protocol with 35 items by e-mail. Twelve items were accepted in full, while 10 items were linguistically reworded and then included in further analysis. Thirteen items were excluded. Of the thirteen excluded items, six fell into the "Treatment" category, three of which the participants suggested should be excluded entirely because they were not relevant to the domains of specific teachers' knowledge. Therefore, all the items from this category were excluded from further analysis, even though most of them individually met the acceptability criteria. Two items were added according to the participants' suggestions. The revised form of the Teachers' Knowledge about Students with Dyslexia Scale after the first round of the Delphi survey consisted of 24 items.

In the second round of the Delphi method, of the total of 24 items proposed, 18 were fully accepted (agreement > 90 %). Considering the agreement of less than 90 %, six items were reformulated, while one item was excluded. According to the participants' suggestions, six more items were added (four about the characteristics of dyslexia and two about teaching students with dyslexia).

In the third round of the Delphi method, the participants were sent a protocol with a total of 29 items, also by e-mail. After the third round of research, all the participants agreed with the proposed items in terms of truth/falsity and the particular categories to which they belonged. There was a 100 % agreement for 24 items for truth/falsity of statements, while for five items, agreement was 94 %. For category membership, agreement was 100 % for 23 items and 94 % for six items. In the third round, there were no additional comments, and the participants reached a consensus.

As a result of the application of the Delphi method, the Teachers' Knowledge about Students with Dyslexia Scale contained 29 items based on current theoretical knowledge about dyslexia. Regarding the items about etiology, the theoretically correct statements included the cognitive and neurobiological causes of dyslexia, while misconceptions were related to the perception of external factors or intellectual disabilities as causes of dyslexia. The items about dyslexia characteristics included theoretically correct statements about symptoms and the strengths of students with dyslexia in the educational process, while misconceptions included characteristics that do not relate to students with dyslexia. The teaching-strategy items included theoretically correct statements aligned

with the difficulties and strengths of students in the teaching process, whereas the misconceptions described various instructional strategies not appropriate for students with dyslexia.

After obtaining the results of the Delphi method, a factor analysis was performed to determine the construct validity of the scale. All 29 items on the scale explained 18.6 % of the variance of the factor of teachers' knowledge about dyslexia, with a characteristic root of 5.393. The reliability-coefficient Cronbach alpha was 0.66.

3.2. Teachers' Knowledge about Students with Dyslexia Scale (descriptive data)

Table 1 presents descriptive data on the number of participants and the percentage of responses for the 29 items of the constructed Teachers' Knowledge of about Students with Dyslexia Scale.

Table 1. Teachers' Knowledge about Students with Dyslexia Scale

Teachers' Knowledge about Students with Dyslexia Scale	%		
	True	False	Do not know
One of the causes of dyslexia is poor methods of teaching reading. (F)	7.5	**77.2**	15.4
Deficits in the phonological component of language at the level of phonological processing are one of the causes of dyslexia. (T)	**35.4**	20.4	44.3
Dyslexia is based on neurological differences. (T)	**69.6**	5.9	24.6
One of the causes of dyslexia is insufficient student effort. (F)	5.1	**87.4**	7.5
Due to hereditary factors, dyslexia is more common in some families. (T)	**45.8**	11.4	42.8
One of the causes of dyslexia is intellectual disability. (F)	19.5	**59.8**	20.7
Some characteristics that may indicate dyslexia can be observed before the reading automation stage. (T)	**74.1**	4.0	21.9
One of the characteristics of dyslexia is non-fluent reading. (T)	**85.5**	10.5	4.0
Signs of dyslexia are expressed exclusively in the substitution of the graphemes *b* and *d* in reading. (F)	9.3	**81.4**	9.3
One of the characteristics of dyslexia is prolonged "spelling" in reading after the acquisition phase of initial reading. (T)	**57.5**	12.9	29.7
One of the characteristics of dyslexia is difficulty in reading comprehension. (T)	**86.2**	7.5	6.3
One of the characteristics of dyslexia is difficulty in logical reasoning. (F)	27.4	**58.1**	14.5
One of the characteristics of students with dyslexia is good time-management skills. (F)	6.6	40.5	52.9
One of the characteristics of students with dyslexia is good visual and imaginative ability. (T)	**24.8**	37.9	37.2
One of the characteristics of students with dyslexia is above-average ability in some areas of creative expression (e.g., visual expression, music, dance, or acting). (T)	**57.7**	14.2	28.1
One of the characteristics of students with dyslexia is excellent working-memory skills. (F)	24.7	**27.0**	48.4
One of the characteristics of dyslexia is a lower ability to achieve all educational outcomes. (F)	23.8	**61.2**	15.0
Students with dyslexia have a disparity between scores on written and oral knowledge tests. (T)	**94.7**	3.2	2.1
Difficulties in acquiring basic academic skills are the same in form and degree for all students with dyslexia. (F)	3.3	**88.4**	8.4
The symptoms of dyslexia disappear in adulthood. (F)	4.4	**76.0**	19.5

For most students with dyslexia, the curriculum content of subjects should be reduced. (F)	34.6	**55.8**	9.6
When adapting teaching and testing materials for students with dyslexia, it is sufficient to use an appropriate font and increase the font size. (F)	12.1	**79.8**	8.1
When teaching students with dyslexia, it is recommended to use mind maps, schematic diagrams, and pictures to make the lesson content visually clear. (T)	**94.9**	1.2	3.9
When teaching students with dyslexia, it is important to additionally check that the student has understood the written instructions or the task. (T)	**97.7**	0.2	2.1
When teaching students with dyslexia, frequent repetition of content in different contexts is recommended. (T)	**83.7**	5.3	10.9
When testing the knowledge of students with dyslexia, the students' specific errors in reading and writing should be evaluated. (F)	12.5	**78.4**	9.0
Impaired reading speed and accuracy should be practiced by reading aloud in class. (F)	11.7	**78.0**	10.3
When testing the knowledge of students with dyslexia, oral tests should be preferred along with written tests. (T)	**96.5**	1.9	1.6
It is desirable to correct specific errors in the written work of students with dyslexia with red ink. (F)	14.0	**70.2**	15.8

Notes: T = true; F = false

The first part of the descriptive analysis contained items which the largest percentage of participants answered correctly, according to the descriptive indicators. This was followed by items which the majority of participants answered either incorrectly or with "I do not know". A similar model of descriptive analysis can be found in other papers on this topic (Wadlington, Wadlington, 2005; Washburn et al., 2013; Mullikin et al., 2021). The teacher-response accuracy ranged from 35 to 87 % for the etiology items, from 25 to 95 % for the characteristic items, and from 57 to 97 % for the teaching-strategies items.

Concerning all parts of the scale, the most frequent correct answers were found on the items that explore specific teaching procedures and the characteristics of students with dyslexia that are visible in the teaching process at different educational levels (e.g., the importance of additional checks on the comprehension of written tasks, oral knowledge tests, the visually clear presentation of teaching content, discrepancies in written- and oral-knowledge-test scores). More than 90 % of the teachers answered the above items correctly. In addition, it was found that a high percentage (with an accuracy of answers of about 80 %) of teachers answered correctly the items describing difficulties in the reading mastery of students with dyslexia (e.g., early signs of dyslexia, reading fluency and comprehension problems, symptoms of dyslexia not expressed exclusively in the substitution of graphically similar phonemes).

Marking the "I do not know" response to certain items reflects the teacher's uncertainty about the accuracy or inaccuracy of a particular statement and/or lack of knowledge. The highest percentage of "don't know" responses was recorded on the items describing the causes and characteristics of dyslexia (e.g., deficits in the phonological component of language, hereditary factors associated with dyslexia, poor time-management skills, working-memory problems and strong visual skills).

The teachers' most frequent incorrect responses were found on items describing various characteristics that may be present in students with dyslexia (e.g., the strengths of students with dyslexia and working-memory problems). Furthermore, one-third of teachers believe it is true that students with dyslexia have difficulties with reasoning, need reduced curriculum content, and are less able to achieve all educational goals.

An individual participant's score on the scale was calculated as the total sum of correct answers, with 1 point assigned to each theoretically correct answer and 0 points assigned to each theoretically incorrect answer and to the answer marked "I do not know." It was found that out of the total 29 items of the Teachers' Knowledge about Students with Dyslexia Scale, the teachers

answered 20 items correctly, i.e., 68.9%, on average. The obtained composite variable (M = 20.13; SD = 3.707) deviated statistically significantly from the normal distribution (z = 0.114; p <.001).

3.3. Differences in teachers' knowledge about students with dyslexia according to participation in various forms of professional development activities

To determine whether there were statistically significant differences in the teachers' knowledge about students with dyslexia according to their participation in different forms of professional development activities (pre-service, in-service, and self-directed learning), the Mann–Whitney U test was conducted (Table 2).

Table 2. Differences in the teachers' knowledge about students with dyslexia according to their participation in different forms of professional development activities

		Pre-service training		In-service training		Self-directed learning	
		Yes	No	Yes	No	Yes	No
Teachers' knowledge about students with dyslexia	N	129	282	186	229	276	135
	C(Q$_{3-1}$)	21(5)	20(4)	22(5)	20(4)	21(4)	19(5)
	U	14673.000**		13589.000***		11570.500***	
	z	-3.160		-6.370***		-6.269	
	r	0.16		0.31		0.31	

Notes: U = Mann–Whitney U test; N = number of teachers; C = median; Q$_{3-1}$ = interquartile range; r = effect size; Yes = participated in professional development; No = did not participated in professional development; ** p < .01; *** p < .001.

The results indicated that statistically significant differences were found in the teachers' knowledge about teaching students with dyslexia in relation to the teachers' participation in professional development. The teachers who covered at least one topic about teaching students with dyslexia on various courses during their initial training, and who had participated in in-service training and self-directed learning in the previous three years, showed higher levels of knowledge about teaching students with dyslexia. The effect-size coefficients indicate a small effect of pre-service training and a medium effect of in-service training and self-directed learning on teachers' knowledge about students with dyslexia.

4. Discussion

In accordance with the first research aim, the content validity of the newly constructed Teachers' Knowledge about Students with Dyslexia Scale was confirmed as unidimensional construct. One of the priority tasks of this study was to focus on the Delphi method due to the objectivity of the assessment, the understanding of the process, the generation of ideas, and the achievement of consensus among the experts involved. For the purpose of this study, the SLTs were selected for their expertise in diagnosing and treating students with dyslexia, and some of them were employed in educational institutions. With the consensus reached, the experts modified and confirmed the necessary set of dyslexia knowledge that included 29 statements on the etiology and characteristics of dyslexia and on appropriate instructional strategies for students with dyslexia.

According to the second aim, insufficient teachers' knowledge about students with dyslexia was established, similar to other findings (Wadlington, Wadlington, 2005; Soriano-Ferrer, Echegaray-Bengoa, 2014; Soriano-Ferrer et al., 2016; Echegaray-Bengoa et al., 2017; Washburn et al., 2017; Ramli et al., 2019; Yin et al., 2019; Sümer Dodur, Altındağ Kumaş, 2020; Mullikin et al., 2021; Peltier et al., 2022). Knowledge about dyslexia varies widely among Croatian teachers (25-97 %) in degrees and types of information. The majority of teachers know that appropriate accommodations in classroom for students with dyslexia are needed, such as the use of oral testing, the use of additional oral verification for the written instructions and the use of mind maps, schematic diagrams, and pictures to visually clarify the lesson content. In addition, teachers know that dyslexia is not caused by insufficient student effort neither inappropriate teaching methods.

The stereotypical statements to students that they just need to try a little harder in order to overcome the disorder are less common compared to the past. The finding that teachers know that difficulties in reading and writing do not depend on students' insufficient effort or teaching methods sheds light on the true nature of the disorder, that students with dyslexia have difficulties in reading fluency and reading comprehension. The role and responsibility of teachers, who are in a unique position of daily interaction with students with dyslexia, is of immeasurable importance in identifying the characteristics of dyslexia that are most visible at school age (Ramli et al., 2019). In today's classroom practice, the early identification of students with dyslexia and appropriate support increases the likelihood of their success (Dyson, Skidmore, 2003; Carvalhais, da Silva, 2010). Because of the characteristics of dyslexia that are sometimes not immediately apparent, some of which even overlap with the characteristics of other learning difficulties, teachers may sometimes ignore dyslexia in students or confuse it with other difficulties, lack of motivation and effort, or with an unfavorable family situation (Dockrell, Lindsay, 2001).

On the other hand, only one third of teachers know about the cognitive and neurobiological causes and characteristics of dyslexia. For example, that the cause of dyslexia is a deficit in the phonological component of language at the level of phonological processing and that dyslexia is more common in some families due to hereditary factors, which is similar to the findings of Soriano-Ferrer et al. (2016). Teachers should have knowledge about the causes of dyslexia in order to understand the cognitive processes of students with dyslexia, which are invisible to them but are extremely important in shaping the teaching process. When teachers do not know what causes dyslexia, they form their own interpretations, which may be incorrect. For example, the fact that the student performs worse on reading and writing tasks compared to other educational outcomes may lead to the conclusion that only more practice can remedy the difficulty in mastering a literacy skill. This may influence the negative consequences of such teacher attitudes, which are rooted in insufficient knowledge. Ignorance of the causes and neurobiological factors of dyslexia can lead to inappropriate teaching, whereas specific knowledge of the etiology of dyslexia ensures quality teaching that is responsive to the needs of students (Dockrell, Lindsay, 2001). Only a quarter of teachers know that students with dyslexia have potential strengths in visual and imaginative ability, visual capacity, and imagination. Some individuals with dyslexia show above-average results on tests of general creativity and originality in thinking (LaFrance, 1997; Tafti et al., 2009; Cancer et al., 2016), global spatial abilities (Von Károlyi, Winner, 2004), and visual spatial memory (Tafti et al., 2009). Empirical research on areas of the potential talents of students with dyslexia related to visual skills and creativity is also sparse and inconsistent (LaFrance, 1997; Winner et al., 2001; Von Károlyi, Winner, 2004). Teachers should focus on students' strengths, which primarily means knowing how to recognize them. Teaching based on the strengths and potentials of students with dyslexia enables improvements in their basic academic skills, self-confidence, and confidence in their academic abilities (Singer, 2008). When teachers understand a student's strenghts (Dyson, Skidmore, 2003), they are more able to provide appropriate accommodations to ensure the maximum development of students' potential (Singer, 2008; Antoniazzi et al., 2010).

If we focus on what teachers say they do not know, it is evident that almost half of teachers do not know that students with dyslexia can have deficits in working memory (48 %), in time-management skills (53 %), in the phonological component of language at the level of phonological processing (44 %), and that dyslexia is more common in some families due to hereditary factors (42 %). Insufficient knowledge about dyslexia could lead teachers to apply inappropriate accommodations (Lenček, 2012). The facts about dyslexia about which teachers consider they have no knowledge indicate their real educational needs and this finding is critical in the context of teachers' professional development.

Similar to previous findings (e.g., Wadlington, Wadlington, 2005; Soriano-Ferrer et al., 2016; Echegaray-Bengoa et al., 2017), teachers' misconceptions about dyslexia were also noted. More than a third of teachers believe that students with dyslexia do not have good visual or imaginative abilities and that the curriculum content of subjects should be reduced, and a quarter of teachers believe that dyslexia is a difficulty in reasoning and that students with dyslexia have a lower ability to achieve all educational outcomes. This is compounded by the fact that around 40 % of teachers do not know or have a misconception surrounding the fact that dyslexia is caused by intellectual and reasoning difficulties, which is consistent with studies in Ghana, Spain, and Peru (Soriano-Ferrer et al., 2016; Acheampong et al., 2019). By contrast, in most studies in Anglo-Saxon countries, teachers do not associate dyslexia with intellectual disabilities (Bell et al., 2011;

Washburn et al., 2017). Knowledge of the cognitive abilities of students with dyslexia is essential. Based on this, teachers can make appropriate accommodations without reducing the curriculum.

Obviously, seems that misconceptions about dyslexia are rooted among teachers. Knowledge about dyslexia is the basis for teachers to ensure high quality teaching. Teaching students with dyslexia in classrooms using standard teaching materials and strategies is not aligned with their educational needs (Skočić Mihić et al., 2021). In order for teachers to provide quality education for students with dyslexia, they need to know (1) the characteristics of students that are strongly influenced by cognitive and neurobiological differences due to etiological causes, (2) how they manifest in the learning process, and (3) which teaching strategies are needed in classroom. Only accommodations that are scientifically and theoretically grounded, consider the strengths of students with dyslexia, and respect their individual learning pace to progress.

Taking into account the above findings about teachers' insufficient knowledge and misconceptions, it becomes clear how important teachers' professional development is for developing competencies for teaching students with dyslexia. Questions arise about how teachers can provide appropriate instructions for students with dyslexia if they do not have adequate professional development, through which they can acquire the necessary competencies.

According to the third aim of this study, differences in teachers' knowledge about students with dyslexia are established according to participation in different forms of professional development (pre-service, in-service, and self-directed learning). The planning, organization, and development of various professional development programs should be based on an objective assessment of needs, conditions, and opportunities, and should lead to improvements in teachers' knowledge and skills or competencies. Teachers' professional development is a lifelong learning process. It is important for teachers to be able to assess their competencies and know how to evaluate their professional development activities (Čepić et al., 2017; Čepić et al., 2019; Čepić, 2020). The complex relationship between educational needs, conditions, and opportunities offers guidelines for reflecting on and improving curriculum planning in the context of teachers' professional development (Čepić, 2020). The same author points out that despite the recognition of the importance of professional development and the pressures arising from current educational needs, most professional development opportunities remain fragmented, insufficiently linked to curricula, and inadequately adapted to teachers' needs, conditions, and opportunities. Due to the adaptation to individual needs, the purpose of professional development should be to enable teachers to strive for and apply new knowledge in the profession, share interdisciplinary experiences, and acquire the highest level of professional competency (Čepić, Kalin, 2017; Kalin, Čepić, 2019).

Improving the quality of teaching during initial training can contribute to relevant knowledge about dyslexia and teaching students with dyslexia. A question may be raised as to how realistic it is to expect teacher-training programs to be adjusted to provide specialized knowledge in dyslexia in an already crowded curriculum. It is necessary for student teachers to gain at least a minimum amount of experience with students with dyslexia during their student practice or volunteering, which can have a positive impact on their attitudes and sensibilization to the needs of students with dyslexia in the early phases of their professional development. Certainly, post-graduate programs and/or professional development opportunities for early-career teachers seem to be more realistic. One example is to offer micro-qualifications (so-called micro-credentials/minors) that enable the acquisition of relevant skills necessary for inclusion in the work process. In the Croatian educational context, most dominant forms of professional training for teachers about dyslexia is organized by the Education and Teacher Training Agency, in the form of short lectures at the request of schools that express a need for this type of education. It is necessary to develop modular programs for teachers' professional development, lifelong-learning programs, and specialized postgraduate programs on dyslexia to arrange conditions and opportunities that can contribute to additional training and professional development, particularly concerning teaching students with dyslexia. The contribution of this work is its shedding of light on teachers' knowledge of teaching students with dyslexia in the Republic of Croatia, which could be useful in creating professional development programs for subject and classroom teachers.

The results of this study are valuable in several key respects. First, in this research, a measuring instrument was created to assess teachers' knowledge about dyslexia based on dyslexia theory and previous research. According to the information available to the authors, this is the first study in which the content validity of the Teachers' Knowledge about Dyslexia Scale was determined using the

Delphi method. Thus, the contribution of this study is the application of the Delphi method, which proved to be useful in the creation of the Teachers' Knowledge about Students with Dyslexia Scale and can be used for the development of other instruments on this topic.

The second specific contribution of this study lies in its unique research design, in which experts in the field of SLT examined the validity, modified and added items that examined teachers' basic theoretical knowledge about the etiology, symptoms, and strategies for teaching students with dyslexia. The research was based on the principles of inclusive education and the social model, and teachers' knowledge about dyslexia is considered a resource for ensuring quality learning and teaching. The opinions of professionals who are involved in the treatment of students with dyslexia enabled particularly valuable insights about what teachers need to know about the etiology, the basic characteristics of students with dyslexia, and teaching and assessment accommodations. On the other hand, according to their opinion, knowledge about the therapeutic procedures (treatment) for students with dyslexia performed by SLTs is not one of teachers' key areas of knowledge because Croatian teachers do not use it in classrooms. Expertise is the path to a scientific and professional interdisciplinary contribution to the progress and well-being of students.

Third, the created set of items is relevant worldwide because they refer to basic knowledge about dyslexia, which is part of the diagnostic criteria of the DSM-5. At the same time, it is adapted to the specificities of the national educational context. Thus, this study makes a valuable contribution to the understanding of teachers' generic knowledge about dyslexia, which is related to the neurodiversity of this group of students and is not conditioned by specific sociocultural factors, such as language transparency, educational context, support, or others. On the other hand, the items of the measuring instrument examine teachers' knowledge about dyslexia as determined by the national context, i.e., educational policies describing the form of schooling and professional support for students with dyslexia.

The limitations are related to the narrowly defined aim of this study, which focuses deliberately on the content validity of the scale, which was chosen to provide a deeper insight into teachers' knowledge. There is also a need to include other methods of investigating teachers' knowledge about dyslexia, such as open-ended questions or guided interviews.

5. Conclusion

Ensuring a high-quality educational process requires competent teachers who are able to recognize the individual characteristics of students with dyslexia and provide them with appropriate support. Teachers play an important role in the identification and referral of students suspected to have dyslexia, and this process can only be improved if teachers have accurate knowledge about dyslexia and effective teaching accommodations, so that any student with reading difficulties can be supported in the classroom.

Although the lack of knowledge about dyslexia among teachers is well-documented in studies, this study is based on what experts consider necessary knowledge that teachers should possess to ensure the maximum development of the potential of students with dyslexia. The assessment of relevant teachers' knowledge about dyslexia in order to respond professionally and qualitatively to the educational needs of students with dyslexia from the perspective of experts is a methodological strategy rarely used in research. Therefore, in order to provide important insights into teachers' necessary knowledge from the perspective of experts working with students with dyslexia, a newly constructed instrument was developed with content thematically adapted to the area that covers causes, characteristics, and teaching procedures. Content validity was verified using the Delphi method in three rounds in which 18 experts (SLTs) agreed on their assessments of teachers' necessary knowledge about dyslexia.

The obtained results indicate a similar pattern of inadequate teacher knowledge of dyslexia's causes and symptoms. Teachers need different types of knowledge about dyslexia, primarily about its etiology and the strengths of students, which is the basis for understanding the visible and manifest problems associated with it, as well as accommodations based on scientific and theoretical expertise and examples of good practice. This clearly indicates the essential role of teachers' professional development. That is, teachers who have received professional training in teaching students with dyslexia through pre-service, in-service, and self-directed learning have higher levels of knowledge about dyslexia. Professional development programs are often unsuccessful because they do not anticipate the competencies that teachers need in practice. It is important to point out that the teaching of students with dyslexia should be based on knowledge about dyslexia to provide

appropriate teaching accommodations. This is in line with the social inclusion model, which supports the rights of people with dyslexia and the recognition of their potential.

This study can contribute to the exploration of knowledge about dyslexia in a national and international research context with an approach based on (1) a theoretical body of knowledge about what teachers should know about dyslexia, (2) a scientific research approach that includes a review of relevant research on teachers' knowledge about dyslexia, and (3) expert opinions from professionals who have unique insights into the educational needs of students with dyslexia and the competencies of teachers in supporting these students through accommodations of learning and instruction. In addition, the implications of this study show the possibilities of an interdisciplinary approach, which involves experts specialized in the treatment of students with dyslexia in defining relevant teacher knowledge, as well as teachers themselves. This would contribute to success in creating teacher professional development programs that respond to the educational needs of teachers and their students.

6. Funding

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Self-Authorship in the Mentoring Process at Pre-School Education

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Abstract

There are relatively few scientific sources, which help to reveal the phenomenon of self-authorship in the mentoring process, when a social contact is established between a young, less qualified person and a senior specialist with more professional experience. Thus, this study strives to find the answers to the emerging research questions: what are the preconditions for the emergence of self-authorship in mentoring; what are the interrelationships between these processes. Semi-structured on-line interviews using an interpretative research approach were conducted. The 12 pre-school mentor teachers participated in the research on voluntary basis. After thematic analysis of the interview data, the 2 major themes and 5 sub themes have emerged. Pre-school educators perceive self-authorship as a cognitive journey, i.e. the process of creating their own personal qualities and self as a mentor via helping others, as well as cognition of the young educator's motivation to work in pedagogy and develop themselves at the same time. Self-authorship manifests an informal assistance to mentees. This support presupposes the need for collegial learning, sharing of experience, that promotes the overall growth of the whole teaching staff. The study findings express the need of a deeper analysis of how self-authorship contributes to the formation of a new role of a teacher-mentor in pre-school education. It is also necessary to explore the propensity of pre-school educators towards collegial learning in a more detailed way. Finally, the study contributes to the understanding of the critical concept of self-authorship in professional contexts.

Keywords: sefl-authorship, pre-school teacher, pre-school education, mentoring, semi-structured interview.

1. Introduction

Self-authorship, as an "internal capacity to generate one's own views on the world, oneself, and relationships with others" (Baxter Magolda, 2014: 25) is receiving increasing attention from researchers. The most extensively researched is students' self-authorship (McGowan, 2016; Ricks et al., 2021; Cohen et al., 2013; Pizzolato, 2003; Sandars, Jackson, 2015), the self-authorship of

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future teachers being relevant as well (Brownlee et al., 2011; Mascadri et al., 2017; Survutaitė, 2006). Among the research themes there are also highlighted the issues of the impact of teachers on students' self-efficacy (Stone, Surmitis, 2018; Mondisa, Adams, 2020) and the interrelation between students' peer mentoring and self-authorship processes (Del Prato, 2017; Pizzolato, 2008). However, there are few scientific sources that help to reveal the phenomenon of self-authorship at an older age, especially when social contact is established between a young, less experienced person and an older one with more professional experience, as it is in the process of mentoring. Gunersel et al. (2013) state, that self-authorship enables the continuous accommodation to new phenomenon and ideas. Thus, studying how pre-school teachers exercise self-authorship in their role as mentors provides a valuable insights into the contextual aspects of development. In order to reveal the phenomenon under discussion, first, a literature review focusing on self-authorship within the lifelong process was conducted by constructing a conceptual framework for this study; the second part presents the research methodology and method; qualitative research findings are presented and discussed according to research questions.

2. Literature review

The self-authorship concept has been analysed by a great number of researchers (Pizzolato, 2008; Brownlee et al., 2011; Gunersel et al., 2013; Sandars, Jackson, 2015; Del Prato, 2017; Stone, Surmitis, 2018; Ricks et al., 2021). Their main ideas can be generally interpreted concentrating on the statement that individuals' self-authorship continues to develop throughout their lives as they grow into new roles. Still, this major issue is very closely linked to leading theory of Baxter Magolda (Baxter Magolda, 2012, Baxter Magolda, 2014, Baxter Magolda, 2020), stating that self-authorship is "a holistic meaning-making capacity" that is characterized by internally dictating one's beliefs and values instead of depending on external values and figures (Boes et al., 2010: 4). Pizzolato (2003) defined self-authorship as a relatively enduring way of understanding and orienting oneself toward provocative and uncomfortable disequilibrating situations in which the person recognizes "a) the contextual nature of knowledge and b) balances this understanding with the development of his or her own internally defined goals and sense of self, which may be expressed via created personal interior voice" (p. 32).

The underlining of enduring way of understanding and orienting oneself toward provocative and uncomfortable disequilibrating situations, the development of his or her own internally defined goals and sense of self may imply the fact that at each stage of personality development, an individual faces significant challenges and obligations at that time, sets different goals for himself, and solves new life problems. Today, pedagogues have to balance the scope of very different needs (personal, educational, work, family), change themselves and change their students, solve problems of the content of the pedagogue's professional role, respond to the demands placed on his/her activity and personality.

Even bigger challenges are faced by young pedagogues who have just started working, who, according to Monkevičienė and Rauckienė (2010), experience "a reality shock" after feeling a huge difference between their visions and the realities in schools. What happens in the surrounding reality and in one's life is beyond the control of one's capabilities, but trusting one's interior voice, identifying and following one's inner authorities and beliefs help one choose the way how to respond to these events. Trusting personal interior voice allows you to be more flexible and adapt to change. This ability to manage and grow through interactions across diverse contexts while balancing divergent needs, values and beliefs is reminiscent of self-authority, as Pizzolato and Olson (2016) describes. It is emphasized that self-authorship begins when a person is able to integrate and harmonize three dimensions: personal beliefs (epistemological level), identity (intrapersonal level) and social relations (interpersonal level) (Pizzolato, Olson, 2016; Augustiniene, Ciuciulkiene 2013). Epistemological foundation refers to "the evolution of the assumptions about nature, limits, and certainty of knowledge;" intrapersonal foundation can be described as "individuals' sense of who they are and what they believe;" and interpersonal foundation refers to "how one perceives and constructs one's relationships with others" (Baxter Magolda, 2014: 28). Thus, it is possible to state that self-authorship is a complex process that manifests itself through self-knowledge (development of positive qualities and changing negative qualities), realization of one's aspirations (goals), value system (formation of attitudes, beliefs, attitudes, priorities), relationship with the environment (communication), taking over experience and sharing it.

Self-authorship growths from external to internal forms of meaning making (Edwards, 2014). The developmental process toward self-authorship conform to what Baxter Magolda (2012) calls *The Learning Partnerships Model* (LPM). The model can take place in educational, workplace, or community settings, and is based on three main assumptions as presented in Table 1.

Self-authorship also takes place in the mentoring process. Premkumar (2007) observes that the mentor uses his/her own experience as the main source of knowledge and shares it with the mentee, promoting the learning process and individual growth. It is important for the mentor to know the mentee, identify his/her opportunities and encourage him/her to engage in the processes of self-knowledge, self-esteem and continuous self-improvement and self-realization. The research, that explored students' progress towards self-authorship after completing an authentic workplace learning, showed that mentors co-construct self-authorship strategies with mentees; work with their mentees to help them learn how to build persistence; want their mentees to recognize their own strengths to exude confidence; and learn about their mentees' experiences (Mondisa, Adams, 2020). Work placements proved useful for gauging and developing self-authorship, making meaning of students' learning experiences (Jackson, Trede, 2020). In alignment with dimensions of the learning partnerships model, mentors' engagement with mentees contributes to mentees' development as self-authors of their experiences.

If we assume that in reverse mentoring young and technologically adept junior members can consult senior colleagues (Kemmis et al., 2014), it is possible to look for the incentives of senior teachers for self-authorship. Kochan and Trimble (2000) argue that if the mentee is not waiting to be discovered but rather is discovering him/herself, and the mentor, rather than serving as a font of perfect knowledge, become a co-learner in a process of discovery, this relationship is seen to grow into a mutually developmental one. Thus, mentoring as a construct has shifted away from the traditional notion of being a hierarchical, one-way relationship (Ragins, 2012) to a developmentally enriching relationship.

Conceptual framework and research questions

Noting that little empirical research had linked self-authorship and mentoring, we tried to extend the development of self-authorship within mentoring process in workplace settings. An understanding of developmental transformations a conceptual framework, that represents ways of thinking about a problem or ways of representing the inner workings of complex phenomena (Bordage, 2009), is required. The conceptual framework for this study (see Table 1) is based on the LPM (Baxter Magolda, 2012), that, as Meszaros (2007) noticed, grows from the tenets of self-authorship and provides a practice model linking learning and development for implementing the transformations needed to become self-authored. Mentoring serves a developmental purpose as well with the mentor fostering the development (Ragins, 2012).

Table 1. Conceptual framework for self-authorship within mentoring process build on LPM Assumptions

Dimensions of self-authorship (Baxter Magolda, 2012)	LPM assumptions (Baxter Magolda, 2012)	Mentoring process
Epistemological	Knowledge is complex and socially constructed	Construction of knowledge and belief system in the context help to build persistence in everyday activity
Intrapersonal	Self is central to knowledge construction	Construction of own identity on personal beliefs and values, recognition of own strengths
Interpersonal	Shared authority and expertise in mutual construction of knowledge among mentor and mentee	Development of the capacity for interdependence and interaction with different social groups

In Table 1, three dimensions of self-authorship are promoted by way of mentoring:

- the personal epistemological dimension – Knowledge about pre-school child education – during the mentoring process means, that prior assumptions are evaluated, interpreted, and judgements in light of evidence relevant to the context are constructed to develop own internal belief systems (Baxter Magolda, 2012). Construction of knowledge and belief system helps mentees to learn how to build persistence in everyday activities at work placement (Mondisa, Adams, 2020);

- The intrapersonal dimension – Sense of self – reffers to internal identity or personal beliefs and values about the self and work with childs that support the knowledge construction process. Developing self-authorship within mentoring process, the mentees need to sense how they explore, reflect on and internally choose enduring values to form their identities rather than by simply using those of others (Edwards, 2014);

- the interpersonal dimension – Sharing authority and expertise assists in the mutual construction of knowing. During professional engagement, as Edwards (2014) describes, the self-authored person respects one's own and others needs, negotiate other perspectives and engage in genuinely mutual relationships. Such person is able to interact with different social groups, are less judgemental and more open.

Therefore, development of self-authorship by way of mentoring requires mentees to think critically about what brings meaning to their professional engagement, and mentoring offers a coaching mechanism that guides the developmental process. The question arise, whether self-authorship is only a one-way process in the mentoring. Therefore, in this study, we tried to look at mentoring from a different perspective addressing the research questions as follows:

- how the phenomena of self-development and mentoring are perceived at an older age?
- what are the preconditions for the emergence of self-authorship in mentoring process?
- what kind of interrelationships between these processes they experience?
- what are the characteristics of the interaction between self-development and mentoring?

3. Method

The lack of research revealing the relationship between self-authorship and mentoring led to the fact that a qualitative research paradigm was chosen for empirical research, which helps to know and understand human experience and social reality, to reveal the subjective meaning and interpretation of cases of individual experience without separating them from the context (Creswell, Poth, 2016). Qualitative research is based on induction and the description of results, and its purpose is to explore and understand complex phenomena, with their characteristics, and to present various meanings and viewpoints about the studied phenomenon from the perspective of research participants (Creswell, Poth, 2016; Flick, 2018; Vaismoradi et al., 2016). The qualitative research approach creates the preconditions for obtaining data on self-authorship during mentoring as a little-researched social phenomenon directly from the research field, revealing the meanings, motives and practices of the research participants' perceptions. A semi-structured interview was used to find out how the research participants understand self-authorship and mentoring, what interrelationships they experience between these processes. During the interview, open-ended questions were used to obtain detailed descriptions of the studied phenomenon (Smith et al., 2009).

Using qualitative datasets, samples must be selected purposively in accordance with the research questions (Joffe, 2011). Therefore, research participants were selected using criterion sampling. The following criteria were applied:

- have at least a higher pedagogical education,
- have at least 3 years of age work experience in the field of preschool education,
- engage in mentoring.

A total of 12 participants were included in the study. All of them had higher education, and their work experience in preschool educational institutions ranged from 12 to 40 years. Research participants had to be involved in mentoring from one to several times. The number of participants involved meets recent guidelines for sample size in qualitative research (e.g. Baker, Edwards, 2012; Fugard, Potts, 2015). For instance, Baker and Edwards (2012) consider that a relatively few people, such as between six and a dozen, may offer insights into little-researched problem.

While following the main ethical principles of the study, the participants were introduced and explained the purpose of the study, the usefulness of the study, as well as the right to safety, privacy, confidentiality, and fairness were ensured. Study participants took part in the research voluntarily, and individuals' agreement was obtained. In order to ensure and maximize the security of research participant's identification, they were coded as T1 [Teacher1], T2, etc., participants.

Due to the pandemic situation, the interviews were conducted online. Each interview lasted from 45 to 60 minutes. To ensure the internal validity of the study, the most accurate method of data recording was chosen – the interview was recorded, then the text was transcribed verbatim. The detailed data were received.

Following Clarke et al. (2015), the thematic analysis was conducted in the following sequence: familiarization with the data (transcribing the data, active and repeated reading of the data, searching for meanings and noting primary codes, initial research ideas); generation of primary codes (selection of data ideas, systematization of repeated codes into meaningful groups, comparison of data with code correspondence); searching for themes (grouping codes into broader themes, assigning data to each potential theme, thinking about connections between themes and codes, interrelation among themes, regrouping themes); review of topics (assessment of internal homogeneity and external heterogeneity of topics); definition and accurate naming of topics (assessment of consistency of topics, creation of clear names for topics); description of the analysis process (selection of the most vivid and vivid examples of data, final description of the data, interpretation, argumentation, linking it to the research question and scientific literature). For greater reliability, the authors of this work performed the first stage of the thematic analysis, namely the initial coding of the available data, independently of each other, and then checked the correspondence of the extracted sub themes and themes.

4. Results

During the qualitative research, applying the data processing method of thematic analysis, two major themes were formed, which reveal the phenomenon of the interaction between self-development and mentoring of preschool teachers, consisting of continuous cognition and teamwork processes. In the narratives of the participants, these processes are so closely interrelated that they can only be separated analytically. Therefore, we see the relationship between self-authorship and mentoring as two sides of the same coin.

Table 2. Data analysis result

Themes	Sub-themes	Codes (frequences)
Self-authorship as a journey of cognition	The process of self-knowledge	Continuous self-improvement (7) The need for self-assessment (5) Association with traveling (4)
	Knowing the motivation of the young pedagogue for self-authorship: when theoretical knowledge is not enough	Theoretically inclined young specialists (8) Feeling the motivation of a young person (7) Importance of self-authorship (7)
	Developing oneself in the role of a mentor by helping another	Personal and professional growth (9) Incentives to be active (6) Two sides of mentoring (5)
Mentoring as a team growth	Informal help inspired by empathy	Support, encouragement are needed (9) "A friendly help" (5) Empathy for a young specialist (4)
	Community professional development	Team work (10) Opportunity to learn from several senior colleagues (8)

In Table 2, the themes, sub-themes and the codes with frequencies of participants' statements are desplayed. Following this sequence, the data of the study on the self-authorship and mentoring processes of preschool teachers will be presented.

Self-Authorship as a Journey of Cognition

The research revealed that when discussing the phenomenon of self-authorship the participants talk about self-education in general, as a process common to all preschool education pedagogues (even all people), and then link it to the self-education of young pedagogues and experienced pedagogues.

The Process of Self-Knowledge

Research participants understand self-authorship as continuous self-improvement: *I understand self-authorship as self-improvement. And it seems to me that self-authorship must take place throughout a person's conscious life* (T1). *The process of self-authorship is the development of the person himself/herself* (T6).

In this process, according to the research participants, it is necessary to self-assess what the person is missing. Some participants indicate that it is necessary *to polish* what a person lacks: *his/her personality, his/her will, character traits* (T1), *spiritual and value attitudes* (T2). Others believe that *it is necessary to find those strong beginnings in oneself and improve them as much as possible* (T6), because one cannot know everything. Although the elements of the intrapersonal dimension (Pizzolato, Olson, 2016), such as will, character, values, are mentioned, the respondents' answers often include elements related to the dimensions of epistemology and interpersonal communication: *identification of knowledge, abilities* (T11), *continuous improvement of professional abilities* (T2), *improvement of subject, didactic, social and personal competence* (T6); *ability to work in a team, communication, cooperation* (T2 and T4).

One participant, talking about self-authorship, presented the association of travel: for her, self-authorship is *like exploration, search and discovery* (T5). In this journey, the participants tend to rely on themselves – *conducting the search themselves, through their experiential development* (T5); it is possible to do this with the help of others: specialists, senior assistants, administration, because *each person brings something new to personal self-authorship* (T8). On the other hand, as participant T5 says, *the trip can be simple, it can be the trip with a guide;* she compares the latter with *exploration.*

The research participants commented on the need for self-authorship quite modestly*: many innovations, modern technologies: [need] to be able to use various angles* (T9). Thus, the process of self-authorship, in the words of the research participants, could be described as a never-ending journey of knowing and creating oneself as a person and as an employee.

Knowing the Motivation of the Young Pedagogue for Self-Authorship: When Theoretical Knowledge is not Enough

The concept of self-authorship is extended and made concrete by describing the beginning of the young pedagogue's professional activity in a preschool educational institution. Almost all research participants describe the young pedagogue as having a lot of theoretical knowledge, but little practice: *... when we come to the institution, we immediately encounter practice. <...> Because there is no time to remember those theories here, but you need to work immediately ...* (T7). *This is where the need and opportunities for self-development arise: ... self-development is very important, because I see what I lack, when a young educator comes to an institution, with his great knowledge, I see that I lack this, that, some other professional skills, and then I myself analyze what I need and then in the areas where I see I have gaps where I don't know what to do, for example with the pupils with special needs or gifted pupils, then I dash to create myself, I dash to read, look for material, look for people who would help me ...* (T11). Here appears the needs and possibilities for self-authorship.

All research participants emphasize the motivation of a young specialist: *it is important to find a motivated young person who wants to do pedagogical work* (T6). Because *if that young pedagogue doesn't want to, then you can do anything you want* (T1), nothing will help. When a young person comes, the older educators quickly understand and immediately feel <...> if he/she is in his/her place* (T5).

Retrospectively recalling their first year at the educational institution, the pedagogues who took part in the research note that self-authorship helped them *to gain self-confidence, to be able to listen to other people and their opinions, as well as to choose what is necessary and what is not* (T12). Two levels can be distinguished in the presented answers: *personal level (self-regulation, self-control* (T3); *... I learned to dig deeper into myself and personal values* (T2)) and *professional activities (problem solving, understanding emotions, for example, children's and own* (T4)).

Developing Oneself in the Role of a Mentor by Helping Another

The self-authorship of the mentor (experienced pedagogue) received more consideration from the research participants. The research participants associate their self-care with both personal and professional areas*: ... in the process of self-authorship, you put information and knowledge into yourself, promote self-confidence, develop yourself, improve personal qualities and you can use all this as a mentor* (T2); *... professional self-authorship is very important in our work. While being a mentor we can convey or transfer self-authorship skills, to a younger specialist* (T12).

The position of a mentor presupposes an incentive to be active in the professional field*: ... what kind of mentor can he/she be, if he/she is not interested, does not seek innovations, does not look for changes, is stuck only in his/her own narrow activity field <...> It is important to seek to know more, to be eager to share and know how to share the experience, <... > not to be, as they say, omniscient all my life, relying on what was learned several decades ago ...* (T6).

Motivations for self-development do not only arise from the awareness of the need to adapt to the change; the contact with a young person also presupposes them. As the research participants note, *young pedagogues bring to the institution an extraordinary amount of new things, new ideas, new winds* (T10), as well as *practical things, methodological tools, where I could also use them (T3).* It happens that young colleagues are not omniscient either, so one has to research, search, and discover: *... you learn very, very, many new things from your young specialists. And this is necessary for my own self-authorship... I realized that I cannot get everything from that young student, that I must be interested myself, look for opportunities, attend seminars, lectures. <...> The young specialist initiates our own development and shows the directions of development* (T5).

A two-folded situation arises: on the one hand, the mentor helps a younger colleague with his/her knowledge and experience, on the other hand, that help becomes an iniciative to improve oneself, not to stand still in one place: *... so that I can not only know things myself, but also convey my knowledge to others or to give a beginner a piece of advice and help to the teacher* (T2). Or as another participant says*:... during mentoring, you build yourself <...> you help others, and you improve yourself"* (T10). In this way, preschool teachers see the essence of self-authorship in helping others.

Analysis and reflection become the most important instruments in the process of self-authorship. Research participants note that they must constantly analyze their activities... *This helps to get to know the other person better, to direct his/her efforts in the right direction, and also to improve oneself: ... you have to analyze your activities - am I doing the right thing? Am I guiding the person to the right direction? Do I see the personality traits that young specialist lacks* (T11); *...we must want to search, to analyze what we see, what we hear, ponder, reflect and improve* (T6).

Mentoring as a Team Growth

Linking self-authorship with mentoring, the research participants highlight mentoring as an informal activity that is common to their institutions and as a group learning from each other.

Informal Help Inspired by Empathy

Mentoring in a preschool educational institution is informal – *there are no programs for the adaptation of young educators or formal procedures of the institution determining the appointment of a mentor. Usually it is an informal request from the head of the institution to help a young teacher: Well, you see how this young girl is doing, help her"* (T1). Or *the young colleagues approach each other for the consultations about one or another professional issue* (T2). Therefore, the research participants present unanimous opinion *that mentoring in their educational institutions takes place in an informal way* (T11). *This friendly help, as the participants themselves call it, is inspired by empathy, seeing how a new specialist <...> digs, works somehow ...* (T4). The reverse side of this friendly help is that the research participants become more empathetic by developing themselves: *empathy and interior goodness simply come from self-authorship, from self-development* (T2). According to research participants, *being empathetic makes one a better person and a better mentor* (T4). Thus, self-authorship in this informal help can be expressed as the development (formation) of positive character, which enables a person to be useful to people working in the organization.

Community Professional Development

A sense of community clears out when the participants of the research start to analyse the pecularities of mentorship in preschool. The participants agree that mentoring should be a team

work effort: *...we should all work as a team, not individually* (T6). As one participant states*: it should be like a circle of mentors and we would have some kind of general plan according to which we could raise, improve, finally, analyze those results, each mentor's sharing of good experience among other mentors would be of high quality* (T5). According to the participants, pedagogues should work together with the administration so that young professionals feel welcomed*: they should be warmly accepted in the school not only when they fall into a certain group, but simply feel invited into the whole teaching staff team* (T4).

Preschools *have successful teachers* (T6), so according to the participants, *it would be useful for a beginner to work with several senior teachers to see several educational options* (T3). The participants notice that new employees with their fresh ideas also strengthen that sense of community: *sometimes even a novice pedagogue brings more innovation than a senior pedagogue. This is how we become a community, develop and grow professionally together* (T2). It is noticeable that collegial, communal development is valued in the pre-school education institution, and the content of self-authorship is manifested here through the sharing of knowledge and experience.

5. Discussion

This study contributes to the wider research of self-authorship by revealing the peculiarities of self-authorship in the process of mentoring. It reveals the incentives that pedagogues encounter while interacting with young colleagues of preschool teachers. This study also contributes to the understanding of the critical concept of self-authorship in professional contexts, while also suggesting how new domain-specific challenges can become opportunities for incremental, and yet professionally important, growth. The discussion part will contain the answers to the raised research questions.

How are the phenomena of self-development and mentoring perceived at an older age? What kind of interrelationships between these processes do they experience? The analysis revealed that both processes – self-authorship and mentoring – are closely related to each other. We have used a metaphor of a coin with both sides: reverse and obverse to argue that in older age it is understood as inseparable processes. On the one hand, mentoring is the help to another person. When mentors encounter a new colleague, they immediately assess the practical experience (more precisely, the lack of it) and personal motivation for work and development. It becomes the axis of mentoring process and the young colleague's education. On the other hand, as the participants of the research state, by helping others one improves oneself both: personally and professionally. When meeting a new colleague, mentors encounter knowledge (more often) and experience (less often) transferred, as Kemmis et al. (2014) says, from outside the organization. The desire to know professional current affairs (educational trends, modern tools and methods) is perhaps the biggest intention to form one's identity as a mentor, and thus to indulge in the self-authorship.

Another metaphor used in this study is the journey. This metaphor has already the archietipical meaning and is connoted in major educational concepts such as "curriculum", "methods" and others. Metaphor of the journey is used by many authors when talking about mentoring and seeing the transformative effect on the personality (Mason, Hickman, 2019; Atkinson, 2018; Spencer, Molina, 2018, etc.). We applied "the journey metaphor" to describe the process of self-development in later life. As it was said before, according to each case of mentoring, pre-school teachers are reshaping themselves.

What are the characteristics of the interaction between self-development and mentoring? In this research, it has became clear that the research participants understand self-authorship primarily as continuous self-development process. In the literature, self-authorship is also associated with improvement and a lifelong development process (Kolbergytė, Indrašienė, 2013). When self-authorship is understood as continuous improvement, it is identified with the learning process. Thus, the emphasis is placed on the cognitive (or epistemological) dimension. In our study, the cognitive dimension was highlighted clearly, the interpersonal dimension was sufficiently important, and the intrapersonal dimension was the least expressed. Similar results were obtained by Gunersel et al. (2013), who studied how pedagogical training programs can create opportunities for faculty members to exercise their self-authorship to develop as educators. Only they found a connection between all three dimensions in their research: the three foundation dimensions influenced each other and were linked to one another (Gunersel et al., 2013: 40). Meanwhile, research on college students talks about the asynchronous relationship between these three dimensions: although the intrapersonal dimension was the most common leading dimension, the greatest amount of development occurred along the cognitive

dimension and the interpersonal dimension was most likely to show developmental regression (Pizzolato, Olson, 2016: 411). The low attention to the intrapersonal dimension in our study can be explained by the peculiarities of the development of senior age, when both personal and professional identities and value systems have already been formed.

What are the preconditions for the emergence of self-authorship in mentoring process? The literature mentions formal and informal mentoring, where the former is characterized by a regulated and pre-established structure by the organization. The latter occurs naturally through the relationships and connections that are developed (Inzer, Crawford, 2005). In the pre-school education institutions that we studied, informal mentoring, manifested in empathy and friendly relations with the mentee prevails. The absence of formal mentoring programs allows this process to be formed "from the bottom upwards", i.e. responding more to the needs and expectations of the process participants themselves. And they, as our research shows, are based on communityship – interaction and the desire to learn from each other. This would the preconditions of the self-authorship in the mentoring process that our research revealed.

Other authors call these synergistic and mutually beneficial co-mentoring relationships as a collaborative learning community (Kenahan et al., 2016), which reveals such postmodern workplaces features with interdependent ways of working (Kochan, Trimble, 2000), emotional and social sustain in order to cultivate new work skills and behaviors, focused on individual and spiritual well-being, relational transformation, and professional growth (Kenahan et al., 2016).

Reffering to the Learning Partnerships Model, it is possible to generelise that „community partnerships support self-authorship via three principles: validating learners' capacity as knowledge constructors, situating learning in learners' experience, and defining learning as mutually constructing meaning" (Meszaros, 2007: 12). Additionally, this finding highlights the importance of interacting with young colleagues who are different in age, social background, and practical experience for the exercise of self-authorship, still in spite of it, the mentee and the preschool educator are a good company for each other on the journey of learning and personal development.

6. Conclusion

Preschool teachers perceive self-authorship as a continuous journey of knowing: the process of developing their personal and mentoring competencies, helping others, as well as the young pedagogue's motivation to do pedagogical work and to develop at the same time.

Self-authorship is a significant component of the mentoring process, where its content manifests itself in informal support for mentees, and this support presupposes the need for team/community learning, sharing knowledge and experience, which promotes the overall growth of the pedagogic team.

The findings of this study and their reflection have suggested some insights for a more in-depth exploration of the self-authorship of some preschool teachers. A deeper analysis of the relationship between the identity of preschool pedagogues as mentors and self-authorship is needed, as well as the possible explanations of how self-authorship contributes to the formation of the new role of the preschool pedagogue – mentor. In addition, preschool teachers' inclination to community learning should be explored more deeply, perhaps while comparing it with general patterns of teacher development.

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The Relationship between Principals' Perception of their Leadership Style and Positive Attitudes towards Change in the Light of COVID-19 Pandemic

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Abstract

The global COVID-19 pandemic has caused one of the largest disruptions in world education systems ever in history. This situation has greatly affected the educational systems, causing unprecedented pressure "from above" and the need for strategically unpredictable changes in educational organisations. The COVID-19 pandemic is a recent example of a globally imposed change for nations across the globe. Unlike the organisational change research that has existed so far, school principals have simultaneously become change initiators and executors in their school in the context of this imposed change. In this case, school principals may hold negative attitudes towards the change, and thus resist change implementation and do not support their school community members. Therefore, the paper examines whether, and to what extent, school principals' leadership style (adaptive, distributed, collaborative) predicts their positive attitudes towards change. For this purpose, 229 school principals from Lithuania took part in this study. A quantitative research strategy, using adaptive, collaborative, and distributed leadership, and attitude towards change scales, was applied. The findings from multiple linear regression reveal that adaptive, distributed, and collaborative leadership styles are positively related to their positive attitudes towards change. More specifically, adaptive leadership is the strongest predictor for school principals' positive attitudes towards change. The study uncovers the under researched

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connection between the leadership style and attitudes towards change in the light of the imposed changes and gives practical implications for the future.

Keywords: COVID-19, adaptive leadership, distributed leadership, collaborative leadership, principal, attitudes towards change.

1. Introduction

Similar to organisations in other sectors, educational organisations have been affected by the COVID-19 pandemic. School principals' role in the processes of organisational change is crucial, and even more crucial now, when educational systems around the world face with the imposed change. Van Wart, Kapucu (2011) note that to overcome these changes, there is little preparation and decision making occurs outside the organisation, whereas the change affects the entire organisation. It is in the context of the pandemic that school principals have become executors of national guidelines, and coordinators of crisis management in schools and communities. In other words, school principals have not become the initiators of change, but rather its recipients. Yet on the other hand, in the absence of a clear strategy for the implementation of the change at the school level, they had to search for ways and solutions to manage the changes in the organisations. And it is even more important that this change is understood, accepted, supported, and successfully implemented by the school community. The existing literature has not yet fully revealed how, under the conditions of the imposed change, the principal acts simultaneously as an initiator and an executor of change. In this dual role, school principals must personally be able to change and adapt to changes. Therefore, we believe that not only principals' openness to change (Harris, 2001), perception or belief about change (Goodson, 2001), but also their own readiness for change (Zimmerman, 2011), commitment to change (Herscovitch, Meyer, 2002), and positive attitudes towards change (Dunham et al., 1989) is the key leading school in the COVID-19 conditions. Moreover, the attitudes of the principal towards change determine the employees' attitudes towards change (Aslan et al., 2008). The study of Walk (2022) demonstrates that leader resistance to change is positively related to follower resistance.

Previous literature has predominantly investigated the impact of certain leadership styles (e.g., transformational or transactional leadership, instructional leadership) on employee reactions to change (e.g. Kursunoglu, Tanriogen, 2009; Leithwood et al., 1994). However, there is gap in studies analysing how certain leadership style is connected to the same person's attitudes towards change. Moreover, the research prior to the pandemic (e.g. Moore, 2009) shows that school principals with appropriate leadership skills and attitudes are likely to manage changes in the organisation more successfully. Yet, the pandemic situation itself is changing the leadership employed by school principals and its nature (Harris, 2020). The scientific studies conducted in the context of COVID-19 (e.g., Azorín, 2020; Harris, 2020; Harris, Jones, 2020; Leithwood et al., 2020; Thornton, 2021) reveal that there is a reorientation of school principals towards collaborative, distributed, and adaptive leadership. Thus, the lack of research analysing the relationship between leadership styles and attitudes under the conditions of imposed change determined our aspiration to scientifically assess the relationships between different leadership styles (adaptive, distributed and collaborative in the case of our study) of school principals and their attitudes towards change under the conditions of the COVID-19 pandemic. Assuming that some leadership styles encourage the principals' positive attitude towards changes more than others, we raise the research question – whether, and to what extent, school principals' leadership style predicts their positive attitudes towards change.

2. Theoretical Background
2.1 Attitudes toward Change

Change is the process in the organisation, which can either positively affect the organisation and promote its development or result in failure and negative consequences for organisation. In many cases, it depends upon the leader's attitudes and behaviour, which could influence the development of successful change strategies and enhance the health of applicable organisational cultures (Stauffer, Maxwell, 2020). Attitudes of individuals towards change are one of the most significant factors, which determine successful and sustainable reforms in schools (Aslan et al., 2008). Therefore, the aforesaid authors claim that attention should be drawn to principals' attitudes towards change before proposing changes in schools.

Attitudes are internal dispositions of an evaluative nature, which determine a person's reactions towards a situation and their behaviour (Ajzen, 2012). According to the theory of planned behaviour (Ajzen, 1991), attitude is based on the beliefs a person holds regarding the consequences of behaviour, knowledge (not necessarily correct or factual information) and experience, which he or she has, and is defined as a tendency to respond to an object in a favourable or unfavourable way (Ajzen, 2020). In other words, a person has a positive or negative reaction to a specific object. Thus, evaluation is the key aspect of attitude-like construct. Attitudes can differ in their strength, stability, and resistance to change (Ajzen, 1991). It may depend on the extent to which the object or issue is important and personally relevant (the so-called personal relevance) for a person, on how much direct experience was gained with the attitude object, as well as on the attitudinal extremity. The stronger and more stable the attitude, the better a person's behaviour is predicted (Ajzen, 2012). A person's attitude shapes his or her behavioural intention, which in turn is related to his or her behaviour: the person will choose the option that is associated with the strongest intention. This is referred to as a decision-making model regarding an individual's behaviour (Ajzen, 2020).

In this study we focus on principals' attitudes towards change. While analysing this construct, we refer to a three-dimensional model of attitudes towards change, proposed by Dunham et al. (1989), which is composed of: cognitive, affective, and behavioural dimensions. The cognitive dimension of an attitude defines a person's thoughts directed at the attitude object. It consists of the information and beliefs that a person possesses about the object (Eagly, Chaiken, 1993). The affective dimension describes a person's feelings when the attitude object is encountered with. A person's emotions can be either positive or negative, depending on how the person evaluates the attitude object (Eagly, Chaiken, 1993). In other words, the affective dimension reveals the extent to which a person likes, enjoys, or dislikes changes in the organisation (Dunham et al., 1989). The behavioural dimension defines the way a person intends to behave towards the attitude object: depending on how a person evaluates the attitude object, his or her behaviour will be either supportive and encouraging or hindering and opposing the attitude object (Eagly, Chaiken, 1993). Thus, the principal perceives and interprets, as well as develops feelings regarding the change; whereas these cognitive and affective reactions to change determine his or her tendency to act in one way or another. Summarizing, attitudes towards change refer to the evaluation of the change, which is manifested by a person's positive or negative reaction to that change. Therefore, a person's attitudes towards change can play an important role when explaining why the members of an organisation might choose to support or resist the organisational change, and how much effort they will expend in exchange (Dunham et al., 1989; Kin et al., 2018). Hence, seeking for positive changes in an organisation, managed and implemented employees' attitudes need to be understood. School principals' attitudes towards change are even more significant, since they determine not only principals' behaviour regarding the change, but also teachers' attitudes and behaviour through principals' behaviour (Kin et al., 2018), as well as the success or failure of the change implementation at school in general (Dolph, 2017; Preston et al., 2013).

There are numerous studies that confirm the relationship between employees' positive attitudes towards change and successful change implementation (Walk, 2022), as well as those proving that negative attitudes are one of the major contributors to the high rate of organisational change failure (Mukhtar, Fook, 2020). Yet, there is a lack of research analysing principals' attitudes towards change. Seemingly, the most frequent assumption is that principals have positive attitudes towards change. However, the research findings do not confirm this assumption. For instance, the study conducted by Sarafidou, Nikolaidis (2009) reveals that the perceptions of the principal as a 'responder' to change (low level of facilitation) were held by 33 % of the teachers and were associated with less positive attitudes towards school change, half of the teachers perceived their principal as the 'manager' of change (medium level of facilitation) and only 17 % as its 'initiator'. In order changes to be successfully implemented in the organisation, the school principal themselves must first have positive attitudes towards change, because only then will they be able to inspire the school community for successful changes (Heim, Sardar-Drenda, 2021).

Hence, based on the theory of planned behaviour as the conceptual framework (Ajzen, 1991) and Dunham's et al. (1989) three-dimensional model of attitudes towards change, in this study we analyse principals' attitudes towards change as a significant factor of the successful implementation of changes, caused by the COVID-19 pandemic, at school.

2.2. School Principals' Leadership in the Context of Change

A number of researchers (e.g., Fullan, 2007; Leithwood, Strauss, 2009) underline that the principal is the main factor in implementing change and innovation at school. Scientific studies emphasise on such abilities of school principals as an ability to initiate the change process competently (Kin et al., 2018), to manage the change (Kotter, 2012), to facilitate the change (Fessehatsion, 2017), to prepare the staff for the change (Baesu, Bejinaru, 2013), and others. Consequently, school principals not only perform administrative functions, but also act as a change agent (Fullan, 2007). In this act, the importance of school principals' attitudes towards change – positive or negative – is highlighted. It stands to reason that if principals are resistant to change then, far from leading as change agents, they may impede the capacity for change (Aslan et al., 2008).

It is well known that principals' leadership has differing relations to school change depending upon the leadership style; for example, instructional leadership to teachers' attitudes towards change (Kursunoglu, Tanriogen, 2009), transformational leadership to teacher commitment to change (Leithwood et al., 1994; Yu et al., 2002), distributed leadership to teachers' affective commitment to change (Thien, 2019), etc. Yet, there is a lack of scientific evidence, how the leadership style employed by the principals themselves is related to their positive attitudes towards change. Moreover, consenting to Harris (2020), COVID-19 has dramatically changed conceptions of leadership and leadership practices. Thus, it is important which leadership strategies school principals have employed during the pandemic (Brown et al., 2021) in order overcome the issues caused by the pandemic, and more specifically, how these leadership strategies are related to their positive attitudes towards change.

According to Dirani et al. (2020), in the conditions of the COVID-19 pandemic, leadership role includes the roles of a sense-maker, technology enabler, emotional stability and employees' well-being, innovative communication, and maintenance of the financial health of the organisation. Consequently, the pandemic highlighted another area, which had attracted less attention so far – namely, employees' well-being, issues of student and staff health, motivation of the staff to act in new conditions, to learn and adapt to new conditions. In these conditions, the importance of the school principal's role as an adaptive leader became apparent. The study on the Catholic Education in Australia, conducted by Goode et al. (2021) revealed that "adopting an adaptive leadership approach were found to be helpful in responding rapidly to remote learning provision" (p. 36). Yukl, Mahsud (2010) note that adaptive leadership is important when unusual events disrupt the work or create an immediate problem that requires the leader's attention. Dunn (2020) argues that basically the pandemic itself is a global adaptive challenge, where the usual performance models and solutions are not suitable. In other words, to overcome the challenges caused by the pandemic, a technical solution to the problem is not enough, it requires an adaptive approach. Thus, is also confirmed by the study of Collins-Warfield, Niewoehner-Green (2021), which was accomplished with 55 educators from 43 school organisations in the United States and other countries. Their study revealed that during the first months of the pandemic, school leaders and educators "were brave enough to try new approaches and create new structures, even when they weren't sure what would work" (p. 11). As the developers of adaptive leadership, Heifetz et al. (2009) claim, the adaptive side of change does not have a clear solution, so it forces individuals, communities, and/or organisations to search for, experiment, and develop new operating models. Heifetz (1994) maintains that adaptive leadership demands adaptive learning, i.e., learning that requires unlearning of old values, assumptions, or mindsets, and learning new ones. In other words, it is related to the changes in habits, values, assumptions, beliefs, or behaviour (Heifetz, 1994). It is recognised that such learning causes a lot of negative feelings: psychological pain, a sense of loss, stress, distress, anxiety, and suffering (Heifetz, 1994). Therefore, it is natural that without positive attitudes towards change, school principals hesitate to act as adaptive leaders. Thus, the adaptability of school leaders should be viewed not only as a framework, but also as a capability. Dunn (2020) refers to it as adaptive mindset and underlines the importance of the 'adaptive stance' of a school principal (which means "constantly looking for ways to test their knowledge about the teaching and learning within their unique school context" (p. 36) in the context of complex changes, such as those caused by the pandemic. Bagwell (2020) advocates that "by adopting an adaptive approach to leadership, school leaders can build resiliency and capacity for their school communities to weather future disruptions cause by the pandemic" (p. 30-31). Thus, we assume that only the leader that has positive attitudes towards change will be inclined to solve challenges by non-technical means.

Meanwhile, other studies (e.g., Harris, 2020; Harris, Jones, 2020; Leithwood et al., 2020; Thornton, 2021) underline the relevance of distributed and collaborative leadership in the COVID-19 context. For instance, Thornton's (2021) research with secondary school principals of New Zealand reveals that principals were most engaged in distributed and collaborative leadership in the pandemic period. As the latter research shows, networking and collaboration outside the school was one of the key changes of the school activity. The importance of networking and collaboration outside the school in the period of a crisis is also revealed in the study conducted by Leithwood et al. (2020). The authors claim that a school principal should have an ability to make connections and facilitate collaboration outside organisational teams. On the other hand, in the face of sudden and unknown changes, leaders will also need the support and cooperation of all employees within the organisation (Harris, Jones, 2020). In other words, the principal, more than ever, will need the involvement and sharing of responsibilities by all members of the community to avoid leader's burnout. Agreeing with Harris (2020), we believe that distributed leadership becomes a necessity rather than choice in the pandemic conditions. Harris (2020) claims that in times of challenge, leaders need to establish and sustain a collaborative culture involving the use of connected networks among people. Thus, distributed leadership becomes essential seeking for the successful implementation of an unexpected change. In the situation of the COVID-19 pandemic, in the presence of "pressure" from above and the implementation of change in the organisation, shared leadership and cooperation are important on several levels, i.e., externally (with other institutions at the municipal and national level) and internally (collaboration and delegation in the organisation). Azorín (2020) identifies the reorientation of school principals to shared, collaborative, and distributed leadership during the pandemic as one of the positive aspects of the pandemic. Thus, school principals became change recipients at the same time. As it has been noted by scientists (e.g., Piderit, 2000; Walk, 2022), change recipients can resist and hinder the implementation of changes, as this requires a change in attitudes, values, and work habits. Therefore, facing this imposed change, the school principal, just like any member of the school community, needs to have a positive attitude towards change.

We believe that the analysis of the relationship between school principals' leadership style, employed dealing with challenges caused by the COVID-19 pandemic, and their attitudes towards changes would provide us with useful theoretical and practical implications regarding school principals' behaviour, leading through unexpected changes (imposed changes, when a school principal appears in a dual role – as an initiator and an executor of change at the same time).

3. Materials and Methods
3.1. Sample and Procedure
A quantitative research approach was chosen for the purpose of this article. The data were collected through an online survey. The anonymous survey was conducted in February 2021. The time of conducting this study is important since Lithuanian school principals experienced two COVID-19 lockdowns in their schools during the study.

Convenience sampling was used for selecting participants. School principals and their deputies of all educational institutions in Lithuania (from pre-school to vocational education sector) were invited (by publicly available email address) to participate in the study. According to the Education Management Information System of Lithuania, in 2020–2021 academic year there were 1676 educational institutions (except higher education institutions). The principals and deputy principals who expressed interest in participating received an email with a consent form and a link to the online questionnaire (using Microsoft Office Forms). Their participation was anonymous and voluntary. Two hundred thirty-three respondents filled a self-report questionnaire. Answers of 229 respondents, who completed the full questionnaire, are analysed in the present article. 117 (51.1 %) respondents were school principals and 112 (48.9%) were deputy principals. The maximum experience of managerial work of the research participants was 40 years, while the minimum was 0.5 years. The characteristics of the study participants are presented in Table 1.

The sociodemographic characteristics of the research participants show that the majority (48.5 %) of the respondents belong to the age group of 50–59. The research participants represent schools of different sizes (large, medium, small) and the geographical context of Lithuania

Table 1. Sociodemographic characteristics of the research sample

	Characteristics	N	%
Gender	Female	202	88.2
	Male	27	11.8
Age groups	< 49 years old	66	28.8
	50–59 years old	111	48.5
	> 60 years old	52	22.7
School location	rural area	58	25.3
	city	110	48.0
	big city	61	26.6
School size	large	78	34.0
	medium	77	33.6
	small	74	32.4

3.2. Instruments

The questionnaire consisted of three parts. The first part – the Attitudes Towards Change Instrument (Dunham et al., 1989) – consisted of three subscales, namely 1) cognitive; 2) affective; and 3) behavioural. Each subscale consisted of six items. Examples of the items included in the cognitive subscale are: "Change usually benefits the organisation"; examples of the items included in the affective subscale are: "I find most change to be pleasing"; examples of the items included in the behavioural tendency subscale are: "I often suggest new approaches to things". The statements were rated on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The scores were calculated by averaging, where higher scores reflected a more positive attitude towards change. The finding of Cronbach's alpha ($\alpha = 0.916$) suggests that the whole Attitudes Toward Change scale has an acceptable internal consistency. The second part of the questionnaire was intended to identify the expression of leadership styles. Adaptive leadership was measured using Adaptive Leadership Questionnaire (Northouse, 2016). 30 items were rated on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The scale was adapted as school leaders' self-assessment form (e.g., the phrase 'this leader' was changed into 'I used to'). The sum of points was calculated, where higher scores reflected a more expressed adaptive leadership style. Cronbach's alpha test showed the Adaptive leadership scale to reach acceptable reliability, $\alpha = 0.706$. Distributed leadership was measured using eight items developed by Canterino et al. (2020). These statements were adapted for the education sector by the first and fourth authors of the article and represent different practices of distributed leadership during the COVID-19 pandemic (e.g., "I discussed with and helped my teachers in solving problems caused by the pandemic"). A five-point Likert scale was used for the measures (1 = strongly disagree; 5 = strongly agree). The scores were calculated by averaging, where higher scores reflected a more expressed distributed leadership style. Cronbach's alpha coefficient, which measures the internal consistency of the Distributed Leadership Scale, was satisfactory ($\alpha = 0.739$). The first and fourth authors of the article formulated the statements to determine the collaborative leadership of school principals. Examples of the statements are as follows: "I was involved in the preparation of the national recommendations on how to work during the pandemic"; "The vision of organisational changes was clearly communicated to me as a manager"; "I can always consult with the municipality on the issues of work organisation issues"; etc. Possible responses ranged on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The scores were calculated by averaging, where higher scores reflected a more expressed collaborative leadership style. The Cronbach's alpha score, which measures the internal consistency of the Collaborative Leadership Scale, was satisfactory ($\alpha = 0.811$). The third part of the questionnaire contained questions to determine the respondents' sociodemographic characteristics (gender, age groups) and to define the school they represent.

3.3. Data Analysis

The data analysis was made using IBM SPSS Statistics 22.0. statistical package. Descriptive statistics, which including frequencies and percentages, was used to present the main characteristics of the research sample. Means, standard deviations, kurtosis, skewness, and correlations were calculated to present the general results of the study.

In this research, correlational analysis was used to test the relationship between adaptive leadership, distributed leadership, collaborative leadership, and attitudes towards change. The absolute value of the Pearson coefficient (r) determined the strength of the correlation. Cohen's (1988) guidelines were used to interpret the strength of the association: $0.1 < r < 0.3$ a small correlation, $0.3 < r < 0.5$ a moderate correlation, $r > 0.5$ a strong correlation.

Multiple linear regression was used to estimate the relationship between independent variables and the dependent variable. In order to conduct multiple regression analysis, multicollinearity was checked by correlation matrix and variance inflation factor (VIF). High correlation values (greater than ± 0.8) and VIF > 4 indicate multicollinearity. Autocorrelation in the residuals of a linear regression model was checked with the Durbin-Watson test. The test statistic ranges from 0 to 4. A value near 2 indicates no autocorrelation (Hair et al., 2019). In the regression analysis, the effect size of the predictor variables is given by the beta loadings. In interpreting the effect, the size gives the following guidance: $0 - 0.1$ weak effect, $0.1 - 0.3$ modest effect, $0.3 - 0.5$ moderate effect, and > 0.5 strong effect (Cohen et al., 2018).

Cronbach's alpha was used to determine the internal consistency and reliability of the questionnaire. If Cronbach's alpha ranges from 0, it means that there is no internal consistency; if it ranges to 1, it means the maximum internal consistency score. The Cronbach's alpha of 0.70 or higher for a set of items is considered acceptable (Cohen et al., 2018).

The statistical significance level is paramount when testing the hypotheses. The most generally used statistical differences are grounded on $p < 0.05$ as a rule, thus providing 95 % confidence in the results being recognised as the standard when being contextualised to other research perspectives (Neuman, 2014).

4. Results

In the first step of the analytic process, descriptive statistics were computed for each scale. The obtained results are presented in Table 2. The study reveals that school principals have relatively positive attitudes towards change. The results of the descriptive statistics demonstrate that the mean score of attitude towards change (M = 4) is above scale midpoint 3. The means of the attitude components (cognitive, affective, behavioural) are also higher than the average score, but we can see that the behavioural component of attitudes is rated higher.

Table 2. Descriptive statistics of the study variables

	Min	Max	Mean	SD	Skewness	Kurtosis
Attitudes towards change	3	5	4	0.45	-0.086	-0.262
Cognitive	2.80	5	3.89	0.47	0.062	-0.061
Affective	2.70	5	3.97	0.52	-0.065	-0.545
Behavioural	3	5	4.14	0.49	-0.280	-0.394
Adaptive leadership	14	22	18.13	1.301	0.321	0.677
Distributed leadership	2.88	5	4.10	0.43	-0.068	-0.151
Collaborative leadership	1.44	4.56	3.04	0.64	-0.040	-0.384

The mean of the adaptive leadership scale (M = 18.13) shows that school leaders are characterised by moderately expressed adaptive leadership. The obtained minimum value (Min = 14) reveals that some school leaders are less characterized by adaptive leadership, and the maximum value (Max = 22) shows that some of them are characterised by strong adaptive leadership. Similar results are observed in the case of distributed leadership – the assessment ranges from 2.88 to 5 (M = 4.10). It can be stated that school principals are characterised by moderately and strongly expressed distributed leadership. Meanwhile, the values of the collaborative leadership scale range from 1.44 to 4.56, and the obtained average is only 3.04. In this case, the collaborative leadership of the school principals can be considered as moderately expressed. In other words, in the case of the study, the school leaders were not inclined to collaborate with the Ministry of Education, Science, and Sport, municipality or other national or regional institutions.

Table 3. Correlations between the study variables

	Collaborative leadership	Distributed leadership	Adaptive leadership
Attitude toward change	0.272**	0.402**	0.397**
Collaborative leadership		0.347**	0.128*
Distributed leadership			0.382**

Note. * – Correlation is significant at the 0.05 level (2-tailed).
** – Correlation is significant at the 0.01 level (2-tailed).

Correlational analysis of the research data reveals that the more expressed adaptive, distributed, and collaborative leadership of the school principals, the more positive attitudes towards change are characteristic of them (Table 3). This is confirmed by the moderate correlation coefficient between the principals' distributed leadership and attitudes towards change (r = 0.402, p < 0.01), as well as between the principals' adaptive leadership style and attitudes towards change (r = 0.397, p < 0.01). The principals' collaborative leadership and attitudes towards change have a small correlation (r = 0.272, p < 0.01).

Multiple linear regression aims to determine whether the leadership behaviour of school principals can predict their positive attitudes towards change. The results in Table 3 (correlation) and Table 4 (VIF) shows that there is no multicollinearity between the predictors (collaborative, distributed and adaptive leadership). Thus, multiple linear regression is possible. The model coefficient of determination R^2 > 0.20 was obtained, so it is concluded that the linear regression model cannot be rejected. The ANOVA result (R^2 = 0.265; F = 27.471, p < 0.0001) confirms that there are predictors in the model that depend on the positive attitudes of school principals towards change (Table 4). The assumption that the residuals are uncorrelated with the independent variable is satisfied because the Durbin–Watson value (*d* = 1.677) is close to 2. The model does not have any autocorrelation problem. Judging from the values of standardised coefficients β, all predictors are statistically significant. However, it is adaptive leadership (β = 0.298) that most predicts the school principals' positive attitudes towards change, although beta loadings disclose a modest effect. The prognostic value of distributed leadership (β = 0.250) is similar to adaptive leadership. The weakest predictor is collaborative leadership (β = 0.153).

Table 4. Linear regression analysis of leadership as a predictor of the school principals' attitudes toward change

	Unstandardized Coefficients		Standardized Coefficients β	t	p	VIF
	B	SE				
(Constant)	0.714	0.380		1.876	0.062	
Collaborative leadership	0.108	0.042	0.153	2.557	0.011	1.115
Distributed leadership	0.261	0.067	0.250	3.868	0.0001	1.297
Adaptive leadership	0.104	0.021	0.298	4.848	0.0001	1.175

The obtained regression model is recorded by the following equation:
$$Y = 0.714 + 0.104AL + 0.261DL + 0.108CL$$
Note: Y – Attitudes towards change; AL – Adaptive leadership; DL – Distributed leadership; CL – Collaborative leadership.

As it has already been mentioned, attitudes towards change include three components: cognitive, affective, and behavioural. Table 5 presents the results of multiple linear regression, revealing how different assumed leadership styles of school principals predict individual components of attitudes towards change. Judging from the obtained coefficients of determination R^2, leadership styles explain a similar percentage (about 23 %) of the cognitive and behavioural components of attitudes.

Table 5. Linear regression analysis of three attitudinal components predicting leadership

	Unstandardized Coefficients		Standardized Coefficients β	t	p	VIF
	B	SE				
Cognitive component (R^2 = 0.238; F = 23.465, p < 0.0001; *d* = 2.100)						
(Constant)	0.794	0.406		1.957	0.052	
Collaborative leadership	0.150	0.046	0.203	3.271	0.001	1.137
Distributed leadership	0.243	0.074	0.219	3.296	0.001	1.309
Adaptive leadership	0.091	0.023	0.251	3.984	0.0001	1.171
Affective component (R^2 = 0.168; F = 15.182, p < 0.0001; *d* = 2.038)						
(Constant)	1.015	0.471		2.157	0.032	
Collaborative leadership	0.101	0.053	0.124	1.911	0.057	1.137
Distributed leadership	0.262	0.085	0.214	3.076	0.002	1.309
Adaptive leadership	0.087	0.026	0.216	3.282	0.001	1.171
Behavioural component (R^2 = 0.228; F = 22.120, p < 0.0001; *d* = 2.095)						
(Constant)	0.731	0.429		1.705	0.090	
Collaborative leadership	0.069	0.048	0.089	1.432	0.154	1.137
Distributed leadership	0.256	0.078	0.221	3.296	0.001	1.309
Adaptive leadership	0.119	0.024	0.312	4.921	0.0001	1.171

Note. *d* – Durbin-Watson test statistic.

The cognitive component is statistically significantly predicted by all the three leadership styles, particularly by adaptive leadership. The behavioural component is statistically significantly predicted by distributed leadership and adaptive leadership. Although the emotional component is predicted by two leadership styles, the linear regression model is rejected, since the coefficient of determination is R^2 < 0.20.

5. Conclusion

As an imposed change, the COVID-19 pandemic showed that school principals cannot only become change initiators, but also be its executors. Moreover, they can perform these two roles simultaneously, i.e., they can implement national guidelines and initiate change within the organisation. In such a dual role, it is important that school principals have positive attitudes towards change. This study, therefore, integrated school principals' attitudes towards change and captured leaders as recipients and executors of change, as well as explored how their attitudes correlated with their employed leadership style during COVID-19. More specifically, we sought to examine whether, and to what extent, school principals' leadership style (adaptive, distributed, collaborative) predicted their positive attitudes towards change.

The results indicated that adaptive, distributed, and collaborative leadership styles were positively related to school principals' positive attitudes towards change. More specifically, the adaptive leadership was the strongest predictor for school principals' positive attitudes towards change, while collaborative leadership was the weakest one. These results of our study showed that in the conditions of imposed change, not all the employed leadership styles were equally effective. On the one hand, our study revealed that collaborative leadership was a predictor for school principals' positive attitudes towards change, yet a very weak one (the effect size of the predictor is modest). On the other hand, the school principals' collaborative leadership itself was moderately expressed. The findings that Lithuanian school leaders were not inclined to collaborate and network during the COVID-19 pandemic are in line with previous studies in this field (Kaminskienė et al., 2021). More specifically, this study (Kaminskienė et al., 2021) showed that those principals who had more work experience were less willing to cooperate and communicate with the national institutions (e.g., Ministry of Education, Science, and Sport) during the first two months of the lockdown. We assume that such results of our and other researchers' studies could have been determined by the specifics and context of the work of Lithuanian school principals. Compared to other countries, school principals in Lithuania participate much less often in the activities of professional networks: 13 % of principals in Lithuania have participated in such activities, while in the OECD it is slightly more than 60 % (OECD, 2019). Moreover, according to the TALIS 2018 data (OECD, 2019), more than a third of school principals in Lithuania claim that during their formal

studies (before becoming a school principal or after) they did not study school administration or leadership. Meanwhile, the implemented national projects on educational leadership have the least impact on strengthening school principals' networking outside of school (Damkuvienė et al., 2021).

As can be seen from the research results, some leadership styles encourage principals' positive attitude towards changes more than others. As already mentioned, in the case of our study, adaptive leadership promotes positive attitudes towards change more than other styles. To be more precise, adaptive leadership mostly affects all the three components of attitudes towards change: cognitive, affective, and behavioural. It must be mentioned that adaptive leadership effect size for cognitive and affective components is modest, meanwhile for behavioural – moderate. Having positive attitudes in all these three aspects, school principals are likely to show commitment to changes and effectively implement changes (Kin, Kareem, 2017). Distributed leadership predicts school principals' cognitive and behavioural components of attitudes towards changes (however effect size of the predictor is modest); meanwhile, collaborative leadership statistically significantly predicts only the cognitive component (effect size of the predictor is modest). The non-expression of the affective component in this case can pose a risk that school principals will demonstrate less proactive behaviour in the implementation of changes, since research shows that it is the affective component that is a significant factor in predicting an individual's employed behaviour (Forgas, 2010; Lawton et al., 2009; Taut, Baban, 2012).

The results of the study on the ambiguous interaction of principals' leadership styles with the individual components (affective, cognitive, behavioural) of the attitude concept invite a discussion about the significance of these components for the principals' attitudes and behaviour. Previous studies (e.g., Taut, Baban, 2012) reveal the influence of the affective component on the behaviour of individuals. As stated by Forgas (2010), affective component is a key feature of attitude concept, which is a dominant force in determining employees' responses and dispositions to social situations, affecting subsequent behaviour. It is believed that the affective component is very significant in attitude formation, since the strength and direction of attitudes largely depend on this component (the more negative the feelings are in relation to a specific object, the more negative, critical attitudes are produced) (Forgas, 2010). The results of our research reveal that although the affective component is predicted by two leadership styles, the linear regression model is rejected because the coefficient of determination is $R^2 < 0.20$. These results raise considerations in two directions: (1) to what extent the affective component is significant for the formation of the principals' positive attitudes towards changes and for the implementation of changes at school as an organisation, and (2) what leadership style could be recommended for school leaders in the context when the school encounters a need to quickly and efficiently implement changes, and the school principal has to assume the roles of a change agent and a facilitator of changes. Unfortunately, studies on the first question could not be found in the sample of principals, yet the studies in the sample of teachers reveal ambiguous results. On the one hand, it seems that the cognitive component is more significant for teachers' positive attitudes towards change than the affective component (Kin, Kareem, 2017). According to the researchers, it is the cognitive mechanism and process of reasoning that are essential in the formation of teachers' attitudes: teachers must have a clear understanding of the purpose of the change, they should have sufficient knowledge about the change, teachers scrutinise the strengths and weaknesses of the potential change to be made in school and then form attitudes towards change, and if these are positive, they put a lot of effort into implementing this change. On the other hand, the researchers (Kin, Kareem, 2017) claim that the affective component cannot be rejected as insignificant in the process of the formation of teachers' attitudes, since changes are related to emotions, which form the background of any urge of change, whereas the dominance of the cognitive component, in comparison with affective component, only shows that teachers are not emotional, but rather they are more rational in making sense of change. Finally, the significance of the behavioural component of attitudes for teachers' behaviour in a specific situation is emphasised: the more expressed the behavioural component is, the more actively teachers are involved in the implementation of changes (Kin, Kareem, 2017). The question arises whether the results of the research in the sample of teachers can be applied to school leaders. We would like to invite to consider this issue, which is very important in revealing the mechanisms of the formation of attitudes and their significance for the behaviour of leaders in the implementation of changes at school, in the future research. As far as the second question (what leadership style could be recommended for school leaders when implementing changes) is concerned, attention should be drawn to the research results obtained in

other research samples (rather than school principals) that the congruence of affective and cognitive components increases the manifestation of certain behaviour, while greater cognitive-affective inconsistency is associated with weaker attitude-intention relationships (Conner et al., 2021; Sánchez-García, Batista-Foguet, 2008). This encourages the assumption that positive cognitive and affective components, which will lead to positive behavioural component (Kin, Kareem, 2017) and all together will form positive attitudes towards change, are highly significant for school principals. In this context, it is important to understand why, based on the results of our study, the affective component of attitudes was least predicted by all the three leadership styles. Other researchers note that cognitive and behavioural components converge across cultures and religions, but the affective component remains significantly diverse (Zhang et al., 2021). Hence, the results obtained in our study could be determined by cultural differences (Lithuanians are not inclined to talk and show emotions, the display of emotions is culturally regarded as negative behaviour, which may explain why the affective component is less expressed in the attitudes). Another possible assumption explaining these results is related to the context in which the study was conducted. The study was conducted during the COVID-19 pandemic, when schools encountered unexpected changes that needed to be implemented urgently, which caused mixed emotions for teachers. The obtained results of the study may reveal that school principals deliberately based their leadership style on the cognitive and behavioural components, putting less emphasis on the affective component.

This study has several limitations that should be addressed. First, the results obtained in our study were based on self-report assessments. Therefore, the responses of the research participants could have a common method bias. To test if the collected data were prone to the common method bias, Harman's single-factor test was conducted. The results indicated that a single factor accounted for only 20.15 % of the total variance (i.e., < 50 %), which showed that a single factor of the data set did not explain most of the variance for the research objective; therefore, the assumption of common method bias was withdrawn (Podsakoff et al., 2003). Second, the research context (a pandemic) can also be considered as a limitation. School principals had experienced two COVID-19 lockdowns in their schools during the study. Lockdown fatigue may have influenced the low participation of school principals in the study. On the other hand, it was important for us to reveal the connections between school principals' leadership and attitudes towards change particularly in a crisis situation. Acknowledging the limitations of the current study, we envisage the value of a future longitudinal research, seeking to reveal the formation of attitudes toward change in the contexts of extreme change. Moreover, it is also important to highlight how school principals' attitudes towards change are related to the socio-demographic variables: age, gender, type of organisation, size of organisation, etc.

Despite some limitations of this study, it is important in several ways. First, our study shifts the research focus from teachers and students to the school leader as the central figure. More importantly, the focus is not on the interaction and influence of principals and teachers, but on the performance and attitudes of the principals themselves in the conditions of COVID-19. Moreover, in the face of this imposed change, school principals become the recipients of change, too. Second, the study highlights the importance of different leadership styles in the light of the imposed change for positive attitudes towards change. School principals are encouraged to employ the adaptive leadership style when they have to work in uncertain circumstances or in the context of constant changes. Although school principals' collaboration outside the school is important in overcoming imposed change challenges, it should be noted that they may approve of changes at the level of ideas; in other words, their attitudes towards changes will be positive at the cognitive level, with a risk to never be manifested through behaviour. The results of the study also encourage the search for solutions on how to arouse positive attitudes of school principals towards changes not only on the cognitive, but also on the affective levels, since all the three components of attitudes – cognitive, affective, and behavioural – are important for the effective implementation of changes, for personal involvement and engagement of other employees, as well as for the commitment to changes.

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Using Artificial Intelligence Tools in Teaching a Foreign Language in Higher Technical Institutions

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Abstract

Technological developments that take place nowadays and the accompanying process of digitalization in every area entail serious challenges for the whole society and for the system of education as its integral part. As a result, the teaching process nowadays, including foreign language teaching, involves using a wide range of technical and technological facilities. This paper analyses the possibilities of using digital intelligent technologies in university academic process with the focus on teaching a foreign language to students of higher education institutions specialising in the technical field. The work gives a review of existing online study courses, educational platforms, and artificial intelligence (AI) technologies. The key features of several intelligent applications that are in common use are also outlined. The paper presents a description of a pedagogical experiment carried out in a technical university and aimed at estimating the effectiveness of integration of digital tools into the teaching and learning process. The outcomes of the experiment are evidence that using digital technologies enhances the learning activity and motivation of the students, with a positive impact on their lexical skills and overall performance, which as a result leads to achieving the ultimate goal of language learning, the communicative competence. The article also offers specific recommendations on the choice of electronic educational resources and outlines a number of problems encountered while using digital software.

Keywords: digital technologies, foreign language learning, artificial intelligence, mobile applications, educational platforms.

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1. Introduction

In recent years numerous works have been published on the use of artificial intelligence (Zakharov et al., 2022), neural network technologies (Ignatiev i dr., 2019; Zemenkova et al., 2022), and the introduction of machine learning in various industries (Filippov et al., 2022) as well as in education (Amemado, 2020; Chen, et al., 2020; Larimore, 2020) and, in particular, in teaching a foreign language language to students of a technical university (Pikhart, 2020; Schmidt, Strasse, 2022; Varlakova et al., 2023). Teaching a foreign language is now associated with the use of various technical facilities, such as language laboratories, training programs, electronic dictionaries, audio and video courses. Advances in technology and the accompanying digitalization in the 21ST century imply significant challenges both for society as a whole and for educational system. The provision of broadband access to the Internet allows for use of distance technologies and adapting education to individual learner's needs. The article aims to analyze the use of digital intelligent technologies in teaching a foreign language to students of a technical university, as well as to consider the effectiveness of using digital technologies in foreign language teaching (Pikhart, 2020).

In the Russian Federation, the strategy for development of artificial intelligence (AI) for the period up to the year 2030 was approved by the Presidential Decree № 490 (Decree of the President, 2019) as of October 10, 2019. Since September 1, 2021 the relevant strategies have been introduced in the curricula of Russian universities. Digital competences now included in the Federal State Educational Standards of Higher Education for the Bachelor and Specialist degrees are aimed at implementing the key priorities of the Digital Economy of the Russian Federation national programme (Pasport natsional'nogo proekta...; Shestakova, Morgunov, 2023). The use of Big Data technology in combination with sophisticated analytical processes (learning analytics) opens the prospect for personalised education that has a direct bearing on blended learning (Owoc et al., 2021).

Today, over 400 Russian companies are active in developing and use of artificial intelligence. An alliance of IT companies has been established, with the participants making it their ultimate goal to place Russia in the top ten of countries with most advanced digital technologies.

As a rule, intellectual technologies are supported by the e-learning environment existing in a specific educational institution. The task performed by such environment is to form a learners' digital footprint by gradually accumulating a variety of data and storing the reported database that contains the data on their performance and assessment indicators (Kovalenko i dr., 2021). Internet services and educational platforms provide a wide range of tools for designing learning content and management of learning (Gerasimova et al., 2022; Koltsova, Kartashkova, 2022; Pivkina, Nikonova, 2022; Pivkina, Nikonova, 2022). Another fact that should be taken into account is that along with the e-learning environment, educational institutions normally use electronic tools for management of learning (LMS), accounting (1C), and for personnel management (ERP, e-HRM). In this connection, algorithms must be developed to synchronize their data and processes.

With this in mind, the purpose of this work is to consider possibilities of designing and using elements of e-learning environment in teaching foreign languages at a technical university. The work analyses the effectiveness of desktop and smartphone applications use for the learning process. It also gives an outline of special aspects of using intelligent applications in foreign language classes, of the possibility of using AI to create an adaptive learning environment, and of common digital learning platforms. The work provides direction for work with electronic educational resources and outlines the questions of software development and use. Therefore, the ultimate purpose of our work is to analyze results of using intelligent applications in teaching a foreign language, which is not their core subject, to students of technical specialties. Our objectives are to carry out an educational experiment, comparing and contrasting the data of the control and experimental groups of students, and to receive student feedback with regard to using intelligent applications as part of the teaching and learning process.

2. Literature review

The most known international MOOC platforms are Coursera with 24 million users and more than 2000 courses at the end of 2017, and edX with 14 million users and more than 1800 courses. Both platforms offer language courses. Leading universities of Russia, namely, Moscow State University, Moscow Institute of Physics and Technology, Higher School of Economics, Moscow Engineering Physics Institute, National Research Technological University MISIS, Saint Petersburg State University, Peter the Great Saint Petersburg Polytechnic University, National Research

University of Information Technologies, Mechanics and Optics, Urals Federal University made their online courses available on these platforms. On completing a course, students took exams and received certificates issued by the universities. However, both platforms suspended the content from Russian universities following the international sanctions. Now the courses developed by Russian universities can be accessed through such educational platforms as Open Education, My Education (online.edu.ru) we study Emdesell, GetCourse, Justclick, Innovationbro, Memberlux, Zenclass, and others. Language courses are also on offer (in particular, English and Chinese, the most common business languages currently).

Using digital technologies in education is a new rapidly developing trend (Murzo, Chuvileva, 2021; Plario; Luchshie obrazovatelnye…, 2022). And one of the challenges teachers face today is contributing to its growth and sharing responsibility for all the aspects of intelligent information processing that should be taken into account while developing or upgrading learning courses in their field of study.

The list of web services frequently used both by secondary and higher education institutions includes the following: Cisco Webex, a multi-platform online service that allows students, faculty and staff to meet via conferencing and screen sharing, Google Classroom, a web service developed by Google for schools that aims to make it easier to develop, share and grade assignments in a paperless way, Google Forms, an online tool that allows you to create forms for collecting data, online testing, and voting, LearningApps, a free service to support teaching or self-study by offering interactive modules, Kahoot, a service that facilitates developing online quizzes, tests and surveys, Quizlet, a free online service that allows the user to design and work with flashcards and learning games of various types and in various areas (languages, culture, maths, geography, etc.), Popplet, a service for creating mental maps.

The institutions that choose to introduce digital learning often face the dilemma of whether to develop their own e-learning environment or use one of the existing digital platforms, either free or paid. The second option makes it possible to start the teaching and learning process sooner and with lower costs.

Tomsk Polytechnic University chose to develop its own system. The first in Russia adaptive learning system for teaching mathematics based on Plario platform was designed by researchers from Tomsk State University in cooperation with IT company ENBISYS (Plario). The scientists from this university together with researchers of Bryullov Consulting also developed Aktru, a unique digital platform with elements of AI, aimed at organization of teaching process for both contact and distance learning formats.mEdCrunch University education center at National Research Technological University MISIS also announced the launch of a platform for student knowledge assessment. The platform, as its developers believe, will enhance the learning by regularly informing students of their achievements and mistakes. Saint-Petersburg Mining University created new lines of research for its Educational Research Centre for Digital Technologies; within this project, Schneider Electric Company created a number of clusters based on Aveva software platform.

Digital learning management systems. The purpose of digital Learning Management Systems (LMS) is to create a unified database of e-courses and materials within an e-learning environment. They allow for both course and learner management. Learning with an LMS is equally successful in remote and contact formats, which actually means the possibility of blended learning. A distinction is made between cloud-based and server-based LMSs. The former are more often used in corporate education (iSpring online, TeachBase, Loop), while the server-based ones are employed in universities and learning centres, also for foreign language teaching. Another important consideration than the learning options offered by these applications is their cost. Among the most popular ones there are some that are free of charge; the best rated of the latter are such platforms as Moodle, Ilias, and Edmodo (The best educational platforms).

Mobile devices have become common, and their impact on practically all sides of human life is now unprecedented and manifold. Mobile technology provides the learners with more opportunities to access various internal digital services of higher education institutions at any time convenient for them (Mehdipour, Zerehkafi, 2013; Skornyakova et al., 2022). LMSs running on iOS and Android operating systems have certain advantages in this regard.

AI applications. Development of simple purpose-specific algorithms meant for effectively solving simple problems, combined with methodology from the field of AI, can be instrumental in optimizing the teaching and learning process (Lisovets, 2013; Rodionov, Tamp, 2022).

AI algorithms do not (and are not supposed to) replace the teacher, but they can take on most of the teaching routine this giving the teacher more time for professional development.

Today it is not enough for a platform to be just a repository of texts, videos, tests and communication tools. Personalized learning is based on intellectual processing of data from every learner (Boyko et al., 2022; Hinojo-Lucena et al., 2019; Watts, 2018). Big Data algorithms make it possible to create a learner profile so that the application used in the learning process provides the learner with information tailored to his or her specific needs and requirements (Cope, Kalantzis, 2016). This is of great importance not only with respect to testing, but also throughout the process of learning, so that the user is provided with optimised information and data. M. Pikhart from the University of Hradec Kralove (Czech Republic) in (Pikhart, 2020) cites the results of testing 10 mobile applications running on Android and iOS platforms that were designed for foreign language learning. The results show that in most of them, AI is not used to its full potential; only two of the applications in question comprised AI algorithms in speech recognition options.

There is also a known off-the-shelf solution, which is DialogFlow based on Google's cloud solutions, designed to make chatbots (Schipachev i dr., 2021). The platform offers a friendly interface, and many of the processes are performed automatically with a reasonably good quality. In addition, its free-of-charge version is often sufficient to create and test a virtual assistant. In other cases a paid service should be chosen, with the bot that not only gives information on the subject but also "hears" the learner as a teacher would. All in all, the use of intelligent applications in higher education institutions requires substantial investment on the part of the institutions themselves, as well as individuals and businesses.

3. Materials and methods

Development of AI algorithms. The strategy for introducing AI in higher education institutions, as in any other organisations, is a five-stage process of solving ordered and systematised tasks by successive teams (see Figure1) (Rodionov, Tamp, 2022). According to a number of researchers (Healey, 2020; Watts, 2018; Hinojo-Lisena et al., 2019; Gid po iskusstvennomu…, 2022), the use of AI can prove effective in more than ten areas pertaining to education. However, it should be remembered that the task of developing and structuring AI algorithms is elaborate and time-consuming. It requires a large number of databases, each provided by qualified experts, with the data sometimes turning out to be insufficient or incorrect. Every component must go through a rigorous check, and dedicated programs may be necessary to spot any possible errors. For example, for the technical staff of Tomsk State University it took 7 years to develop the content for its own e-learning platform website. The advantage is that the platform meets all the specific needs of the university and comprises a full range of effective components for organising the teaching and learning process.
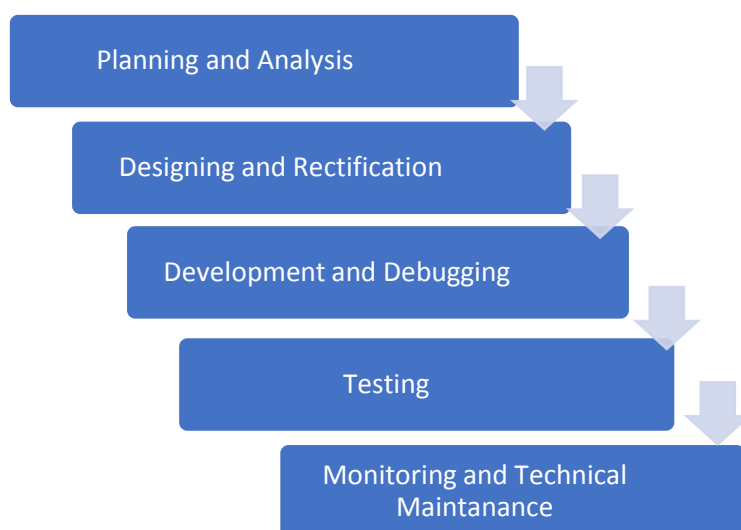

Fig. 1. Outline of an overall strategy for introducing AI in higher education (Rodionov, Tamp, 2022)

Difficulties in introducing AI technology may affect the following areas (AI in Education Market, 2018; Artificial intelligence in education).

In order to implement an intellectual and adaptive process, a computer-based language learning support system needs a specific architecture that comprises three essential closely interlinked components:

- A model of the knowledge area that contains information about a foreign language or certain aspects of the language targeted by the tasks (e.g. a comprehensive model of English verb tense system), an extensive set of exercises covering all the specifics for all levels of difficulty, combined with feedback, support comments and teaching guides underpinned by an empirically tested difficulty model comprising the relevant grammatical concepts.

- An assessment model that continuously monitors the progress of every individual learner in every activity, identifies errors and their types, and keeps the record of the learning time, number of attempts, use of feedback, methodological support, prompts and teaching aids.

- A model of a learner that retrieves and updates the data on their progress in the knowledge area as they study the subject.

Such factors as enhanced capability of digital resources, exponential increase in AI technology use, using virtual reality, and integration of digital learning environment into teaching and learning process underpinned by broadband Internet access and big data processing technologies allow for personalising the process of learning and for in-depth analysis of the individual characteristics of the learner (Artificial intelligence in education; Goddard, 2020). With all the results already achieved, AI is still at an early stage of development. The pandemic and the resulting need for distance learning have only accelerated the process of integrating AI technology into the education sector. By esteem of experts from the eLearning Industry platform, over 47 % of learning management tools will be complete with AI in the next couple of years (AI in Educational market, 2018).

In St. Petersburg Mining University, the electronic information and education environment includes personal accounts for teachers and students, corporate email system, and access to electronic libraries. LMS Moodle is also installed on the university website and so can be accessed by teachers. The system facilitates remote communication of the participants to the teaching and learning process through access to learning materials, file sharing and both synchronous and asynchronous communication (Makhovikov, 2021).

The following summary table gives examples of use of different elements of intelligent digital education platforms and systems in universities for instructional purposes, including teaching a foreign (English) language.

Table 1. Classification review of components present in electronic information and education environment of higher education institutions (compiled by the authors)

Type	Functions in the teaching and learning process	Examples
Massive online education courses	Improving skills and knowledge and developing competences in a specific field; preparing for study abroad; enhancing employment prospects	Coursera, edX, My Education FP
Internet servicesandportals	Administering learning assignments, video lectures (streamed or recorded); administering tests and quizzes, including online testing; online voting; progress assessment and analysis; sharing materials between students and teachers/ lecturers; data retrieval	Cisco Webex, Google Classroom, Google Forms, LearningApps
Digital learning management platforms	Distance learning and direct classroom instruction; testing; listening; monitoring of attendance and progress; feedback and sharing experience	Moodle, Ilias, Edmodo
Intelligent applications using AI algorithms.	Personalisation of the learning process; developing learner-oriented strategies;	University-developed adaptive learning

	creating learner profiles; optimisation of teaching and learning process; decreasing the share of repetitive/ routine teaching workload; using tools for visualising vocabulary; developing virtual tutoring services; provisions for teacher-learner communication and feedback	systems; chatbots: Virtual Talk App, Mondly, Memrise, Duolingo

In the spring of 2022, a group of teachers from Saint Petersburg Mining University took a training course at Innopolis University as part of a professional development programme intended for teachers of higher, secondary vocational, and additional vocational education within the framework of the federal project "Personnel for Digital Economy". The course was delivered via the educational platform of Innopolis University. After that, a number of the university study course programmes for different subjects were updated with the view to introducing digital technologies into the teaching and learning process in order to meet the growing requirements to university graduate preparation standards.

At the beginning of 2021, the survey was carried out among the students and teachers of Mining University (Kremcheeva i dr., 2021); it aimed at getting an insight into their attitude to the use of online technologies and covered all subject areas in general, not just the Foreign language. The results showed that most of the students were prepared and eager to try the new forms of learning. The majority of the teachers, on the contrary, regarded the use of digital methods as a threat to the quality of learning and student knowledge.

In order to estimate the motivation to use digital technologies and the prospects for further implementation of digital learning for the subject of foreign language in Saint Petersburg Mining University, in the autumn of 2022 a survey was conducted among students of the university specialty 21.05.06 "Oil and gas engineering and technology".

For statistical data processing, SPSS 17.0 software (IBM) was used. The attribute values are represented as observed frequencies (absolute numbers) and percentages. To compare the attributes, Pearson's chi-squared test was applied to confusion matrices. In the case of small frequencies (5 to 10), Yates' continuity correction was used. The differences were assumed as statistically significant at $p < 0,05$, where p is type I error probability in testing the null hypothesis.

The surveying showed that:

1. For students, the motivation to learn a foreign language is related to the specifics of their future professional activity (62 %), the possibility of doing research work (33 %) and self-development that includes enhancing their personal qualities, intellect, imagination, and creative thinking (5 %).

2. In preparation for classes and of home assignments, the majority of students (88 %) rely on digital technologies in as many as 60-70 % of cases.

3. Students turn to digital technologies for the performance of everyday tasks (study or work) almost as much as for leisure activities. The instruments most frequently used in preparation for classes are as follows: Coursera (25 %), Cisco Webex (20 %), Google Classroom and LearningApp cloud services (21 %), Moodle (17 %), open access e-learning materials (17 %).

4. The vast majority of respondents find it easy to find information on the Internet (98 %); however, only 53 % of the students select and evaluate the information they have found with regard to its accuracy, quality, reliability, and relevance, which indicates the need for awareness-raising classroom activities on the part of the teachers.

5. The vast majority of the students surveyed regard the rules and norms of behaviour during communication in digital environments as a necessity (90 %), with the remaining 10 % associating such rules and norms with restrictions to free speech, and 4 % of them stated the need to review the conventional rules of communication adapting them to the specifics of digital environment.

6. The majority of students (86 %) view electronic gadgets and the related technologies as in integral part of life and are aware of the need to protect the devices and personal data (92 %) while using them.

7. Another important criterion to explore in our study was to specify the students' own awareness of their professional learning needs and so their ability to choose the right digital tools while performing the training assignments. 95 % respondents acknowledged that they did not need any additional guidance, while 5 % would choose to ask the teacher for help.

The next stage was a pedagogical experiment aimed at testing the effectiveness of integrating digital technologies into the teaching and learning process, conducted at Saint Petersburg Mining University. Two groups of first-year students from Faculty of Oil and Gas Engineering took part in the experiment. Teaching of the experimental group (17 students) involved the use of digital technologies, while the control group (14 students) was taught in the traditional way.

The baseline level of parametres and factors to be monitored in the experiment was determined by an entry test taken by all the students. It was based on the material covered by the students before the start of the experiment and included four tasks. The test consisted of 30 questions with one point given for every correct answer, so the maximum number of points was the same as the number of test questions. The test was conducted in accordance with the traditional teaching model, in written form in a classroom; the students were given 30 minutes to complete it.

The testing results are presented in Table 2.

Table 2. Entrance test results (control group and experimental groups)

Mark	Points	Control group n = 14		Experimental group n = 17		Chi-square criterion	Statistical significance of differences, P
		Absolute number of students	Percentage of students	Absolute number of students	Percentage of students		
5 (excellent)	27-30	1	7	2	12	0.188	0.859
4 (good)	22-26	6	43	7	41	0.009	0.786
3 (satisfactory)	16-21	6	33	6	35	0.185	0.952
2 (fail)	≤15	1	7	2	12	0.188	0.859

Two groups of first-year students from Faculty of Oil and Gas Engineering took part in the experiment. Teaching of the experimental group (17 students) involved the use of digital technologies, while the control group (14 students) was taught in the traditional way.

Upon analyzing the outcomes of the survey and the entry test we proceeded to the next stage of the pedagogical experiment. This involved planning and designing tasks and activities for two different short sample courses for the two groups. The contact sample course was intended for the control group, while the distance learning sample course was designed for the experimental group.

Accordingly, the contact sample course included the following components: introducing new material to students with explanation on the part of the teacher; doing speech exercises and practicing a variety of speech activities in small groups; preparing and delivering presentations; entrance and final tests. The distance learning sample course included the following components: independent online search and research; working with information resources and learning materials (glossary, links to topic-related resources, etc.); doing a variety of practice tasks, including pre-communication activities; entrance and final questionnaires.

The last stage of the experiment included efficiency estimation of the foreign language teaching and learning model that was developed and tested. The effectiveness of teaching relying on digital learning was evaluated through a final questionnaire and a final test.

The final questionnaire offered to the experimental group was instrumental in taking the students' opinion on digital learning technologies. Over 85 % respondents said the course involving digital technologies was interesting to work with. More than 90 % of them found it practical to use digital technology to support the learning process. 83 % of the students found it easy to work with digital technology. Among the advantages of the updated study programme, students indicated the possibility to work in the learning environment at a convenient time and pace; the convenience of working in the learning environment, as all the necessary information and training materials were grouped together, easy to use and well structured; the opportunity to better prepare for the contact

class by studying in advance the material available in the e-learning environment. Among the disadvantages the students mentioned some technical problems, such as the impossibility to access the website because it was overloaded, problems with the Internet connection, etc.

Both the control and experimental group were given a common final test; the results were compared. The test was administered in written form in the classroom and included nine questions. The time given was 1 hour and 10 minutes, the total number of questions was 68, with students receiving one point for each correct answer. So the maximum number of points that students could score was the same as the number of questions in the test. The results of the final test are presented in Table 3.

Table 3. Final test results (control group and experimental groups)

Mark	Points	Control group n = 14		Experimental group n = 17		Chi-square criterion	Statistical significance of differences, P
		Absolute number of students	Percentage of students	Absolute number of students	Percentage of students		
5 (excellent)	60-68	2	14	2	12	0.043	0.741
4 (good)	47-59	4	29	8	47	1.106	0.496
3 (satisfactory)	35-46	6	43	5	29	0.606	0.688
2 (fail)	≤34	2	14	2	12	0.043	0.741

Over 50 % of students in the control group got satisfactory or lower marks in the final test, which shows insufficient acquisition of the course material. In the experimental group, the results were much better: only 29 % of the students got satisfactory marks, with over 50 % scoring "good" or "excellent".

It is also of importance that the tasks which presented a problem for the students during the entrance test were completed with much better results in the final test. The average score for Task 2 (matching the words to make collocations) in the experimental group was 7.5 out of 8; and for Tasks 5 and 6 the average scores were 6 out of 8 and 4 out of 5 respectively.

Therefore, there are no great statistically significant differences between the control and experimental groups (P > 0.05) both for entrance test and for final test results. However, with all the significance of statistical data in evaluating experimental results, consideration should also be given to such important factors as keeping the students motivated by maintaining their interest in the subject, and developing their research and self-study skills.

The analysis of the final questionnaire and test outcomes together with overall analysis of the students' performance in the experiment showed that studying the sample short course that involved digital technology enhanced the learning activity and motivation of the students. In particular, their class participation increased, and they regularly did the pre-communication activities and other training tasks.

Thus, all that was said above confirms the assumption that the use of digital learning enhances the quality and effectiveness of learning. Moreover, we can say that the digital learning sample course had a favourable impact on the lexical skills development and overall performance of the students, and consequently, facilitated the achievement of the ultimate goal, which is communicative competence.

Upon completing the sample course developed as part of the updated study course programme the students acquired new knowledge in the field of information and communication technologies, namely of the principles of searching for accurate and reliable information in the Internet and about contemporary digital tools for information collection and processing, and developed their skills of preparing presentations and/or other audiovisual content with Canva and Visme, searching for the relevant learning and profession-related content using the databases

of information and professional resources, including eLIBRARY.RU. They also mastered the foundations of infographics using Piktochart and Infogram and developed groupwork skills for digital environment by working with Padlet and Jumboard, and gained the experience of communication in the virtual environment through teleconferencing service, including Yandex Teleconference.

4. Conclusion

The impact of new digital technologies on education system goes further than didactics. Their use blurs the boundaries between formally organised learning environment of the classroom and the opportunities of learning at the convenient time and location outside the classroom.

Digital learning platforms are commonly used for running online courses, administering tests, tracking learners' progress and generating reports for teachers, sharing audio, video, text and graphic content, managing and monitoring students' independent study. The use of mobile applications in foreign language teaching is developing rapidly, and they prove effective even without the use of AI algorithms.

The opportunities offered by AI increase dramatically the effectiveness of digital educational platforms. This breaks a new ground for major innovations and development of new knowledge and practices. By 2023, more than 40 % of global education capital is projected to be spent on AI in education.

AI algorithms would be practical to use not just for teaching individual subjects but in information and education systems of higher education institutions as a whole. There are prospects of employing AI algorithms for admission and enrolment of students, improving accessibility for learners with disabilities, organising lifelong learning, and developing dedicated programmes adapted to the needs of different learners, thus allowing them to study without comparing their results and achievements with those of others, and so relieving social and academic pressures. However, due to the complexity of such systems, the development of AI-based learning environment that is adapted to different types of learners, at the same time ensuring high standards of both knowledge and practice, is still in its initial stage.

The authors hope for strengthened interdisciplinary cooperation of experts in foreign language teaching, computer linguistics, psychology of learning, computer-aided learning and Big Data, as well as multimedia designers in developing advanced language learning systems.

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Raising Teaching Efficiency: Teaching Translation of Business Correspondence to Economics Students

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Abstract

The development of written translation competency in economics students is a topical problem in foreign language teaching. The object of the study is the method of teaching written translation to economics students. The subject of the research is testing the efficiency of the method for teaching written translation of business correspondence to economics students in the framework of English as a foreign language. The goal of the study is to develop a model for teaching written translation of business correspondence and to substantiate its use in the training of economics students. The authors propose and experimentally test a method of teaching the translation of English-language business correspondence. The research methodology involved a pedagogical experiment conducted in several stages with four experimental groups (120 students). The experiment included the selection of suitable educational materials, the development of a set of exercises, and criteria for evaluating WTBC skill formation. The efficiency of two teaching variants, Variant A and Variant B, was compared. The results obtained evidence that the use of appropriately selected educational material and a set of exercises developed on its basis ensure the high quality of the written translation of business correspondence by students. Furthermore, the variant of performing special exercises to improve translation skills in all types of business correspondence at the end of each learning cycle improves learning outcomes.

Keywords: English, economics students, written translation, business correspondence, original text, translation text.

1. Introduction

Business correspondence (BC) plays a fundamental role in intercultural communication between business partners (Demina, 2012) as it is used to establish commercial relations, negotiate

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contract terms, and discuss ways of fulfilling them (Skripak et al., 2022). This creates a social demand for the training of professionals who are able to translate BC in written form and assume responsibility for the quality of their work and the success of intercultural business communication. The goals of improving educational programs and materials and raising the quality of teaching are directly influenced by the social demand for written translation of business communication (WTBC) skills. This highlights the importance of WTBC in the professional lives of students – future economists and the significant role that the ability to translate various forms of BC plays in intercultural communication (Eskerkhanova et al., 2023; Sergeeva et al., 2022).

The current developments in the economy have a direct impact on the necessity for scientific research on the issue of teaching written translation of business communication (WTBC).

Our investigation of the problem of teaching written translation reveals that this phenomenon has been studied predominantly by linguists (Kaba, Gjinali, 2023; Iliushkina, 2015; Adipat et al., 2023; Enesi et al., 2021) and there are no pedagogical studies of WTBC teaching methods.

A significant issue in teaching WTBC to economics students is the selection of educational materials (Vinogradova, 2021). The choice of learning materials has always been and continues to be one of the most complex problems in teaching methodology (Nguyen, 2022). There are various approaches that can be utilized to address the task of teaching written translation of BC, including functional, situational-functional, communicative, and statistical-pragmatic approaches (Enesi et al., 2021).

The problem of selecting materials for teaching written translation in higher education has been explored in several works (Kovalenko et al., 2023, Wu et al., 2023; Popova, 2014; Volkova, 2019). Researchers suggest that in choosing materials for teaching written translation, it is necessary to consider the methodological principles of communicative necessity and sufficiency (Papadakis et al., 2022), thematic selection (Popova, 2014), and the accessibility of the selected material for its assimilation (Litwinowa et al., 2022). Although authors of the article agree with these principles being significant, authors are also believing it crucial to rely on the principle of "use in practice" (frequency and prevalence) (Volkova, 2019).

Authors propose several principles to consider when selecting learning materials for teaching WTBC, including thematic relevance, necessity and sufficiency of the materials, feasibility and accessibility, as well as usage, such as frequency and prevalence (Borodina et al., 2023; Feizuldayeva et al., 2018).

Based on the analysis of psycholinguistic features of the process of written translation (Fedorova, Karpova, 2019; Zhao et al., 2020), consideration of the structure and content of written translation competence (Chernova et al., 2022; Tolmachev et al., 2022), and the analysis of the challenges of WTBC (Andreeva et al., 2017; Kuznetsova, 2020), authors proposed an experimental hypothesis that the mastery of WTBC skills at a high level is achievable through the selection of appropriate training content, the implementation of a system of exercises, and the use of an optimal teaching methodology.

The purpose of this study was to create a teaching model for WTBC and evaluate its effectiveness in training economics students. To accomplish this goal, the study set out the following research objectives:

1) to choose suitable educational materials, establish stages and sub-stages for WTBC teaching, develop a set of exercises, and determine criteria for evaluating the level of WTBC skill formation;

2) to conduct an experimental test to assess the efficiency of the proposed teaching method on economics students;

3) to draw conclusions based on the study's findings.

2. Methods

Based on the purpose of the study, a pedagogical experiment was selected as the main research method, which was conducted in multiple stages.

At the preparatory stage, authors have defined the goal and objectives of the experiment. Thus, the goal of the experiment was to test the efficiency of the developed method of teaching WTBC, particularly the expediency and adequacy of using the developed subsystem of exercises, as well as to compare the efficiency of two variants of the method.

The experiment was conducted within 5 months in the 1st and 2nd semesters of the 2021–2022 academic year based on 3 universities: K.G. Razumovsky Moscow State University of

Technologies and Management (the First Cossack University), Peoples' Friendship University of Russia and Moscow Polytechnic University. The study was conducted with the participation of second-year students studying economics and management. The cluster method was employed for sampling since the unit of measurement was a student group. In total, 120 students were involved. In the process of the experiment students were divided into 4 experimental groups (EG) of 30 people each.

To effectively organize and implement training in written translation of business correspondence (WTBC), the authors selected English and Russian-language BC training texts. The texts were chosen based on several criteria, such as authenticity, relevance to the subject matter, linguistic complexity, translation value, and volume. The authors obtained the training texts from authentic educational literature and websites that presented English and Russian-language BC of Russian companies. These selected texts were then utilized in a set of exercises for teaching WTBC.

The authors proposed a division of business correspondence (BC) into three groups based on the stages of contractual activity in intercultural business communication. The first group consists of pre-contractual BC, such as appeals, requests, and offers. The second group is contractual BC, which includes messages, confirmations, reminders, and refusals that are attached to the conclusion of a contract. The third group is post-contractual BC, which pertains to the fulfillment of the terms of the contract, such as complaints and apologies. These specified groups and types of BC were used in the set of exercises for teaching WTBC.

Based on the aim of the study and an analysis of existing approaches to creating systems of exercises for translation students, authors of the article identified two stages: mastering the basics of WTBC and improving WTBC skills. The first stage of mastering the basics of WTBC was divided into four sub-stages to correspond with the stages of the translation process: 1) analyzing the original text (OT), 2) translating the OT, 3) evaluating the translation text (TT), and 4) editing the TT.

1 Stage. The exercises were categorized into four groups based on the number of sub-stages: 1) to form skills to analyze OT; 2) to form skills to carry out translation; 3) to form skills to critically evaluate TT; 4) to form skills to edit TT.

2 Stage. A group of exercises was implemented to specifically improve WTBC skills. Thus, it can be concluded that the developed system for WTBC training comprises five different groups of exercises, as outlined previously.

Based on the goal, authors have chosen a basic, natural vertical-horizontal experiment, with the vertical dimension testing the effectiveness of the proposed exercise sub-system for training WTBC translators. The horizontal dimension involved comparing two variants of the method.

To ensure accurate interpretation of the experimental results, scientifically justified criteria were selected to assess the level of WTBC skills. These criteria included the accuracy of conveying the content of the OT and the communicative intentions of the sender to the receiver of the TT, the stylistic accuracy of the TT, the relative correctness of the linguistic rendering of the TT, and the accuracy of the extra-linguistic rendering of the TT.

Each participant's TT in the experiment was evaluated and graded in points, with a maximum score of 100 points available for all the criteria. The points were distributed between the criteria based on their significance for achieving the training goals in WTBC, as shown in Table 1.

Table 1. Distribution of points by criteria for assessing the level of WTBC skills

Criterion	Maximum score
1. Accuracy of OT content conveyance	40
2. Stylistic accuracy of TT execution	20
3. Relative correctness of the linguistic rendering of the TT	20
4. Accuracy of the extra-linguistic rendering of the TT	20

The specified criteria for assessing the WTBC skills of each participant allowed for an objective evaluation. The points received for each criterion were totaled, and the learning rate was computed using the equitation:

$$K = Q / N$$

where Q represents the number of correct answers and N represents the total number of tasks (Bespalko, 1968).

A learning rate of at least 0.7, the coefficient of scientificity, was considered satisfactory. Scores were graded on a scale from 0 to 1 (100 %), and the learning rate was compared to this range. The relation of scores, the learning rate, and grades are presented in Table 2.

Table 2. The relation of scores, the learning rate, and grades

Score	Learning rate	Grade
90-100	0.9-1	Excellent
80-89	0.8-0.89	Good
70-7 9	0.7-0.79	Satisfactory
> 69	> 0.69	Unsatisfactory

Prior to the experiment, the participants underwent a pre-experimental cross-section, which was designed to assess their proficiency in WTBC. The selection of the appropriate form of assessment was based on the study's objectives, which aimed to evaluate the participants' ability to perform WTBC. The pre-experimental cross-section aimed to evaluate the initial level of written translation competency in the field of English-language BC. Two authentic commercial letters of approximately 1,200 characters each were given for written translation from English to Russian and vice versa. The first letter was a post-contract complaint from a buyer about defective goods and a demand for compensation, while the second was a pre-contract offer letter from the head of the sales department of a Russian company addressed to potential clients, which needed to be translated from Russian to English.

The process of the pedagogical experiment involved teaching WTBC to students in the experimental groups.

The learning process consisted of three cycles: 1) training in the written translation of pre-contractual BC; 2) training in the written translation of contractual BC; 3) training in the written translation of post-contractual BC. Each of the three cycles was comprised of microcycles (MCs) corresponding to the groups of exercises in the developed system. Furthermore, authors produced two variants of the WTBC teaching method.

In variant A, cycles 1-3 each contain five MCs. The first four of these match the groups of exercises in the developed system. The additional MC-5 is a summarizing cycle created using the simulation of real situations of business communication and designed to improve the skills of written translation of the types of BC covered in a particular cycle.

Variant B of the proposed methodology for teaching WTBC includes three cycles, each consisting of multiple choice exercises (MCs). Cycles 1 and 2 contain four MCs each, but without the summarizing MC-5. In contrast, cycle 3 includes five MCs, including the summarizing MC-5, which is aimed at improving the written translation of all types of BC.

During the experimental phase, the training was conducted according to a predetermined schedule in a classroom setting using the training materials prepared for the study. The training was conducted once a week for a duration of 52 minutes (equivalent to 1.3 academic hours), taking into account the two versions of the developed WTBC teaching method.

The experimental training in each group comprised a total of 35.2 academic hours, out of which 20.8 hours were allotted for classroom work, 10.4 hours for independent work (homework), and 2.6 hours for control tests. Thus, the total time invested in the experiment across all four groups was 83.2 classroom hours, 41.6 hours of independent work, and 10.4 hours of control tests.

At the end of the first cycle, an interim cross-section (a control test) was conducted in all four groups to assess the level of WTBC skills after the initial training using the proposed method. The objective of the interim testing was similar to the pre-experimental one and used the same scale to determine the extent of improvement in WTBC skills.

After the completion of the pedagogical experiment, a post-experimental cross-section was conducted in all the groups to assess the level of students' mastery of WTBC skills and determine a more effective version of the teaching method. The validity of the results was tested using the F-test, specifically the Fisher angular transformation criterion. To determine which variant of the WTBC training method, A or B, was more effective, the following equation was used:

$$\varphi^* = (\varphi_1 - \varphi_2)\sqrt{\frac{n_1 \cdot n_2}{n_1 + n_2}}$$

where φ_1 – the angle that corresponds to the larger percentage; φ_2 – the angle that corresponds to a smaller percentage; n_1 – the number of observations in sample 1; n_2 – the number of observations in sample 2.

3. Results

Tables 3 and 4 show the average results of the pre-experimental cross-section for all of the defined criteria.

Table 3. Pre-experimental results (translation from Russian into English)

Group	Mean values for individual criteria, in points				Total score	Mean learning rate
	Accuracy of OT content conveyance	Stylistics of TT rendering	Linguistic rendering of the TT	Extra-linguistic rendering of the TT		
EG-1	20.5	11	11.5	10.5	53.5	0.54
EG-2	21	10.5	13	10	54.5	0.55
EG-3	24	12	15.5	13.5	65	0.65
EG-4	23.5	12.5	15	12	63	0.63
max	40	20	20	20	100	1

*EG – experimental group

Table 4. Pre-experimental results (translation from English into Russian)

Group	Mean values for individual criteria, in points				Total score	Mean learning rate
	Accuracy of OT content conveyance	Stylistics of TT rendering	Linguistic rendering of the TT	Extra-linguistic rendering of the TT		
EG-1	23	11	13.5	10.5	58	0.58
EG-2	23.5	11.5	13.5	10.5	59	0.59
EG-3	26.5	15.5	13.5	11	66.5	0.67
EG-4	27	15.5	13.5	11.5	67.5	0.68

*EG – experimental group

Based on the presented tables (Tables 3-4), it can be observed that the learning rates obtained in the pre-experimental cross-section are below the sufficient level of 0.7, indicating that students in all groups lacked sufficient skills to perform WTBC.

The decision was made to teach WTBC to EG-1 and EG-2 using variant B of the method since their learning rate was slightly lower than that of EG-3 and EG-4, which were taught using variant A. Variant B was considered more efficient as it concentrated the exercises aimed at improving WTBC skills across all types of BC, which modeled real-life business communication situations and allowed for better results. Table 5 displays the mean results of translations from English to Russian and vice versa in the pre-experimental and interim cross-sections.

Table 5. Comparison of the results of pre-experimental and interim cross-sections

Group	Learning rate in pre-experimental testing	Learning rate in interim testing	Increase
EG-1	0.56	0.72	0.16
EG-2	0.57	0.72	0.15
EG-3	0.66	0.84	0.18
EG-4	0.66	0.85	0.19

*EG – experimental group

Table 5 presents the results of the interim testing, indicating that all groups achieved a learning rate of at least 0.7, indicating the efficiency of both the A and B variants of the proposed teaching method.

Table 6. Comparison table of the results of pre- and post-experimental cross-sections

Group	Learning rate in pre-experimental testing	Learning rate in post-experimental testing	Increase
EG-1	0.56	0.92	0.37
EG-2	0.57	0.92	0.36
EG-3	0.66	0.89	0.23
EG-4	0.66	0.88	0.22

*EG – experimental group

Table 6 shows the average performance results for pre- and post-experimental cross-sections in English to Russian and Russian to English translations.

The pre-experimental testing conducted and the results obtained (Tables 3-4) helped to identify the challenges that students faced in translating BC and confirmed the need for a specifically designed set of exercises to improve their written translation skills. The low scores obtained in all criteria at this stage suggest that students lacked sufficient knowledge in intercultural business communication, particularly in BC form, and were deficient in terms of vocabulary and translation skills.

The authors observed that groups EG-3 and EG-4, which were trained according to variant A, achieved the best results in the interim cross-section (Table 5). The authors attribute this to the inclusion of the fifth MC in the first cycle, which aimed to improve students' ability to translate pre-contractual correspondence.

While the interim results showed improvement, it is crucial to note that the criteria indicators did not reach the desired level. The average number of semantic mistakes made by students in both translations was three in EG-1 and EG-2, and two in each text for EG-3 and EG-4. Although these numbers may seem acceptable, even one semantic mistake can result in a misunderstanding of the TT, leading to unexpected outcomes in intercultural business communication. Therefore, this number of mistakes is considered as unacceptable.

The efficiency of the two variants of the method was compared on a horizontal level, based on the results of the experimental training. Table 6 indicates that the mean learning rate did not differ significantly across the groups. The highest learning rates were observed in EG-1 (0.92) and EG-2 (0.92) that were taught using variant B, where the improvement of WTBC skills was conducted at the end of the final training cycle over three lessons and based on all types of BC. On the other hand, students in EG-3 and EG-4, who were taught using variant A, with the improvement of WTBC skills at the end of each cycle and by specific types of BC according to the cycle, demonstrated slightly lower learning rates (0.89 and 0.88, respectively).

Based on the experiment, it can be concluded that the participants were able to improve their skills in accurately conveying the meaning of the OT and the communicative intentions of the sender in the TT, with an increase of 1.7 times in EG-1 and EG-2 and 1.4 times in EG-3 and EG-4. They were also able to correctly render the TT in terms of stylistics, with an increase of 1.5 times in EG-1 and EG-2 and 1.2 times in EG-3 and EG-4, and at the linguistic level, with an increase of 1.3 times in EG-1 and EG-2 and 1.2 times in EG-3 and EG-4. Finally, the participants also improved their skills at the extra-linguistic level, with an increase of 1.8 times in EG-1 and EG-2 and 1.6 times in EG-3 and EG-4.

Based on the experimental results, it can be concluded that variant B is more effective in teaching WTBC. The performance of exercises aimed at improving the skills of translation of all types of BC at the end of training cycles contributes to higher learning outcomes.

Authors used the F-test to statistically confirm this conclusion.

As a rule, methodological research considers the presence of effect as the attainment of the 0.7 learning rate and the absence of effect – as the failure to reach it. Yet since all participants in our experiment reached the sufficient learning rate and the obtained mean rates were much higher than the sufficient (0.7), it is reasonable to consider the learning rate of 0.9 as the effect and the

failure to achieve this coefficient – as the lack of effect. Thus, authors have determined the difference in the shares of students who failed to reach the 0.9 learning rate.

Table 7. Average results of pre- and post-experimental cross-sections

Group	Presence of effect		Absence of effect		Total number of students
	Number of students	Percentage share	Number of students	Percentage share	
EG-1, EG-2	45	75 %	15	25 %	60
EG-3, EG-4	21	35 %	39	65 %	60
Number of students	66		54		120

*EG – experimental group

The statistical analysis showed that the value of φemp is 3.318, which is higher than the critical values of φcrit (1.64 with $p < 0.05$ and 2.31 with $p < 0.01$). This indicates that a higher proportion of students in EG-1 and EG-2 achieved the learning rate of 0.9 compared to EG-3 and EG-4. Based on these findings, it can be concluded that the variant B of the developed model for teaching WTBC is more efficient than variant A.

4. Conclusion
The results of the study support the hypothesis that the use of carefully selected educational materials and a corresponding set of exercises can improve the quality of student performance in WTBC. Additionally, as it was obtained in the results the use of specialized exercises to enhance translation skills in all types of BC at the end of each learning cycle led to improved learning outcomes.

The potential applicability of the proposed methodology for teaching translation of other types of official business texts is a promising area for future research. However, it should be noted that the effectiveness of the methodology may vary depending on the specific characteristics of the text and the learning context. Further studies could explore the generalizability of the findings to different types of texts and learning environments.

The main limitation of this study is that there were no control groups. Furthermore, due to the limited duration of the pedagogical experiment, which spanned only two semesters, it was not possible to observe the long-term development of WTBC skills beyond this timeframe.

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Students' Attitude Towards Online English Language learning during COVID-19 Outbreak in the North Asia: a Case Study of North-Eastern Federal University

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Abstract

This article aimed to identify the attitudes of undergraduate students towards online English language learning in the North-Eastern Federal University, Russia. The questionnaire was conducted using Google form. The sample included 303 undergraduate EFL students. The research subjects are the students of Institute of Engineering and Technology, Institute of Mathematics and Information Sciences and Automobile and Road College. The research tools were questionnaire and Chi-square test. The data were interpreted in terms of three parameters: by gender, by place of residence and by academic achievement. By gender 180 respondents were male, while 123 were female. The number of rural students is 125 students, whereas urban students make up 178. The majority of students (65,7 %) are B grade students, 16,2 % of students are A grade students, 18,2 % of students are C grade students. The results of the study revealed that students have a favourable attitude to online learning. In particular, female students were statistically detected to have a more complimentary attitude to online learning than male students. In contrast, the statistics did not discover the preference of online learning by the place of residence. As it was also shown that academic performance did not affect the preference of online learning. The challenges faced by students are slow Internet connection, non-comprehension of learning material, lack of effort and interest, and lack of personal space. In addition, this study revealed the unpreparedness of university network infrastructure and its technological capacity for conducting online classes. The study discovered that students prefer an equal mix of online and face-to-face instruction.

Keywords: COVID-19, English as a foreign language, Arctic, Russian Far North, online learning, perception, circumpolar region, Northern Asia.

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1. Introduction

During the COVID-19 pandemic, universities and institutes have transferred to online education. The impact of COVID-19, particularly on education, work, economy, and governance is immense and unprecedented worldwide (Papapicco, 2020). Educational establishments had to offer a variety of online courses by the needs of students in different subjects. Online learning has become a popular tool for teaching and learning. A wide range of modern technologies and platforms are being used in online learning.

The transition to online training took place in 2020 across the entire territory of the Russian Federation, including the Russian Far North. Specifically, the transition to online training took place in March 2020 at the North-Eastern Federal University, which is located in Northern Asia or in the Arctic zone. Such a sharp transition from full-time education to online education caused challenges and stresses for both students and teachers due to the lack of internet learning experience. Russia's Arctic zone, as the most remote and vast territory to live in, has experienced access difficulties to online training. English as a foreign language is studied by all students (approximately 20,000 students) of all schools and colleges of North-Eastern Federal University. The university employs online platforms such as Moodle and Skyes. Moodle is a free open-source learning management system used by a large number of educational institutions in the Far Eastern regions of Russia. In addition, the Skyes digital platform is used for learning English.

The article seeks to discover attitudes, perceptions and challenges that undergraduate students' have faced in online English language learning during COVID-19 lockdown in the Republic of Sakha (Yakutia). The challenges are related to learning content, use of technology and perspectives of online learning. It discusses the following research questions: (1) What is the students' attitude to online English language learning in terms of gender, place of residence and academic achievement? (2) What difficulties and challenges have the students faced during online English language learning? (3) What are the perspectives of online English language learning in students' opinion?

2. Discussion
Definition of online learning, E-learning and distance learning

In scholarly literature the terms "online learning", "e-learning", and "distance learning" are used interchangeably. Recent research in education gives different definitions of the terms under discussion. The scholars have elaborated different aspects of online learning or e-learning. (Cojocariu et al., 2014; Rekkedal et al., 2003; Hiltz, Turoff, 2005; Singh, Thurman, 2019; Anderson, 2011 and etc.). In particular, Cojocariu et al. (2014, p.2000) argue that "most of the terms (online learning, open learning, web-based learning, computer-mediated learning, blended learning, m-learning) have in common the ability to use a computer connected to a network, that offers the possibility to learn from anywhere, anytime, in any rhythm, with any means".

Rekkedal et al. (2003, p. 7) state that "online learning represents a subset of distance education". It is characterized by (a) the separation of teacher and learner; (b) learning materials provided by educational organizations; (c) the use of computers and computer networks by the participants in the learning process.

Hiltz and Turoff (2005) regard online learning as a new version of distance learning. Similarly, Benson (2002) states that online learning is a newer version or, an improved version of distance learning.

According to Singh and Thurman (2019: 291), online learning is "learning experiences in synchronous or asynchronous environments using different devices (e.g., mobile phones, laptops, etc.) with internet access. In these environments, students can be anywhere (independent) to learn and interact with instructors and other students". Online learning makes the teaching-learning process more student-centered, more innovative, and even more flexible.

Anderson (2011) clarifies that online learning refers to a type of teaching and learning situation in which (a) the learner is at a distance from the tutor/instructor, (b) the learner uses some form of technology to access the learning materials, (c) the learner uses technology to interact with the tutor/instructor and with other learners and (d) some kind of support is provided to learners.

Harasim (2006, p.64) distinguishes three categories of online learning: (a) adjunct mode is when online learning activities are used only to supplement a course; (b) mixed (blended) mode is when online activities are used as a significant part of a course: (c) totally online mode describes courses in which the majority (if not all) of the course activities are done online.

While continuing the consideration of the basic terms, we witness that researchers diversely define E-learning. For instance, Guri-Rosenblit (2005: 469) thinks that E-learning is "the use of electronic media for a variety of learning purposes that range from add-on functions in conventional classrooms to full substitution for face-to-face meetings by online encounters".

Marquès (2006) considers E-learning to be "distance education through remote resources". Li, Lau and Dharmendran (2009) regard E-learning as "the delivery of a learning, training or education program by electronic means". Bermejo (2005) understands E-learning as "education that uses computerised communication systems as an environment for communication, the exchange of information and interaction between students and instructors". Liao and Lu (2008) interpret E-learning as education delivered, or learning conducted, by Web techniques. Lee and Lee (2006) are of the opinion that E-learning is an on-line education conducted as the self-paced or real-time delivery of training and education over the internet to an end-user device".

Koohang and Harman (2005) review that E-learning is the "delivery of education (all activities relevant to instructing, teaching, and learning) through various electronic media". Aldrich (2005) believes that "E-learning is a broad combination of processes, content, and infrastructure to use computers and networks to scale and/or improve one or more significant parts of a learning value chain, including management and delivery".

Roblyer and Edwards (2000: 192) characterize distance learning as "the acquisition of knowledge and skills through mediated information and instruction, encompassing all technologies and other forms of learning at a distance". Polat (2020: 18) explains distance learning technologies as "educational technologies realized by means of information technologies and telecommunications in indirect or not-so-indirect interaction of the student and the teacher".

Having considered all the definitions, we make a conclusion that the discussed terms have much in common. Thus, online learning is carried out using electronic tools remotely through training materials supported by feedback. It is conducted in educational institutions according to the curriculum based on distance technologies.

Challenges of online learning during COVID-19 pandemic in EFL setting

The new research articles concerning English language teaching during COVID-19 pandemic have been published. Mahyoob (2019) conducted research on identifying the challenges and obstacles experienced by English language learners (EFL) in Taibah University, Saudi Arabia during COVID-19 pandemic. He pinpoints that the challenges faced by EFL students in online learning are related to technical problems, communication issues, and low satisfaction of students with online courses. Karim and Hasan conducted a study to know the challenges confronted by students in a virtual learning, and prospects of a virtual learning from the undergraduate students' point of view in Saudi Arabia at a tertiary level. The results of the study revealed that students have a preference for a blended and online mode of education rather than face-to-face regular classes. The author concludes that students' preferences for online learning should be taken into account in designing the syllabus. It is also needed to upgrade the students' and teachers' use of technology for efficient education.

Alfiras et al. (2020) bring up methodological questions about online learning arising from COVID-19 pandemic from the point of view of both teachers and students. Faculty members believe that online learning is good for theoretical and semitheoretical classes. But online learning is ineffective in teaching practice oriented courses in contrast to face-to-face instruction.

The authors conclude that online learning and face-to-face learning have become commonplace in the post-pandemic era. The following methodological issues remain unresolved. They include: 1. The nature of the training materials used for online learning 2. The problem of assessing students' knowledge and skills in online learning, their effectiveness and validity. 3. The lack of skills in the use of technology for both students and teachers 4. The format of training depends on the discipline in question.

Ajmal et al. (2020) explored the responses and feedback of EFL students to the advantages, limitations of online teaching at University of Lahore, Pakistan. The results of the study demonstrate that modern technology in English language teaching has a beneficial effect on students' achievement, students' motivation, and students' language awareness. However, it has several limitations: limited internet access area. Secondly, teachers' lack of technological skills on the part of teachers or computer know-how, learners' anxiety, low motivation, and low English proficiency level prevent them from developing their English skills. Technological tools cannot

replace classroom teaching. Their role is supplementary. Face-to-face interactions between teachers and students is essential for many courses which are aesthetic and practical in nature.

Furthermore, Farrah and Al-Bakry (2020) studied challenges of online learning faced by EFL students in Palestinian universities. The study concluded that students have a positive attitude to online learning. However, poor technological skills of students decreased learning efficiency. Among other problems determined are an unreliable evaluation system of students' performance, and the poor technological infrastructure of universities.

In a similar direction, Novrika and Arif (2020) investigated challenges encountered by EFL students' in Indonesia. The study reported that the main challenges were unsteady network connection, lack of communication or social interactions between teachers and students, lack of feedback, and frequent students' distraction from studying.

Kasyfur (2020) researched the perception of online learning byEFL students in Indonesia at the tertiary level. The research demonstrated that the students regard online learning to provide flexible time and nurture their autonomy/independence and confidence. However, the students have internet connection problems, their poor understanding of the online materials and lack of technological skills on the part of students. Overall, students have a positive attitude to online learning. The students consider online learning ineffective.

Coman et al. (2020) conducted research on students' perception of online learning and teaching in Romanian universities. The research concluded that universities, teachers and students were not prepared for fully online learning. The researchers identified the following problems: technical problems with the platforms provided by the universities, slow internet connection, lack of adequate technologies to connect to online learning, lack of communication (interaction) between teachers and students, online courses are difficult to assimilate (poor assimilation of courses), students' distraction and loss of focus. Students felt isolated. To sum up, students have a negative attitude towards online learning.

3. Methodology
Sample

A total of 303 respondents from the North-Eastern Federal University learning English as a foreign language participated in this research. Out of the total number of respondents, 180 respondents (59,4 %) were male, while 123 (40,6 %) were female. The number of rural students is 125 students (41,3 %), whereas urban students make up 178 (58,7 %). 65,7 % of students are B grade students (N = 199), 16,2 % of students are A grade students (N = 49), 18,2 % of students are C grade students (N = 55).
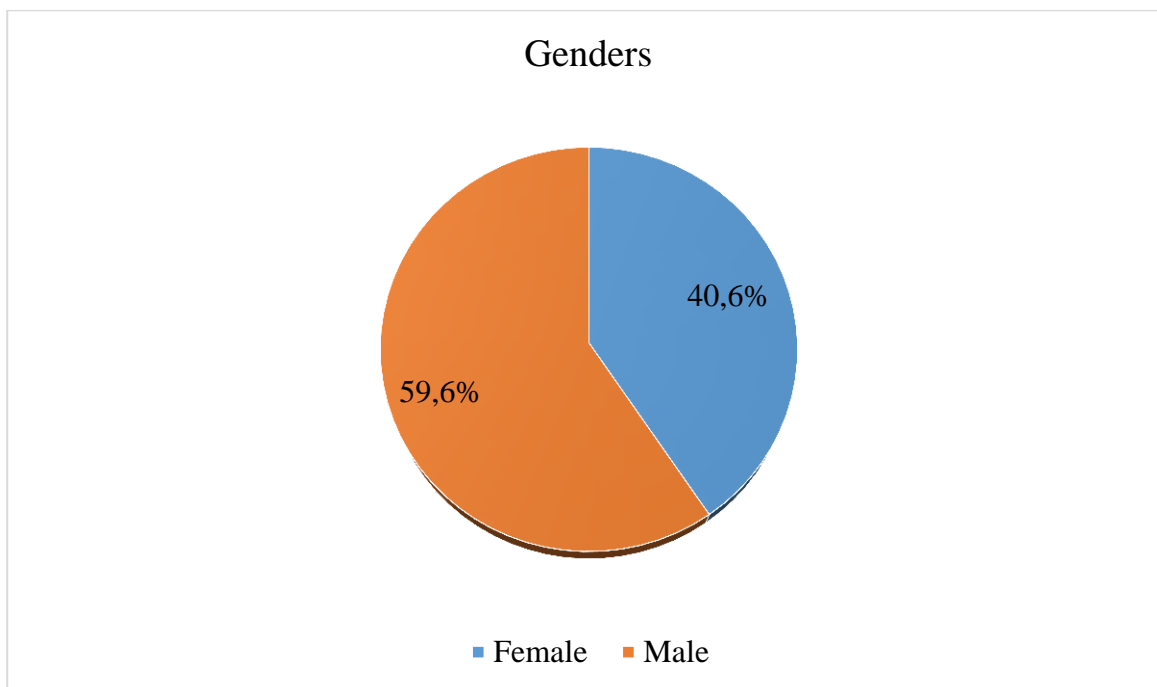
Fig. 1. Gender of participants
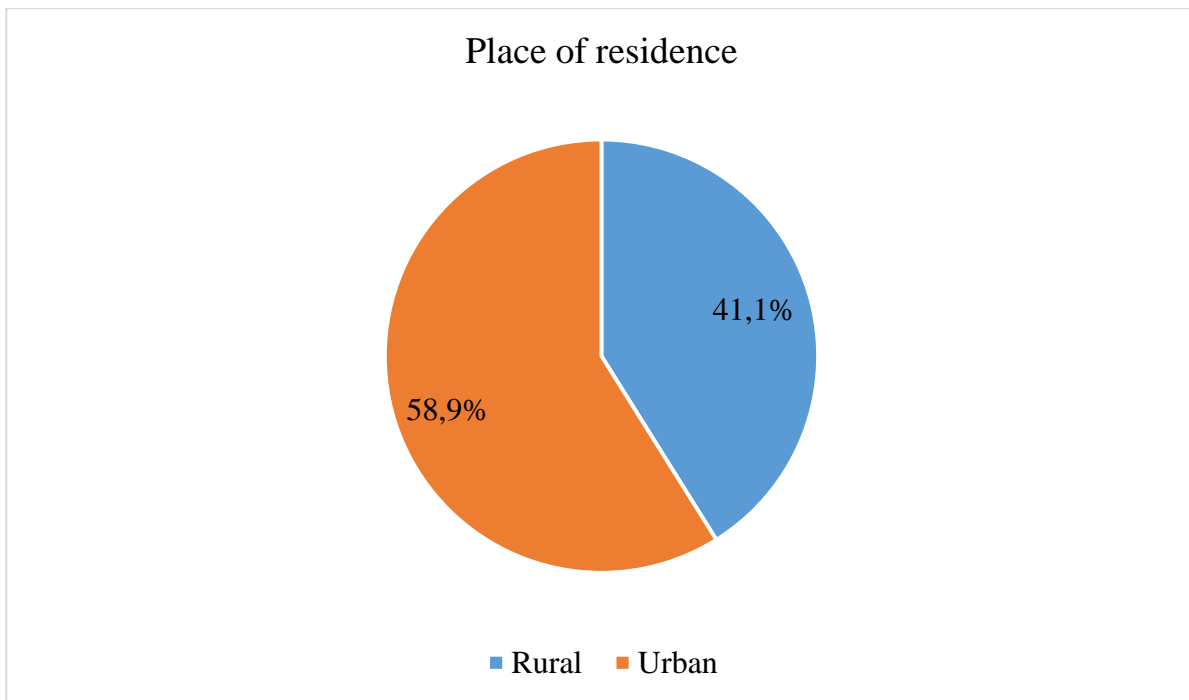
Place of residence

Fig. 2. Participants' place of residence

Academic performamce
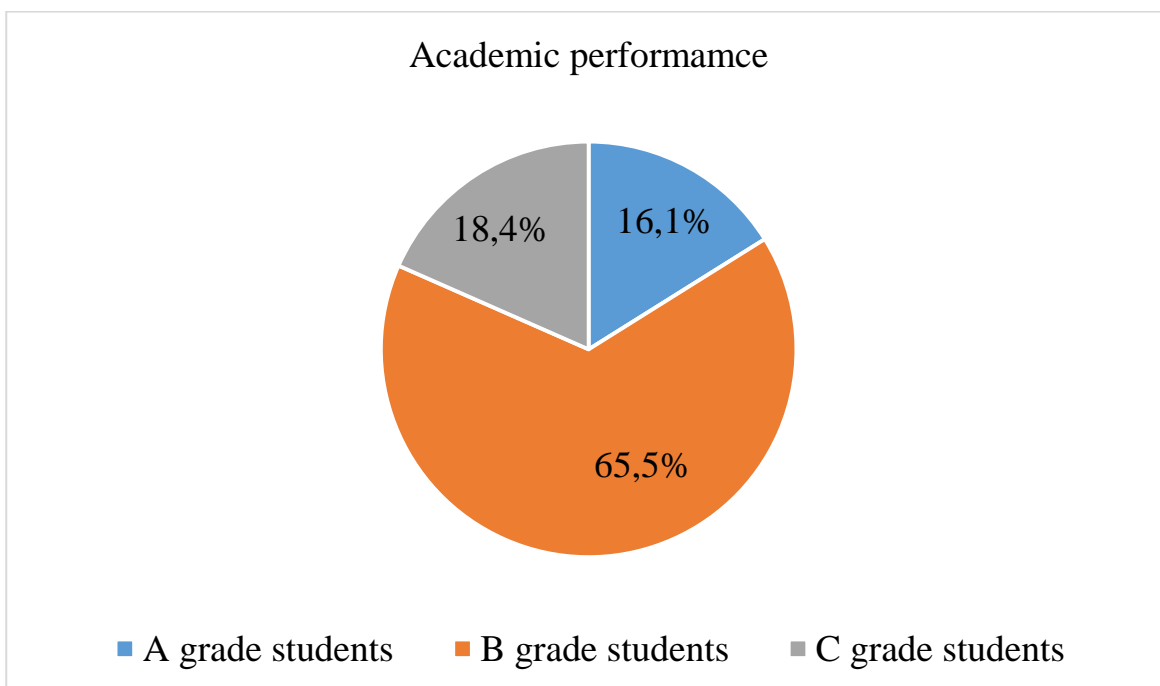
Fig. 3. Participants' academic performance

Instrument

The survey was held by means of a Google form (https://docs.google.com/forms/d/1kko KfaQv oHdGdIOlSdJw_EZyp5Q3pSD_F4-IQAtJhOI/edit?usp=forms_home&ths=true). The questionnaire included four major components: (a) demographic information, (b) online learning effectiveness, (c) challenges of online learning and (d) perspectives of online learning. When filling out the questionnaire, students chose answers on a 5-point scale ("strongly disagree", "disagree", "neutral", "agree", "strongly agree"). The questionnaire items are based on several studies (Farrah, al-Bakry, 2020; Kasyfur, 2020; Mishra, Panda, 2007). The items were adapted to find answers to the research questions. The said questionnaire consists of 20 questions. The results of the questionnaire were

calculated using chi-square test. In the course of statistical processing, contingency tables were made for three parameters: by gender, by place of residence, and academic performance.

4. Data analysis

Regarding the first research question, the answers of male and female respondents revealed the noticeable differences on the 3 questions of the survey. Specifically, most female students 65 % (N = 80) have a more favourable attitude to online learning than male students 37,2 % (N = 67). 55,2 % (N = 65) female students think that online learning increases flexibility, whereas 55,5 % (N = 100) of male students have the opposite opinion. Furthermore, 59,3 % (N = 73) female students think that online learning improves their independence and self-development, while 62,7 % (N = 123) of male students disagree with this statement.

Other questionnaire items did not elicit obvious differences in the responses of the students. The majority of both genders' representatives disagreed with other statements of the questionnaire. For example, the students of both sexes do not consider that online learning increases their productivity and effectiveness 72,2 % (N = 130) male students and 58,5 % (N = 72) female students). Overall, both genders demonstrated a positive perception of online English language learning.

Moreover, almost half of male students 56, 2 % (N = 101) and 56, 9 % (N = 70) female students had no problems with the Internet connection. 71, 6 % (N = 129) male students and 65 % (N = 80) female students think that online learning did not affect their understanding of English. 81,1 % (N = 146) male students and 74,7 % (N = 92) female students disagree that online learning improves communication.

Online learning materials are comprehensible for the most part of male and female students respectively. 75 % (N = 135) male students and 61 % N = 106 female students). 75,5 % (N = 136) male students and 87,7 % (N = 108) female students responded that online learning did not motivate them to learn more English during the COVID-19 outbreak.

As it turned out, the technological skills of both genders are at a high level. 71,6 % (N = 129) male students and 79,6 % (N = 98) female students know how to use the technology for online learning. The majority of 71,1 % (N = 128) male students and 65 % (N = 85) female students did not notice the increasing size of assignments and the studying hours. Furthermore, 52,2 % (N = 94) male students and 62,6 % (N = 77) female students tend to study English online.

The students' answers were checked by a chi-square test presented in Table 1. The chi-square indicator is 22.6383, having the *p*-value is < .00001. The result proves significant at *p* < .05.

Table 1. Preference of online learning by genders

	Preferred online learning	Not preferred online learning	Row Totals
Male	67 (87.33) [4.73]	113 (92.67) [4.46]	180
Female	80 (59.67) [6.92]	43 (63.33) [6.52]	123
Column Totals	147	156	303 (Grand Total)

Touching upon the second question of the research it should be pinpointed that the responses of urban and rural students did not reveal a significant difference in all questions. More than half of the urban students 52,2 % (N = 93) have a favourable attitude towards online learning, whereas over the half of rural students 56,8% (N = 71) showed a negative attitude towards it. Moreover, 65,1 % (N = 116) urban students responded that they did not have problems with Internet connection. In contrast, under half 44 % (N = 55) of rural students faced no issues with Internet connection. The vast majority 93,8 % (N = 167) of urban students would like to learn English online in the near future, while only 53,6 % (N = 67) of rural students have the same intentions.

With respect to other questions in the questionnaire, more than half of the students give negative answers on the development of productivity, independence and self-development and motivation to learn more English during COVID-19 outbreak. For instance, only 34,8 % (N = 62) urban students and 31,2 % (N = 39) rural students said that online learning enhanced my effectiveness and productivity in learning. 55 % (N = 98) of urban students agreed that online learning increases the flexibility of teaching and learning. Only 37,6 % (N = 47) students agreed.

32.5 % (N = 58) urban students and 28,3 % (N = 36) rural students agreed that online learning improves their understanding of English.

Moreover, 75,8 % (N = 135) urban students and 82,4 % (N = 103) disagree that online learning improves communication (or feedback) between students and teachers. 39, 8 % (N = 71) urban students and 32 % (N = 40) rural students did not find materials provided easy to understand. 51, 6 % (N = 92) urban students and 38,4 % (N = 48) did not agree that online learning improves my independence and self-development. Only 34,2 % (N = 61) urban students and 34,4 % (N = 43) rural students agree that online learning motivates me to learn more English during the COVID-19 outbreak.

Both 69,2 % (N = 71) urban and 68,8 % (N = 39) rural students have an opinion that online learning did not increase the size of assignments and the studying hours. It should be noted that 82 % (N = 146) of urban students and 64 % (N = 80) rural students know how to use the technology for online learning. Moreover, 39,8 % (N = 71) urban students and 32 % (N = 40) rural students did not find materials provided easy to understand. In a similar way, 32,5 % (N = 58) urban students and 28,8 % (N = 36) rural students agreed that online learning improves my understanding of English. 65,8 % (N = 117) urban students and 65,6 % (N = 82) rural students disagree that online learning motivates them to learn more English during the COVID-19 outbreak.

65,1 % (N = 116) of urban students said that they did not have problems with Internet connection. In contrast, under half 44 % (N = 55) rural students faced no issues with Internet connection. The vast majority 93,8 % (N = 167) of urban students would like to learn English online in the near future, while only 53,6 % (N = 67) of rural students have the same intentions. 69,2 % (N = 71) of urban students and 68,8 % (N = 39) of rural students did not notice that online learning increased the size of assignments and the studying hours. 63,4 % (N = 113) of urban and 60,1 % (N = 77) of rural students would like to have online English classes. In general, the responses of urban and rural students did not reveal a significant difference in all questions.

The chi-square test did not prove the preference or non-preference of online learning by the place of residence (Table 2). The chi-square indicator is 2.4063, the *p*-value being .120844. The result is not significant at *p* < .05.

Table 2. Preference of online learning by the place of residence

	Preferred online learning	Not preferred online learning	Row Totals
Urban	93 (86.36) [0.51]	85 (91.64) [0.48]	178
Rural	54 (60.64) [0.73]	71 (64.36) [0.69]	125
Column Totals	147	156	303 (Grand Total)

In relation to academic performance, the students' responses reflected different opinions. Firstly, twice as many A grade students 89,7 % (N = 44) have a favourable attitude towards online learning in contrast to B grade and C grade students. The overwhelming majority of A grade students 93,8 % (N = 46) agree that online learning materials are easy to understand. Similarly, 79,3 % (N = 158) of B grade students and 38,1 % (N = 21) of C grade students adhere to the same opinion. Additionally, A grade students 71,2 % (N = 35) replied that online learning improves their independence and self-development. By contrast, the same opinion is shared by only 45,2 % (N = 90) of B grade students and 27,2 % (N = 15) of C grade students. The number of A grade students, who have high technological skills, are greater than the number of B and C grade students. In total, the biggest half of A grade students 73,4 % (N = 36), and slightly over half of B grade students 56, 7 % (N = 113) and less than half of C grade students 40 % (N = 22) are inclined to learn English online in the near future.

The students did not accord with the other statements of the questionnaire. For instance, only 40,8 % (N = 20) of A grade students, 32,6 % (N = 65) of B grade students and 29 % (N = 16) of C grade students agreed that online learning enhanced their effectiveness and productivity in learning. 38,7 % (N = 19) of A grade students, 30,1 % (N = 60) of B grade students and 27,2 % (N = 15) of C grade students did not think that online learning improves their understanding of English. Correspondingly, 36,7 % (N = 18) of A grade students, 34, 6 % (N = 69) of B grade

students, 30,9 % of (N = 17) of C grade students think that online learning did not motivate them to learn more English during the COVID-19 outbreak. Moreover, as the questionnaire shows, 69,4 % (N = 34) of A grade students, 80,5 % (N = 161) of B grade students, 80 % (N = 44) of C grade students discorded that online learning improves communication (or feedback) between students and teachers. In a similar way, 75,5 % (N = 37) of A grade students, 68,3 % (N = 136) of B grade students, 65,4 % (N = 36) of C grade students rejected that online learning increased the size of assignments and the studying hours. Less than half of all students agreed that online learning increases the flexibility of teaching and learning.

As for the Internet connection, 77,5 % (N = 38) of A grade students did not encounter problems, 58,2 % (N = 116) of B grade students did not have, in contrast to the C grade students, whose 30, 9 % (N = 17) of them did not have problems with the Internet. Particularly, 81,6 % (N = 40) of A grade students and 75, 3 % (N = 150) of B grade students and 67,2 % (N = 37) of C grade students responded that they know how to use the technology for online learning.

The percentage of B grade students and C grade students who have a positive attitude to online learning makes up 47,2 % (N = 94) and 40 % (N = 22) respectively.

Table 3 displays the data obtained by the A, B, and C grade students. As is shown in this table, the result is significant at $p < .05$. The chi-square indicator equals 32.9989. The p-value is < 0.00001. Thus, the students of all grades prefer online learning.

Table 3. Preference of online learning by academic performance

	Preferred online learning	Not preferred online learning	Row Totals
Level A	44 (25.87) [12.70]	5 (23.13) [14.21]	49
Level B	94 (105.08) [1.17]	105 (93.92) [1.31]	199
Level C	22 (29.04) [1.71]	33 (25.96) [1.91]	55
Column Totals	160	143	303 (Grand Total)

In regard to English skills, 45,2 % (N = 137) students indicated that the most difficult skills are speaking, 44,2 % (N = 134) of students identified grammar, and 36 % (N = 109)of students indicated listening as is shown in Figure 4. Appropriately, among the skills need to improved are: speaking (63,4 % (N = 192)), grammar (56,1 % (N = 170)), vocabulary (51,2 % (N = 155)) and listening (51,2 % (N = 155)).
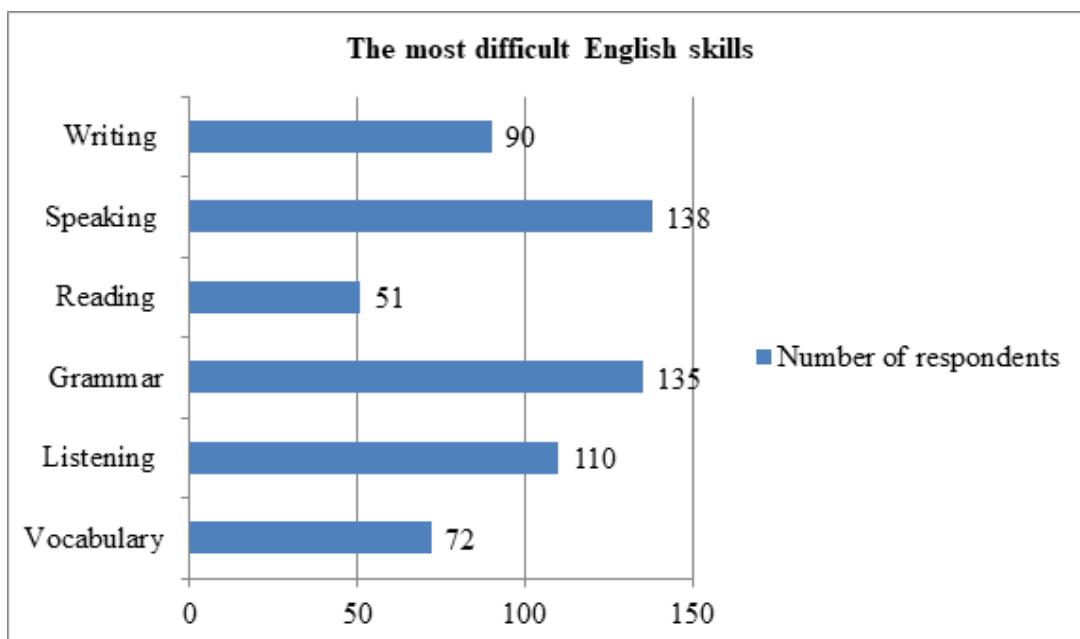
Fig. 4. The most difficult English language skills

The following chart shows the reasons why the students had problems with English learning: 30 % (N = 90) indicated lack of time, 26,1 % (N = 79) indicated lack of interest and effort, 25,4 % (N = 77) indicated lack of personal space (see the Figure 5).
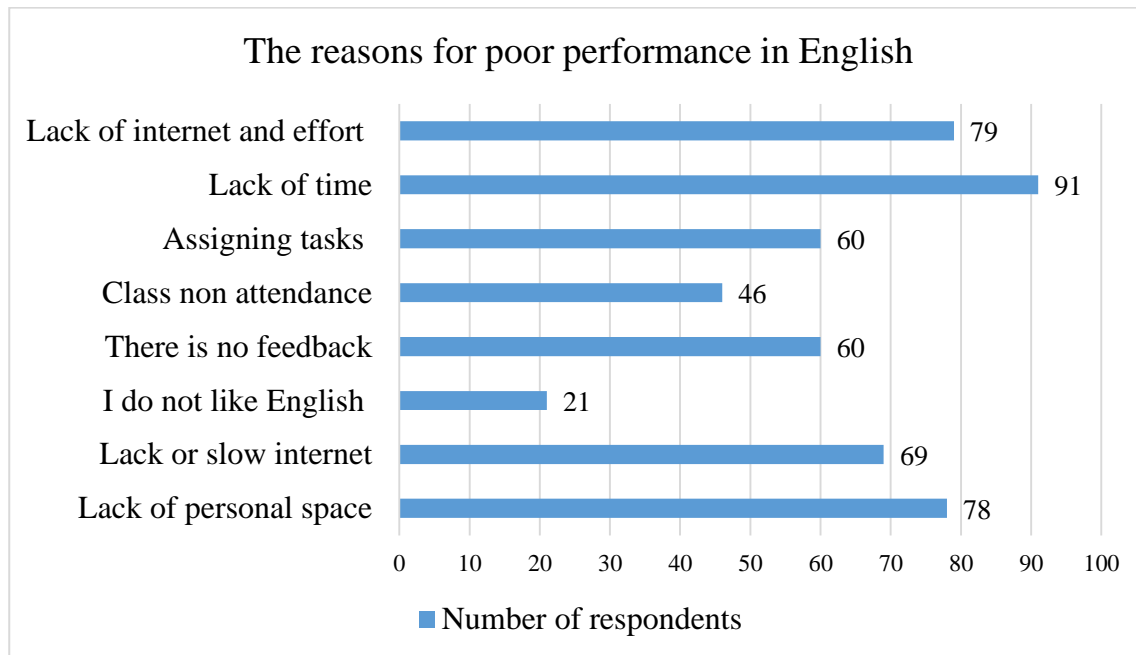
Fig. 5. The reasons for poor performance in English

Concerning the perspectives of English language learning, 37,2 % (N = 113) students chose an equal mix of online and face-to-face instruction. 20,7 % (N = 60) of students chose extensive online, some face-to-face format. Furthermore, 17,1 % (N = 52) of students chose an entirely online format. 16,8 % (N = 51) chose mostly face-to-face, minimal online format. Out of the proposed activities the students prefer the following: watching movies 61,1 % (N = 185), 45,9 % (N = 139) tests, 44,6 % (N = 135) online discussion, 32,3 % (N = 98) grammar rules and exercises, and 31,4 % (N = 95) role-plays and games.
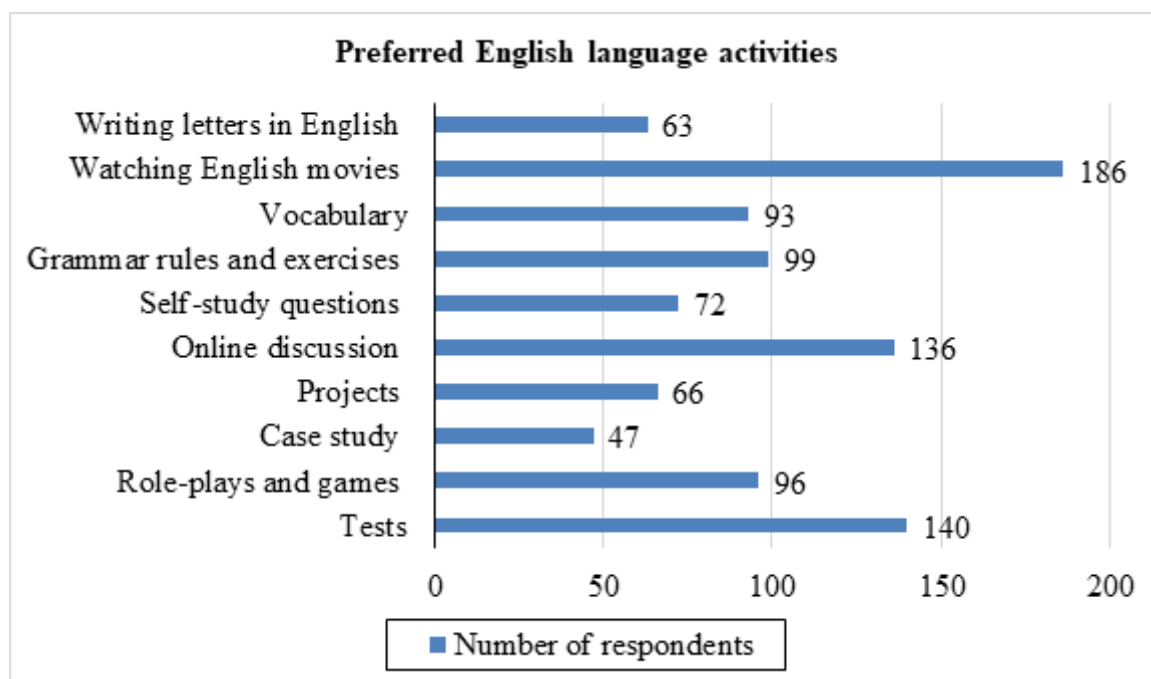
Fig. 6. The preferred English language activities

5. Discussion and implications

The survey conducted allowed us to reach certain conclusions about the perception of online learning by English non-major students. In general, male students tend to give neutral answers to the questions posed, while female students tend to give definite answers. Female students demonstrated a more favourable attitude towards online learning than male students. This was confirmed by the chi-square test, proving that female students have a clear preference of online learning. It can be assumed that the answers indicate that male students have not made a specific opinion about online learning as opposed to female students. They refer to flexibility and opportunities for independence or self-development to the advantages of online learning. More than half of male and female students would like to be taught English online.

Despite the fact that urban students in quantitative terms demonstrated a more favourable attitude towards online learning than rural students, the chi-square test did not detect statistically significant preference of online learning by them. Undoubtedly, the urban students are in a better position than rural students as the city or towns have better infrastructure and internet connection. Such conclusions are directly confirmed by the data that the majority of urban students had no problems with the Internet, while rural students often encountered such a problem during online learning. However, both urban and rural students aspire to learn English online. What is more, students from rural and urban areas displayed fairly high levels of technological skills. It can be explained by the fact that young people grew up and went to school in the digital era.

Although chi-squared statistics revealed a clear preference for online learning by students of A, B and C academic performance, the answers to the questionnaire questions allow us to make the following reasoning. A grade students in quantitative terms were discovered to favour online learning than B grade students and C grade students. The lowest percentage of positive attitude to online learning is shown by C grade students. Unlike C grade students, A grade and B grade students fully comprehend online materials. This is due to the fact that students with good grades understand English better. Moreover, the share of A grade students who indicated that online learning develops independence and self-development is much higher than that of B and C grade students. Apparently, the materials of the classes are more suitable for excellent students. Most of the A grade students did not have problems with the Internet in contrast to the C grade students. This may be due to the fact that most A grade students live in the city, while C grade students live in rural areas. Additionally, more A grade students know how to use technology for online learning than C grade students. As a result, more A and B grade students are more likely to learn English online than C grade students. On the whole, we come to the conclusion that there are certain problems with the infrastructure and Internet connection in the rural areas in the Arctic, which decreases students' motivation to learn English online. We assume that online learning materials are difficult for C grade students, that to a certain extent leads to a loss of interest in learning English. In sum, all students agreed that online learning did not improve their effectiveness and productivity, and their understanding of English. In students' opinion, communication between teachers and students also deteriorated in online learning. The students' responses indicate that they were not psychologically and technologically ready for online learning in a pandemic situation. The indicated reasons for poor academic performance such as lack of time, lack of interest and effort, lack of personal space and slow Internet connection confirm our conclusion.

To sum it up, the statistics indicated that most students demonstrated a favourable attitude to online learning. The majority of respondents chose an equal mix of online and face-to-face instruction. Thus, the students showed their balanced approach to English language education because they think that online education meets the demands of the up-to-date educational process. The questionnaire results may be used for the designing of online English language courses for A, B and C grade students. Timely needs analyses are necessary for creating flexible online courses. The students expressed their preferences for watching movies, tests, online discussion, grammar rules and exercises, and role-plays and games. The activities are expected to be included in the upcoming online course.

6. Conclusion

In this study, we examined the effectiveness of online learning, the challenges of online learning and the prospects of online learning in the Republic of Sakha (Yakutia). The students rated the overall effectiveness of online learning as low and not improving the quality of learning. The students pointed out a number of problems such as poor Internet connection, lack of

understanding of online learning materials, lack of interest and effort and poor feedback from the teacher. The findings of this study testifies that there are problems with the Internet due to poorly developed infrastructure in the Arctic rural regions, which has a bad effect on the quality of education. During the online learning the students demonstrated lack of self-motivation and self-organization skills. The university's communication systems and technical platforms proved to be unprepared for the active use of online learning means. However, the perspectives for online learning are hopeful since students' perception of online learning is predominantly positive.

The survey results showed that students have both a positive attitude and a favourable perception of online learning. Online learning is considered by them as an integral part of modern education in general, and English language teaching, in particular. The students' choice of equal online and face-to-face instruction learning format reflects a mature choice of students. The modern education is impossible without online learning. Online education should remain and develop simultaneously with a traditional format for creating modern education. For this purpose, it is necessary to take into account students' and teachers' opinions on learning and teaching, that lead to the effective functioning of the education system. Online English learning can be improved by developing of effective instructional materials. Thus, the challenges imposed by the implementation of online learning during COVID-19 pandemic open up new opportunities for efficient creation of digital learning environment.

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Involving Future Teachers in Practical Activities on Developing the Multifunctional Interactive Portfolio for their Professional Development

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Abstract

In accordance with the requirements of the professional standard, the teacher of the modern school must have skills related to digital technologies, communicative competence, and the skill to manage educational projects. Professional development of future specialists requires organization of purposeful practical activities, within which students of pedagogical specialties will be able to acquire skills to work with information, use various software environments to create the e-portfolio and present necessary educational resources in it.

The purpose of the research is to study the impact of participation of future teachers in practical activities of developing the multifunctional interactive portfolio of their professional development.

The methodology is based on the analysis of the didactic potential of the e-portfolio technology, support for UNESCO initiatives, state programs for the development of education. The analysis and generalization of literature on the problem of using interactive tools in the digital school, processing of test results are applied. The software tools are: interactive simulators; timelines; mental maps; presentations. The experiment involved 80 students of Vyatka State University who major in Pedagogical Education (bachelor degree level).

Research results. The implementation of the system of practical exercises on the development of the multifunctional interactive portfolio made it possible to change the nature of interaction between participants in educational relations in the experimental group; to improve quality of services in the electronic form; to determine priority areas for development for each student, etc.

In conclusion, the features of applying the proposed portfolio model are described: principles of the unity of education and upbringing, individualization, variability, reflection and cooperation; the system of components that take into account professional competences, etc.

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Keywords: digitalization of society, teacher education, professional competences, cloud technology, interaction, assessment of results.

1. Introduction

Changes in the world and education, new challenges and new opportunities for participants in the didactic process increase the need for developing and subsequent implementing innovative didactic approaches, models and technologies as the basis for the development of modern society.

According to the provisions of the UNESCO Strategy for Technological Innovation in Education (2022–2025), the COVID-19 pandemic has contributed to disorganization of education. But at the same time, in addition to the needs associated with ensuring the continuity of learning, the pandemic has raised the importance of technology and digital innovation to the higher level for increasing the resilience of educational systems and rethinking the future of education (UNESCO Strategy…, 2022).

A. Hanelt et al. are conducting research on the conditions and factors of the new digital didactics (Hanelt et al., 2021). S. Bećirović, M. Dervić discuss the problems of higher education transformation (Bećirović, Dervić, 2022). In other words, scientific work in the field of higher pedagogical education is being activated in the context of improving the quality of education systems (Soboleva et al., 2022).

Today pedagogical education, according to O.A. Imanova, has a special responsibility (Imanova, 2021). The main task of the teacher education is to train teachers who are able to work in the face of modern challenges, quickly respond to external influences and changing priorities. This requires a complete transformation of technologies and communications, educational environments when transferring knowledge in the didactic process. There is also a radical renewal of the methodology of education, the modernization of teacher training (Prokhorova, Semchenko, 2018).

At the same time, the mentor of the new digital school, as a responsible and active subject of society, often has to realize personal meanings through certain professional practices, including the use of innovative technologies. And then the teacher can confidently and skillfully reproduce those teaching technologies that he/she "knew to own cost".

The current mentors of the modern school and future teachers need:
– teaching methods that will inspire students to be creative.
– electronic educational resources that will allow them to develop scientific goals, content and tools for assessing learning in the digital age;
– services of information interaction, in the space of which it will be possible to teach students to cooperate and solve problems creatively;
– means with the help of which it will be possible to involve students in the processes of goal-setting, designing their own educational trajectory;
– "opportunity maps" for planning own activities to achieve individual educational results;
– tools for assessment and self-assessment of results and achievements.

According to L. E. Babushkina et al. using the e-portfolio technology is a possible way to solve this problem (Babushkina et al., 2021). The electronic portfolio is a promising pedagogical technology for assessing educational achievements, professional development and employment.

O.G. Smolyaninova, E.A. Bezyzvestnykh also convincingly prove that the electronic portfolio contributes to solving the problems of professional development of future teachers (Smolyaninova, Bezyzvestnykh, 2019).

As a result, the future teacher in the context of modern requirements for the quality of higher education for the level of formation of digital skills for successful professional activity needs to master the relevant information and activity competences.

The formation of these competences requires the organization of purposeful practical activities, within which students, future teachers will be able to acquire the skills to work with information, use various software environments to create the e-portfolio and present the necessary educational resources in it.

Practical activities at seminars and laboratory work is a natural situation when future teachers assess their professional knowledge and skills, it can really contribute to professional development in the field of information technology.

In addition, within the framework of practical activities on designing the electronic portfolio, students of pedagogical specialties receive a unique opportunity:

– for the purposeful development of reflection as a process of knowing oneself as a professional;

– for analysis own thoughts and experiences in connection with professional teaching activities.

So, the electronic portfolio in the context of digitalization of education allows to:

– effectively carry out interaction between the teacher and students to organize joint activities when working with documents, when assessing educational results;

– track the individual progress of each student;

– diversify the forms of control;

– self-compare;

- develop professional and personal competences.

It should be noted that most often the electronic portfolio is considered as a means of demonstrating the competences received by students; as a reflective tool that allows to track the dynamics of students' individual progress and assess academic achievements. In other words, in the vast majority of cases, existing e-portfolio developments are focused on performing one or two functions. However, the range of didactic possibilities of the e-portfolio makes it possible to enrich its content and reasonably expand the range of applications.

So, on the one hand, the work on designing electronic portfolios is effectively used to form professional competences in students of pedagogical specialties. At the same time, digital school teachers need experience in developing multifunctional interactive portfolios.

2. Relevance
2.1. Literature review
2.1.1. Analysis of Russian scientific and pedagogical literature

A.D. Korol, Yu.I. Vorotnitsky note that the digital transformation of all areas of human activities makes new demands on the education of people who will participate in modernization of production, in public and private life, create, implement and use digital technologies in everyday practice (Korol, Vorotnitsky, 2021).

This is confirmed by the provisions of the law "On Education in the Russian Federation" (Federal'nyj zakon "Ob obrazovanii..., 2012), the state program "Development of Education" (2018–2025) and other regulations that determine priorities for the development of a modern school (Gosudarstvennaya programma..., 2017).

According to V.G. Larionov, E.N. Sheremetyeva, L.A. Gorshkova, the global penetration of digital technologies into all spheres of human life and society has not left education aside (Larionov i dr., 2021). In the context of the digitalization of the economy, the guidelines for the development of higher education are changing. Higher education is seen as a kind of "bridge", which is aimed at ensuring the transition of the entire society into the digital age. This bridge involves the education and training of completely new specialists with digital thinking and digital competences. As prerequisites for the digital transformation of higher education the authors indicate both penetration into the educational field of various information technologies that have changed the learning process itself and emergence of a number of legal acts. The scientists reasonably prove that the digital transformation of higher education involves restructuring of all areas of activities based on information and communication technologies.

O.A. Imanova examined a number of state documents aimed at modernizing domestic education; she notes that the main content of the training of a modern teacher is also changing (Imanova, 2021).

The introduction of new state educational standards of higher education for the training program 44.03.01 "Pedagogical education" and the professional standard of the teacher is a logical reflection of the new requirements for training of teaching staff (Prikaz «Ob utverzhdenii...», 2018). An important direction of modern Russian education, according to the author, should be the study of international experience, widening domestic developments aimed at creating and implementing assessment tools that meet the needs of modern society.

N.V. Tikhonova considers that digital technologies are actively used at all levels of education (Tikhonova, 2021). This allows them to be effectively used when solving many methodological problems (training, demonstration, modeling, educational and gaming, etc.). In her study the information technology is considered as an important element in assessing professional competences of students of pedagogical faculties.

Information and communication technologies (photo and video cameras, phones, tablets, computers, etc.) perform the following functions:

– a tool that allows to document the process of acquiring the first professional experience;

– a tool that allows to conduct an objective analysis of professional experience;

– a resource with the help of which the obtained results can be used in the future to improve professional competences.

N.V. Tikhonova notes that the main task of students is an adequate interpretation and structuring of the material, as well as high-quality reflection, which is a key factor in personal and professional development (Tikhonova, 2021).

S.D. Yakusheva uses the concept of "professional skills", which determine the teacher's readiness for an activity, study and generalization of pedagogical experience (Yakusheva, 2019). It is professional skills, according to the author, that are the main methodological principles of pedagogy, which allow selecting and enriching the innovative palette of the new century.

Vashetina, Asafova, Kaur et al. analyze features of the professional development of future and current teachers in Russia, India, and Brazil (Vashetina et al., 2022). They singled out the aspect of the influence of the activity of future teachers in the digital environment on their professional development and self-development, as well as the relationship of professional development with self-determination, namely with goal setting.

N.G. Zharkikh, S.S. Kostyria consider the professional development as a process of qualitative and quantitative changes occurring in various professionally significant personality structures, the result of which are positive changes in professional activity and human consciousness (Zharkih, Kostyrya, 2018).

According to the conclusions of O.G. Smolyaninova, E.A. Bezyzvestnykh the interactive portfolio technology is aimed primarily at increasing students' own activity and their motivation for educational activities (Smolyaninova, Bezyzvestnykh, 2019).

M.I. Tomilova, E.Yu. Vasilyeva, O.A. Kharkova argue that alternative forms play a significant role in the process of assessing academic achievements of students at the present stage: creating a portfolio, conducting open lessons, and practical research (Tomilova i dr, 2013).

A.A. Samsonova defines the portfolio as a set (collection) of works of a student or teacher, which is a presentation of the activities for a certain period of time (Samsonova, 2020). The portfolio may also include sections related to students' self-assessment of achievements and planning for further stages and forms of education. For example, the choice of specialized classes, the design of an individual educational trajectory, etc.

E.V. Neborsky et al. conducted similar empirical studies (Neborsky et al., 2021). But their work is distinguished precisely by the sample, which includes students of pedagogical training programs, that is, future teachers. For such students, it is not just an experience, but development of an attitude and own pedagogical strategy for using digital technologies in education.

M.A. Choshanov lists the following qualities of teachers in the digital age: the ability to inspire students to be creative; develop on a scientific basis the goals, content and tools for assessing learning in the digital age; to teach students to cooperate and solve problems creatively (Choshanov, 2021). N.V. Garashkina, A.A. Druzhinina also believe that the teacher of the electronic educational environment should be able to combine traditional and innovative approaches, create and implement original technologies for teaching and educating using digital resources (Garashkina, Druzhinina, 2022). And further N.V. Garashkina, A.A. Druzhinina for the professional development of students-future teachers offer a learning model based on a combination of learning forms that integrate resources of digital and traditional didactics (Garashkina, Druzhinina, 2022).

O.G. Smolyaninova, E.A. Bezyzvestnykh in their works show that the electronic portfolio allows to optimize the work with information (search, processing, updating, reorganization, transfer), create a non-linear structure of materials in different formats, and organize quick access to them for students, parents, and teachers (Smolyaninova, Bezyzvestnykh, 2019). The electronic portfolio allows to design and implement an individual educational route, see progress in educational activities.

According to the findings of E. V. Borzova and M. A. Shemanaeva, the multifunctionality of technology is ensured not only by the number of functions, but also by several modalities of functions: functions are presented for each subject of the educational process (Borzova, Shemanaeva, 2022). This allows educational technology to be designed according to the stages of growth and development that characterize progressive development of the individual.

So, in the modern electronic portfolio of a student information about the results of both educational and extracurricular activities of the future teacher is most often included. But they do not pay enough attention to tracking changes in professional activities and human consciousness. In addition, in the overwhelming majority of cases, the existing e-portfolio developments are focused on performing a single function – recording the educational achievements of students. They do not fully implement the property of interactivity and, as a rule, do not use cloud technologies to individualize learning and form the required professional competences.

2.1.2. Analysis of foreign studies

In the research A.-S. Ulfert, I. Schmidt show that the digital environment today penetrates both everyday practices and the field of professional activities, not only radically changing their forms, but also rebuilding people's consciousness. The use of educational technologies in pedagogical practice, as scientists note, has become an integral part of the didactic process. Information technology allows to create entire collections of images, texts and data, accompanied by sound, video, animation and other visual effects, it includes an interactive interface and other control mechanisms. As a result, according to the authors, the problem of developing digital literacy of people is gaining unprecedented relevance (Ulfert, Schmidt, 2022). A.-S. Ulfert, I. Schmidt consider that development of digital competences has particular importance. Developed basic digital competences are the foundation for activities in the digital space (Ulfert, Schmidt, 2022). An individual possessing digital competences increases the level of efficiency of his/her professional activity, reduces the time to perform not only professional, but also personal tasks. These conditions open up new opportunities for professional and personal growth. Self-efficacy is described by the authors as one of the most important determinants of the productive use of information systems. A.-S. Ulfert, I. Schmidt propose to actively connect the possibilities of information and communication technologies for the formation and assessment of digital self-efficacy (Ulfert, Schmidt, 2022).

P. Sikström et al. indicate that the digital educational environment provides fundamentally new opportunities (Sikström et al., 2022):

– to move from learning in the classroom to learning anywhere, anytime;

– to design an individual educational route, thereby satisfying the educational needs of the student;

– to turn students not only into active consumers of electronic resources, but also creators of new resources, etc.

Considering transformations of the information society, Ch. Edwards et al. highlight the following characteristics (Edwards et al., 2018):

– a high level of development of computer technology, information and telecommunication technologies;

– increasing opportunities for access to information for a wide range of people;

– transformation of information and knowledge into a strategic resource, the main driving force of economic and social development.

The authors note that technology forces many countries to introduce technology consumption into the education sector. But at the same time, scientists call for the methods of education and upbringing to be also changed with the use of smart technologies. The use of information technologies, according to Ch. Edwards et al. will influence upbringing and learning strategies (Edwards et al., 2018). Since there is an integration of intellectual technologies with education and upbringing, new pedagogical techniques will be required for teachers and students to learn how to integrate technologies and goals.

B. Depro, K. Rouse describe possibilities of the case method as a professionally oriented technology for students. In their opinion, conducting a case study reveals and explores a contemporary phenomenon in real life through a detailed contextual analysis of a limited number of events or conditions and their relationships (Depro, Rouse, 2022).

H. Kim rightly notes that participation of teachers and computers in the didactic process at the same time significantly improves the quality of education (Kim, 2022).

Author researched didactic opportunities confirming the feasibility of using information technologies in training based on the cooperation of the teacher and the student: the joint use and publication of documents of various types and purposes; organization of group, paired and individual works; organization of interactive classes and collective training.

The personal qualities that are in demand in the conditions of the developing digital economy can be formed in the conditions of the digital educational environment built on the basis of new approaches to the use of forms, methods and teaching aids (including those implemented with the help of educational electronic resources). Therefore, one of the main goals of education, according to A. Hanelt et al., is the development of the student as a subject of own activity in the process of education and upbringing using digital information technologies (Hanelt et al., 2021).

An interesting approach is presented in the studies of P. Middleditch, W. Moindrot, S. Rudkin. The authors consider the possibilities of Twitter for training and formation of professional competences (Middleditch et al., 2022). Interaction on Twitter is considered by the author as a way of digital identification in the electronic space, a means of building an image and promoting an individual or organization.

Among promising educational technologies that are adequate to modern educational tasks, contributing to the development of student independence and formation of skills to manage own educational and cognitive activities, C. Chang et al. single out the technology of the electronic portfolio as a way of fixing, accumulating and evaluating the individual educational results of a student in a certain period of education (Chang et al., 2017).

According to H. Barret, the electronic portfolio is a promising pedagogical technology for assessing educational achievements, professional development and employment, and has been successfully used in America, Europe, Australia and other countries for more than 20 years (Barrett, 2007).

Interactive exchange between the teacher and students using information technologies is rational to use not only for organizing joint activities when working with documents, but also when assessing educational results. One of the effective forms of evaluation of training results is the portfolio.

The e-portfolio, according to Johansen, is used in international educational practice as a means of demonstrating competences and reflection, as a tool for development in the educational and professional sphere, and as a way to advance in the labor market (Johansen, 2023).

D.J. Cole, C.W. Ryan, F. Kick emphasize the possibilities of the electronic portfolio in the prolonged authentic assessment of the individual achievements of students which are in demand in the rapidly changing technologies of the modern economy (Cole et al., 1995).

A. Oosterbaan et al. believe that the portfolio artifacts reflect the achievement of certain goals and acquired competences. Also, the electronic portfolio is a reflective tool that demonstrates the development of competences (Oosterbaan et al., 2011).

From the point of view of I. Nicolaidou, portfolios allow students to participate in tassessment of their own work, track individual progress and provide a basis for a full assessment of the quality of individual work (Nicolaidou, 2012).

J. Arter, V. Spandel believe that the portfolio is used as a conscious collection of students' works, subject to a specific goal, which shows the author of the portfolio or other participants in the educational process efforts and achievements in one or more areas (Arter, Spandel, 2005).

Thus, from the perspective of foreign authors, the electronic portfolio is:
– a means of demonstrating competences received by the trainee;
– a reflective tool that allows to track the dynamics of the individual progress of students and assess individual achievements.

However, the property of interactivity is far from being fully realized in them. As a rule, the sections aimed at informatization and individualization of the educational, social, scientific activities of students and the implementation of the professional development of students are poorly developed.

2.2. Purposes and objectives of the study

The purpose of the work is determined from the need to study the impact of involving future teachers in practical activities to develop the multifunctional interactive portfolio on the level of their professional development.

Research objectives:
– clarify the potential of the electronic portfolio for the formation of professional competences of future teachers;
– develop a system of practical exercises for designing the interactive multifunctional cloud portfolio as a means of professional development of students of pedagogical specialties;

– systematize and select tools for filling the interactive multifunctional cloud portfolio;
– experimentally confirm the effectiveness of the proposed system of work.

3. Materials and methods
3.1. Theoretical and empirical methods

The methods for studying the aspects of using the interactive multifunctional cloud portfolio for constructing and implementing individual educational routes for students in the course of project activities are the analysis of legal acts, teaching aids, literature in the field of using interactive tools in the field of education. The methods of theoretical analysis are used (comparative method, generalization of experience); study and analysis of the experience of using the electronic portfolio.

In the study, when creating a business card site for the future teacher, Google Sites resources are used.

To assess achievements, interactive exercises developed in ProProfs are used. ProProfs is an online application to support the learning process through interactive exercises. In ProProfs educators create electronic manuals, surveys, quizzes and flash cards.

The Timeline JS service allows to display a time line on the site.

Mind maps designed in MindMap are used in educational and teaching activities. They allow to select only the most important points from a huge amount of text, provide a structural representation of a large amount of information and allow building causal-logical relationships.

During the pedagogical experiment, the analysis and generalization of the experience of students with the interactive multifunctional cloud portfolio aimed at constructing and implementing individual educational routes of students in the course of practical activities was carried out.

To process the results questionnaire and diagnostic methods were used (observation, conversation, generalization, questioning, testing, evaluation).

When selecting the control and experimental and control groups, the authors took into account the results of the author's testing which consisted of 80 questions grouped in blocks in accordance with the types of tasks of the professional activity:

PC-1. Willingness to implement educational programs in the subject in accordance with the requirements of educational standards.

PC-2. Ability to use modern methods and technologies of training and diagnostics.

PC-3. The ability to solve the problems of education and spiritual and moral development of students in educational and extracurricular activities.

PC-4. The ability to use the possibilities of the educational environment to achieve personal, meta-subject and subject learning outcomes and ensure the quality of the educational process by means of the taught subject.

PC-5. The ability to provide pedagogical support for socialization and professional self-determination of students.

PC-6. Willingness to interact with participants in the educational process.

PC-7. The ability to design individual educational routes for students.

PC-8. The ability to design trajectories of professional growth and personal development.

There are 10 questions in each block. The principles and content of the questions are disclosed in the research program. The portfolio was designed as part of the course Digital Technologies in Education.

Processing of statistical data was performed using Pearson's $\chi 2$ (chi-square) test.

Methodological feature of determining the levels: professional competences correspond to the training program 44.03.01 Pedagogical education.

3.2. The base of research

The main purpose of the experiment was to test the impact of involving students of a pedagogical specialty in the practice of designing the interactive multifunctional cloud portfolio of their level of professional development.

80 students of the training program Pedagogical education were involved (bachelor degree level, 5 1 % female, 49 % male).

The development and filling of the multifunctional cloud portfolio took place as part of the course "Digital Technologies in Education".

There was a general assessment of the level of professional development of students of pedagogical specialties: pedagogical skill, pedagogical technique, pedagogical mastery, pedagogical creativity, pedagogical innovation.

As part of the control event future teachers were asked to complete 80 tasks (tasks in accordance with the indicators of achieving professional competences of the main training program).

3.3. Stages of research

At the first stage of the study the analysis of domestic and foreign works in the field of modeling and technologization of higher pedagogical education was carried out, including the use of interactive and cloud technologies for professional development.

In addition, 80 questions for the control work were compiled. Their examples are presented in 4.3.1.

Based on the control materials, general assessment of the levels of professional development of students of pedagogical specialties was carried out. As part of the control event the future teachers were asked to do 80 tasks (10 questions for each task of professional activity). Correct performance was scored in 1 point.

Conditional names for the levels of professional development were introduced to interpret the results: skill, technique, mastery, creativity, innovation.

The student could get from 0 to 80 points for the control work. According to the measurement results the levels were determined as follows: from 0 (inclusive) to 24 points – "skill"; from 25 (inclusive) to 40 points – "technique"; from 41 (inclusive) to 54 points – "mastery"; from 55 (inclusive) to 59 points – "creativity"; and "innovation" in all other cases.

The second stage of the experiment was devoted to determining the structure of the course "Digital Technologies in Education" in accordance with the purpose of the study.

The third stage of the study is practical activities for designing and filling the portfolio: determining the structure of a business card site, creating timelines, quizzes, mind maps, electronic teaching aids and planned interactive activities (discussion, didactic games, situations of pedagogical communication).

4. Results
4.1. Key concepts of designing didactic games

When analyzing the literature, it was revealed that the processes associated with formation and development of the digital economy inevitably have an impact on development of educational systems around the world. Diffusion of end-to-end digital technologies is observed everywhere in all spheres of human activity, including education.

1. So, the main task of the digital transformation of education is to improve its quality through introduction of digital technologies at various levels (from management of educational organizations to private methods). In response to the challenges of the digital economy, changes are expected in the context of achieving qualitative changes in the digital transformation of education.

The digital transformation of education, as a new stage in its development, is associated with the diffusion of end-to-end digital technologies into its structure and content. We consider that the main guidelines for education at this stage are:
– development of personal independence of students;
– formation of the subjectivity of students;
– development of new forms of interaction between participants in the educational process;
– development of new ways of organizing joint (group, collective) work;
– development and implementation of a personalized learning system based on hierarchies to automate the content of educational resources.

The personal qualities that are in demand in the conditions of the developing digital economy can be formed in the digital educational environment built on the basis of new approaches to the use of forms, methods and teaching aids (including those implemented with the help of educational electronic resources).

Therefore, one of the main goals of education is the development of the student as a subject of own activity in the process of education and upbringing using digital information technologies.

2. According to the authors, the electronic portfolio technology can be attributed to promising educational technologies that are adequate to modern educational tasks and contribute

to the development of student independence and formation of skills to manage their own educational and cognitive activities.

In this study the electronic portfolio is considered as a way of recording, accumulating and evaluating the individual educational results of a student in a certain period of education.

3. When analyzing the term "interactivity", its concept was clarified both in pedagogical and technical senses.

They imply purposeful inter-subject interaction between the teacher and students to create optimal conditions for development of the student.

Among leading signs and tools of interaction are polylogue, dialogue, mental activity, meaning creation, intersubjective relations, freedom of choice, a situation of success, positivity, optimism in assessment, and reflection.

In the technical sense, interactive is understood as electronic content in which operations with its elements are possible: manipulations with objects, interference in processes. The conceptual difference between interactive multimedia content lies in the replacement of textual (verbal) descriptions with a direct audiovisual representation of objects, processes, phenomena with the modeling of typical reactions to external influences or changing conditions. When analyzing educational resources posted on the Internet, we take into account both aspects of the concept of "interactivity".

Currently, Internet resources that can be used to create a digital educational environment and implement e-learning have been developed. Among them are the Russian Electronic School, Uchi.ru, YaKlass, etc. The tasks are designed in such a way that they enable students to realize themselves as a subject of the activity, that is, these projects implement interactivity in the technical sense, and at the same time, the teacher can use these resources by organizing activities using interactive teaching methods.

The systems highlight the roles of the teacher, student, parent. Students are given the opportunity to construct an individual educational trajectory, within which the system will automatically create and save the student's digital portfolio. It should be noted that the listed platforms are mainly focused on the implementation of the learning function, while the social or scientific component of the educational process is practically not discussed. No attention is paid to supporting the purposeful interaction of participants in educational relations, aimed at planning and analyzing joint affairs and events.

4. In the presented study the joint activity of students in the process of cognition implies the exchange of knowledge, ideas, methods of activity. Each student makes own individual contribution to the result of group work. Moreover, this happens in an atmosphere of goodwill and mutual support, which allows students not only to acquire new knowledge, but also to plan, analyze their activities, develop skills of interaction and cooperation.

5. The authors identify the following didactic possibilities, confirming the feasibility of using cloud technologies in teaching based on the cooperation of the teacher and the student: sharing and publishing documents of various types and purposes; organization of group, pair and individual work not only in the classroom, but also outside school hours; organization of interactive classes and collective teaching.

The author's position is that it is rational to use interaction of the teacher and students with the use of cloud technologies not only for organizing joint activities when working with documents, but also for assessing educational results. One of the effective forms of assessing learning outcomes is a portfolio.

6. The work presents a system of activities for designing and filling the electronic portfolio, during which future teachers form the following competences:

– communicative, including knowledge, application of technical means of communication in the transfer of new information (PC-5, PC-6);

– cognitive as a skill to learn new information and its interaction with existing knowledge (PC-1, PC-3);

– reflexive - the level of self-development and self-control of a person, associated with self-awareness and responsibility (PC-7, PC-8);

– motivational - the level of motives that influence formation of values and needs in the digital environment (PC-8, PC-3);

– technological as a skill to study information technologies, as well as understanding their principles of operation and capabilities (PC-2, PC-3).

The formation of each competence corresponds to the function of a multifunctional learning model

At the same time, these functions correlate with the professional competences identified earlier in 3.1.

4.2. The system of practical exercises for designing the interactive multifunctional cloud portfolio by students of pedagogical specialties as a means of their professional development

Let us describe the logic of work on developing and filling the multifunctional portfolio, which was organized by the university teacher as part of the course "Digital Technologies in Education".

The first lesson. On a local disk (for example, on the Desktop), create the folder "Your Full Name_Your Group_Report 01" and save all subsequent files to this folder. Tip: Use the help available at (https://support.google.com/accounts#topic=3382296) to get the work done.

Next, on the Google.com resource, create a new or use a previously created account for Google services (which will later be used to perform practical work).

After that, in the browser's "Bookmarks" folder, create a folder and name it Your Surname (Bookmarks / Bookmark Manager / New Folder).

Answer the following questions (give answers):

a. What is mode "Incognito" in the browser? In what cases is it used?

b. How do lock a tab in the browser? In what cases can this function be useful?

c. Check the keyboard shortcut of "Ctrl + Shift + t" in the browser. In what cases can this combination be useful?

Remember that effectiveness of searching for information on the Internet largely depends on the skill to formulate a competent search query. Therefore, advice: read the article "How to search for information on the Internet."

After reading the article, answer the following questions (give answers):

a. How to search for information using the exact phrase? Give a specific example.

b. How to highlight the most important words in a search query (specify the icon operator)? Give a specific example.

c. How to exclude pages containing unwanted words from the query results (specify the icon operator)? Give a specific example.

Reflection was organized at the end of the first lesson. For example, in one document on a network drive, each of the students wrote down words that characterize his/her state or attitude to the work done. Words could be highlighted in color or graphics could be used.

The second lesson. On your Google Drive, in the My Drive section, create a folder called My Portfolio. Open the window for setting access rights for the My Portfolio folder (open the context menu with the right mouse button). Carefully study the options for granting access and answer the questions (answers should be short):

a. Open access via the link to the "My portfolio" folder (insert a screenshot confirming the completion of the task);

b. In what case can you find usernames or animal icons unfamiliar to you in a document, spreadsheet or presentation;

c. What access roles can be granted to a specific user?

d. How to recover a file accidentally deleted from Google Drive?

e. How long do files deleted from Google Drive stay in the Recycle Bin?

Set up your mailbox (https://mail.google.com/mail/) in such a way that when writing a new letter, your signature is automatically added: your full name and group code (insert a screenshot of the dialog box with the settings).

Consider: what rules are needed to follow when writing an email (netiquette) (give at least 5 IMPORTANT rules). Design them in your portfolio.

Next, using your personal Google mail (***@gmail.com), create and send to your corporate address (stud******@vyatsu.ru) a letter which will have the subject "Checking the connection", when writing the letter, be sure to follow the network etiquette. Check the fact of receiving the letter on your corporate mail https://mail.vyatsu.ru/owa/ (insert a screenshot showing the contents of the received letter)

In the lesson report, enter the answers to the following questions (you can use the Help in the upper right corner) (answers should be short):

- Why do I need to fill in the "Subject" field in the email?
- Identify the difference between a copy of a letter and a blind copy of a letter.
- How to schedule sending of the created letter at the right time?

The next step is email filtering. Explore the message filtering settings (Settings/All setting/ Filters and blocked addresses/Create a new filter). Make sure that the letters coming from the teacher never fall into the "Spam". Insert a screenshot with the settings confirming the completion of the task.

In your "My Portfolio" folder on Google Drive, create a Google document containing your short biography, teaching experience, experience of using information technologies. Open editing access to this document to one or more of your classmates by agreement (insert a screenshot confirming the completion of the task).

Reflection was also organized at the end of the second lesson. For example, "Picture in a circle". Each of the students in the graphic editor added a detail/fragment to the overall image.

The third lesson. On your disk in the "My Portfolio" folder, create your own form for surveying your classmates (on any topic), consisting of 10 questions (use at least five different types of questions). Choose the design you like (add a link to the report to fill out the form).

Next, send a link to fill in the form to two classmates. Look at the results of their answers. Required - with the generation of a pivot table and chart. Add a screenshot of the table and chart with the form results to the report (there must be at least 3 records).

The proposed service contains a free designer for developing web pages. The designer is as lightweight and functionally simplified as possible. It is used to quickly publish web pages of a simple structure. To organize teamwork with them. Important advantages: ease of use, availability, convenience, high speed of loading ready-made pages.

Using the reference material, create a personal business card site consisting of three pages: "Biography", "Achievements", "Pedagogical activity", "Useful services".

In the third lesson, students filled in the "Biography" page with information about themselves, added photos.

Reflection was also organized at the end of the third session. For example, "Compliment", which was expressed orally by the participants. But, if desired, it could be sent by e-mail. At the same time, it was necessary to follow the rules of network etiquette.

The fourth lesson. On the pages "Achievements" and "Pedagogical activity" it was necessary to enter information about diplomas, certificates, medals, letters of commendation, achievements in the field of sports, music, etc. (if possible with photos). For example, participants prepared a report on a youth forum, an event at the Engineering Institute, or organizing a school Olympiad.

For example, in 2019, students as part of the Vyatsky Talker team organized an event for students of school No. 48 in Kirov. Schoolchildren completed tasks "Regional Features of Russian Speech". According to the results, each participant could receive an illustrated electronic dictionary of Vyatka words.

At the same lesson, a template for the "Useful Services" page was prepared. Subsequently, this template was filled in by the following references: developed interactive simulators (ProProfs); timelines (Timeline JS); mental maps (MindMap); presentations (Prezi).

The study and development of services for each application took place during separate classes.

That is **the fifth lesson** is the compilation of interactive simulators; **the sixth lesson** – timeline planning; **the seventh lesson** – the design of a mental map; **the eighth lesson** is mastering the Prezi tools.

At the end of each lesson, time for reflection or self-reflection was necessarily freed up.

The ninth lesson. Publish the resulting site and place a link to it in the report.

Save the report and name it: Report_YourName_YourGroup.docx. Upload the completed report as an answer to the Moodle task.

Self-representation and defense of the report.

So, the resulting electronic portfolio is:

1) interactive, because it contains electronic content, in which various operations with its elements are possible: from manipulations with the objects of a business card site and filling in a form to setting security parameters;

2) multifunctional, since

- there is a change in the nature of interaction between participants in educational relations, which is expressed in their active involvement in the process of professional development of students;

- individualization within the framework of cognitive activities and taking into account the educational needs of future teachers (individual educational routes);

- personal development of students (hard work, curiosity, imagination, memory, emotional intelligence, etc.).

4.3. Experimental assessment

4.3.1. The ascertaining stage of the experiment

The experimental and search work was carried out on the basis of Vyatka State University. The experiment involved 80 students: 41 girls (51 %) and 39 young people (49 %). The average age of respondents is 18 years. Program of the training - 44.03.01 Pedagogical education.

When selecting the control and experimental and control groups, the authors took into account the results of the author's testing which consisted of 80 questions (10 questions for each task of professional activities). Correct performance was scored in 1 point.

Thus, it was possible to collect data on 80 students, from which the experimental and control groups were formed. Each of them has 40 people. The sample was not random. The experimental group included 58 % of girls and 42 % of young people.

Classes were conducted as follows: one lecture (two hours a week) and two practical classes (4 hours a week). A total of 9 classes. 4 hours of lecture and 14 hours of the practical exercises were allocated for the experiment. The content of each of them is disclosed earlier in paragraph 4.2.

To interpret the results conditional names for the levels of professional development were introduced: skill, technique, mastery, creativity, innovation.

Let us describe the essence of the levels of professional development in order to assess the results of the experimental work later.

Level "Skill" – when implementing educational programs both support of a mentor and detailed instructions are needed; the student is able to use the same teaching/diagnostic methods and technologies; without errors solves repetitive tasks of education and development of students. The future teacher uses (mostly) the same possibilities of the educational environment to achieve learning outcomes and ensure the quality of the educational process; carries out the required support of the socialization and self-determination of students by means proven and known to him. The future teacher interacts with the participants of the educational process according to the same plan/scheme; designs individual educational routes for students and trajectories of their professional development by means of the same technologies.

Level "Technique" – the student needs a clear plan or instruction for implementing the program; periodic consultation on how to use the methods and technologies of training and diagnostics is needed; help in solving the problems of education and development of students is required. The student consciously uses the main features of the educational environment to achieve learning outcomes and ensure the quality of the educational process; provides the required pedagogical support for socialization and professional self-determination of students; technically interacts with participants of the educational process and only within the scope of activities. The future teacher designs individual routes for students and the trajectories of their professional development by means of technologies known to them.

Level "Mastery" – ready to implement, with the assistance of a mentor, programs in a subject; is able to use the methods and technologies of training and diagnostics proposed by the mentor. The future teacher solves the necessary tasks of education and development of students; applies the main features of the educational environment to achieve learning outcomes and ensure the quality of the educational process. The future teacher provides the required pedagogical support for socialization and professional self-determination of students; interacts with participants of the educational process; designs individual educational routes for students and trajectories of their professional development by means of the technologies proposed by the mentor.

Level "Creativity" – ready to implement educational programs in the subject and introduce new blocks/modules into them; is able to use creative methods and technologies of training and diagnostics; solves the most important tasks of education and development of students. The student uses possibilities of the educational environment to achieve learning outcomes and ensure the quality of the educational process; provides effective pedagogical support for socialization and professional self-determination of students. The future teacher interacts

creatively with participants of the educational process; shows creativity when designing individual educational routes for students and trajectories of their professional development by means of traditional technologies.

Level "Innovation" – ready to implement experimental programs in the subject; provides effective pedagogical support for socialization and professional self-determination of students. The future teacher interacts intensively with participants of the educational process; designs individual educational routes for students and trajectories of their professional development by means of new technologies.

Here are some examples of tasks for each competence.

PC-1. A project can be defined as:

a) a set of activities aimed at achieving a unique goal which are limited in resources and time;

b) a system of goals, results, technical and organizational documentation, material, financial, labor and other resources, as well as management decisions and measures for their implementation;

c) a system complex of planning (financial, technological, organizational, etc.) documents containing a complex system model of actions aimed at achieving the original goal.

PC-2. From the standpoint of the ability to use digital resources when solving the problems of professional activities, determine what should be understood as a method of teaching in the digital educational environment? (choose one the most complete answer):

- it is an ordered activity of the teacher and students, aimed at achieving the goal of learning;

- it is a way of movement of thoughts from the teacher to students in order to transfer knowledge to the latter;

- it is such a logical category that indicates the way of organizing cognitive activities;

- a way to organize independent activities of students with information resources of the environment (information, communication, management), which ensure the acceptance by students of the goal, its organization, stimulation, evaluation and control, with the possibility of remote pedagogical correction.

PC-3. What are the forms of education in inclusive education? Answer options: only full-time; only evening; full-time and evening; not legally defined.

PC-4. The prezi.com service allows to create: tests to test students' knowledge; interactive multimedia presentations; text documents and store them in the "cloud"; thematic sites.

PC-5. Methods for studying the real pedagogical process do not include ... Answer options: observation; survey; questioning; pedagogical experiment.

PC-6. Which of the applications contributes to communication of all participants in educational relations remotely? Answer options: Prezi, Notepad, Paint, Twiddla, LearningApps, Learnis, Sferum, OpenMeetings, Yandex.Telebridge.

PC-7. Which application does not support cloud collaboration? Answer options: GoogleClassroom, Notepad, Dnevnik.ru, Sferum, CloudTop, Joli Cloud.

PC-8. Open project management has developed on the basis of:

a) rolling planning;

b) risk management;

c) dialectical materialism;

d) goal management;

e) corporate open door policy.

Thus, taking into account the results of processing materials, it was possible to collect data on 80 students of pedagogical specialties, of them, the experimental and control groups were formed.

4.3.2. Forming stage of the experiment

Thus, the teacher, when supervising practical work on designing the multifunctional cloud portfolio as a means of professional development of students of pedagogical specialties, organized activities in the experimental group according to the logic of the previously described classes.

The tasks of the described system of work:

- master the basic principles of working with web browsers and search engines;

- master the basic methods of working with Google services: mail, disk, documents, forms, sites;

- revise the basic rules of working on the Internet, including network etiquette;

- get acquainted with the official network services and resources of the university;

- explore interactive services that are potentially useful for a novice teacher;
- track the individual progress of the student, achieved in the process of obtaining education, and beyond direct comparison with the achievements of other students;
- to form in-demand professional skills: information interaction; management of educational projects, etc.;
- to form ideas about technologies, methods and techniques of reflection.

Figure 1 shows a variant of organizing tracking and analyzing the progress of students in the development and filling in the multifunctional cloud portfolio by the teacher.

Mark the completion of a work step in the required column with a "+" sign. After validation, the cell will be colored							
Last name, first name	Worked out reference material	Completed the interactive task "Stages of creating a resource"	Invented content, drew sketches	Wrote the script	Created the document structure	Made a reflection	Link to the game
Murov Ivan	+	+					
Popov Oleg	+	+					
Nizina Maria	+	+					
Goreva Ann	+	+	+	+	+	+	

Fig. 1. Filling in the "progress table" when developing the portfolio

The participants of the control group also learned the basics of working with web browsers and search engines; methods of working with Google services: they revised the rules of working on the Internet, including network etiquette; official network services and resources of the university; interactive services potentially useful for a novice teacher. However, they were not involved in specially organized activities for the development and filling in the multifunctional cloud portfolio.

4.3.3. Control stage of the experiment

At the fixing stage of the experiment, testing was also carried out on the basis of the course materials in accordance with the competences indicated in paragraph 3.1. Information about the levels of professional development of future teachers before and after the experiment is presented in Table. 1. (Table 1).

Table 1. Assessment of the level of professional development

Level	Groups			
	The experimental group (40 students)		the control group (40 students)	
	before the experiment	after the experiment	before the experiment	after the experiment
Skill	35 % (14)	10 % (4)	33 % (13)	30 % (12)
Technique	18 % (7)	10 % (4)	18 % (7)	20 % (8)
Mastery	23 % (9)	23 % (9)	25 % (10)	25 % (10)
Creativity	18 % (7)	38 % (15)	18 % (7)	18 % (7)
Innovation	8 % (3)	20 % (8)	8 % (3)	8 % (3)

For $\alpha = 0.05$, according to the distribution tables, $\chi2$crit is equal to 9.488. Thus, we get: $\chi2$obs.1 < $\chi2$crit (0.090 < 9.488), and $\chi2$obs. 2 > $\chi2$crit (10.244 > 9.488).

Consequently, the shift towards increasing the level of professional development of students of pedagogical specialties can be considered non-random.

After the quantitative analysis of the obtained data it can be concluded that the number of future teachers in the experimental group who have the level "Innovation" increased from 8 % to 20 %.

A significant positive shift was also recorded for the level "Skill" level: from 10 % to 35 % of the respondents. There were no changes in the level of "Mastery" in the experimental group. The reason, in the opinion of the course teacher, is that the transition from a skillful or technically sound way of professional actions takes more time. Formation of own approach to the implementation of the program, to solving problems of pedagogical communication, choosing own tool for designing the development trajectory involves more systematic and lengthy work.

Qualitative changes were recorded for the level "Creativity". 15 out of 40 respondents developed qualities and competences corresponding to this level. At the beginning of the course the number of such respondents was 7.

For the control group there is also a positive trend in certain levels of professional development. But it is less significant. For example, the level "Technique", the indicator increased from 18 % to 20 %. The value of the level "Skill" changed from 33 % to 30 %.

The reasons for this are seen in the fact that even the best result for each lesson in the traditional system of practices and seminars has a predominantly educational focus, without a global focus on social, scientific or professional activities. Therefore, future teachers did not have the opportunity to improve the technique of communication, development of educational programs and support for self-determination of their potential students.

5. Discussion

The research materials correspond to the priority areas of the activity of UNESCO and the Russian education system in terms of ensuring the continuity of learning, development of technologies and digital innovations to increase the sustainability of educational systems and rethink the future of education.

In this context, also identified the following benefits of using interactive technologies to support innovative pedagogical activities:

- widening of opportunities for presentation of educational material;
- emergence of additional opportunities for variable transformation of the content of the material;
- development of communication skills;
- widening of the list of educational tasks to be solved and the tools to be used;
- the emergence of additional opportunities for the use of different forms of work (individual, group);
- increasing motivation, self-control, ability to reflect.

The obtained conclusions about the didactic potential of the interactive multifunctional cloud portfolio in relation to the individualization of learning confirm and complement the results of the work of I. Nicolaidou (Nicolaidou, 2012).

In this context, it was found that the cloud portfolio that supports a full cycle of activities can become a means of professional development for teachers.

A significant result of the study is the description of the basic ideas of the approach that extend the ideas of O.G. Smolyaninova, E.A. Bezyzvestnykh about the possibilities of digital interactive tools for the formation of professional competences of students of pedagogical specialties (Smolyaninova, Bezyzvestnykh, 2019). In particular, through activities that implied:

- planning and analysis of activities: designing the content of the resource, summarizing and systematizing the material in the form of mind maps, setting educational goals for the study period, planning the timeline, summing up the results of educational activities, etc.;
- organizing joint work using cloud technologies in a single educational space.

6. Limitations

It is needed to pay attention to the possible limitations for the study:

1. The formation of questions for the authors' testing in such a way as to ensure that the control and experimental groups have the same knowledge and skills that form the basis of the professional competences of the teacher (in accordance with the training program of Vyatka State University 44.03.01 Pedagogical education (bachelor degree level).

The formation of each competence corresponds to the function of a multifunctional learning model

At the same time, these functions correlate with the professional competences identified earlier in 3.1.

2. An important condition is that the guidance of the practice of students in designing and filling the interactive multifunctional cloud portfolio, organizing the joint work of all participants in educational relations in the educational space throughout the experiment was carried out by the same teacher. The development of the interactive multifunctional cloud portfolio took place in the same classrooms. The software also remained unchanged.

7. Conclusion

In the course of the study the following possibilities of the interactive multifunctional cloud portfolio for the professional development of future teachers were identified:

- changing the nature of interaction between participants in educational relations;
- individualization in the course of educational and cognitive activities;
- taking into account educational needs of future teachers (individual educational routes) and practice orientation of the projected portfolio;
- development of personality traits (hard work, patience, creativity, aesthetic expressiveness, emotional intelligence, etc.);
- development of professional competences in accordance with the training program.

The proposed model of the interactive multifunctional cloud portfolio has the following distinctive features:

1. It is based on the principles of the unity of education and upbringing, individualization, variability, reflection and cooperation.

2. It is a system of interrelated components, determined by professional competences in accordance with the training program and labor functions of future teachers.

In addition, each competence corresponds to a specific function of the learning model.

The analysis of all the merits and demerits of the proposed system of classes for designing the interactive multifunctional portfolio made it possible to formulate the following conditions for the effective realization of the allocated didactic potential:

1. Definition the filling of the portfolio, the purpose of its creation and evaluation criteria. Students must understand why they are doing this, what components they need to include in the portfolio, what should be its structure, how and by what criteria their work will be assessed.

2. Clear planning of time and duration of work. Both the teacher and the student should be as focused as possible on filling in the portfolio.

3. Qualitative portfolio analysis and selection of fragments for presentation. From the position of reflection, the collection of a large amount of factual material is of interest for development of methodological skills of future teachers.

4. Presentation of the interactive multifunctional portfolio. During the defense of the results of practical training, the course teacher assesses all components of the portfolio, including photo and video recordings, mind maps, interactive exercises, presentation, quality of introspection and self-assessment.

This study convincingly proves that the cloud portfolio can become an effective multifunctional tool for implementing educational, research activities of students under the following conditions:

- a clear definition of the didactic functions of the projected portfolio;
- selection of digital tools that have the necessary didactic capabilities and properties; precise formulation of methodological tasks for the solution of which the portfolio will be sent;
- taking into account the structure and specifics of the future professional activity of students.

The use of the proposed model and tools of cloud services makes it possible to determine the best options and solutions that contribute to professional development of students of pedagogical specialties, their high-quality training and conscious choice of the place of work.

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Higher Education Experience in the Shadow of COVID-19: The Hungarian Online Education

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Abstract

It is a well-known fact COVID-19 has changed our concepts about crisis situations and forced us to make changes in every area of our lives, some of which are still there to stay. The article investigates online education in Hungary from the instructors' perspective focusing on experience, digital competences and the digital tools provided. After exploring the difficulties, the future of online education is addressed. It is hypothesised that the success of digital education depends to a large extent on digital competences, digital tools and also the content and structure of education. That is why difficulties are perceived differently. The research is based on a questionnaire completed by 681 instructors from 36 Hungarian higher education institutions in the summer of 2020. The research results indicate that due to the stringent emergency measures, teachers were forced to reschedule their classes, which led to a variety of difficulties, but online education will continue to play a significant role in the future. In the long run, digital learning environments and schools in general should be taken into consideration. According to the findings, developing digital skills is critical so educational systems and curriculum must be revised in terms of content and technology as it is of paramount importance to keep track of both instructors' and students' digital skills on a regular basis.

Keywords: higher, education, Hungary, COVID-19, pandemic, online education, IT, digital transformation, ICT, digital competence, digital skills, instructors, lecturers.

1. Introduction

With the outbreak of the pandemic, an unprecedented situation has arisen, which lead to a significant downturn in the economy and changes in working and educational conditions. Although some restrictions were lifted in the summer of 2020 as infection and mortality rates had decreased, it was only a year later, in the summer of 2021, when the economy started to recover with the

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advent of vaccinations, but the pandemic has not yet been completely eradicated. One area that has significantly been affected by the pandemic is education.

This article places Hungarian higher education in the limelight. During the lockdown, Hungarian universities were obliged to switch to online education, for which they were not fully prepared. Although some of the lecturers and instructors possessed an adequate level of digital competence, the picture is rather mixed. First, the paper analyses the concept of digital competence and then describes the rise of digital and ICT tools while emphasising the role of digital technologies. This is followed by a detailed discussion of the digital competences and skills of educators and a discussion of the difficulties and challenges of online education.

The second half of the article discusses primary research. After the methodological overview, a summary of the main findings is presented, which is followed by hypotheses test and the authors' conclusions and recommendations. A description of the limitations of the research also indicates further research directions.

Research problem

Developments that may have taken years happened in a matter of weeks of the lockdown and strict measures taken against the pandemic (European Commission, 2020a). As a result of physical distancing measures established in reaction to COVID-19, in the spring of 2020 tertiary education institutions changed to an emergency online learning model and distant education became universal (Grubic et al., 2020; Kim, 2020). COVID-19 caused onsite lessons to be cancelled for 86.7 % of pupils worldwide, according to Aristovnik et al. (2020). As a result, numerous types of online lectures have emerged. Real-time video conferences were used the most (59.4 %), followed by asynchronous types of lectures, such as emailing students presentations (15.2 %), video recordings (11.6 %), and textual communication via forums and chats (9.1 %).

The researchers conducted their research alongside the following research questions:

Q1. How do research participants perceive their digital competence?

Q2. What digital equipment did the employer provide during the pandemic to deliver the training?

Q3. How did the content and structure of education change during the pandemic?

Q4. What difficulties did teachers and academics face in delivering online education during the pandemic?

Q5. What future can be expected for online education after the pandemic?

The objectives (O) of the study can be summarised as follows.

O1. Describe the digital competences of the instructors based on gender, age and position before the pandemic.

O2. List all digital equipment provided by higher education institutions.

O2. Determine what changes took place in the structure and content of education due to the pandemic including digital (online) education.

O3. Analyse the difficulties they had to face.

O4. Present the future possibilities of online education.

Based on the questions and objectives above, the authors in the present study test the following hypotheses:

H1. The success of digital education during the COVID period depended largely on the digital competence of the instructors, the digital equipment offered, as well as the content and structure of the instruction.

H2: The difficulties of teaching during the pandemic were perceived differently by lecturers.

H3: Digital education introduced during COVID-19 will continue to be part of education after the end of the pandemic, mainly in the form of a hybrid course.

2. Literature review
Online education

Online education is a type of remote education in which students access the learning content using digital technology, online course materials, and online interactions. Online learning occurs as a result of online education (Yilmaz, 2019). Asynchronous and synchronous remote education are the two basic types of distant learning. Asynchronous learning supports work relationships among learners and between learners and teachers when participants cannot be online at the same time, whereas synchronous distance education can occur through live video and/or audio conferencing.

Synchronous online education can make students feel like participants, and instant feedback can be obtained (Hrastinski, 2008).

According to Kim (2020), there are various advantages to online learning, whether it is synchronous or asynchronous. Students, for example, are not required to be at the same physical area, which might boost participation rates. Online learning can also save money since it eliminates the need for travel and other expenses associated with attending in-person sessions.

On their digital action plan for 2020, the European Commission (2020b) held an open public consultation on digital education, which revealed that prior to the pandemic, about 60 % of respondents had not used distance or online learning. This demonstrates a lack of preparedness when change to online education was implemented. Sixty percent of respondents stated the pandemic enhanced their digital abilities, and 95 percent said the pandemic represented a point of no return in terms of how technology is utilized in education (European Commission, 2020a).

Digital competence

Introducing digital technology into the classroom presents instructors with recent problems and obligations. Apart from the existing professional competencies, digital skills have become a new need for handling instruction, guidance, and evaluation (Hatos et al., 2022).

The Council of the European Union defines digital competence as 'the safe, critical and responsible use of and interaction with digital technologies for learning, at work and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), security (including digital well-being and cybersecurity-related skills), intellectual property issues, problem solving and critical thinking.' (Council of the European Union, 2018: 9)

Digital competence, defined as the set of knowledge, abilities, and attitudes required to effectively utilize technology, has begun to take the lead in the educational arena, since it is one of the most important competences that teachers and educators must possess in today's world. The teacher's role is vital in integrating technologies and implementing Information and Communication Technologies (ICT) in the classroom, since education will depend, among other aspects, on educational action, which implies that teachers must have effective digital competencies (Basilotta-Gómez-Pablos et al., 2022).

According to a recent research by Erstad et al. (2021), the term 'digital competence' has become more complicated and confusing in the context of education and curriculum development, and multiple conceptual frameworks have been constructed to understand various parts of this complexity. Erstad et al. distinguish three theoretical approaches on digital competence, each with a unique perspective: (1) new literacy studies, (2) media cultures, and (3) learning science.

Digital transformation

The COVID-19 outbreak forced teachers to change their educational practice quickly to guarantee learning continuity (Cabero, 2020; Casado-Aranda et al., 2021; Usher et al., 2021). The health crisis since 2020 has resulted in a greater demand for ICT, the exponential increase in information, the use and the creation of digital media and other platforms that make distance teaching and learning or the adaptation of onsite teaching to emergency remote teaching possible (Trust, Whalen, 2020). According to the European Commission (2020a), increases in connectivity, greater usage of devices and digital apps, the need for individual flexibility, and growing demand for digital skills are the driving forces of the digital revolution in education. Digital technology may help students learn in a more personalized, flexible, and student-centred way, and can be a powerful and engaging instrument for collaborative and creative learning.

Otherwise, there has also been a profound digital revolution since the turn of the millennium, and higher education must be prepared to react to the demands of this digital society, as well as foresee the needs of the future society. The effort made by higher education institutions towards the virtual development of teaching, as a consequence of the pandemic, has led to a review of educational practices to adapt teaching to a digital environment (Sales et al., 2020). Digital technologies are now more prevalent in higher education than they were previously (Heidari et al., 2020; Murphy, 2020).

Challenges of digitalisation

Four essential ideas underline the necessity to handle technology in the context of teachers' digital competence: computer literacy, media literacy, digital literacy, and digital competence (Røkenes, Krumsvik, 2014). The constraints of online teaching, according to Kim (2020),

are frequently related to instructors' lack of expertise or technical abilities. In many cases, people face problems such as lack of access to the internet or the tools and skills to use it (Kovács, 2020).

Many educational and academic institutions use digital technology. Consequently, the academic community is facing several new challenges (Toquero, 2020). One of the issues tertiary education institutions confront in adjusting to new digital procedures is maintaining and enhancing students' academic involvement (Bond, 2020; Campbell et al., 2019). During the pandemic, a number of concerns in online learning surfaced, including excessive cognitive load, academic burnout, and disengagement, all of which have been raised repeatedly (Cao et al., 2020; Islam et al., 2020; Pohan, 2020). Teachers' digital skills are critical for optimizing innovative technologies in the classroom (Engen, Engen, 2019). As a result, it is critical to recognize that teachers' digital skills are linked to students' performance in digital learning environments (OECD, 2019a). Teachers' and students' perceptions of their digital abilities have been critical throughout this pandemic time, since an individual's judgment of their ICT skills is a key mediator in terms of how well they are put into practice (Winstone et al., 2021).

It has been found that the higher teachers rate their digital competence, the more likely they are to use ICT in their work (Sundqvist et al., 2020). However, teachers' limited ICT knowledge has caused anxiety about using ICT in the classroom, and they are hesitant to use it (Arkorful et al., 2021; Huang et al., 2021; Šabić et al., 2021), particularly in front of children who are perhaps more digitally literate than they are (Van Mechelen et al., 2021).

Computer anxiety (ICT anxiety) is a generic sense of discomfort, worry, nervousness of coping, or suffering in expectation of bad results from computer-related processes (Chang, 2005). It is 'the sensation of being uncomfortable when utilizing computers (technology in general in the context of our research).' (Awofala et al., 2017: 92). Awofala et al. (2019) discovered that computer anxiety is adversely related to self-efficacy. In some situations, perceived digital competencies can be a good predictor of real digital skills (Porat et al., 2018).

According to one theory (Maderick et al., 2016), individuals with low degrees of experience or training may overestimate their knowledge and skills because they are not aware of their level of competence. This may hold true for digital competences: people who do not understand or do not know digital knowledge and skills they possess may overestimate or underestimate their digital abilities. Those with a low level of digital abilities, on the other hand, are conscious of this and do not overstate their self-assessment as much as those who are aware of having a greater level of digital skills, according to Pavić and Černja (2019).

To sum up, in literature reviews, infrastructure; ICT devices available in the school; training in digital applications; cognitive and socio-emotional skills (Bacter et al., 2021), 'supported by effective lifelong learning systems' (OECD, 2019a, OECD, 2019b, OECD, 2019c); school environment; academic engagement; and appropriate ongoing technical support influence teachers' acquisition of skills for use in online environments (Hatos, 2019; Akmal et al., 2021).

Apparently, we would assume younger instructors to have a better digital competence score than their older counterparts (Cruz, Diaz, 2016) However, other studies found no significant relationship between the instructors' self-assessed digital competence and age (Drossel et al., 2017; Gil-Flores et al., 2017), so the age of the instructor has no impact on their usage of ICT.

Digital competence models

Several models and frameworks were adopted by some countries to indicate which digital competencies teachers should be trained in. A case in point is 'European Framework for Digital Competence of Teachers: DigCompEdu' which articulated around six differentiated competency areas that teachers must possess to promote effective, inclusive and innovative learning strategies using digital tools (Caena, Redecker, 2019; Lu et al., 2021). The Council of the European Union (2018) elaborated the so-called DIGCOM 2.0 model, which is the most widely used competence framework for the development and understanding of digital competence in Europe (digitally accessible: European Commission, 2021). Calvani et al. (2012) defined digital competence as having three dimensions: technical skill, cognitive skill, and ethical knowledge.

There is still a long way to go, but literature shows the interest and relevance of Teachers' Digital Competence (TDC). As Triadó states 'we never finish learning, (...) students change, knowledge advances, and it is always necessary to be up to date. A good teacher, like any professional who wants to stand out, cannot stop continuous training" (2020: 12).

3. Methodology

In the summer of 2020, the staff of the former Institute of Human Sciences of the Hungarian University of Agricultural and Life Sciences (MATE) launched a research during the COVID-19 outbreak designed to assess the experiences of digital education in response to the outbreak, including university lecturers and students.

The primary research was aimed to reach the greatest possible extent of representativeness and to conduct a survey with a national coverage. In compiling the questionnaire, the authors stressed to the respondents that the responses were voluntary and anonymous, and that the information provided would be used by the researchers for research purposes only. The current paper presents some of the results of the survey. The questionnaire was to be completed online by the research participants. The survey was also supported by the Hungarian Rectors' Conference, which helped to disseminate the call for research to the management of all higher education institutions. Data collection took place between 03 June 2020 and 09 July 2020. Thirty-six higher education institutions in Hungary participated in the survey, with 681 respondents from the teaching staff. This number also demonstrates that the authors were striving for a national coverage.

The higher education institutions involved in the survey were as follows: 25 % of the respondents worked at MATE University, 11.01 % at the Budapest Business School, 10.57 % at the University of Miskolc, 9.99 % at the University of Sopron, 5.58 % at the Pázmány Péter Catholic University, 4.26 % at the University of Kaposvár, 3.67 % at the National University of Public Service and 3.47 % at the Semmelweis University of Medicine.

In terms of study programmes (majors), staff members teaching in agricultural, technical, economic, natural sciences and social sciences responded to the questionnaire.

Statistical analysis

The data were analysed by the researchers using SPSS 25 statistical software and the following statistical procedures were applied: univariate and multivariate statistical methods, mean, standard deviation, Chi-square test, Mann-Whitney U test, ANOVA, factor analysis, correlation, logistic regression.

The questionnaire consisted fundamentally of closed questions; it was typically based on nominal and metric variables.

The structure of the questionnaire is summarised in Table 1.

Table 1. Structure of the questionnaire

Question Group 1 Experience before COVID-19	Question Group 2 Experience during COVID-19	Question Group 3 Sample specification
Characteristics of working in the digital space before the pandemic Digital competence of the respondent Digital equipment provided by employers before the pandemic	Characteristics of working in the digital space before the pandemic Impressions of online education Difficulties of online education Engaging students in online education The impact of the pandemic on higher education in the future	Gender Age Position Place of work

Source: authors' own research

The research, based on the five objectives, has the following structure.
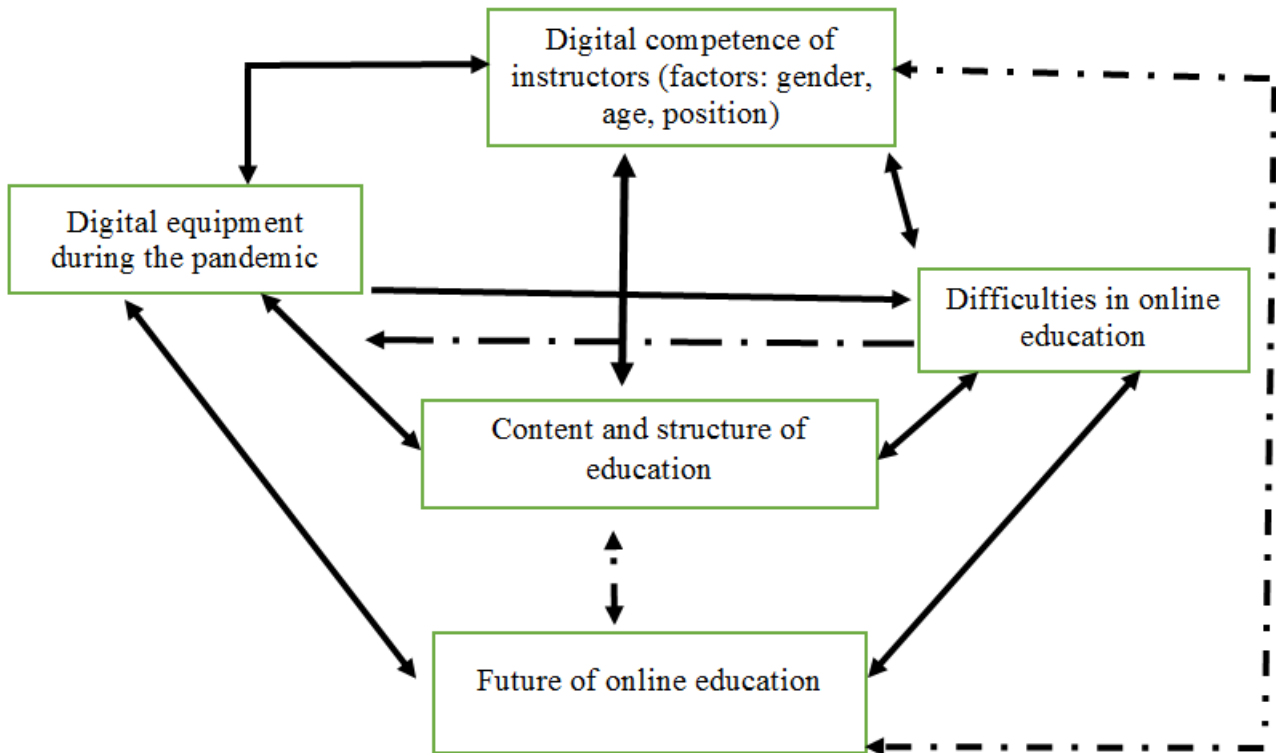
Fig. 1. The research objectives
Source: authors' own editing

In the figure the solid arrows show the direct effects, the dashed arrows the possible effects. The analyses were based on the digital competence of instructors, which the authors analysed by gender, age, and position. They also looked at the digital equipment that higher education institutions were able to provide for teaching purposes. In other words, these two areas analysed were closely related back and forth based on the researchers' assumptions. Of course, the way in which the content and structure of education had changed as a result of the impact of COVID-19 and the fact that both digital and hybrid education had become compulsory at university level could not be ignored. The success of these processes has depended, among other things, on the digital competence of the instructors, the quality of the digital tools provided and the flexibility of the educational content and structure. These experiences shed light on the future of digitalisation in education: are we going to live with it, integrate it into education, or are we going to return to traditional teaching tools, content and methods?

The specifications of the sample are presented in Table 2.

Table 2. Specification of the sample (%)

Specification	%
Gender	54 % male 46 % female
Age	0.3 % younger than 25 31.1 % between 25 and 35 31.5 % between 36 and 45 29.2 % between 46 and 55 17.5 % between 56 and 65 7.9 % older than 65
Position	1.2 % research fellow 11.7 % full professor 38.8 % associate professor 20.0 % assistant professor 28.3 % other

Source: authors' own research, n = 681

The highest proportion of men was in the 36-45 age group (31.1 %) while the highest proportion of women was in the 46-55 age group (33.2 %). By job title, those under 35 were most likely to be in the 'other' category (33.7 %), those aged 35-55 were predominantly associate professors (46.9 %) while among those older, associate professors and full professors (39.3 % and 31.8 %, respectively) were in high proportions.

4. Results

In the study, the authors analysed two time periods. One was the pre-emergency period, and the other was the post-emergency period. First, let us review the pre-emergency period.

Before the outbreak of COVID-19

Before the emergency was declared, the majority of respondents (33.9 %) spent an average of three to four hours a day working in the digital space, 15.1 % worked 1-2 hours, 28.8 % 5-6 hours, and 12.5 % 7-8 hours. By schedule, assistant professors were most likely to spend five to six hours a day (34.6 %), associate professors three to four hours a day (36.4 %) and full professors five to six hours a day (32.5 %) in the digital space.

By gender, both men and women were most likely to spend three to four hours a day on digital tools (31.9 % and 36.2 %, respectively).

The survey asked respondents what online educational activities they had previously engaged in regularly. 56.8 % of respondents had no previous experience in online education. 4.1 % conducted online oral exams, 18.4 % organised online written exams, 24.2 % consulted with students on online platforms and 12.0 % had online contact hours. Before the COVID-19, 60.9 % of women and one in two men had no online experience. The highest proportion of university lecturers had not worked in the online space before (56.3 %), while the highest proportion of associate professors had worked with digital tools (47.1 %). The most common platforms used for online communication before the COVID-19 were e-learning, email, Messenger, Neptun, Skype and Viber.

Prior to the COVID-19 emergency, higher education institutions most often provided their lecturers with the following tools: 58.9 % with a PC, 42.1 % with a laptop, 10 % with a microphone, while 22.5 % said they did not provide any of these tools.

The surveys showed that many institutions were unable to provide digital equipment to their colleagues. Digitalisation in education has been relatively modest. Approximately one in ten teachers had integrated digitalisation into the content and structure of their teaching and used it primarily for communication rather than for teaching activities. One of the reasons for this was that an extremely high proportion of respondents had not used or were not aware of the opportunities and solutions offered by digitalisation before the outbreak of COVID-19.

After the outbreak of COVID-19

The study then focused on the emergency situation after the COVID-19 outbreak. The proclamation of online education affected education stakeholders in a very unexpected and, in many places, unprepared way. While one day the course had been delivered in the classroom, the other day it was broadcast digitally from home, and at some places, in a hybrid format. The first semester of 2020 was conducted in these forms and under such circumstances, and examinations were also arranged predominantly in the digital space.

After the emergency was declared, 35.1 % of respondents spent more than eight hours a day in the digital space. This proportion was 9.8 % before the emergency. The highest proportion of women, 37.5 %, and 32.8 % of men spent more than 8 hours on digital devices during this period. By position, one-third of assistant professors typically spent 7-8 hours working digitally, while about one-third of associate professors and professors spent more than 8 hours.

The most common platforms include e-learning, email, Google Drive, Teams, Neptun, Skype and Zoom.

Respondents were asked to rate their impressions of online education on a five-point Likert scale. One was unsatisfactory and five was excellent. The mean and variance of the responses are summarised in Table 3.

The principal areas of dissatisfaction were the provision of institutional educational devices, online methodological skills and the active involvement of students in class. The strongest satisfaction could be found with the quality of online learning materials and teaching activities.

Afterwards, the authors examined the relationship between each variable. The results confirmed the following.

Table 3. Impressions of online education (mean and standard deviation, N:681)

Impression	Mean	Std dev
Supply of institutional equipment	2.69	1.263
My methodological background in online education	2.74	1.075
Active class participation/engagement of students	3.29	1.044
Digital literacy of my direct reports	3.53	0.852
Effectiveness of my online teaching activities	3.69	0.807
Digital literacy of students	3.71	0.741
My own digital readiness	3.79	0.860
My own tool availability	3.88	0.996
Quality of my online learning materials	3.89	0.757
Quality of my online teaching activities	3.91	0.708
Availability of my online learning materials	4.45	0.744

Source: authors' own research, n = 681

The more satisfied one was with their own digital literacy, the more positive one's impressions of the situation were, i.e., the more satisfied instructors were with their online methodological knowledge (Pearson correlation: .513 $p < 0.01$), the effectiveness of their online teaching (Pearson correlation: .323 $p < 0.01$), the quality of their online learning materials (Pearson correlation: .305 $p < 0.01$).

In relation to the online digital readiness of their immediate colleagues, respondents indicated that they were positively influenced by the digital readiness of students (Pearson correlation: .362 sig.: .001 $p < 0.01$), the quality of online learning materials of colleagues (Pearson correlation: .197 sig.: .001 $p < 0.01$).

The availability of their own tools is closely related to digital readiness (Pearson correlation: .384 $p < 0.01$) and online teaching methodology (Pearson correlation: .266 $p < 0.01$).

Institutional tool availability influenced the digital literacy of staff (Pearson correlation: .267 sign.: .001 $p < 0.01$), availability of online learning materials (Pearson correlation: .082 sign.:.001 $p < 0.01$) and effectiveness of teaching activities (Pearson correlation: .134 sign.:.001 $p < 0.01$).

The authors analysed how respondents rated their own digital literacy by classification. The Kruskal-Wallis test showed that there was a significant difference (Kruskal-Wallis: 18.547 df: 4 sig.: 0.001 $p < 0.05$). The most satisfied were assistant professors (mean: 3.99), while the least satisfied were full professors (mean: 3.53). There was also a significant difference confirmed by age (Kruskal-Wallis: 73.388 df: 4 sig.: 0.001 $p < 0.05$), meaning that those under 35 years of age felt their digital competence much stronger, while those over 56 years of age felt it less strong.

The results also confirmed that time spent in the digital space in the time before an emergency had an impact on digital competence (Kruskal Wallis: 41.216 df: 4 sig: 0.001), and those who spent more than 8 hours on average with digital tools were the most satisfied with their digital competence.

There were no differences of opinion in the provision of institutional devices, either by age or by job title. Assistant professors and academic staff aged 30-55 were the least satisfied with this issue.

The survey also asked about the success of online teaching, i.e., how they rated their teaching activities during the pandemic, to what extent they felt that their experience of online education was positive, or, on the contrary, whether they feel that it was possibly negative. 71.1 % of respondents thought it was a good opportunity, while 28.9 % said the opposite. Regarding this question, there was no difference in the ranking of the survey participants (Chi-square test: 5.488 df: 4 sig.: 0.240 $p > 0.05$), nor by age (Chi-square test: .146 df: 2 sig.: 0.930 $p > 0.05$). The study also examined the extent to which the impressions and opportunities given in Table 3 were correlated with perceptions of educational success. Table 4 shows the correlations and, where there are differences, indicates which group felt this factor strong.

The data show that both the prior digital skills of instructors and the availability of tools and methodological knowledge related to online education have an impact on how educators perceive the success of their teaching activity. These factors were perceived to be strong by those who rated the output of education as positive. Those who felt they were weak rated online education as

negative. However, the quality and availability of learning materials did not influence success. In the light of these results, the authors partially accept their first hypothesis.

Table 4. Correlation between impressions and educational success (Mann-Whitney U test results, p = 0.05)

Impressions	Correlations
Supply of institutional equipment	Whitney U: 41725.5, sig.: 0.01 Who is positive feels it stronger
My methodological background in online education	Whitney U: 36810 sig.: 0.001 Who is positive feels it stronger
Active class participation/engagement of students	Whitney U: 33340.5 sig.: 0.001 Who is positive feels it stronger
Digital literacy of my direct staff	No correlation
Effectiveness of my online teaching activities	Whitney U: 31818, sig.: 0.001 Who is positive feels it stronger
Digital literacy of students	Whitney U: 42442, sig.: 0.013 Who is positive feels it stronger
My own digital readiness	Whitney U: 37635, sig.: 0.01 Who is positive feels it stronger
My own tool availability	Whitney U: 41511, sig.: 0.005
Quality of my online learning materials	No correlation
Quality of my online teaching activities	Whitney U: 37019.5, sig.: 0.001 Who is positive feels it stronger
Availability of my online learning materials	No correlation

Source: authors' own editing

Table 5. Difficulties (average, standard deviation, N:480)

Difficulties	Average	St.dev.
Liaison with the Registrar's Office	1.80	1.65
My own internet connection problems	1.88	1.054
Contact with staff	2.00	1.085
Accessing necessary online learning platforms (e.g.: subscription)	2.09	1.284
Creating online learning materials	2.29	1.186
Ensuring adequate time for teaching at home	2.29	1.362
Maintaining contact with students	2.30	1.172
Providing adequate space for teaching in my home	2.39	1.369
Institutional communication on emergency management	2.40	1.277
Internet connection problems for students	2.41	1.119
Developing a set of requirements appropriate to the emergency	2.58	1.234
Knowledge and use of online educational platforms	2.64	1.162
Reconciling home office and private life	2.69	1.421
New administrative tasks	2.68	1.131
Personal presence, lack of direct contact with colleagues	2.74	1.295
Narrowing of the range of traditional teaching methods	2.90	1.277
Lack of personal presence and direct contact with students	3.49	1.278

Source: authors' own editing

The study also analysed the difficulties one encountered during online teaching. For the second hypothesis, the authors specifically considered the opinions of the instructors, thus

reducing the study sample to assistant, associate and full professors. The remaining sample size was 480. The difficulties were also rated by the respondents on a five-point Likert scale. A one was given as 'no difficulty caused' and a five as 'great difficulty caused'. The means and variances are summarised in Table 5.

The least difficulties were in the area of institutional relations. It was more difficult to organise home education and involve students in education. The most problematic was the minimisation of personal contacts and the need for a rapid rethinking of traditional educational opportunities. In other words, there was a need to adapt quickly and flexibly to a novel approach to education, with staff not necessarily having the adequate digital skills.

For further analysis, the authors developed factors from the variables. All variables were suitable for factor construction. The KMO Barlett's test scores were .835, the Chi-square was 2964.849, df: 136, sig. 0.000 and the explained variance ratio 65.344 %, respectively. Factor rotation was carried out by Varimax method. The following factors were obtained.

Table 6. Factors of difficulties

Difficulties	Factors				
	1	2	3	4	5
COM1Intense presence, lack of direct contact with students	0.750				
COM2Intense presence, lack of direct contact with staff	0.761				
COM3Communication with students	0.762				
COM4Communication with staff	0.718				
COM5Narrowing of methodological options in traditional education	0.647				
ED1Online creation of teaching materials		0.726			
ED2Developing a set of requirements adapted to the emergency		0.729			
ED3Knowledge and use of online learning platforms		0.672			
ED4New administrative tasks		.668			
OR1Allocate sufficient time for teaching at home			0.847		
OR2Balancing home office and private life			0.853		
OR3Allowing enough space for education at home			0.787		
D1Students' internet connection problems				0.758	
D2Their own internet connection problems				0.747	
D3Access to necessary online learning platforms (e.g.: subscription)				0.668	
IN1Liaising with the Registrar's Department					0.742
IN2Institutional communication on emergency management					0.713
Cronbach Alpha	.837	.751	.840	.639	.548

Source: authors' own research

The letter symbols in front of the variables are used in the construction of the SEM model (Figure 1)
Factors are named as follows:
Factor 1: Lack of personal communication
Factor 2: Organisation of education on the digital platform
Factor 3: The creation of home office
Factor 4: Providing digital access
Factor 5: Communication with the institution
The researchers used the SPSS AMOS 27 programme to further test their model. The essence of the model was how the difficulties were perceived by each group of instructors in the light of the

given factors. The idea of SEM (Structural Equation Modelling) is to examine the relationship between one or more exogenous variables (independent) and one or more endogenous (dependent) variables. The endogenous variables are affected directly and indirectly by the exogenous variables. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) studies aim to analyse the relationships between the variables under investigation and the latent variables. The EFA is used when the relationship between the investigated and the latent variables is not known. The CFA is used when the researcher has some knowledge about the structure of the latent variable. Path model analysis is the visual representation of relationships between variables.

The authors created the model of the factors and variables under study using SPSS AMOS Version 27. In the figure, each arrow next to the latent and test variables shows the effect of one variable on another, and the back and forth arrows symbolize the covariance, or correlation, between variables. The error variables are indicated by circles in the figure. These are the factors that were ignored in the analysis but have an effect on the variables.

The fit of the constructed model was checked by the researchers using a number of criteria. The first test metrics confirm 'absolute model fit': the Chi-square was significant ((480)494.031, df: 121, p: ,0.00). However, this is not sufficient for the researchers to reject the fit of the model, as the significance of the Chi-square is stronger after a sample size above 200. Additional measures were tested by the authors. For example, the RMSEA (Root Mean Square Error Approximation) value: .080, which should typically be below .08. This value is right at the limit. The third such indicator is the GFI (Goodness of Fit Index), which is acceptable for values above 0.9. In the authors' model, the value is .897, i.e., at the limit. In the context of Incremental Model Fit, the authors checked four indices, AGFI, CFI, NFI, TLI, with values above 0.9. In the model, AGFI: .854, CFI: .872, NFI: .839, TLI ..838, i.e., these indices are also close to the fit value. For Parsimonious Fit, the Chi-squared/df value is 4.083, which is less than threshold value of 5, hence, it indicates that the model is fit. Figure 2 shows the model.
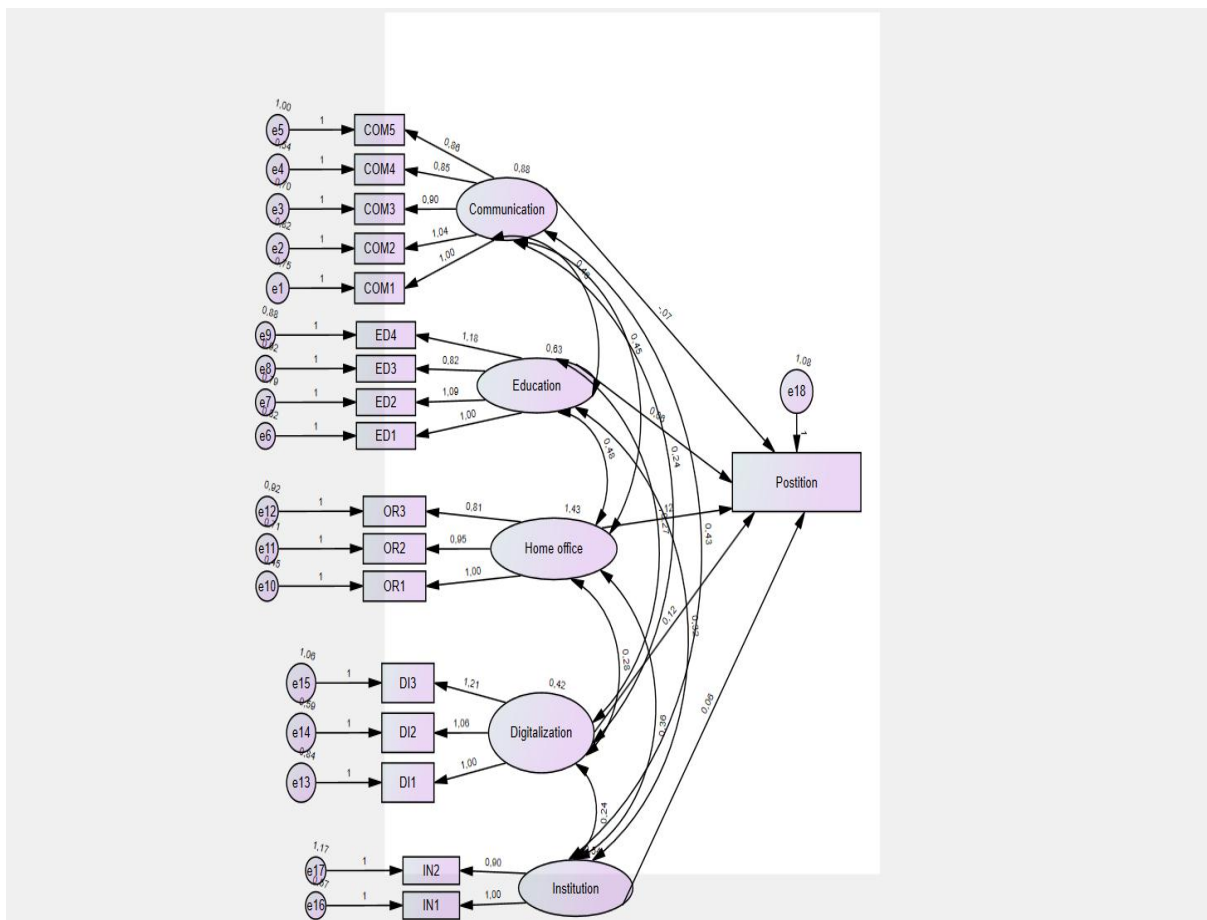

Fig. 2. Perception of difficulties in the light of the positions (N = 480)
Source: authors' own editing

In addition to the five factors shown in the figure, the following were added to the positions: assistant, associate and full professors. The letter names of the variables that make up each factor were shown in Table 5. Table 7 presents the standardized and nonstandardized regression weights.

Table 7. Regression results (p = 0,05)

			Nonstandardized				Standardized
			Estimate	**S.E.**	**C.R.**	**P**	**Estimate**
COM1	<--	Communication	1				0,718
COM2	<--	Communication	1.044	0.071	14.658	***	0.742
COM3	<--	Communication	0.917	0.064	14.257	***	0.719
COM4	<--	Communication	0.895	0.06	14.955	***	0.759
COM5	<--	Communication	0.877	0.07	12.613	***	0.632
ED1	<--	Education	1				0.674
ED2	<--	Education	1.075	0.089	12.029	***	0.697
ED3	<--	Education	0.797	0.078	10.213	***	0.564
ED4	<--	Education	1.157	0.096	12.013	***	0.695
OR1	<--	Home office	1				0.865
OR2	<--	Home office	0.987	0.053	18.612	***	0.819
OR3	<--	Home office	0.836	0.051	16.466	***	0.719
DI1	<--	Digitalization	1				0.575
DI2	<--	Digitalization	1.059	0.125	8.457	***	0.646
DI3	<--	Digitalization	1.235	0.148	8.363	***	0.619
IN1	<--	Institution	1				0.705
IN2	<--	Institution	0.78	0.117	6.695	***	0.477
Position	<--	Communication	-0.039	0.059	-0.656	0.512	-0.054
Position	<--	Education	0.059	0.068	0.862	0.388	0.071
Position	<--	Home office	-0.189	0.034	-5.612	***	-0.337
Position	<--	Digitalization	0.216	0.08	2.694	0.007	0.21
Position	<--	Institution	0.018	0.086	0.208	0.835	0.02

Source: authors' own research

The table shows that in two cases a correlation could be identified between the factors studied and the positions. These were the organisation of the home office and digital accessibility. The lack of face-to-face communication, the transfer of education to a digital platform and the difficulties resulting from communication with educational institutions were experienced in a basically comparable way by the participants in the study. Home office and digital access were the most problematic for full professors among the three educational actors. This was also due to the fact that they had relatively fewer compulsory hours than assistant professors and associate professors.

In their own words, the lecturers also expressed what they found really difficult.
Some ideas are summarised in Table 8.

Table 8. Respondents' own opinions on difficulties

Assistant professor	Associate professor	Full professor
'Cancelled practices'	'Having the key during the exams.'	'Lack of student contact.'
'Work-life balance.'	'Preparing video training materials.'	'Lack of students' digital literacy.'
'Lack of frontal	'Preparation took too much	'Attitude of students to the

presentation.'	time.'	lessons.'
'Promoting student activity.'	'The lack of interest of the students.'	'Students and teachers' lack of IT tools.'

Source: authors' own editing

Overall, in the light of the above results, the many difficulties experienced by the trainers were different, and the authors accept their second hypothesis.

Finally, the authors wanted to know how the research participants perceived that online education would be integrated into the structure and content of their teaching. Of the 681 respondents surveyed, less than 1 % of respondents believe that online education will replace traditional classroom-based education in the future. 5 % thought that online education will replace traditional classroom education. 82 % reckoned that online education would be a complement to traditional education, while 12 % were on the opinion that education would return to the way it was. The authors also examined whether there is a correlation between gender, age and position (job title) in terms of future perceptions. The Chi-square tests showed no evidence of a relationship by any of these criteria. Of course, it is important to underline that it was not only disadvantages that respondents perceived in online education. Many of them perceived learning to use the online platform as a positive, realised the hidden skills they had previously had, were able to develop students' creativity, saved time getting to the workplace, and were given opportunities to expand their pedagogical methods. Overall, therefore, it was concluded that, despite the many difficulties and gains, the duality of traditional and online education will be achieved in the future, according to the respondents' opinions, with hybrid education gaining ground. Accordingly, the authors accept their third hypothesis.

5. Discussion

Before the pandemic, the digitisation of education was relatively modest. Around 1 in 10 teachers had integrated digitisation into the content and structure of their teaching, primarily for communication rather than teaching. Prior to the COVID-19 outbreak, the majority of respondents had not even used digitisation opportunities and solutions. This finding is in line with the public consultation on digital education of the European Commission (2020b), according to which approximately 60 % of respondents had not used online learning prior to the pandemic. It underlines the same lack of preparedness the researchers also found in Hungary.

In spring 2020, teachers would have no time at all to make the digital switchover. The results of our survey show that 35.1 % of respondents spent more than 8 hours a day in the digital space after the state of emergency was declared (11 March 2020), compared to 9.8 % before the emergency. As we could also found in literature, the COVID-19 outbreak forced teachers to change their educational practice quickly to guarantee learning continuity (Cabero, 2020; Casado-Aranda et al., 2021; Usher et al., 2021).

The study also analysed the difficulties of online education. In the second hypothesis, the respondents on a 5-point Likert scale. The difficulties were less in institutional communication, while the organisation of home education and the effective involvement of students in education were more limited and required a rapid rethinking of traditional teaching options, while not everyone necessarily had the right digital skills.

The biggest problems were in the provision of institutional tools, online methodological skills and active learner participation. In the literature, we could also find references to the constraints of online teaching, which are frequently related to instructors' lack of expertise or technical abilities (Kim, 2020), lack of access to the internet or the tools and skills to use it (Kovács, 2020) as well as maintaining and enhancing students' academic involvement (Bond, 2020; Campbell et al., 2019).

Respondents were most satisfied with the quality of online learning materials and activities.

The data suggest that the prior digital knowledge of the instructors, as well as the tools and methodological background related to online education, may influence the perception of instructors' success. Those who rated educational outcomes positively felt that the above factors were strong. Those who rated themselves as weaker were more critical of online education. Our results echo the conclusions of Sundqvist et al. (2020), according to whom the higher teachers rate their digital competence, the more likely they are to use ICT in their work but teacher with limited ICT knowledge are hesitant to use it (Arkorful et al., 2021; Huang et al., 2021; Šabić et al., 2021).

However, the quality and availability of the learning materials did not affect the success rate. In view of the above results, the authors only partially accept their first hypothesis.

The authors used the SPSS AMOS 27 programme to test their model, which focused on how each group of teachers perceived the difficulties, as expressed in their own words, in the light of the factors created in the factor analysis.

The results of the study showed that the instructors faced a number of difficulties, which they experienced and judged differently. The second hypothesis can thus be considered to be confirmed.

The authors also asked how the participants assessed the future of online education and its possible integration into the structure and content of education. Less than 1 % of the 681 respondents think that online education will replace traditional classroom education in the future. 5 % think that online education will complement traditional school education, while 82 % think that online education will be a complement to traditional education. 12 % thought that education would return to business as usual. We agree with Engen and Engen (2019) and Winstone et al. (2021) in stating that teachers' digital skills are still critical for optimizing new technologies in the classroom, and also with the fact that the pandemic has led to a review of educational practices to adapt teaching to a digital environment (Sales et al., 2020; Heidari et al., 2020; Murphy, 2020).

In the survey, respondents not only highlighted the drawbacks of online education, but also its positive benefits: they increased their computer, methodological and pedagogical knowledge, became more creative and saved time by avoiding travel.

Overall, the opinions suggest that hybrid education is on the horizon for future education, and the authors accept their third hypothesis. The future significance of online education is also supported by the European Commission's 2020 consultation on digital education, where sixty percent of respondents stated the pandemic enhanced their digital abilities, and 95 percent said the pandemic represented a point of no return in terms of how technology is utilized in education (European Commission, 2020a).

6. Conclusion and recommendations

On the whole, the findings revealed that teachers had been compelled to immediately reschedule to all their classes online due to the strict emergency measures. Consequently, they faced various hardships due to some external (such as digital equipment, platforms provided) and internal (e.g., different level of digital competence) constraints, but online education will still be playing a crucial role in the future. Digital school and digital education in general should also be considered a decisive factor in the long term.

Finally, this research, like any other research, has limitations. Despite the substantial relevance of this issue, it would be beneficial to conduct more in-depth analyses of the statistical information obtained. Another new challenge would be to extend the boundaries abroad and increase the sample with other counties to be able to make some comparison. With the addition of new concepts to the review and an increase in the number of research papers, these constraints may provide an impetus for future study. Another significant path of future research is to look more into the evaluation of teachers' digital competencies, considering that this topic is prevalent in the literature reviewed.

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Financial Literacy on High School Students. How is Their Performance if Study and Work?

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Abstract

The aim of the study is to analyze the financial knowledge of high school students in Mexico; its relationship with the student's age, gender, and condition of studying and working. The study is a non-experimental quantitative, descriptive, exploratory, and correlational cross-sectional study. Through a non-probabilistic sampling by self-determination, the total participants were 423 students enrolled in three institutions of Higher Education, all belonging to the state of Oaxaca. For the application of the instrument, we had the support of some teachers to share a link to Google forms. In order to determine the relationship between financial literacy (FL) and other sociodemographic variables (gender, age, and employment status), a dichotomous Probit model is used. The results show low financial literacy of the students, who only a fifth understand the concepts of compound interest, inflation, and diversification; no gender difference was identified in this age group. The significant effect of the interaction variable (gender and condition of studying and working) on the probability of understanding the effect of inflation on purchasing power is evident. Therefore, the results obtained can contribute to the design of financial education (FE) programs for young people at an early age that allows them to make informed financial decisions in any aspect of their personal and work life.

Keywords: financial education, financial literacy, high school, students.

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1. Introduction

According to Goyar and Kumar (2020), Financial Education (FE) influences people's daily economic decisions, hence the importance of this issue, which is becoming increasingly relevant worldwide and is included in the G20 agendas, governments, ministries and secretariats of finance, international and central organizations, banks, among others. It is relevant to have a better financial education that leads people to a better attitude and good financial practices (Yong et al., 2017); since it prepares people to make quality financial decisions, improving their financial well-being (Garg, Singh, 2018) and a better quality of future life (Domínguez, 2013).

Existing literature on Financial Literacy (FL) show that FL has a significant contribution to people's financial behavior (Arofah et al., 2018). Starting with the definition of financial education, the OECD (2005) defines it as the process through which users had better understand financial products and risks, developing skills to make better-informed decisions with the risks that these decisions entail. Given its importance, it should not only be limited to older people, it is also necessary for young people, who are already or will soon be, users of financial services (Domínguez, 2013). Even though FE allows improving the quality of people's life, especially in young people. In this idea, the study carried out by by Klapper and Lusardi (2019) worldwide, demonstrate that only one in three adults has FL, with poor and less educated people being the most likely to suffer from gaps in financial knowledge.

In this idea, Bottazzi and Lusardi (2021) analyzed the existence of difference between genders in secondary level students in Italy in relation to financial education. To do this, they used data from the Program for International Student Assessment (PISA, 2012). In their study, they identified that gender differences in FE are highly significant among young people. In addition, the impact that the family has, particularly the role of the mother, is important in the financial knowledge of girls, as well as the sociocultural situation in which they live. The life of women and men at younger ages allows us to understand the differences between both genders.

Similar results reported by Swiecka, Yesildag, Özen and Grima (2020), who conducted a study in Poland with the participation of high school students with an age range of 5 to 16 years. The goal was to measure the level of FL of high school students and to determine whether FL changes according to gender. Their study showed that there is a high level of FL among high school students in Poland, although gender influences in financial behavior and in the use of financial instruments, it does not influence the level of FL of students.

Artavanis and Karra (2020) carry out a study, in which more than 1000 students from a public university in Massachusetts participated. The purpose was to evaluate the level of knowledge of FL in undergraduate students and its implications in the payment of student debt. The results showed low levels of financial education, especially among women. They also found that students with a low FL level are more likely to disregard future student loans, hence, when they start working, they receive lower wages. This can affect their future solvency, in addition to weakening the economic capacity to pay the debt after completing their studies. On the contrary, having high FL reduces the likelihood of significant underestimation.

In the same idea, Kadoya and Rahim (2019), carry out research with students from the University of Osaka in Japan, in their study they use demographic variables (gender, age and education); as well as the socioeconomic (income and occupation) and psychological factors on perceptions of the future. The results they obtained show that these variables together significantly affect the level of FE and orientation toward the future. It is also a factor specific to FE because people tend to make better financial decisions when they perceive the future as something important.

In another sense Mancebón, Ximénez, Mediavilla and Gómez (2018), examine the development of mathematical and financial skills among 471 students in Spain. They obtain as a result, that the development of financial skills among young consumers is mediated by their mathematical skills; also, a relevant finding is how the family is a key variable in the development of financial skills.

Based on the empirical evidence presented on financial education, we can say, that it is a relatively important topic especially for policy makers, regulators and academic researchers to know the basics of financial education and identify relevant areas in need of research. Therefore, the following questions arise:

Question Research

To what degree do high school students in Tuxtepec, Oaxaca understand financial education? In addition, the level of FE of high school students differ by gender, age, and employment status?. Therefore, the following objectives are set: Determine the level of FE in the high school students. In addition, to identify if the level of FE that young people have in the high school level in Tuxtepec, Oaxaca differs by gender, age, and employment status.

Hypothesis

H1. The predominant financial knowledge of high school students differs by gender, age, and employment status.

H2. The percentage of women answering the financial knowledge questions correctly is lower compared to the group of men.

H3. The interaction of gender and student's studying and working status influence their financial literacy.

2. Literature review

The existing literature on financial education has served to design policies focused on promoting this topic, especially among the younger population. About this, in the study conducted by Lusardi, Hasler and Yakoboski (2021), results show that financial fragility is highly related to FE and that people are not prepared to face the financial decisions necessary to face a financial crisis as COVID-19 pandemic. If the level of FE of young people is high, the health of the economic indicators will be better, which becomes an economic and sustainable development, as referred by Swiecka, Yesildag, Özen and Grima (2020). Another study by Morgan and Long (2020), reveals that FE has statistically positive effects on both financial inclusion and savings.

In the same idea, the study carried out by Thomas and Subhashree (2020), to students engineering degree in universities located in Karnataka, Kerala and Tamil Nadu, showed that financial knowledge and attitude, as well as family, influence the level of FE among students. Antonio, Peña and López (2020), carried out a study with the objective to analyze the elements that help explain the level of FE in adults that live in Mexico. Their results show that a higher level of education and income, as well as marital status, age and gender are associated with better access to financial products, as well as, a higher level of FE. In addition, the factors that relate negatively are the male gender and the condition of having a job. To this work we may added the research carried out by Al-Bahrani, Buser and Patel (2020). On the other hand, Patel (2020) analyzed a sample of 529 college students in three institutions in the southeastern United States; the objective was to examine the underlying causes of the gender-based financial literacy gap. The results show that the gender gap develops in early college age, before people have had the opportunity to develop financial skills through experience or specialization in domestic roles, i.e. financial literacy is acquired through education and cultural influences, not only through experiences.

On the contrary, Douissa (2020) carried out a study in order to analyze the socioeconomic and demographic factors of FE among university students of the University of Sharjah in the United Arab Emirates. The results obtained show that factors widely used in the literature such as: gender, educational level, business studies, financial inclusion, family income, etc., only capture the knowledge dimension of financial education, but do not explain the financial behavior and financial attitude dimensions.

In the Latin American context, Ramos, García-Santillán and Molchanova (2020), measured the financial competence of 224 university students from Mexico and Colombia, their findings show a low level of FE in the analyzed population, particularly in the topics of inflation, use of credit cards, risk diversification, retirement planning, savings and investment. In addition, the results show that university Colombian students have a higher level of FE than Mexican students.

Similarly, García-Santillán (2020) conducts a study with high school students; the results indicated that according to the savings and investment variables, the perspective of economic income, the students have a favorable attitude towards their personal finances, as well as a significant relationship between financial knowledge and the use and application of financial products.

Karakurum, Kokkizil and Uysal (2019), conducted a study to a group of middle-income countries, such as Mexico, Lebanon, Uruguay, Colombia, and Turkey, with the objective to determine the factor that influences financial wellbeing. Their result found that financial education

is the main factor and this is lower among women, younger adults, and people who cannot read or write in the official language of their country of residence. In the same idea Bannier and Schwarz (2018), show that better financial education generates greater wealth.

In the study carried out by Garg and Singh (2018), they identified that the level of FE among young people is low worldwide. In addition, they found that factors related to the social, economic and demographic context of the participants, such as gender, age, education and marital status, influence the level of FE of young people and there is an interrelation between the financial attitude, knowledge and behavior.

From another perspective, Hussan, Salia and Karim (2018), carry out a study to demonstrate whether financial education helps SME owners to optimize the capital structure and improve access to financing. The results showed that financial knowledge the owners have, the better and more effective financial decisions they will make, which positively affects their economic growth.

In Mexico, high school students combine school and work. Cruz et al. (2017) identify that 10 % of male students work and study, and in the case of women, it is 5 %, associated in both cases to both sociodemographic and contextual variables. For this research, it is relevant to identify the FE of students who work and study, compared to those who study exclusively.

Design and method

The study is a non-experimental quantitative, descriptive, exploratory, and correlational cross-sectional study. The participants were 423 students enrolled in three institutions of Higher Education, Centro De Bachillerato Tecnológico Industrial y de Servicios (CBTis) N° 107; Colegio de Bachilleres de Bachilleres del Estado de Oaxaca (COBAO) and Centros de Educación Tecnológica Agropecuaria (CBTA), all belonging to the state of Oaxaca. Through a non-probabilistic sampling by self-determination, the instrument was applied to obtain the information in person with the support of some teachers.

To measure financial literacy in this research, the definition of Lusardi (2019) is used, which uses three fundamental concepts for financial decision-making: i) arithmetic, related to the ability to perform calculations and understand compound interest; ii) inflation; iii) risk diversification. According to Lusardi (2019), FL is measured based on three essential questions. Question 1: "If you deposit 100 pesos in a savings account that gives you a profit of 2 % per year and you make no deposits or withdrawals, including interest, will you have at the end of five years: (Answers: more than 102 pesos?, exactly 102 pesos?, less than 102 pesos?, no answer, don't know)"; question 2: Imagine that your savings account has an interest rate of 1 % per year and that inflation is 2 % per year. After 1 year, with the money in this account, you could buy: (Answers: more than today, exactly the same, less than today, no answer, don't know; question 3: Indicate whether the argument is true or false: buying stocks of a single company generally provides a safer return than a stock mutual fund (answers: true, false, no answer, don't know).

In the empirical measurement, for each financial literacy question, a dichotomous variable is designed: 1 if the respondent answers correctly and 0 otherwise, from which the percentage of correct answers to each question is obtained. To determine whether the results differ significantly between men and women, a test of population proportions is performed.

In order to determine the relationship between FE and other sociodemographic variables (gender, age, and employment status), a dichotomous Probit model is used. Gender is coded as a dichotomous variable: 1 if male, or 0 if female; age is coded as a numerical variable; employment status is coded as a dichotomous variable with 1 if the subject is working and studying, and 0 otherwise. Likewise, an interaction variable is included between gender and the student's work status. The binary Probit response model is denoted as:

$$P(y = 1 / X) = G(\beta_0 + \beta_1 X_1 + \cdots \beta_{k-1} X_{k-1} + \beta_k) = G(\beta_0 + X\beta)$$

Where G is the cumulative normal distribution function and X denotes the characteristics of the respondents (Wooldridge, 2015). From the estimation, the significant variables related to financial literacy and the probability of answering each of the questions correctly are identified, for which the z-contrast statistic is used. Under the null hypothesis $H_0: \beta_i = 0$,

$$z = \frac{\beta_i' - \beta_i}{\sqrt{var(\beta_i')}} = \frac{\beta_i'}{\sqrt{var(\beta_i')}} = \sim Z(0,1)$$

If α is the significance level of the test and Z tables is the critical value, then the testing mechanism that rejects the null hypothesis is when,

$$P[|Z| > Z_{tablas}] = \alpha$$

The marginal effect of the quantitative variable is calculated by means of the expression,

$$\frac{dP_i}{dX} = G(\beta_0 + \beta_i X_i)\,\beta_i$$

and for the case of binary explanatory variables the marginal effect of going from xk=0 to xk=1, keeping all other feasible variables fixed, is computed as

$$= G(\beta_0 + \beta_1 X_1 + \cdots \beta_{k-1} X_{k-1} + \beta_k) - G(\beta_0 + \beta_1 X_1 + \cdots \beta_{k-1} X_{k-1})$$

Where the expression $G(\bullet)$ is evaluated with the average value of the independent variables.

3. Data analysis

The sample is made up of 423 high school students, whose age range is between 15 and 20 years old, 40 % are men and 60 % are women, 19 % of them study and work; 80 % of the students receive a scholarship from the Federal Government, an average of $3,200.00 pesos.

The distribution of financial literacy responses of the students in the sample is presented in Table 1. From the results, about one-fifth correctly answer the financial literacy questions; 17.49 % correctly answer the compound interest question, 17.30 % correctly answer the inflation knowledge question and 21.62 % correctly answer the diversification question. The results obtained give evidence of the difficulty that the students surveyed have in answering questions that incorporate the concept of the interest rate, the effect of inflation on purchasing power after one year, as well as the concept of diversification.

In the comparison of results by gender, in the three FL questions, the percentage of men who answer the questions correctly is higher compared to the percentage of women who answer correctly. The largest difference by gender (up to 4 percentage points) is in the diversification question. Likewise, the results obtained not only distinguish between correct and incorrect answers, but also between answers that indicate that the respondent "does not know" or "does not answer". In all three questions, the most frequent response (around 35 %) is the "don't know" option, for both men and women. These results show that, this is a group that does not have the knowledge regarding these concepts.

Table 1. Distribution of responses on financial knowledge, by gender

Questions/answers	Male	Female	Total
Knowledge of compound interest			
More than $102 (*Correct answer*)	18.93 %	16.54 %	17.49 %
Exactly $102	12.43 %	10.24 %	11.11 %
Less than $110	15.38 %	17.32 %	16.55 %
Do not know	34.32 %	35.43 %	34.99 %
Refuses to answer	18.93 %	20.47 %	19.86 %
Knowledge of inflation			
More than today	20.71 %	21.34 %	21.09 %
Exactly the same as today	7.69 %	13.44 %	11.14 %
Less than today (*Correct Answer*)	18.93 %	16.21 %	17.30 %
Do not know	37.28 %	35.18 %	36.02 %
Refuses to answer	15.38 %	13.44 %	14.22 %
Knowledge of diversification			
True	20.83 %	24.90 %	23.28 %
False (*correct answer*)	24.40 %	19.76 %	21.62 %
Do not know	35.12 %	33.20 %	33.97 %
Refuses to answer	19.64 %	21.74 %	20.90 %

Source: own

The results of the population proportions test indicate that there is no significant difference between the two genders for each financial literacy question, given by the p-value (greater than 0.05), as seen in Table 2.

Table 2. Test of difference of proportions of financial literacy between men and women

	Proportion	Z statistic (Ho:difference=0)	p-value
Compound interest			
Men	18.93 %		
Women	16.54 %		
Difference	2.39 %	0.63	0.52
Inflation			
Men	18.93 %		
Women	16.14 %		
Difference	2.79 %	0.74	0.45
Diversification			
Men	24.26 %		
Women	19.69 %		
Difference	4.57 %	1.23	0.21
Sample size:			
Men	169		
Women	254		

Source: own

The results of the Probit model estimation for each financial literacy question are presented in Table 3. In all three models, the gender variable is not statistically significant, indicating that there is no difference between the two genders with respect to the probability of correctly answering the compound interest, inflation and risk diversification questions. The age of the students does influence the probability of correctly answering the compound interest question. The negative sign of the age variable is evidence that older students are less likely to answer the compound interest question correctly compared to younger students.

Since the results in the three models, we identified that the gender variable and the student's employment status individually do not influence the probability of correctly answering the financial literacy questions. By including the interaction variable between gender and the student's employment status, we identify its statistical significance in the probability of correctly answering the inflation question.

Table 3. Probit model estimates of financial literacy concepts

	Compound interest model		Inflation model		Risk diversification model	
	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect
Constant	1.1170		-0.9077		-0.7041	
	(1.0403)		(1.0516)		(1.0001)	
Gender (male)	0.0636	0.0163	-0.0983	-0.0244	0.1790	0.0528
	(0.16211)		(0.1661)		(0.1554)	
Age	-0.1252**	-0.0319	-0.0018	-0.0004	-0.0117	-0.0034
	(0.0626)		(0.0630)		(0.0597)	
Study and work	-0.05471	-0.0137	-0.2713	-0.0627	0.2133	0.0652
	(0.2363)		(0.2497)		(0.2145)	
Interaction Variable	0.0806	0.0212	0.9997***	0.336440	-0.0926	-0.0261
	(0.3774)		(0.3693)		(0.3498)	

Number of observations:	423	423	423
Number of 'correctly predicted' cases	349 (82.5 %)	350 (82.7 %)	332 (78.5 %)
McFadden's R-square	0.011749	0.023007	0.005394
Likelihood ratio test: Chi-square(4)	4.60822 [0.3299]	8.95257 [0.0623]	2.44602 [0.6543]

Notes: *,**;***: Statistical significance at 10 %, 5 %, 1 % respectively. Standard errors in parentheses. Source: own

From the results of the Probit model, the probability of correctly answering the inflation question is obtained, given the characteristics of the student regarding gender and employment status, as presented in Table 4.

Table 4. Probability of answering the inflation question correctly, by gender and employment status

	Male student (studying and working)	Female student (studying and working)	Male student (studying)	Female student (studying)
Estimated probability	0.3789	0.1132	0.1499	0.1740

Source: own

The results show that male students who study and work are 26.57 (0.3789-0.1132) percentage points more likely to answer the inflation question correctly compared to females in the same condition, and 22.9 (0.3789-0.1499) percentage points more likely than male students who only study. Of the group of students (male and female) who only study, females are 2.4 percentage points more likely than males.

4. Discussion

Financial literacy is a topic of great relevance for decision-making in various contexts of daily life. Hence, to the extent that individuals are better financially prepared, it will improve their well-being. The results of the National Survey of Financial Inclusion of Mexico 2021 (CNBV, 2022) show that only 40 % of respondents aged 18 and over correctly answered the compound interest question, 76 % understand the impact of inflation on purchasing power and 69 % understand the advantages of diversifying savings, in whose results a difference by gender is identified.

The results of this research show that around 20 % of high school students correctly answer the financial literacy questions. The percentage is lower compared to those obtained in other populations (Lusardi, 2014; Silgoner, 2015; Villagómez, 2016; Hasler, Lusardi, 2017; Lusardi, 2019; OECD, 2020). It is relevant to mention that the results are consistent with specialized literature on the subject, considering that the respondents are students who are in the stage of educational training and some in the first stage of their working life (Garg, Singh, 2018).

In our results of the econometric model, the gender variable does not influence the probability of correctly answering the financial literacy questions, which indicates that there is no gender difference. These results differ from those obtained by Bottazzi and Lusardi (2021) and Hasler and Lusardi (2017), but coincide with those obtained by Villagómez (2016) regarding groups of high school youth and with those obtained by Swiecka, Yesildag, Özen and Grima (2020).

The results of the Probit model show that the interaction variable between gender and the student's employment status is significant in the probability of correctly answering the inflation question. This result indicates that students who are in the condition of studying and working understand the effect of inflation on purchasing power, through experience, contrary to what Al-Bahrani, Buser and Patel (2020) point out.

5. Conclusion

The aim of this research was to determine the financial knowledge of high school students in Tuxtepec, Oaxaca, as well as its relationship with the student's gender, age, and employment status. The results show low FE of the students, who only a fifth of them understand the full meaning of concepts like compound interest, inflation, and diversification.

The results coincide with the empirical evidence regarding the financial literacy of groups in the school stage. The significant effect of the interaction variable (gender and the condition of studying and working) on the probability of understanding the effect of inflation on purchasing power is evident. The results obtained can contribute to the design of financial education programs for young people at an early age and that allow them to make informed financial decisions in any aspect of personal and work life.

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Development of Students' Creativity: Results of Practical Testing of the Learning Model during the Pandemic

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Abstract

The effective implementation of the goals of solving modern problems in the field of education depends on the creative indicators of the student and the degree of independent development of the personality. The purpose of this study is the theoretical development and practical testing of a model for the development of creativity of students in the educational process, including identifying the prerequisites and pedagogical features of the studied process. To achieve this goal, we organized and conducted experimental work with students of various intellectual schools. A total of 164 people took part in the study at different stages of experimental work: 14 teachers, 150 students (75 each in the experimental and control groups). As a result of the study, the effectiveness of the potential of the study group as a prerequisite for preparing students for a socio-cultural environment was proved. A model for the development of students' creativity indicators has been developed and theoretically substantiated. The model was tested, the prerequisites for the development of students' creativity in the author's version were identified and the criteria for the formation of students' creativity were selected and proved. To determine them, along with qualitative indicators, the results of the assessment of competent specialists, standardized tests and methods are used. The correctness of the studies carried out was confirmed by the possible duplication of the results of the experimental study, statistical indicators confirming the objectivity, reliability of scientific conclusions.

Keywords: creativity, development, experimental work, learning model, social education, the process of teaching students.

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1. Introduction

Modern society, as a complex, differentiated social education, puts forward increasingly complex requirements for the education and upbringing of young people (Liang et al., 2022).

The results of the analysis of psychological and pedagogical literature on the topic of the study show that, although there are many publications on the issue close to our study (Nizaar et al., 2020; Tubb et al., 2020; Durkalevych, 2022; Ramankulov et al., 2019), it shows that the process of social education in the research group in the context of the development of students' creativity is still little studied. As we can see from the scientific literature, in domestic and foreign Science, the development of the concept of creativity is perceived as a concept that has taken an important place in the context of the educational process. In addition, the results of the analysis of the scientific literature showed that this problem has not been adequately studied on the formation of social practices and the necessary presentation to students. For example, a meta-analysis of a large number of literature shows that the practical experience of developing students' creativity in the aspect of social education has been studied at a low level.

The above conclusions and the results of literary reviews have shown us that the problem of studying the development of students' creativity in social education should be in the first place. It also allowed us to conclude that the study is distinguished by the determination of the solution of the following problems:

- insufficient use and implementation of the capabilities of advanced technologies in the field of education for the development of students' creative abilities in educational institutions;

- professional requirements for students in the field of education and the fact that the development of their creative abilities is at a low level.

We will be looking for a clear answer to the research question about what are the pedagogical conditions for the development of students' creativity in the educational process, what are the pedagogical characteristics of the development of creativity.

These questions and research questions formed the basis for determining the purpose of the research from theoretical and practical perspectives – both the development of a model for the development of students' creative abilities in a learning process that includes the prerequisites and pedagogical features of the research process, and the evaluation of the effectiveness of the pedagogical experiment. Human uniqueness and personality are closely related to the problem of creativity.

Today, Research in the field of pedagogy involves a comprehensive knowledge of the problem, the solution of which needs to be determined. Therefore, these studies require an objective study in terms of their systemic basis and structural components and a search based on interdisciplinary communication (Shubina, Kulakli, 2019).

In addition, currently, cognitive approaches and psychometric approaches are found in the psychological and pedagogical concepts of creativity. However, it should be borne in mind that mystical, motivational, personal, social approaches are also used in a special way, and on their basis there are many approaches that characterize the concept of "creativity".

So, according to the concept of reduction creativity to the intelligence level of creative abilities is determined by the level of intelligence (Koval, 2020).

There are four aspects to the phenomenon of creativity:
- The creative environment;
- Creative product
- Creative process
- Creative personality (Antopolskaya, Silakov, 2021).

The question of the development of creativity in pedagogical terms has an important age aspect. An analysis of the literature shows that researchers offer many options for favorable times (sensitive periods) for the development of personal creativity (Hidajat, 2021; Cheung, 2018; Herzog, 2020; Hart et al., 2022).

It is logical to assume that students, as a special social category of young people, are most capable of manifesting and choosing original solutions, to begin independent creativity.

Based on the above conclusions and characteristics, we took the development of students' creativity in the context of social education in the study group as the idea of the main study. This is because it is important to enrich subjective experience such as creativity, organize students' creative communication and teach them teaching skills on this basis, develop the student's creative qualities and create resources for self-improvement.

2. Materials and methods

In the course of the study, theoretical methods, including analysis and generalization, are used to solve the main problems of the study, methods of generalization and systematization of scientific works and provisions on the research problem were used. In addition, a survey of empirical methods, testing of students, observation, pedagogical experiment, statistical methods of processing research results were used.

The reliability and validity of the results obtained in the course of the study is ensured by the identification of the initial methodological prerequisites and the selection of a complex of scientific, theoretical, empirical methods. The use of the evaluative opinions of competent experts necessary for the study, the use of evidence-based tests and standardized methods (Torrens, Mednik, Tunik, etc.), their confirmation by statistical indicators confirm the objectivity and validity and reliability of scientific results and conclusions (Ramankulov et al., 2020).

To obtain an objective and complete picture of the study according to R. B. Kettel's classification, three data sources were used according to L -, Q -, T-in the diagnostic part of the experimental work on the development of students' creativity in the study group.

«The first source is L» – data, obtained by registering a person's life mainly as a result of observation.

«The second source is Q» – data, obtained on the basis of questionnaires and other self-assessment methods.

«The third source T» – data – is the data of objective tests obtained under strictly controlled conditions, when the subject does not know which characteristic the diagnostic procedure is aimed at evaluating.

In total, 164 people took part in the study at different stages of experimental work: 14 teachers, 150 students (75 each in the experimental and control groups) from the Nazarbayev Intellectual School of Physics and Mathematics in Astana, Almaty, Shymkent.

The determination of decisions on the research issues was carried out in 4 stages:

At the first stage, the scientific and methodological literature on the formation and development of students' creativity was analyzed. The initial state of the research problems is determined.

The second stage in the course of the study made it possible to identify the leading conceptual idea of the problem. Diagnostic methods aimed at solving research tasks have been identified. In addition, methods and techniques for the development of students' creative performance were identified. At this stage of the study, the results were mathematically processed and the data obtained were clarified.

At the 3rd stage, called formative, the main experimental work in the study was implemented and the effectiveness of the model developed by us for the formation of creativity was tested.

The experts were teachers and an experimenter. The main characteristics of students' creativity with such basic criteria as "performance", "flexibility", "originality", "development", the indicators of creativity selected by us were taken as a basis (Table 2).

In accordance with our study, during the pedagogical experiment, the evaluation experts were recommended to use the following guidelines:

"Dear expert, it is recommended that you determine the level of formation of three indicators for assessing the student's creativity (a.performance (P) – inefficiency (irrationality); b. flexibility (F) – rigidity (inertia); c. originality (O) – simple (medium))."

Take a closer look at these indicators. Then, on the scale below, rate the student for each indicator:

5 points-according to the evaluated indicator, the personality trait is well developed, achievements are often manifested;

4 points-the personality trait according to the indicator is clearly manifested, even if it is not constant.

3 points-will be in rare manifestations on assessed and opposite personal qualities.

2 points-the trait of the personality according to the evaluated indicator is often not manifested;

1 point-the trait of the personality according to the evaluated indicator is completely invisible;

0 points-there is no information for assessing this quality (I do not have it).

A simplified version: the evaluation of indicators is done on a five-point scale, where the lowest score is 0, and the highest is 5."

According to the proposed method, the total final assessment of creativity is defined as the sum of the points scored according to four indicators (criteria) of creativity. There are 3 indicators for each criterion, a total of 11. The minimum score is 20 points or lower, the maximum score is 80 points. Below is the correspondence of the sum of points to the levels of formation of students' creativity:

Productive (high) level: 80-61;

Reconstructive (average) level: 60-29;

Reproductive (low) level: 29-20 (and below).

The degree of external validity of the method of expert assessment of creativity (EOC) was determined using the Spearman rank correlation coefficient. The data obtained by the J. Johnson creativity method were used as an equivalent form.

3. Results

A model for the development of students' creativity in the process of learning and social education.
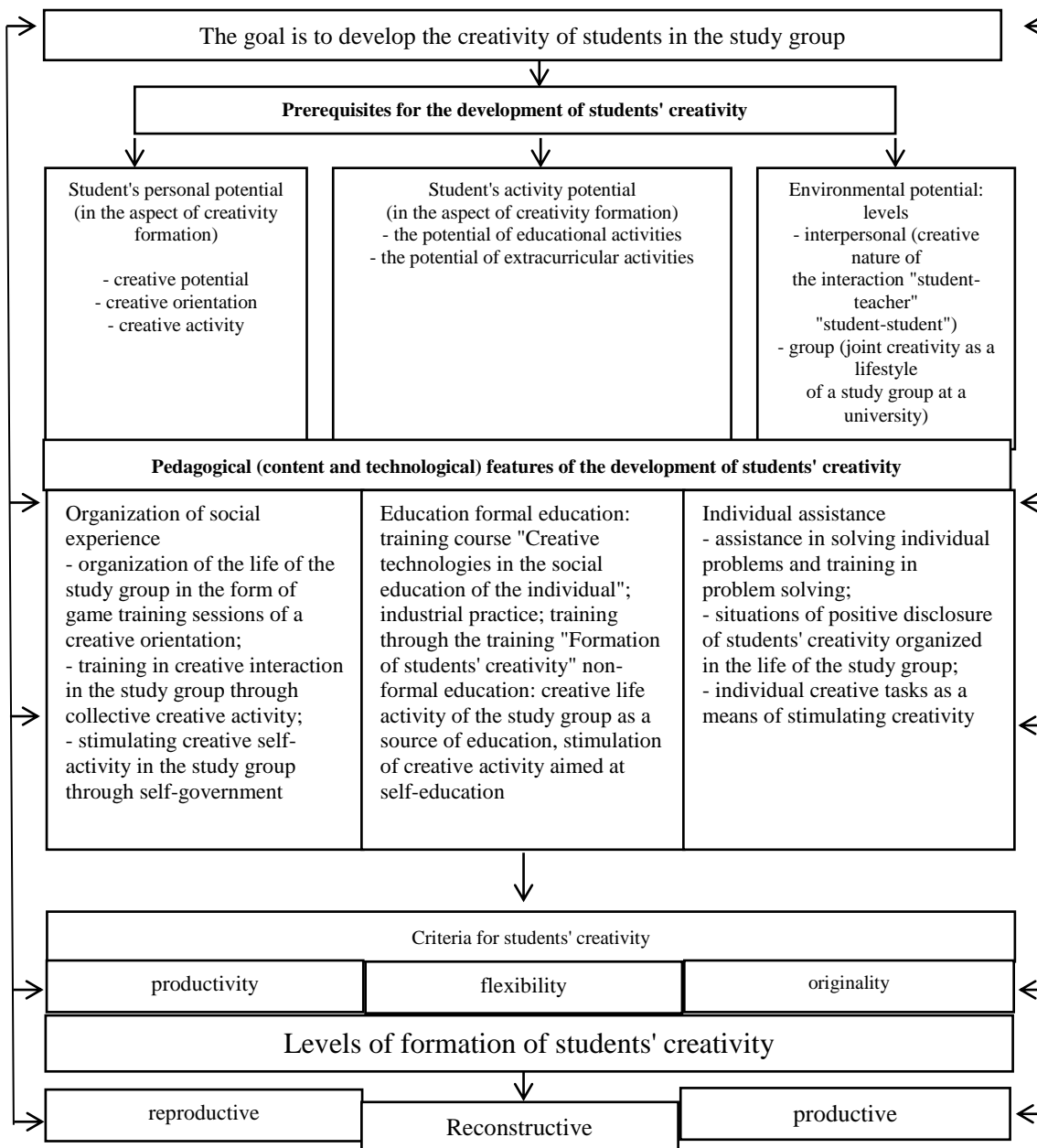

Fig. 1. Structural model of the development of students' creativity in the process of social education in accordance with the pedagogical experiment

Secondary educational institutions provide the formation of a future specialist with a certain set of knowledge, skills and abilities, but the current education system does not create the proper conditions for the development and realization of the creative potential of students. Based on the research of the problem of creativity development in the scientific literature, in accordance with the socio-pedagogical concept, we have developed a model for the development of students' creativity in the process of social education in the study group (Figure 1).

Modeling of the development of students' creativity was carried out based on the provisions of humanistic, activity-based, systematic approaches.

Representatives of humanistic psychology (Elkins, 2022; Sukawi et al., 2021; Holm-Hadulla et al., 2021) consider the healthy creative personality of a person to be the subject of research.

The model for the development of students'creativity in a social study group includes the following components: the purpose of training, the tasks of training; principles of social education; pedagogical prerequisites for the development of students' creativity; pedagogical (substantive and technological) features of the development of students' creativity. In addition, the criteria and levels of creativity of students are also the structure of the model.

So, the effective development of students' creativity in the process of social education in the study group hypothetically contributes to the full use of the resources of personal potential, the direct inclusion of students in the activity potential (active, creative activities), with indirect influence, "immersion" in the environmental potential. Let us illustrate the identified and theoretically justified prerequisites for the development of students' creativity through graphical modeling (Figure 2).
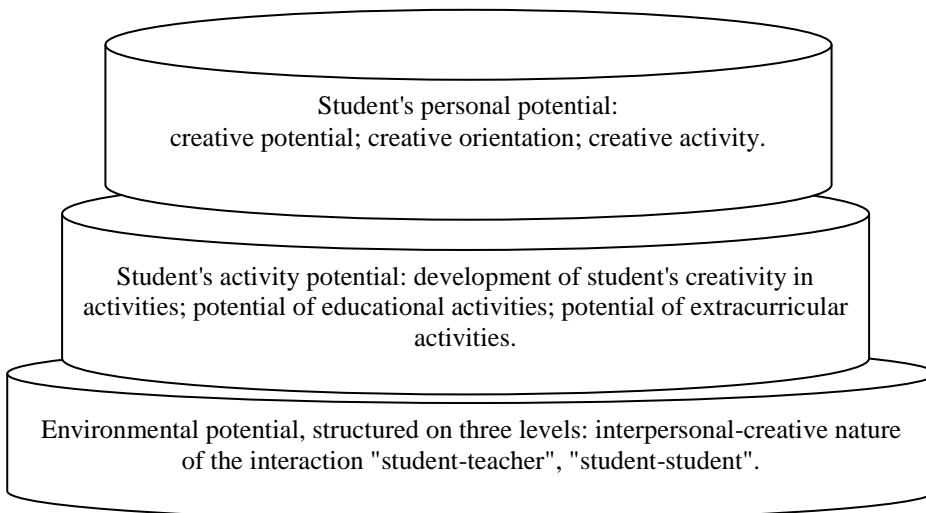

Fig. 2. The model of prerequisites for the development of students' creativity

The wide variety of problems that students face in the educational process, the variety of life activities and the use of their abilities at UUI, the limited resources required to fulfill their tasks, require the use of innovative pedagogical technologies depending on the activity and intensity of students (Mukhametshin et al., 2021).

The technological components (forms, methods, techniques, means) of developing students' creativity in the process of social education in the study group are presented in Table 1.

Table 1. Forms, methods, tools to increase students' creativity in the process of social education in the Study group

1	2
Forms of educational and extracurricular activities of a creative orientation	- author's training course "Creative technologies in the social education of the individual"; - author's training "Formation of students'creativity"; - industrial practice; - collective creative activity (KVN, ritual "Student wedding", "Creative day", etc.);

Technologies for the development of students' creative performance	- the technology of active learning (group discussion, brainstorming and its types; the method of synectics, the method of morphological analysis, etc.); - creative design technology; - technology of collective creative activity (I.P. Ivanov); - interactive game technologies (trainings);
Methods for the development of students' creative performance	- methods of organizing creative life activity (partially-search, research, methods of group solution of creative tasks, methods of active learning, etc.); - methods of stimulating creativity (creating success situations, the method of inversion, heuristic questions, focal objects, mental maps, "six hats", "bouquet of problems", etc.
Tools for the development of students' creative performance	- Different performers; - Teaching aids; - Computer courses;

The main provisions of the pedagogically expedient organization of the social experience of students in the study group, on which the development of creativity depends, are as follows:

1) Understanding the perspective of all members of the team participating in the pedagogical experiment aimed at group activity;

2) Implementation of the principle of complementarity, mutual enrichment of knowledge of participants in the pedagogical experiment to solve problems in the educational process;

3) Improving students' activities through the use of types of content and creative nature of the educational process;

4) Participation in activities aimed at improving the microenvironment around students, exceeding the interests and needs of the team, including addressing broader social problems;

5) Self-confidence and the ability to control and improve oneself.

Implementation of the program of experimental work on the development of students' creativity:

In an experimental study, we separated dependent (affective) and independent variables (affective factor). In our case, there is student creativity in the form of the ability to create a dependent range, an independent range is the requirements (personal, activity, environmental capabilities) and pedagogical (material and technical) characteristics of the creative development of students in the process of social education in the research group. We thought:

1. If the process of social education in the research group takes into account the requirements, that is, individual, active, environmental abilities, then the effectiveness of the creative development of students is possible.

2. If in the process of social education the following pedagogical (material and technical) information is taken into account in the research group, namely:

- In the course of the pedagogical experiment, the organization of social practice will be carried out by teaching interaction through creative activities in a joint research group, organizing training through creative games, encouraging creative independence in the research group through individual management;

- The training will consider the educational course "innovative technologies in the social education of the individual", the training" creative formation of students", as well as the life of the research group as a source of knowledge that stimulates creative activity aimed at self-education;

- If in the course of a pedagogical experiment tasks of a creative nature are used as a means of developing creativity, then the plan for the development of students' creativity is effectively implemented.

Currently, most researchers use the E.P. Torrens test to measure three indicators of creativity: productivity, flexibility, and originality. In our research work, these indicators were adopted as criteria for the formation of creative indicators of students participating in the process of social education.

During the implementation of the pedagogical experiment, the selected and evidence-based criteria for the formation of creativity of students participating in the study are shown in Table 2.

Table 2. Criteria and indicators of students' creativity formation

Criteria for the formation of students' creativity	Indicators of the formation of students' creativity
1	2
Productivity. It is measured by the number of results (selected and successfully completed creative tasks), determined by the number of general responses. It is evaluated by the speed and ease of performing creative tasks.	- opportunities for students to create many ideas on their own; - opportunities for creative product development according to the pre-given model; - sensitivity to creative activity and independence in new situations; - mobility in performing tasks of a creative nature.
Flexibility. It is measured by the number of switches (categories) from one class of objects or phenomena to another during the response. The speed and efficiency of switching is important.	- the ability to quickly find new (alternative) solution strategies; - the ability to establish a wide range of associative connections and freely move from phenomena of one class to others, often distant in content; - the ability to transform the functions of an object and offer its new use; - the ability to overcome stereotypes.
Originality. It is measured by the number of extraordinary, non-repeating answers (images, ideas). It is diagnosed by the minimum frequency of this response in a homogeneous group.	- the ability to produce (put forward) new ideas and solutions, distant associations; - the ability to put forward unique, exceptional ideas that differ from the obvious answers; - the ability to solve problems in a peculiar, unusual and constructive way.

For the effective implementation of the program of the pedagogical experiment, we adhered to the following principles: to help students solve problems related to practical knowledge during the educational process.

The organization of social and public practice of students of the group of grades 10-11 participating in the pedagogical experiment included such components as the use of situational problems in the study group, teaching creative interaction and stimulating creative skills.

The use of tasks of a creative nature began with the first days of students in the group participating in the study at the intellectual school and took place in the form of Game trainings of a creative direction. This principle is also found in other research literature (Toril et al., 2016; Mangiron, 2021).

Examples of sports classes with students of the 10th grade, which are used in the process of social education in the study group at the main stage of experimental work.

A game training session of a creative orientation for acquaintance. Pedagogical tasks of creative orientation: the development of creative imagination, imagination, the ability to put forward associations; the formation of the ability to create an image; acquaintance of students of the study group with each other.

Exercise creative direction: "I – Association," "I know" "Yes, I am!", "Three cases", "Marriage announcement", "Performance partner, My personal coat of arms".

"Self-Association": students in the research group call their name, choose a community that begins with the capital letter of their name and become a member of it.

"I know": participants in the pedagogical experiment line up in a circle and throw balls into each other's hands, linking the names of celebrities with their names. After all the participants have introduced themselves, the ball is thrown again in the reverse order.

"Yes, I am!": Students participating in a pedagogical experiment need to show their collective image: for example, what profession do I want to associate myself with in the future?

"3 facts": in the pedagogical experiment, each participant of the group of students must clearly describe their name and three facts about themselves. It is necessary to determine whether the participants are real facts of each other, real or fictional, by voting for the truth.

"Personal coat of arms": as an exhibition, presentation of works, on 4 sheets divided into 4 parts, you need to draw a) Your Name, b) your symbol, c) what you like or want; d) describe your self-portrait with colored pencils, paints.

As a form of additional (formal) education in extracurricular time with students, the author's training "Formation of students' creativity" was used, with a volume of 72 hours.

The pedagogical tasks of classes organized in a training nature are as follows:
- development of students' enthusiasm for creativity;
- development of teamwork skills of a creative nature;
- effective implementation of creative opportunities in solving situational problems;
- teach students to use their creative abilities.

Thematic planning of the author's training "Formation of students' creativity"

First theme: «Cohesion. Collective decision-making» (8 hours). Exercises: "Interchange", "Number", "Entanglements", "Ball", "Who? Where to?

Second theme: «Creative thinking» (6 hours). Exercises: "Associations", "Why?", "Crossence", "Three elephants", "Five seconds to think", "Encryption", "What? Where to? How?"

Third theme: «Barriers of creativity, ways to overcome them» (8 hours). Exercises: "Chairs", "Bridge", "Knees"

Fourth theme: «Nonverbal creativity» (6 hours). Exercises: "Blob", "Magic aquarium", "Supplement the drawing"

Fifth theme: «Verbal creativity» (8 hours). Exercises: "Shifters", "Rhyme", "Add", "Intonation", "Concert", "Joint story", "Conversation"

Sixth theme: «Imagination as a creative process» (4 hours). Exercises: "Guess who I am?", "Clouds", "Freeze frame"

Seventh theme: «Joint creativity» (6 hours). Exercises: "General breathing", "Collage", "Fairy tale", "Count", "Cities", "Row"

Eighth theme: «Individual creativity» (8 hours). Exercises: "Unusual story", "Figures", "Artistry", "Biography of the subject", "This is Me"

Ninth theme: «Creativity in everyday life» (8 hours). Exercises: "Dreams", "Cheat sheet", "Oriental bazaar", "Fashion designer", "Shopping"

Tenth theme: «Creative problem solving» (2 hours). Exercises: "Incredible situation", "Methods of action", "Celebrity", "Flower"

The eleventh theme: «Completion of the training. Summing up the results» (8 hours). Exercises: "Gift", "Crocodile".

Based on the characteristics of the data on clusters and the range of values, the following levels of students' creativity formation in the process of social education in the study group were identified, which are characterized by the corresponding indicators:

Reproductive (R) level. In those characterized by low indicators of the formation of students' creativity, the student is passive in activity, does not show activity when performing tasks of a creative nature. Will be prone to reproductive activity.

Variable (V) level. Due to the fact that it is characterized by average indicators of the formation of creativity, the student shows independent activity, shows the presence of interest in performing tasks of a creative nature. Can offer solutions to practical problems.

Productive (P) level. According to the criteria for the formation of a student's creativity, it is characterized by high and stable performance of all indicators.

Based on the application of the criteria of productivity, flexibility, originality and development used in the study, we measured the levels of creativity formation identified as a result of cluster analysis in the experimental and control groups of subjects.

At the beginning of the pedagogical experiment and at the end of the educational process, the dynamics of assessment by the levels of development of students' creativity and indicators of creativity are clearly shown in Table 3 and Figure 3.

Table 3. Levels of formation of students' creativity in the process of social education in the study group

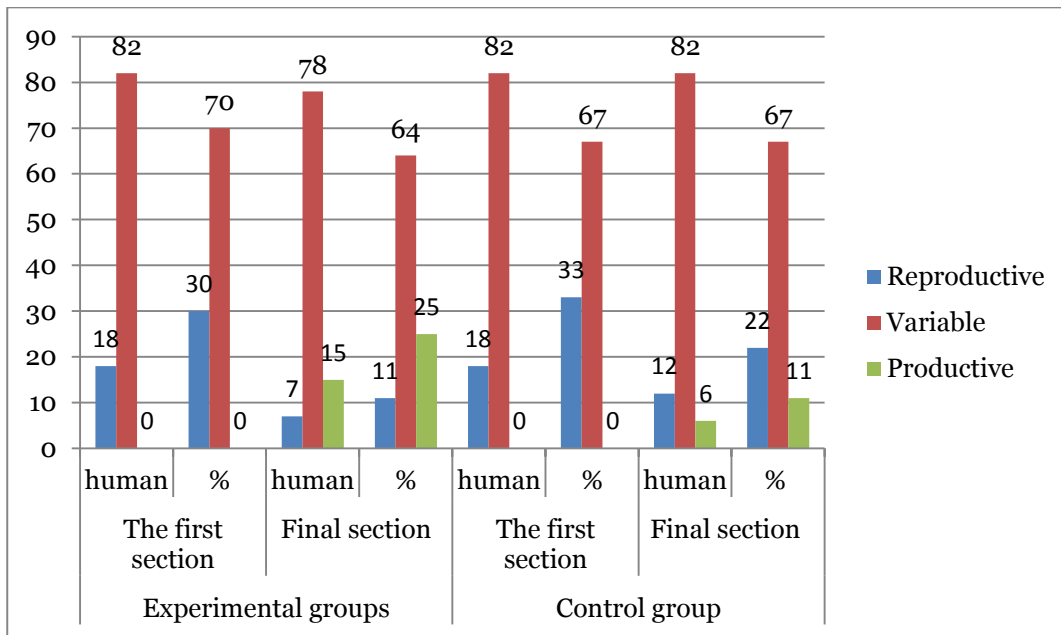|	Experimental groups				Control group			
	The first section (PS)		Final cross-section (FS)		The first section (PS)		Final cross-section (FS)	
	Human	%	Human	%	Human	%	Human	%
Reproductive	18	30	7	11	18	33	12	22
Variable	82	70	78	64	82	67	82	67
Productive	-	-	15	25	-	-	6	11

Fig. 3. The dynamics of the formation of students' creativity in the process of teaching in a pedagogical experiment

The presence of subjects with a reproductive level (EG – 31 % and CG – 32 %), a 70 variable level (EG – 46.7 % and CG – 48 %), a variable level (EG – 69 % and CG – 68 %) in a pedagogical experiment, the correlation of the creative potential of students at the beginning of the study of the educational process is characterized.

The tables and charts obtained from the academic exam results show the stability of the creative development level in the control group and the performance increase in the test group. The calculated value χ^2 e is compared with the critical value χ^2 c, which is determined by the standard table of critical values according to the conditions of a particular experiment. Within the framework of our experiment, for the significance of p ≤ 0.05 with the number of gradations g = 3, the number of degrees of freedom v=2, respectively, χ^2 c = 5,901.

If χ^2 e < χ^2 c then the null hypothesis is accepted (H0), otherwise the experimental hypothesis (H1) is accepted.

The hypothesis was formulated as zero (H0): there are no differences in the distribution of students according to the levels of development of the qualities of creativity in the control and experimental groups. As an experimental hypothesis (H1), the following was adopted: the distribution of students by levels of development of creativity qualities in the experimental group significantly differs from the control group.

At the beginning of the search stage, when comparing the levels of development of the qualities of creativity according to the results of testing in the control and experimental groups, χ^2 e = 0.148 was obtained. Thus χ^2 e < χ^2 c, it allows us to accept the hypothesis H0, and

formulate a conclusion about the absence of a sufficient difference in the levels of creativity qualities in the control and experimental groups.

At the end of the search stage, after repeated testing, χ^2 e = 6,367, i.e. exceeds the value of χ^2 c, thus, the hypothesis H1 is confirmed - the levels of creativity qualities in the control and experimental groups significantly differ.

The statistical analysis of the data obtained during the formative experiment allows us to draw the following conclusions:

- At the beginning of the formative stage, there are no statistically significant differences in the level of development of the qualities of creativity of the control and experimental groups;

- Most students of control and experimental groups at the beginning of the experiment stage have an average and low level of development of creativity;

- The level of development of creativity qualities of students of experimental groups at the end of the experiment stage is statistically significantly higher than the level of development of creativity qualities of students of control groups.

In comparison with the respondents of the CG, the dynamics of the variable level of EG students is 1.5 times higher. It should be noted that at the final stage of the empirical research in the EG, the number of students who have reached the productive level is 26 %, while in the CG, the number of respondents of this level is only 12 %. In general, the number of subjects with a productive level in EG is 2.4 times higher than the corresponding value in CG. The results of comparative analysis showed that there is no high positive dynamics of variable and productive levels in CG.

Therefore, from the table provided, it can be seen that the number of students at the reproductive level in the EG decreased significantly (by 18 %), and in the CG respondents this figure decreased by only 10 %.

It is obvious that the high results obtained in the experimental groups are accompanied by the effect of the complex influence of various factors. These results show the effectiveness of the actions performed in accordance with the model proposed by us for the formation of creativity.

4. Discussion

Researchers distinguish the existence of an actual and potential form of creativity (Kanke et al., 2021). Today, as a realized, expressed creative and potential form, as a potential for creative personal growth and creative self-development, the question of how to change the level of creativity of students has increased.

According to V.N. Druzhinin, the general creative ability corresponds to a certain motivation and a certain type of activity which showed originality. In addition, according to A.G. Maslow, creative activity is interpreted as a motivation for self-actualization.

The opinions of these scientists and the conclusions made as a result of the study allowed us to characterize the indicators that are formed in creative activity as a creative ability. At the same time, this led us to conclude that the effectiveness of creative activity also depends on the level of formation of creativity. This is also found in the works of scientists from other fields of science close to the theory (Oleksyuk, 2021; Berdi et al., 2015).

The identified and justified prerequisites (personal, activity, environmental potentials), the model developed by us clarify the idea of the factors of social education, their consideration contributes to the effective formation of students' creativity in the process of social education in the study group.

The results of our research in the field of creativity give the basis for conclusions about the pedagogical features of the formation of students' creativity in the educational process, and these features will serve as the basis for future research in this area.

5. Conclusion

Searches for the formation of students' creativity in pedagogical education characterize the main development trends in the aspect of the theory of modern knowledge. Creative performance as a skill is reflected not only in the educational activities of students, but also in the organization of life-related activities of the Student Educational team. In the course of our research, we were convinced that the development of a future specialist as an individual, the competitiveness of which depends on the degree of development of his creative abilities. An individual with developed

creative indicators is able to independently solve problems, be flexible in solving problems due to rapidly changing conditions in any area.

Our research work – the result of a preliminary analysis of the literature on the concept of creativity, showed that creativity is the cognitive activity of individuals, generating ideas, methods and new products that have effective integration in different areas to solve a problem.

Consequently, the training of future specialists with a developed creative potential that meets the requirements of the labor market in a dynamically developing society of Science and technology is a vivid reflection of the solution of important problems in the world educational space.

Despite the positive results obtained as a result of a pedagogical experiment, such topical and interesting issues of the study of creativity as the study of the nature of joint creativity in the interaction of interpersonal processes responsible for creativity and innovation, the need and features of the development of creativity in the study of various disciplines remained outside the topic of our research. Based on the results of our research work, it is necessary to further study in all educational institutions as a necessary condition for the social and personal development of students in the study of subjects in the creative sphere.

6. Acknowledgements

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Assessment of the Readiness of Future Mathematics Teachers to Use Digital Educational Resources in the Study of Geometry in Kazakh Universities

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Abstract

The purpose of the study is to assess the readiness of future mathematics teachers to use digital educational resources and analyze their efficiency in the study of geometry in Kazakh universities. The relevance of the study is due to the lack of serious scientific research and reliable data on the effectiveness of using digital educational resources as part of studying mathematical disciplines. An experimental study of the readiness of students majoring in mathematics to use digital educational resources in the study of geometry is carried out based on the Auezov South Kazakhstan University at the Mathematics Department of the Faculty of Natural and Pedagogical Sciences. As part of the experimental work, in the 2020-2021 academic year, an experimental group of 49 students and a control group of 51 students, a total of 100 people, were formed from first-year students in the 6B01510 Mathematics educational program. The main objective of the experimental study was to determine the efficiency of students' learning with and without the adoption of digital educational resources in the educational process.

The survey method is employed to assess students' psychological readiness to use digital educational resources and the level of the development of their motives to do so. The methods of educational testing and methodological experiment are used to establish the effectiveness of digital educational resources in the university study of geometry.

Since the readiness of future mathematics teachers to use and implement digital educational resources in the learning process is found to be high at the first stage of the study, it is deemed necessary to conduct a methodological experiment on the implementation of digital educational resources in the learning process.

As part of the five-semester-long methodological experiment, students in the experimental group were taught with the use of digital educational resources, while the control group students

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studied using the traditional geometry teaching system. The final results based on student testing and the application of statistical methods demonstrated the effectiveness of the use of digital educational resources in the university study of geometry, which leads to higher test scores.

Proceeding from the results of the study, the authors conclude on the feasibility of using digital educational resources in the learning process in the study of mathematical disciplines.

Keywords: geometry, digitalization, digital competence, teacher training, information and computer technology.

1. Introduction

The active introduction of digital technology in all spheres of human life contributes to the popularity and importance of digital educational resources (DERs) as one of the most promising and trending e-learning paradigms.

Although the introduction of computer and information and communications technologies (ICT) in general education and higher education institutions in Kazakhstan is highly widespread (Filinova et al., 2015), the introduction of digital technology in the educational process poses several issues for Kazakh education. First, there is the question of whether future teachers possess sufficient skills, knowledge, and motivation to integrate DERs into the educational process. Second, under question is the efficiency of the use of DERs in teacher training. To comprehensively and competently implement digital technologies in the educational process and the training of future teachers who would be able to use and create interesting, proper, and original digital resources, it is necessary to have theoretically and experimentally confirmed results of DERs effectiveness in the educational sphere.

The above has prompted us to investigate the readiness of future teachers to use DERs in the learning process, as well as the effectiveness of using DERs in the study of geometry in Kazakh universities since the use of DERs promotes better visualization of information provided during the study of geometry by both student teachers and their future students and, as a result, ensures better understanding and assimilation of the studied educational material.

Due to the increased interest in the use of DERs in the classroom (Filinova et al., 2015; Ustatdzhalilova, 2013), the issue of training future teachers in Kazakhstan becomes particularly relevant, and various measures are being taken at the state level to improve the quality of education. Thus, the program for the development of education in Kazakhstan stipulates among the key directions for the modernization of the education system: ensuring equal access for all participants in the educational process to the best educational resources and technologies; integration of ICT into the educational process; creating conditions for the introduction of automation of the educational process (Decree of the government..., 2017; State program..., 2020).

At present, however, training in the use of DERs in Kazakhstan is provided for teachers only in advanced training courses. For this reason, the inclusion of new disciplines related to the preparation and creation of DERs in the curriculum will allow students to acquire skills in the application and implementation of new digital technologies.

Nevertheless, many leading universities in the country, through the efforts of individual scientists and research institutes, are working on the formation of an innovative educational environment for a modern university. The latter represents a set of content, forms, methods, and means of learning, which are based on the transfer of the achievements of modern science and technology in the educational process of the university and are aimed at the formation of innovative personalities of future teachers, capable of making creative decisions in professional activities (Alisov, Podymova, 2011), through the introduction of new digital learning technologies and resources into the traditional system of teacher training (Velitchenko, 2021).

In connection with the above, the purpose of the study is to assess (determine) the readiness of future mathematics teachers to use DERs and to analyze their effectiveness in the study of geometry in Kazakh universities.

Research objectives:

- to consider the essence of DERs and the prerequisites for their use in the educational process based on a review of scientific literature;

- to conduct an empirical study into students' psychological readiness to use DERs and determine their motivation to use DERs;

- to experimentally investigate the impact of introducing DERs into the educational process of higher education institutions on the level of students' knowledge of mathematics.

The novelty of the study lies in the experimental justification of the use of DERs in teaching geometry to future teachers of mathematics.

Conceptual background and research questions

According to I.N. Golitsyna (2014), DERs are a modern variety of information resources used in education. As demonstrated by D.S. Shapiev (2019), DERs are electronically presented teaching and learning materials that accommodate both elementary objects (text, picture, animation, model) and complex forms (document, slide, presentation, test, course). A.G. Rakhymbergenova et al. (2016) point out that DERs combine a wide range of teaching software, electronic textbooks, electronic tests, computer models, simulators, didactic games, and stimulators of different purposes, levels of complexity, a form of technical performance, and types of interface. As defined by A.I. Pasyeva and A.Kh. Shaikhlislamov (2020), DERs are electronically presented teaching and learning materials containing elementary objects (text, pictures, animation, and models) and complex forms (documents, slides, presentations, tests, and courses).

Relying on the theoretical analysis of the concept of DERs, the following definition is the most suitable: DERs are subject-specific information resources for educational purposes – a type of learning tool that exists in an electronic format (Kalimullina, Trotsenko, 2018).

Important for today's pedagogical reality in terms of developing modern pedagogical skills is the ability of future teachers to design digital narratives (Vaindorf-Sysoeva, Subocheva, 2020). D.S. Shapiev (2019) projects the known principles of didactics and didactic conditions for the effectiveness of traditional teaching tools on the requirements for the content and presentation of educational material in DERs, namely the principle of scientificity, the principle of clarity, and the consistency of presentation and delivery of educational material. A.I. Pasyeva and A.Kh. Shaikhlislamov (2020) consider that to create high-quality DERs, one must consider the principles of manufacturability, flexibility, modularity, accessibility, and individuality.

I.F. Yarullin et al. (2015) note that the pedagogical design of DERs combines information culture and multilevel imaginative pedagogical thinking of the developer, the means of implementation of pedagogical creativity in the form of DERs structure, their content, control test tasks, and pedagogical comments and is based on a multi-criteria analysis of compliance with educational standards.

Particularly comprehensive and interesting results on the implementation of DERs in teaching mathematical disciplines are presented by S. Abramovich (2013), A. Sahin and T. Adiguzel (2014), P. Drijvers et al. (2010), and K.E. Leong and N.N. Alexander (2014), and specifically in the geometry course – by D.N. Shekhovtseva (2010), N.K. Madiyarov (2018), and Kh.A. Ustatdzhalilova (2013).

However, the findings of G.O. Haugsbakk (2013) show that investments in high technology in education do not always yield great results, one of the main reasons for this being insufficient training of teachers. Studies (Gouseti, 2013; Selwyn, 2016) demonstrate that a major barrier to the successful integration of digital tools in schools has been the lack of skills and motivation among teachers to use digital resources in the classroom.

The importance of incorporating DERs into the traditional system of mathematics training for future teachers stems from the fact that today's students represent the network generation (N-Geners), and as such require a change in teaching and assessment strategies (Mamina, Tolstikova, 2019). According to M.S. Bezbogova and M.V. Iontseva (2016), the network generation grew up owing to the presence of the Internet and digital technology throughout their lives, making them the first generation to be quite digitally literate. This unique life experience has brought about differences in learning, thinking, and working. In addition, the online generation communicates differently than their predecessors because they tend to use digital resources to communicate (Viberg et al., 2020). The network generation as learners is different from the previous one, for their learning requires a transformation of the educational sphere with the introduction of digital technology in the learning process. The use of the latter is familiar to them, which contributes not only to a better understanding of educational material but also increases learning motivation (Viberg et al., 2020). Consequently, for high-quality and effective education of the future mathematics teacher, it is critical to put into practice innovative digital resources and technologies.

One of the main issues of effective implementation of DERs in the educational process is the preparation and readiness of the teacher to use them. The readiness of teachers to effectively utilize digital technologies in education, as well as their digital competence, become central and are recognized as a key element in the formation of useful practical pedagogical knowledge and skills

(Mena et al., 2017). While universities are increasing expenditures on equipment and software to create infrastructure for the integration of digital technology (Velitchenko, 2021), of equal importance is the motivation of teachers to use digital technology in the educational process (Craven et al., 2014).

2. Materials and methods

The empirical research methods chosen for the experimental study were the following:

a) a survey to determine students' readiness to use DERs and their motivation to use DERs in their future pedagogical practice at school;

b) student testing to determine the level of knowledge in geometry carried out in the first (initial) and the third (control) stages of the study;

c) a methodological experiment consisting in the introduction of DERs in the educational process of the experimental group (EG) carried out in the second (formative) stage of the study.

The preparation and organization of the experimental study involved the formulation of the research hypothesis. The main objective of the experimental study was to determine the effectiveness of student learning with and without the introduction of DERs in the educational process.

The research hypothesis relies on the assumption that the use of DERs in the study of geometry will lead to an increase in the level of geometric training of students.

The experimental study of the readiness of mathematics students to use DERs in the study of geometry was carried out based on the Auezov South Kazakhstan University at the Mathematics Department of the Faculty of Natural and Pedagogical Sciences.

For the experimental work, in the academic year 2020-2021, we allocated an EG consisting of 49 students (two academic groups), and a control group (CG) of 51 students (two academic groups) of the first year, a total of 100 people, studying in the educational program 6B01510 Mathematics.

The characteristics of the study sample are presented in Table 1.

Table 1. Characteristics of the study sample

Group	Number of students, persons		Age, years
	Male	female	
EG	28	21	18-19
CG	29	22	18-19

Four teachers took part in testing students, one for each academic group.

The experimental study was conducted in three stages.

At the first (initial) stage of the experimental study, the students participating in the study were divided into EG and CG, according to the list of student academic groups. Subsequently, students were surveyed to assess their readiness to use DERs. The survey contained 10 questions about the role of DERs in the geometry learning process. The survey was administered on the Google Forms platform (URL: https://forms.gle/Ei1X685XDNGjw9VU8) in September 2020. The link to the survey was distributed in a targeted way through the corporate e-mail of the university, social networks among student associations, and WhatsApp and Telegram messengers.

Moreover, at the first stage, testing of students' knowledge was conducted based on the results of residual geometry knowledge tests in EG and CG to obtain data on the homogeneity of the groups in terms of the initial level of knowledge in geometry.

Before each stage of the testing, the students were familiarized with the rules of conduct during the execution of tasks and the testing algorithm. Test tasks were printed and distributed at the beginning of the testing. For teachers who were involved in the testing, an instruction was drawn up with a clear algorithm for conducting it.

The testing procedure required a clear sequence of actions. For this purpose, schedules for the testing groups of students were drawn up, indicating the location, time, and duration of testing.

The duration of the entire test was 2 hours 10 minutes. The time was determined considering the number of tasks, their complexity, the form of presentation, the method of execution, etc.

Examples of test tasks:

- on the topic "Examples of vector spaces and bases":

1. How many (total) a) vectors, b) ordered sets of k linearly independent vectors, and c) k-dimensional subspaces are in an n-dimensional vector space over a finite field of q elements?

2. Specify the basis and find the dimension of the space:

a) polynomials of degree $\leq n$ in m variables;

b) homogeneous polynomials of degree d in m variables;

c) homogeneous symmetric polynomials of degree 10 in 4 variables;

d) symmetric polynomials of degree ≤ 3 in 4 variables.

- on the topic "Euclidean geometry":

Find a) volume and b) surface area of a section of a 4-dimensional cube $0 \leq x_i \leq 1$ with hyperplane $x_1 + 2\,x_2 + 3\,x_3 + 4\,x_4 = 1$.

At the second (formative) stage of the study, together with the department faculty, different types of DERs were developed for classes in the EG on geometry and the newly introduced subject "Digital Educational Resources in Geometry". Thus, in the EG, all practical and laboratory classes were conducted in a computer lab using various DERs, including such software packages as GeoGebra, Cabri Geometry, the Geometer's Sketchpad, Mathematica, GRAN 2D, as well as presentations, 3D modeling tools, virtualization, animation, electronic textbooks, computer tests, etc. Experimental training with the use of DERs was conducted over two and a half years (the first five semesters). Additionally, a questionnaire survey was conducted in the EG to determine the development of students' motives for using DERs in geometry lessons in their future pedagogical practice at school after a partial familiarization with them during the formative stage of the study (at the end of the second semester).

The CG was trained in the traditional system, without the use of DERs.

At the third (control) stage of the study, special testing of students' knowledge (in EG and CG) and a follow-up questionnaire to determine the development of motives for the application of DERs in geometry classes at school (in EG) were carried out.

The rationale behind the special testing of students in the EG and CG was the assumption that the results of current examinations could be subjective, influenced by the personal preferences of the examiners. The testing included problems compiled by department teachers to assess the ability to solve geometric problems of certain types. The maximum score for each test was 100. The tests were generated by the level of difficulty to avoid ceiling effects where a large percentage of respondents get scores near the upper limit of the test and to ensure that the distribution of test takers by scores falls close to a normal distribution.

Examples of test tasks:

- on the topic "Affine and orthogonal transformations":

Describe the composition of four reflections of a plane about successive (CC) sides of a square.

- on the topic "Convex polyhedral cones and polyhedra":

Show that the inclusion-minimum face σ is $\sigma \cap (-\sigma)$.

- on the topic "Topologies, distances, and convexity":

Prove the equivalence of the following properties of a topological space X (if they hold, the space is called a compact space):

a) from any open cover X, one can choose a finite subcover;

b) any set of closed subsets in X, each finite subset of which has a non-empty intersection, itself has a non-empty intersection.

The groups were compared by the average scores received by the students: x_e – mean score of the EG, x_e – mean score of the CG.

The following statistical hypotheses were formulated:

H0: there are no statistically significant differences between the groups under study in terms of the level of test performance ($x_e = x_c$).

H1: there are statistically significant differences between the groups under study in terms of the level of test performance ($x_e \neq x_c$).

The closeness of the distribution of the students' scores to a normal distribution and the independence of the samples allowed us to use Student's t-test as the statistical criterion.

$$t = \frac{x_e - x_c}{S_{x_e - x_c}}, \tag{1}$$

where:

$$S_{x_e - x_c} = \sqrt{\frac{(n_e - 1) \cdot S_e^2 + (n_c - 1) \cdot S_c^2}{n_e + n_c - 2} \cdot \left(\frac{1}{n_c} + \frac{1}{n_c}\right)}, \tag{2}$$

where n_e and n_c are the sizes of the EG and CG samples and S_e^2 and S_c^2 are distribution variance.

To avoid testing for homogeneity of variance, samples of equal size were taken ($n_e = n_c = n$). In this case, we can check S_{xe-xc}:

$$S_{x_e - x_c} = \sqrt{\frac{S_c^2 + S_c^2}{n}} \tag{3}$$

Checking: at the significance level of $\alpha = 0.05$ with the number of degrees of freedom $v = n_e + n_c - 2$. The number of degrees of freedom v with $n = 61$ is 59, in all of these cases, if $a = 0.05$, $t_{crit} = 2.001$.

3. Results
The results of the initial stage of the study are presented in Table 2 and Figure 1.
The results of the student survey to determine psychological readiness to use DERs are presented in Table 2.

Table 2. Readiness to use DERs among students

Question	Number of responses (people)		
	yes	no	difficult to answer
1. Do you believe the active implementation of digitalization is the right trend?	72	11	17
2. Do you believe it is possible to get a quality education from home?	57	22	21
3. Do you think DERs will help improve the geometric training of schoolchildren?	56	26	18
4. Do you find it difficult to work with DERs?	62	18	20
5. Do you find that the use of DERs can completely replace the teacher?	54	40	16
6. How do you feel about using DERs in geometry classes?	69	27	14
7. Are you familiar with the different types of DERs?	46	39	15
8. Do you think that problems might arise when using DERs in geometry classes?	57	26	17
9. Do you consider it necessary for a future mathematics teacher to be able to use DERs in the classroom?	66	19	15
10. Will the use of DERs help improve the training of future teachers?	77	11	12
Mean, %	**61.6**	**23.9**	**16.5**

The results of the survey (Table 2) suggest that 18 % of respondents believe that they have no difficulty with DERs, and 72 % believe that the active implementation of digitalization in people's lives is the right trend. Thus, 77 % believe that the use of DERs will help increase the effectiveness of geometry training for future teachers and is of undeniable benefit.

However, 26 % of respondents feel that communication with digital resources in geometry or mathematics classes cannot fully replace the teacher, they are more interested in the process of communicating with other students, pupils, or teachers.

Consequently, the results of the survey prompted the conclusion that the use of DERs in the geometric training of students of mathematical specialties is advisable.

The results of the testing of students' knowledge based on residual knowledge tests in geometry prove the level of knowledge of students in the CG and EG to be the same (Figure 1), which demonstrates the homogeneity of the groups by the level of geometric knowledge.
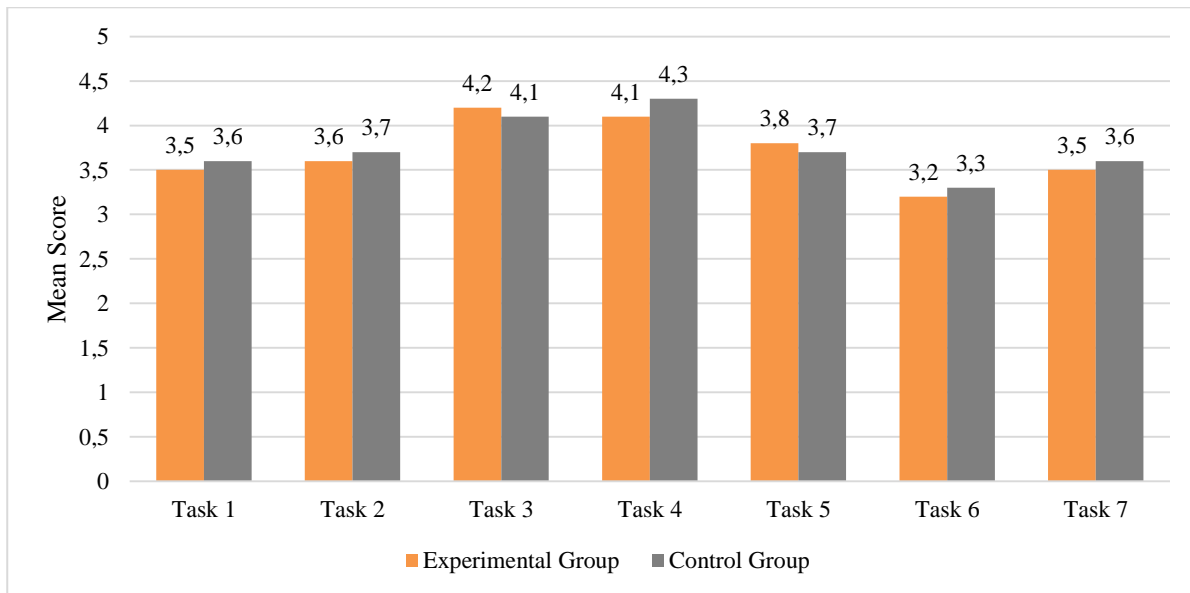

Fig. 1. Comparative characteristics of the results of residual knowledge tests in geometry in the EG and CG

The results of the control stage of the study are presented in Tables 3 and 4 and Figure 2.

A comparative analysis of the results of the student survey in the EG on the formation of motives for the use of DERs at the initial and control stages of the study is presented in Table 3.

Table 3. Assessment of the development of motives for the implementation of DERs in geometry classes

Question	Number of responses			
	2020-2021		2021-2022	
	yes	no	yes	no
Did you enjoy your geometry classes using DERs?	41	8	46	3
Have you gained the motivation to use DERs?	40	9	47	2
Does using DERs help:				
increase the clarity of the discipline?	41	8	46	3
instill independent work skills?	42	7	43	6
visualize geometric objects more clearly?	40	9	46	3
Would you like to create your own DERs in the future?	41	8	45	4

According to the survey results (Table 3), positive motivation for conducting classes with DERs is quite high: upon completion of geometry classes with the introduction of DERs, 93.9 % believe that the visualization of the subject matter is very high, and 95.9 % have a persistent intrinsic motivation to use DERs.

The key results of knowledge testing in the EG and CG focused on students' ability to solve certain types of problems are shown in Table 4 and Figure 2.

Table 4. Key test results

No.	Study	n-sample size	x_e – mean	x_c – mean	S_{ae} variance	S_{ac} variance	S_{ae-ac} standard deviation	t_{emp}	t_{crit}
1	Ability to solve geometry problems and their application	100	83.7	68.2	212	402	3.22	5.73	2.001
2	Ability to establish connections between analytic expressions and geometric images	100	82.4	63.5	285	456	3.54	5.33	2.001
3	Ability to read drawings	100	78.5	70.8	298	399	3.43	2.24	2.001
4	Development of spatial thinking	100	79.5	65.4	318	420	3.53	3.98	2.001
5	Ability to use geometric concepts	100	69.2	62.8	356	433	3.65	1.75	2.001

Testing results, mean score

- Ability to solve geometry problems and their application: 68,2 / 86,7
- Ability to establish connections between analytic expressions and geometric images: 63,5 / 82,4
- Ability to read drawings: 70,8 / 78,5
- Development of spatial thinking: 65,4 / 79,5
- Ability to use geometric concepts: 62,8 / 69,2
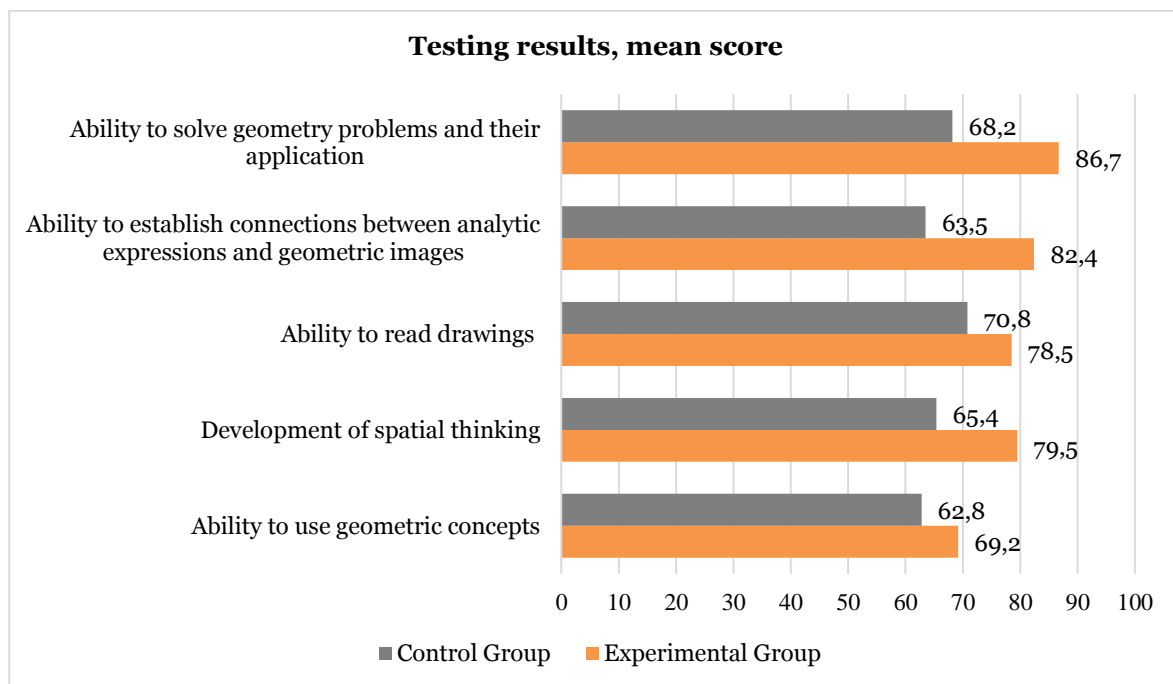
■ Control Group ■ Experimental Group

Fig. 2. Results of tests assessing students' ability to solve geometric problems of certain types

The test results indicate that the most significant difference is found in the students' ability to solve geometry problems and their application and in the development of spatial thinking. A comparison of the results shows that $t_{emp} > t_{crit}$ in four cases out of five. Therefore, the null hypothesis should be rejected, as the surplus of the mean scores in the EG over the mean scores in the CG is statistically significant. Statistically insignificant surplus is observed only in the ability to use geometric concepts.

4. Discussion

The results of students' psychological readiness to use DERs (Table 1) at the initial stage of the study suggest that the use of DERs in the geometric training of students of mathematical specialties is expedient. This is consistent with previous findings (Abramovich, 2013; Yarullin et al.,

2015), according to which the introduction of new teaching tools inevitably leads to changes in the methods and forms of learning. Moreover, researchers also suggest (Madiyarov, 2018; Ustatdzhalilova, 2013) that with the emergence and introduction of ICT tools in the process of teaching geometry, the traditional forms of learning are combined with computer-oriented ones (based on the systematic, consistent, and logical use of ICT in the educational process).

Based on the results showing the development of motivation to use DERs in geometry classes among students in the EG (Table 2), which were investigated in dynamics, we can assume that when DERs are used in classes, students develop a strong interest in creating their own DERs, easily use information from the Internet, and are active in their classes. Most importantly, students in the experiment gained a pronounced desire to become professionals in the design and implementation of DERs in geometry classrooms, and they make every effort to do so.

Students in the EG also report that the use of various digital resources, such as GeoGebra, Cabri Geometry, the Geometer's Sketchpad, Mathematica, and GRAN 2D, which took over all the computational work, made them feel more confident in doing the work and helped them focus on solving more important problems. This falls in line with the conclusions of P. Drijvers, C. Kieran, and M.-A. Mariotti (2010) that when carrying out complex calculations of an intermediate nature, which take a lot of time to solve, it is advisable to use computer mathematical systems (CMS). The availability of a great variety of mathematical packages allows the teacher to choose a resource that is convenient, accessible, and understandable to them, considering the above advantages and disadvantages of the software (Ustatdzhalilova, 2013). Analysis of educational practices in US universities shows that the most popular CMS used in mathematics courses in the US are: Mathematica, MATLAB, Maple, GAUSS, Scilab, Mathcad, Maxima, and Sage (Shekhovtseva, 2010).

Thus, during the two-and-a-half-year study, students in the EG demonstrated a high motivation to use DERs in geometry classes.

The results of the final testing of students' abilities to solve geometric problems of certain types (Table 3) demonstrate that students in the EG taught with the use of DERs perform better than students in the CG on four types of problems out of five. This leads us to conclude that the use of DERs in the study of geometry in higher education is effective and that there is a need to further improve the training of students using DERs in the study of not only geometry but also other mathematical disciplines.

As noted by the EG students themselves after completing the experiment, the DERs succeeded in equipping them with visual skills, helped them develop spatial thinking, and facilitated their understanding of difficult geometric concepts.

The effectiveness of DERs in the study of subjects in the mathematical cycle is also confirmed in a study by A. Sahin and T. Adiguzel (2014).

The main limitation of the study is the fact that it was conducted at one university with a relatively small sample size, which restricts the generalizability of the findings to other contexts. Moreover, the study did not take into account potential challenges and barriers to the implementation of DERs in the educational process, which should be considered in future research to ensure successful integration of DERs into the educational process.

5. Conclusion

The experimental findings indicate the effectiveness of using DERs in the study of geometry in universities, resulting in higher performance on test assignments. Thus, the effectiveness of DERs is confirmed, which testifies to the feasibility of using DERs in the educational process in the study of mathematical disciplines.

The prospect for future research could be to investigate the implementation of DERs in other mathematics disciplines in the training of future mathematics teachers.

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The History of Education

The Development of Vocational-Technical Education in the Ukrainian Governorates of the Russian Empire in the Late 18th and Early 20th Centuries. Part 1

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Abstract

This paper addresses the evolution of vocational-technical education in Ukrainian lands within the Russian Empire. Chronologically, the study covers the period between the late 18th and early 20th centuries. This part of the work is primarily focused on the making and development of particular vocational-technical institutions in the region under examination as well as the specialized and vocational-technical education offered by regular educational institutions in the period between the late 18th and the last quarter of the 19th centuries.

During that period, Ukraine was mainly an agrarian region, so relatively little attention was paid there back then to the training of industrial workers. At the same time, the region witnessed brisk development in its shipbuilding and seaborne trade sectors, which would result in the emergence of the region's first vocational educational institutions – Naval Architecture School and Merchant Shipping School in the city of Kherson. In the first half of the 19th century, the city of Chernigov became home to a trade school and industrial arts instruction began to be implemented in educational institutions of different types in the region. In addition, there emerged schools of horticulture, winemaking, arable farming, apiculture, etc. Despite a number of reforms in the education system, the region still had no system of vocational-technical training in place in the mid-1860s. Of particular note is the role of the Russian Technical Society, which was one of the key initiators of the organization of vocational-technical education in the Russian Empire as a whole and in the Ukrainian lands in particular. However, there were fewer vocational-technical

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educational institutions in Ukrainian governorates back then than in industrially developed Russian governorates.

Keywords: Ukraine, Russian Empire, education, education policy, education reform, economic development, child labor, vocational education, Russian Technical Society, sustainable development in education, education policy, education reform.

1. Introduction

The democratic processes taking place today in Ukrainian society – democratization, reforms in education, and scientific development – are based on the national and historical achievements of the Ukrainian people. The latest progressive trends in the development of Ukrainian society have deep historical roots. A significant portion of the achievements of Ukraine's education system have stemmed from the best practices of its educational institutions of the late 18th and early 20th centuries, including in the areas of organization of the educational process, pedagogical workforce staffing and management, provision of students with appropriate learning aids, and creation of appropriate conditions conducive to effective educational work. The findings of an analysis of a wide range of works by prerevolutionary scholars and pedagogue-practitioners indicate that the development of the system of vocational education was one of the primary concerns for the region's authorities in the past.

A key focus of the nation's education authorities in the 21st century is on enhancing vocational training and having it based on a substantial base of general-education knowledge. The development of technology and production is hardly possible today without a skilled workforce trained within the vocational-technical education sector. Unfortunately, little account has been taken of the many years' experience in implementing workforce training in the Ukrainian governorates of the Russian Empire. One of the key reasons behind this is that during the Soviet period most pedagogue-practitioners had a nihilistically dismissive attitude toward the historical-pedagogical achievements of the pre-Soviet period. With this in mind, the present work is intended to analyze and provide a unique insight into the process of development of vocational-technical education in Ukraine in the late 18th and early 20th centuries.

2. Materials and methods

In writing this paper, use was made of relevant research by pedagogical scholars and historians. More specifically, extensive use was made of relevant works by contemporaries and firsthand participants in the transformations to vocational-technical education that were undertaken between the second half of the 19th and early 20th centuries. Of particular note are the materials published in the periodical *Zapiski Russkogo Tekhnicheskogo Obshchestva* (Russian: "Transactions of the Russian Technical Society") (ZRTO) and the statutory enactments from the first and second parts of 'The Complete Collection of Laws of the Russian Empire' (PSZRI-1; PSZRI-2).

Methodologically, use was made of sets of general and historical research methods. The use of induction and deduction helped identify and amass relevant empirical information, which was employed to substantiate the paper's key tenets. The use of analysis and synthesis helped conduct an objective assessment of the various events and processes that had an effect on the making and development of the vocational-technical education in the Russian Empire as a whole and in Ukrainian governorates in particular. The use of the comparative-historical method helped determine the dynamics and special nature of the development of educational institutions offering vocational-technical training across the empire. It is the use of this method that resulted in the conclusion that in the second half of the 19th century there were fewer vocational-technical educational institutions in Ukrainian governorates than in industrially developed Russian governorates.

3. Discussion

The first research on vocational training emerged between the late 19th and early 20th centuries. Most of the works were focused on issues related to training a workforce for a particular sector of the economy. These included publications summarizing the best practices from vocational educational institutions. Schematic surveys of materials on the history of vocational-technical education are provided in the works by V. Akimov (Akimov, 1916), Ye. Andreyev (Andreyev, 1872; Andreyev, 1892), I. Anopov (Anopov, 1889; Anopov, 1895), S. Vladimirskiy (Vladimirskiy, 1896), N. Korol'kov (Korol'kov, 1897; Korol'kov, 1912), I. Maksin (Maksin, 1909), A. Nebolsin (Nebolsin, 1883; Nebolsin, 1903; Nebolsin, 1912), and other public figures,

pedagogues, and scholars (Goshkevich, 1908; Yershov, 1904; Zavadskiy, 1908; Lavrinovich, 1898; Lavrinovich, 1902; Lyskovskiy, 1897; Lyskovskiy, 1906; Chuprov, 1899). Issues related to vocational training were periodically discussed in the journal *Tekhnicheskoye Obrazovaniye* ("Technical Education"; later to become *Tekhnicheskoye i Kommercheskoye Obrazovaniye* ("Technical and Commercial Education")). This body of literature developed the ideas of the superiority of sustained manpower training and the need to expand the country's network of vocational educational institutions.

What makes it particularly valuable is the extensive factual and statistical material. That said, the works by I. Anopov and A. Nebolsin provide data covering the second half of the 19th century, whereas the significant increase in the number of technical schools in the Russian Empire took place between the late 19th and early 20th centuries. These authors promoted the idea of expanding the network of vocational-technical educational institutions in Russia in conjunction with the brisk growth in industrial production and the corresponding need for a skilled workforce.

A special approach to secondary vocational education was taken by the prominent Russian pedagogical scholars K. Ushinsky, D. Mendeleyev, and P. Kapterev (Ushinskiy, 1974; Mendeleyev, 1901; Kapterev, 1914), who advocated for replacing general education with vocational and suggested that the latter must be based on the former. In addition, these scholars called for developing the country's network of vocational schools as fast and widely as possible due to the need to avoid the dependence of the Russian economy on foreign specialists.

The above studies are limited to investigating the training of workers mainly for the industrial central regions of the Russian Empire. Ukraine (by that time, the region under examination was normally referred to as one of the following: New Russia, Southwest Russia, South Russia, and Little Russia) is mentioned in them rarely, although the region's vocational educational institutions had accumulated a certain amount of experience by that time already.

During the Soviet period, the study of the issue of vocational-technical education was typically associated with the study of the working class in the Soviet Union and in the Ukrainian SSR as its constituent. Virtually all the works released in the interwar period are devoted to the history of the making of the Soviet system of vocational-technical education. Everything that had taken place in the country in the area of the development of vocational-technical education prior to 1917 was seen as something negative and reactionary. Most of the works on the subject released during that time were of a publicistic nature, with the vocational education of the period under review serving in them as a backdrop against which to highlight the advantages of the Soviet vocational education system. The absence of positive assessments of the government's work in the area of vocational education was a distinctive characteristic of Soviet historical-pedagogical science.

The postwar stage of the Soviet historiography on the subject was characterized by more meaning and quality from a scholarly standpoint. Of particular note here are the works by N. Barbashev (Barbashev, 1959), A. Veselov (Veselov, 1955b; Veselov, 1959; Veselov, 1961), N. Kuz'min (Kuz'min, 1971), and M. Puzanov and G. Tereshchenko (Puzanov, Tereshchenko, 1980). The first three authors focused on the national context, and the duo addressed the history of vocational-technical education in Ukraine specifically. This body of literature helps identify some of the key distinctive characteristics of the development of vocational-technical education in different regions of the country and gain insight into the way the government implemented its policy on workforce training.

Worthy of separate mention are the works by Ukrainian researcher T. Demchenko (Demchenko, 1982; Demchenko, 1983), focused on the cultural and educational activity of the local divisions of the Russian Technical Society in Ukraine. The scholar's dissertation-based work provides an insight into the activity of such entities with regard to the creation of educational institutions of different types, most importantly those of a vocational-technical nature, and a glimpse into the history of the school sector run by the Ukrainian divisions of the Russian Technical Society. According to the researcher, "the creation of technical and general-education schools was one of the key areas of activity for the divisions of the Russian Technical Society", which "were interested in a variety of issues related to technical education and eagerly took part in the various forms of examining the state of the technical and trade educational institutions on location" (Demchenko, 1983: 93-115, 116-147).

The contemporary period of the historiography on the making and development of vocational-technical education in the pre-Soviet time, which begins in 1991, is concerned with social processes taking place in post-Soviet society. It is characterized by a radical overhaul of

research paradigms – there was now more freedom of judgment, researchers enjoyed a wider access to documentary materials, and the government's policy on vocational-technical education was more objective.

A major upsurge of interest in the history of the development of vocational-technical education in the Russian Empire, at both the national and regional levels, has been witnessed among historians and pedagogues in the Russian Federation. Over the last few decades, a number of groundbreaking works, mainly dissertation-based, have been released, including those by O. Kir'yanova (Kir'yanova, 1996), T. Abdulmutalinova (Abdulmutalinova, 1998), Yu. Borduchenko (Borduchenko, 1998), V. Sinyushin (Sinyushin, 2003), S. Zyablova (Zyablova, 2004), A. Yermilin (Yermilin, 2004), T. Dubrovskaya (Dubrovskaya, 2004), Ye. Deyev (Deyev, 2007), and I. Belyayeva (Belyayeva, 2012). This body of literature is crucial to gaining an understanding of general trends in the development of vocational-technical education in the Russian Empire, government policy in respect of this sector, and the pedagogical ideas of various scholars and public figures interested in technical education.

Over the last few decades, shifts in the study of the subject under examination have taken place in Ukrainian historical-pedagogical science as well. Of particular note are the works by N. Slyusarenko (Slyusarenko, 2003), V. Dobrovol's'ka (Dobrovol's'ka, 2006), O. Chornyy (Chornyy, 2007), S. Sytnyakivs'ka (Sytnyakivs'ka, 2009a; Sytnyakivs'ka, 2009b; Sytnyakivs'ka, 2010), Ya. Nahrybel'nyy (Nahrybel'nyy, 2012), M. Honchar (Honchar, 2015), T. Moiseeva (Moiseeva, 2020), I. Petrenko and I. Vynnychenko (Petrenko, Vynnychenko, 2022), A. Lebid, V. Korol, and others (Korol, 2015; Korol, Korol, 2017; Degtyarev et al., 2021; Lebid, Shevchenko, 2021; Lebid, 2022; Lebid, Lobko, 2022), which provide insight into various aspects of the development of vocational-technical education in the Russian Empire as a whole and in Ukrainian governorates in particular.

On balance, despite the tangible upswing in the activity of modern-day historians and pedagogues researching the history of vocational-technical education, both in the Ukrainian lands and across the Russian Empire, there are still gaps that need to be filled in this area of research.

4. Results

The late 18th century witnessed the completion of the process of formation of the ethnic Ukrainian lands of Dnieper Ukraine, which incorporated the vast territories of Rightbank Ukraine, Leftbank Ukraine, and Southern Ukraine. The majority of the Ukrainian population was made up of rural residents. In terms of social composition, most of the peasants in Rightbank Ukraine were serfs; in Leftbank Ukraine, one third of the peasants were Cossacks (equated to state peasants) living in small villages; there was almost no serfdom in Southern Ukraine, which was dominated by resettlers, free peasants, and ex-soldiers.

The region was mainly a subsistence economy. By implanting serfdom in all the annexed lands, the government undermined the potential for employing new productive forms of economic management, entrenching outmoded and low-margin ones. This social-economic state of affairs in Dnieper Ukraine was not very conducive to the development of education there, let alone vocational-technical education. At the turn of the century, the operation of the country's entire education system was based on the Statute of 1786, which mainly was focused on educating the urban population. The adoption of this statute had an effect on the education system in Ukraine as well, leading to the opening of new schools in a number of cities. There were opened minor (in uyezd cities) and major (in gubernia cities) public schools. The minor (four-grade) schools had a 6-year program of study and the major ones (two-grade) a 4-year one. In early 1801, the Ukrainian governorates of the Russian Empire had 8 major and 17 minor schools, which, of course, would not be enough to reach a large number of students with education (Luzan, Vasyuk, 2010: 78).

At the same time, the region became home to new cities in the late 18th century – Mariupol (1779), Nikolayev (1784), Kherson (1778), and Odessa (1794). These cities were focused on the new sectors of the Ukrainian economy – shipbuilding and seaborne trade, which were in need of a sizable skilled workforce. As a consequence, the region's first vocational schools were established – Naval Architecture School (1798) and Merchant Shipping School (1834) in the city of Kherson.

In 1802, the Russian government established the Ministry of Public Education, which would have purview of the Main School Directorate, the Academy of Sciences, and the country's universities and schools (exclusive of educational institutions run by other government entities). In 1804, the Russian government adopted the *Statute of Universities* and the *Statute of Educational Institutions Subordinate to Universities*, which would lay the foundation for the

country's system of secular education, composed of four types of educational institutions (parish schools, uyezd schools, gymnasiums, and universities) (Istoriya pedahohiky, 1973: 148-149). With that said, vocational-technical education was left out of account.

Despite the disregard for vocational-technical training, it is in the Ukrainian lands that as early as 1803 the Russian Empire's first trade school was established in the city of Chernigov, which was done on the initiative of Little Russia Governor-General Prince A. Kurakin (PSZRI-1. T. 20VII. №20808: 686). Officially opened on May 1, 1804, the school was to cater to the lower strata of society. In a position to accommodate 336 students, on the day of the opening it had an enrollment of 35 students, with 9 of these representing the Cossacks, 25 – urban commoners, and 1 – the merchantry. In 1811, the school had 96 students. It enrolled teenagers aged 12 through 15, with those older than 15 being admitted to Joinery class only. The project initiated by Prince A. Kurakin envisaged the teaching of 14 crafts. However, initially the curriculum only included joinery, metalworking, silversmithing, shoemaking, turnery, and woodcarving. Each craft was taught by a master craftsman. Most of the master craftsmen were paid an annual salary of 350 rubles. The only general-education subject taught at the trade school was arithmetic. On graduation, each student would receive a sum of money equal to half of what the items they made over the course of the last three years were worth (Siropolko, 2001: 361). The trade school operated until 1832, when on June 14 a decree came out closing it and opening a drawing school in its place (PSZRI-2. T. VII. №5457: 397).

In 1828, the government of Nicholas I launched a counter-reform of the education system, with its primary objective being formulated as "to prepare a person for performing their social duties". It was enshrined in the *Statute of Gymnasiums and Schools Subordinate to Universities*. The reactionary Statute of 1828 legitimized division into classes, monarchism, and religiousness in educational institutions. The school types in the districts were left in place, but continuity between them was undermined, with each type catering to a particular social class now (Luzan, Vasyuk, 2010: 83-84; Istoriya pedahohiky, 1973: 153-154).

However, the Statute of 1828 allowed teaching certain crafts in the specialized second grade of parish schools. More specifically, its Article 58 stated that, in addition to core general-education subjects, it would also be possible to teach, with permission from the Minister of Public Education, some special courses in the crafts and sciences a command of which was believed to be most conducive to success in commerce and industry (PSZRI-2. T. III. №2502: 1104). Article 59 listed the potential additional courses as follows: 1) General Concepts on National Legislation and Legal Procedures (relating mainly to commerce); 2) Fundamentals of Commercial Sciences and Accounting; 3) Fundamentals of Mechanics and Technology. Drawing (as customized for the crafts and vocational skills). Fundamentals of Architecture (focused on the skills of a builder); 4) Agriculture and Horticulture. Articles 60 through 66 established the procedures for introducing and teaching the above additional courses (PSZRI-2. T. III. №2502: 1104-1105). Thus, the third area had an immediate relation to vocational-technical training.

The primary reason behind the increase in attention to vocational training for uyezd school graduates was the need for a well-trained workforce who could be employed at factories and plants (Kuz'min, 1971: 11). This was associated with the brisk economic development in the Russian Empire, including in Ukrainian governorates. The first quarter of the 19th century witnessed the rapid development of a free market economy there.

As a consequence, the first vocational schools were opened in the early 19th century in Dnieper Ukraine – the trade school in Chernigov, the merchant shipping school in Kherson, the schools of horticulture in Poltava, Yekaterinoslav, and a few other areas, the school of winemaking in Crimea (Magarach), the school of arable farming in Kharkov, the school of apiculture in the village of Pal'chiki (Konotop Uyezd, Chernigov Governorate), and others. The emergence of these educational institutions was associated with the needs arising in conjunction with economic development. However, these schools were still not enough. Oftentimes, training was conducted based on 18th-century traditions, i.e. by way of the apprenticeship system, which required one to complete a long work-based schooling journey from being an apprentice to being a journeyman and, lastly, to being a master.

The industrial revolution of the 1830s would present the economy of Dnieper Ukraine with even a greater need for a well-trained workforce than before. This was associated with the wide implementation of cutting-edge technology and machinery in production for the purpose of boosting the competitiveness of Russian-made goods in the international market (Reyent, Maliy, 2009: 59).

As a consequence, in 1839, under pressure from the new bourgeoisie and to help enhance vocational-technical training, the government issued the *Regulation on Real Classes at Educational Institutions Under the Purview of the Ministry of Public Education*. This document captured statutorily the status of real classes and courses, which had evolved from the time this type of training emerged in the early 19th century. It stated that, in essence, real classes were institutions intended for temporary instruction in technical sciences. Therefore, the subjects taught in them were not part of a school's core curriculum. Such specialized courses were typically attended from early October to late March and lasted 2 years (Kuz'min, 1971: 12).

At the same time, despite the fact that the overall network of educational institutions in Ukraine was gradually expanding at the time, the number of vocational-technical schools there remained virtually unchanged (Table 1).

Table 1. Dynamics of the Numbers of Educational Institutions of Different Types in Ukraine in the Second Quarter of the 19th Century (Dani, 1973: 155)

Year	Parochial schools	Uyezd schools	Vocational-technical schools
1830	718	416	1 (Chernigov Trade School (1804–1832))
1850	1062	433	1 (Kherson Nautical School (since 1834))

It must be acknowledged that, despite imperfections in the way they were organized, the creation of additional classes and courses at gymnasiums and uyezd schools was a positive phenomenon. In a country lacking vocational-technical educational institutions, such additional classes and courses were helping fill the shortage of well-trained workers who could be employed in different sectors of the economy (Kuz'min, 1971: 12-13).

The organization of the educational process in such institutions had a number of imperfections. The biggest concern was poor practical training for graduates of real classes and additional courses. General-education schools lacked the capability to provide this kind of training. Things were especially troubling with practical training for students in additional courses in shipbuilding, seamanship, technology, and construction. Additional courses and classes at gymnasiums and uyezd schools could not substitute for specialized educational institutions.

Up until the second half of the 19th century, the government's solicitude for vocational-technical education was limited to encouraging the efforts of private individuals and organizations in creating and maintaining specialized secondary and lower educational institutions. The government would normally set up additional courses and classes or specialized educational institutions only if a city's local commune or private individuals pledged to fund them. Only in rare cases would vocational-technical educational institutions receive subsidies from the government, as was the case in the shipbuilding and nautical sectors.

As a result of the bourgeois reforms undertaken by the government, the first and most important of which was the peasant reform of 1861, Dnieper Ukraine embarked on a path of rapid economic growth. Market relations in agriculture intensified the need for cutting-edge equipment and machinery. A rapidly growing network was that of plants manufacturing agricultural implements. There also was substantial progress in the development of heavy industry. The fulcrum of the region's capitalist industry was coalmining, as coal was the main type of fuel for steam engines, which were being widely implemented at industrial facilities at the time. Another sector that developed rapidly in the second half of the 19th century was the metallurgical industry, with Yekaterinoslav and Kherson Governorates becoming home to a combined 17 metallurgical plants. In 1880, there were 197 mines in the Donbas region.

The brisk development of new industrial sectors in the region brought about the need for enhancing its transportation system. This would spur the development of its inland navigation fleet, navy, and merchant fleet. The biggest boom was in rail transportation. The development of the region's rail network resulted in the ports of Nikolayev and Odessa getting connected to the industrial (e.g., Lugansk, Bakhmut, and Yasinovataya) and agricultural areas of Kiev, Yekaterinoslav, Podolia, and Kharkov Governorates, which would result in a significant increase in trade between them. As a consequence, by the late 1870s Dnieper Ukraine witnessed an industrial revolution that ensured the transition from manual labor to machine labor and the implementation of steam engines and machines in production. The region's principal industrial areas specialized as follows: Rightbank Ukraine – processing and agricultural machinery manufacture; Leftbank

Ukraine – coalmining and metallurgy; Southern Ukraine – shipbuilding and seaborne trade.

The rapid development of industry in the region brought about a corresponding need for a skilled workforce – and, consequently, a pressing need for educational institutions capable of turning out well-trained workers and engineers.

In the mid-1860s, the government undertook reforms in education, which helped upgrade the country's education system – but it did not lead to the creation of a system of vocational-technical training there. (This situation would persist up until 1888.) Prior to that time, vocational-technical educational institutions were typically under the purview of different government entities there. But on May 8, 1864, the Committee of Ministers issued a regulation, *On the Procedure for Establishing Trade and Similar Technical Schools*, whereby it would be permitted to open trade and other technical schools only when such educational institutions could be maintained with funding from local authorities or with donations from private individuals (PSZRI-2. T. XXXIX. №40860: 408-409).

This decision would impede efforts to establish vocational-technical institutions. A good example here is the refusal of Odessa's local government to maintain Odessa Trade School. The school's charter was signed into law on October 26, 1862. However, as early as 1865, Odessa's local commune refused to open the school, limiting itself to setting up trade departments within certain parish schools in the city (PSZRI-2. T. XL. №42762: 328-329).

In the meantime, the natural need for a well-trained workforce kept growing. This is where the general public and several nationwide Russian societies stepped in. Of particular note is the work of the Russian Technical Society (known as the Russian Imperial Technical Society since 1874).

The history of the Russian Technical Society goes back to the late 1850s, when members of Russia's forward-thinking community of engineers and scholars familiar with the best practices of capitalist industrialization in Western European countries and aware of the new role now played by science in the development of industry made it their mission to put those best practices to use to help Russia overcome its technical-economic and cultural backwardness. The Society opened in 1866 on the initiative of Saint Petersburg scholars, engineers, and capitalist entrepreneurs (Karelin, 1985: 10).

The Society had a fairly extensive network of local divisions, with a presence in major industrial cities of Ukraine. In 1896, the Russian Technical Society had 23 divisions (Tekhnicheskiye obshchestva, 1901: 122), of which the following were in Ukraine: Nikolayev (est. 1869), Kiev and Odessa (1871), Kharkov (1879), Yekaterinoslav (1892), and a few others. These divisions would play an important role in establishing vocational-technical educational institutions in the Ukrainian lands (Savchuk, Kushlakova, 2009: 132).

An important fact is that the Russian Technical Society was allowed to establish trade classes and schools at plants and factories and in "areas inhabited by factory workers and tradesmen". Overall, the Society received permission to open two types of vocational-technical school:

1) specialized schools and classes (technical, trade, sketching, and technical drawing), intended to prepare students for work in various industries, with training shops available where necessary;

2) general-education schools offering programs of primary general and elementary technical education (Kuz'min, 1971: 16).

The Society's fit-out work in respect of such schools and courses commenced in 1869. Initially emerging as private educational institutions, schools and courses of the Russian Technical Society would, beginning in 1883, operate based on the *Charter for the Schools of the Russian Technical Society*, signed into law by the Minister of Public Education.

For instance, during the period the Society's Kiev division was in operation, the area became home to the following educational institutions: Smela Technical Classes, which in 1884–1917 turned out 450 specialists for the sugar industry; School for Construction and Rail Foremen, which in 1901–1915 turned out 380 specialists; Courses for Stokers, which in 1901–1908 provided a secondary technical education to 140 students focusing on steam boiler systems; School of Printing; Stonecutting Courses. Some of the leading members of the Society's Kiev division, who included professors of the St. Vladimir University of Kiev, took part in the creation of Kiev Polytechnic Institute (Pylypchuk, 2006: 14).

On May 15, 1868, the Permanent Commission for Technical Education was set up within the Russian Technical Society. It was the country's first institution focused on resolving issues related to the training of workers for the engineering sector. Concerned with determining the content,

methods, and organization of general-education and vocational-technical training and theoretical and on-the-job learning, the Commission would gather and analyze information related to the best practices of the development of vocational-technical education in the Russian Empire and other countries. Its work would produce regulations, curricula and learning programs, rules, and instructions for vocational-technical educational institutions. In 1869, the Russian Technical Society began to publish the periodical *Trudy Postoyannoy Komissii po Tekhnicheskomu Obrazovaniyu* ("Publications of the Permanent Commission for Technical Education"). In 1892, it launched *Tekhnicheskoye Obrazovaniye* ("Technical Education"), Russia's first specialized-pedagogical journal concerned with issues of vocational-technical education.

The Society, which combined members of the progressive bourgeois intelligentsia and industrialists, would play an important role in shaping the bourgeois-liberal concept on vocational-technical training for factory workers in the Russian Empire. This concept was grounded in the following principles: 1) organization of mandatory primary general-education training; 2) separation of general education from vocational-technical education; 3) organization of on-the-job training based on rational methodologies, with a focus on remediating the imperfections of individual apprenticeship; 4) combination of vocational-technical training with indoctrination in bourgeois morals; 5) shifting the costs of educating workers onto themselves; 6) statutory regulation of the labor and education of minor workers (Karelin, 1985: 12-13).

Of particular importance is the Society's role in staging the All-Russian Congresses of Persons Interested in Technical and Vocational Education – in Petersburg (1889–1890), Moscow (1894–1895), Odessa (1903), and Kiev (1917). The first such event was attended by instructors, industrialists, factory owners, and high-ranking government officials.

Issues discussed at the Congresses typically fell into the following categories:
– higher technical educational institutions;
– real and commercial educational institutions;
– agricultural educational institutions;
– educational institutions under the purview of the Ministry of Communication Lines;
– nautical classes;
– female general-education and vocational schools;
– manual labor in schools.

Issues discussed at the Congresses included the state of technical education in Russia; curricula and learning programs at technical educational institutions; educational institutions' participation in the development of industry; manual labor in primary and lower technical educational institutions; sketching and technical drawing in technical education; requirements for instructors of specialized crafts and technical subjects; auxiliary activities aimed at enhancing the educational process; school hygiene; requirements for textbooks and reference books for the training of engineers, technicians, foremen and their assistants, etc.; ways of assessing the knowledge of students at technical educational institutions (ZRTO. 1890. №5: 28-53).

Most of these issues were discussed at the second and third Congresses (Krichko, 1991: 61). Their agenda included not only discussing issues in technical education but establishing requirements concerning technical education. With each event, the number of Congress participants increased, which reflected the public's growing interest in issues concerning technical and vocational education (Veselov, 1955a: 52).

Most Congress participants were perfectly aware of the need for statutory regulation of the status of minor workers. A draft law on minors' labor was even developed. The fitting out of schools for minor workers and courses for adults required funding, so the decision was made to get factory and mill owners to pay a sum equal to 2% of the wages they paid. Underage workers could be admitted to work without attending school provided they had completed primary school. Otherwise, one would have to attend school 2 hours a day (ZRTO. 1874. №6: 89-90; ZRTO. 1875. №1: 34-50). These ideas found a reflection in a report by A. Nebolsin, entitled 'School Education of Minor Workers at Factories and Plants' and presented at the first Congress, in which the scholar suggested introducing a tax to be paid by factory owners to help maintain schools for minor workers regardless of whether or not they had such workers. Factory owners who organized such a school at their facility would be exempted from paying the above tax. It would be mandatory for minor workers to attend such a school (ZRTO. 1890. №4: 13-14).

All three events were characterized by the discussion of similar issues, including looking for effective ways to develop vocational and technical education, developing general primary education

for the lower strata of the population, promoting out-of-school forms of education among workers and tradespeople, and reducing working time (Ocherki istorii shkoly, 1991: 125). However, many of the solutions proposed at the Congresses would eventually not be implemented.

Despite the Congresses' relatively low effectiveness, they did reflect the growing interest in the development of vocational-technical education in the country and facilitated professional exchange among teachers. Hence, the important role of the Russian Technical Society in promoting vocational-technical education across the Russian Empire as a whole and in the Ukrainian lands in particular is unquestionable.

5. Conclusion

The period from the late 18th century to the 1880s can be regarded as a presystemic one in the development of vocational-technical (often referred to as industrial) education in the Russian Empire. This was associated with the fact that the government would implement such training only based on the current needs of particular sectors of the economy.

Since Ukraine was mainly an agrarian society back then, little attention was paid to training for industrial workers there. On the other hand, in the final quarter of the 18th century, the Russian Empire absorbed the vast territories of Southern Ukraine, where shipbuilding and seaborne trade were major sectors of the economy. This would result in the emergence of the region's first vocational educational institutions – Naval Architecture School and Merchant Shipping School in the city of Kherson.

The first half of the 19th century was marked by the brisk development of practical arts, which entailed the need for a large number of craftspeople, with the practice of training tradespeople by way of apprenticeship being no longer viable. As a consequence, there emerged a trade school in the city of Chernigov and industrial arts instruction began to be implemented in educational institutions of different types in the region. The development of agriculture, too, required more skilled workers. There emerged schools of horticulture in Poltava, Yekaterinoslav, and other cities, a school of winemaking in Crimea, a school of arable farming in Kharkov, a school of apiculture in Chernigov Governorate, etc. However, the increase in the number of vocational-technical educational institutions in the region was insignificant.

The reforms undertaken in the third quarter of the 19th century, the development of industrial sectors in the southern governorates, the upturn in rail construction activity, and the end of the industrial revolution only intensified the need for a well-trained workforce – and, consequently, a pressing need for educational institutions capable of turning out well-trained workers and engineers.

In the mid-1860s, the government undertook reforms in education, which helped upgrade the country's education system – but it did not lead to the creation of a system of vocational-technical training there. (This situation would persist up until 1888.) In the 1850s–1880s, vocational-technical education in Ukrainian governorates was characterized by the following two trends – (1) the primary focus being on the training of workers for trades, shipbuilding, and seamanship and (2) educational institutions operating based on individual charters with a narrowly specialized focus. However, there were fewer vocational-technical educational institutions in Ukrainian governorates back then than in industrially developed Russian governorates.

6. Acknowledgements

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Social Portrait of Honorary Members and Doctors of the Kharkiv Imperial University (1804–1917)

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Abstract

The article reconstructs the social portrait of honorary members and doctors of the Kharkiv Imperial University in 1804–1917 (from its foundation till the Russian Empire collapse). The research is based on rare sources.

All honorary members and doctors were analyzed from the social, national, occupational and other perspectives. We verified 255 persons with honorary university titles. In some cases, no important biography features resulted in the incomplete problem reflection. However, it did not prevent us from summarizing obvious trends in the imperial and Ukrainian higher education.

In particular, the rate of honorary title conferment differs in various periods: the lowest amount for the 1870s and the 1910s, the highest amount for the university first years and the 1850s.

Most honorary members and doctors of the Kharkiv Imperial University came from nobles, clergies and petits bourgeois. Sometimes, peasants were represented as well.

Ethnically, most members and doctors were Russians or foreigners. Ukrainians covered under a quarter of them.

In general, the honorary staff of the Kharkiv Imperial University reflected main development trends of the imperial higher education.

Keywords: higher education, honorary members, honorary doctors, educational policy, educational reform, educational access, ethnic disparities, sustainable development in education, education policy, education reform.

1. Introduction

Recently, the Kharkiv University has celebrated its 200th anniversary. The institution has been facing many events since its foundation: rise and fall, development and stagnation. However,

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the university shows a unique resilience between generations. The term "university community" is not abstraction as well. The affiliation feeling unites many people actually. Regardless of external conditions, the symbolic university capital has been growing for years because new members contribute to its history. That makes the entire university strong.

Among the golden university names, we should mention honorary members and doctors (some of them are known worldwide). The most important thing was enlightenment and unity of researchers and artists. The institutional motto on the coat of arms is "Cognoscere. Docere. Erudire" (in English: "Cognize. Teach. Enlighten").

The Kharkiv University originality consists in its emergence within Ukrainian and Russian cultures. Historical facts disprove the second-grade relevance of Slobozhanshchyna as a Ukrainian region. It was mutual interaction that led to huge development of Slavic cultures (including the Ukrainian one).

In particular, Ivan Ryzhskyi (the first university rector) succeeded in Russian philology: his books "Introduction to Linguistics" and "Oratory Experience" were used for study at all Russian universities. In 1841-1848, there was another rector – Petro Hulak-Artemovskyi (a famous Ukrainian poet). He brought up many Ukrainian writers. Izmail Sreznievskyi (a professor) was the first to publish Natalka Poltavka and other works in the literary miscellany "Ukrainskyi Zbirnyk". He insisted that Ukrainians are a separate Slavic nation with its own language. Marin Drinov (a professor) compiled the first Bulgarian spelling rules and became the Bulgarian Education Minister. Besides, it was the Kharkiv University where the first Ukrainian lecture was delivered in the Russian Empire.

2. Materials and methods

To prepare the manuscript, we analyzed many sources that reconstruct the Kharkiv University evolution within the imperial and Ukrainian contexts. We compared the All-Imperial University Charters as of 1804, 1835, 1863 and 1884 (Tablica ustavov, 1901) and that of the Kharkiv University to define roles of its members and doctors in higher education as well as Ukrainian and Russian Empire bureaucracy.

In our study, there were reference books, encyclopedias, rare sources, etc. In some cases, we could not find out relevant biography details of the honorary staff of the Kharkiv University. For some persons, there were superficial data on honorary affiliation, which could not be proven by documents. All sources allowed studying the honorary staff of the Kharkiv Imperial University from the law, social, rank, organizational and other perspectives. Finally, we got the social honorary portrait.

The research methodological base comprises such principles as objectivity, historicism and verification of sources. They are realized via general scientific and special historical methods of research:

– historical analysis (to search and work through necessary information);
– classification (to arrange sources);
– interpretation (to produce the research semantic field);
– comparison (to contrast regulations for honorary title conferment at the Kharkiv Imperial University).

Moreover, we applied methods of historical and logical analysis to solve the study issues via the principles of objectivity, unambiguousness, coherence, and causality. To arrange and differentiate the research data in terms of historical chronology, we used the structural-systemic method.

3. Discussion

The social portrait of honorary members and doctors of the Kharkiv Imperial University attracts a deep interest to consider factors of higher education development in Ukraine. There are many sources on activities of the Kharkiv Imperial University. However, the social portrait of its members and doctors still needs reconsidering.

Studies devoted to university and rector anniversaries lack for a complex analysis of honorary members and doctors at the Kharkiv Imperial University. They only partially provide approaches to research of higher education history.

Most anniversary sources reveal the above-mentioned problem superficially (HGU, 1955; HGU, 1980; Bakirov, Duhopel'nikov, 2004). In this paper, we are going to analyze the Kharkiv Imperial University history within its honorary staff statistics.

For reconstructing the social portrait of honorary members and doctors at the Kharkiv Imperial University, it is relevant to use reference sources on its graduates, professors, researchers and other famous persons with honorary titles (Biograficheskij slovar'…, 1884; Biograficheskij slovar'…, 1855; Biograficheskij slovar'…, 1904; Biograficheskij slovar'…, 1869–1894; Russkij biograficheskij…, 1896–1913; Bogdashina i dr., 2012; Biograficheskij slovar'…, 2019; Shilov, 2001).

Besides, we pay attention to Kharkiv University bulletins (Har'kovskij sbornik…, 1887–1900; Zapiski…, 1874–1917) and faculty history essays (Fiziko-matematicheskij…, 1908; Yuridicheskij…, 1908; Istoriko-filologicheskij…, 1908).

Some problem aspects are studied within general trends of the Russian Empire and Ukrainian higher education as a bureaucratic and academic corporation (Andreev, Posohov, 2012; Lebid, 2022; Lebid, Lobko, 2022; Lebid, Shevchenko, 2021; Siropolko, 2001; Degtyarev, Polyakova, 2020; Degtyarev, Polyakova, Stepanova, 2020). In these works, scientists analyze the Russian Empire bureaucracy, social-cultural influence of universities and local intellectuals, law and other problems of higher education.

Separately, we consider biographies of the honorary staff at the Kharkiv Imperial University. Here, we deal with their research, teaching, administrative, military and other activities (Bagalej, 1905; Korf, 1861; Vovk, 2016).

We include memoirs and obituaries on the honorary staff at the Kharkiv Imperial University. These valuable materials mention rectors and their contribution to the university development. Also, the honorary staff works are applicable: here, we can find both research and biography data.

4. Results

The honorary title conferment at the Kharkiv Imperial University dates back to its foundation. Article 40 of the 1804 University Charter is called "The Honorary Staff". It defines honorary members as "Russian or foreign people who became famous for their research and academic achievements" (Tablica ustavov, 1901).

The Charter states that each faculty should invite honorary members "to establish relations with academic institutions" (Tablica ustavov, 1901). Four corresponding members are selected to communicate with the university and spread reports on its activities. For such a work, they get 200 rubles annually as remuneration (Tablica ustavov, 1901). This norm was partially followed. For example, I.Ye. Betskyi was indeed paid at the end of the 1850s.

In the 1835 University Charter, the honorary article was replaced with a mention of their assignment by the education minister. Honorary titles were conferred on those persons who supported university development initiatives. Consequently, both well-known researchers and politicians became honorary members. The Article 43 fragment: "To select honorary members, the Board should mind their residence: it is local individuals whom the university can benefit more from" (Tablica ustavov, 1901).

The selected honorary members were assigned by the education minister after consent of academic district trustees. Herewith, not all people previously recommended by the University Academic Board became honorary members. The honorary diplomas emerged in 1807 (Tablica ustavov, 1901). Honorary members might visit the Board and vote (Tablica ustavov, 1901).

The 1863 University Charter recorded: "Universities may freely confer higher titles on researchers for their achievements" (Tablica ustavov, 1901: §113). Besides, "with a trustee consent, universities may confer diplomaed honorary titles on researchers for their achievements" (§118). The 1884 Charter regulated the doctoral degree conferment (Tablica ustavov, 1901: §27.2.5; 30.3.10). The university right to select honorary members remained as well (Tablica ustavov, 1901: §30.3.1; §144).

In 1864, universities and the Education Ministry started debating the issue who should be regarded as "a famous scientist" with respective privileges. Then, procedures of the honorary title conferment were settled: an offer required preliminary approving from at least four universities of the Russian Empire.

There was a certain conferment confusion in future as well. In particular, the degree was an honorary title rather than "a specific science rank" (especially, at the beginning of the

20th century). Obviously, this fact was regarded by both title awarders and awardees. Consequently, biographies mentioned the conferred title among honorary achievements.

The Kharkiv University started selection of honorary doctors in the 1890s. In 1805–1916, there were above 200 honorary members and doctors (we defined 255 persons). Among them, you can see M.M. Beketov, S.P. Botkin, M.S. Hrushevskyi, A.I. Mendelieiev, M.M. Kovalevskyi, M.I. Pyrohov, P.P. Semenov-Tian-Shanskyi (scientists); I.I. Mechnykov, K. Golgi (Nobel prize laureates); L.M. Tolstoi, M.Ye. Saltykov-Shchedrin, I.Ya. Franko (writers). During the World War I, Mykola Mykolaiovych (as a prince and the Supreme Commander-in-Chief of the Russian Armed Forces) became an honorary member. On the contrary, two German researchers were deprived of their titles.

We produced the portrait of honorary members and doctors at the Kharkiv Imperial University via their social, ethnical and occupational origin. Besides, we analyzed the chronological order of honorary title conferment for the whole history of the Kharkiv University (Table 1).

Table 1. Honorary members and doctors of the Kharkiv Imperial University (1804–1917)

Years	1800s	1810s	1820s	1830s	1840s	1850s	1860s	1870s	1880s	1890s	1900s	1910s
Amount of persons	18	38	13	13	13	55	27	4	11	9	19	6

For Table 1, we state the following things. Firstly, it was 226 of 255 (88.6%) honorary members for whom we could clarify the exact year of title conferment. Secondly, the conferment rates vary in different periods.

Initially, the most prominent conferment wave occurred at the Kharkiv University foundation. The reason was lack of academic staff to educate students. Employment and conferred honorary titles provided such people with certain guarantees.

Within this period, honorary title holders were Friedrich von Adelung (a Prussian historian and archeologist), Theodor Bause (a Leipzig lawyer), Friedrich August Freiherr Marschall von Bieberstein (a Württemberg botanist), Christian Gottlob Heyne (a Saxon linguist and translator).

The second conferment wave is the 1850s-1860s when 82 verified persons got honorary titles (mostly in 1854-1855, 1859-1860). It is explained by the Alexander II liberalization: weaker censorship, political amnesty, no military settlements, etc.

Moreover, the 1863 University Charter was approved as the most liberal one in the Russian Empire (Tablica ustavov, 1901). It was one of the Great Reform initiatives by Alexander II.

After the Polish Uprising in 1863, the government policy was more restrictive. It affected conferment rates at the Kharkiv Imperial University (Table 1).

For the portrait of honorary staff, another analysis parameter was the social origin. We verified 161 of 255 persons, or 63 % (Table 2). Here, nobles prevail: via higher education, they tried to keep their social identity. Consequently, most honorary members and doctors of the Kharkiv Imperial University belonged to noble families.

The education sphere combined government and noble interests. For a long time, nobles were the only social bureaucracy creator with management functions. Therefore, education became a traditional value of noble families. Their children had to master this value in higher educational institutions.

Also, there were fears that the generally accessible education for all people would oust nobles from the public service. Via higher education, they protected, saved and cherished their past heritage as well as reminded of own merits. Actually, industrialists and bankers sought for nobility to distinguish themselves from other social ranks.

The ethnical origin of honorary staff at the Kharkiv Imperial University is shown on Table 3. Among 228 verified honorary members, foreigners are 38.5 %, Russians are 42.1 %, Ukrainians are 19.2 %. 0.2 % include other nationalities (e.g. Byelorussians). Such a situation reflects the all-imperial policy to incorporate different nations within a single state.

Table 2. Honorary members and doctors of the Kharkiv Imperial University by their social origin (1804–1917)

Social rank	Nobles	Petits bourgeois	Merchants	Military people	Clergies	Landlords	Peasants
Amount of persons	66	32	8	11	34	5	5

Table 3. Honorary members and doctors of the Kharkiv Imperial University by their nationalities (1804–1917)

Nationality	Ukrainians	Russians	Foreigners
Amount of persons	44	96	88

The occupational origin of honorary staff at the Kharkiv Imperial University is the most verified – 100 % (Table 4). As mentioned above, there were honorary scientists (S.P. Botkin, M.S. Hrushevskyi, A.I. Mendelieiev), politicians (K.M. Romanov, M.M. Romanov and M.O. Romanov as sons of Russian Emperors; V.P. Kochubei as the Minister for Internal Affairs in 1802-1807), writers and translators (J.W. Goethe, I.Ya. Franko, P.P. Hulak-Artemovskyi), etc.

Table 4. Honorary members and doctors of the Kharkiv Imperial University by their occupation (1804–1917)

Occupation	History	Medicine	Science	Law	Economy	Linguistics	Military science and politics	Physics and mathematics	Religion	Culture and arts
Amount of persons	37	34	20	19	10	21	59	32	8	15

The honorary members and doctors of the Kharkiv Imperial University graduated from different institutions: the Kharkiv Imperial University (22); the St. Volodymyr Kyiv Imperial University and the Kyiv Theological Academy (9); the Moscow Imperial University and the Moscow Theological Academy (31); the Kazan Imperial University (4); the Dorpat Imperial University (4); the Saint Petersburg Imperial University, the Saint Petersburg Surgery Academy, the Saint Petersburg Theological Academy (36).

5. Conclusion
Therefore, the honorary membership of the Kharkiv Imperial University reflected the main trends of state higher education development. The general social portrait of a typical honorary representative at the Kharkiv Imperial University usually included the following features. A 40 to 50-year-old noble person (foreigner or Russian) who graduated in Europe, Moscow or Saint Petersburg as a researcher or educator. However, there were exceptions (Tables 1, 2, 3, 4).

Unique cases occurred as well. In 1910, O.Ya. Yefimenko (a historian and ethnographer) became the first-ever female honorary doctor. Such a title was also conferred on P.S. Uvarova (a historian, archeologist, public figure, philanthropist) who was born in the Sumy Oblast, Ukraine.

The average honorary staff age at the Kharkiv Imperial University was 54 years. The youngest honorary persons were D.P. Buturlin (19 years: participant of the Patriotic War in 1812, chief of the

Censorship Committee), M.O. Romanov (20 years: son of Alexander II) and Ye.P. Kovalevskyi (29 years: diplomat and traveler).

The oldest honorary persons were P.P. Semenov-Tian-Shanskyi (84 years: geographer and traveler), Alexandre Moreau de Jonnès (83 years: French statistician), M.M. Stasiulevych (80 years: historian and publicist) and J.W. Goethe (78 years: German writer).

6. Acknowledgements

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European Journal of Contemporary Education

ELECTRONIC JOURNAL

The Pedagogical Periodical Press in the Riga Educational District (1832–1915)

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Abstract

This work explored the pedagogical periodical press in the Riga Educational District in the period 1832–1915.

The principal sources for the study were a set of works of a reference-encyclopedic nature.

The study's findings revealed that due to its small population the Riga Educational District had a relatively small number of pedagogical journals – just seven. A major producer of pedagogical periodicals was Reval Gymnasium (established in 1631). It is at this educational institution that one of Russia's first pedagogical journals, *Raduga*, and Europe's first journal on mathematics instruction, *Uchebny Matematichesky Zhurnal*, emerged in the 1830s. Both were published by the school's instructors. Another two pedagogical journals (*Gimnaziya* and *Pedagogichesky Yezhenedel'nik*) were published in the 1890s – both by G.A. Yanchevetsky, Director of Reval Gymnasium. Unlike the instructors, the director had significant funding at his disposal – and that enabled him to publish the periodicals for nearly 10 years, whereas the former had to discontinue their projects as early as the second year.

Two of the periodicals served as the educational district's official organ – first *Bulletin of the Dorpat Educational District*, and later (following a reorganization of the district and the transference of its capital to Riga) *Bulletin of the Riga Educational District*. In 1908, an attempt was undertaken to produce *Shkol'naya Zhizn'*, intended as a vehicle for publishing the unofficial part of *Bulletin of the Riga Educational District*. However, this attempt failed too – the publication ceased to exist that same year.

Keywords: periodical press, Russian Empire, Riga Educational District, period 1832–1915, sustainable development in education, education policy, education reform.

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1. Introduction

During the prerevolutionary period, the Russian Empire had a system of educational districts. By the start of the 20th century, there were a total of 15 educational districts in the country. The Riga Educational District, back then part of European Russia and comprised of Courland, Livonia, and Estland Governorates, was the country's least populated educational district, with a population of just 2,386,998 as at 1897 (Naselenie imperii…, 1898: 5-26). By comparison, the Moscow Educational District had at that time a population of 17,970,749, a difference of more than 7.5 times (Naselenie imperii…, 1898: 5-26). As a result, the area had a smaller pedagogical workforce and fewer pedagogical periodicals. The present work aims to explore the experience of creating pedagogical journals in the Riga Educational District during the prerevolutionary period.

2. Materials and methods

The principal sources for the study were a set of works of a reference-encyclopedic nature. These included reference publications on the periodical, including vocational, press in Russia (Bibliografiya…, 1915; Ablov, 1937) and biographical works on public figures in prerevolutionary Russia (e.g., 'Russian Public and Cultural Figures in Estonia' (Russkie obshchestvennye…, 2006)).

The following research methods were employed to match the work's historical-problem nature: chronological, which helped view the issue under examination in historical retrospective; content analysis, which helped single out the publications having a bearing on the Riga Educational District, and biographical, which helped analyze the biographies of the editors of the pedagogical journals examined in the work.

3. Discussion

The historiography on the subject is relatively thin. For the most part, the journals have been explored only episodically and mainly in conjunction with another topic. For instance, A.Yu. Minakov explored in 2006 the biography of A.I. Bürger, and in that context touched upon the activity of the *Raduga* journal, which that scholar was the editor of in the 1830s (Minakov, 2006). In 2011, the same scholar investigated the influence of M.L. Magnitsky on A.I. Bürger in editing the same journal (Minakov, 2011).

G.V. Kondrat'yeva addressed the experience of creating *Uchebny Matematichesky Zhurnal*, a narrowly specialized publication produced in the city of Reval, while examining the role of pedagogical journalism in enhancing the quality of instruction by mathematics teachers (Kondrat'eva, 2011).

Among the works secondary to the purpose of the present study, of particular note is G.F. Bauer's work on the history of Reval Gymnasium, the oldest gymnasium in the Russian Empire (Bauer, 1910). This educational institution produced four academic pedagogical publications. Other noteworthy works include the one by I.P. Paert and her colleagues, which explores the activity of the church and Orthodox Christian schools in the Baltic region (Pyart i dr., 2015), and the one by V.A. Bogov, which explores the historiography of issues of interethnic relations in Livonia Governorate (Bogov, 2018).

A separate group of works is represented by a set of studies on the history of pedagogical periodicals under the purview of the country's top government entities and educational districts. For instance, over the last few years, research has been undertaken looking at periodicals under the purview of the Ministry of Public Education (Allalyev et al., 2022) and those under the purview of the country's top ecclesiastical authority (Mamadaliev et al., 2022). In terms of educational districts, research has been conducted on the Kazan Educational District (Muzykant et al., 2022) and the Kiev Educational District (Mamadaliev et al., 2023).

Given the paucity of research on pedagogical periodicals in the Riga Educational District, the intent of this study was to fill a research gap on this topic.

4. Results

Overall, there were seven different pedagogical periodicals published in the Riga Educational District. No pedagogical periodicals were produced during the prerevolutionary period in Courland Governorate (capitalled in the city of Mitau). In Livonia Governorate, journals were published in two cities – Riga and Dorpat. In Estland Governorate, journals were produced in the city of Reval. The way in the number of publications produced was led by Reval (presently known as Tallinn) – 4,

followed by Riga – 2, and then Dorpat (Tartu) – 1. These publications are examined below in chronological order.

The first periodicals in the Riga Educational District emerged back in the 1830s. The region's first publication was the journal *Raduga* (Russian: "Rainbow"), published in Reval and focused on philosophy, pedagogy, and belles-lettres (Figure 1). There was an addendum to the journal – *Ostzeyskiye Zapiski* ("Ostsee Papers"). The publisher was litterateur and translator A.I. Bürger (1804–1876) (Minakov, 2006), a Moscow University graduate, who at that time was a senior teacher at Reval Gymnasium.

One of the oldest extant secondary schools in Europe, Reval Gymnasium was established in 1631 by Swedish king Gustavus Adolphus. In 1645, its teaching staff consisted of four professors and two colleagues (Bauer, 1910).

By the start of the 1830s, A.I. Bürger was famous for his translations from Farsi of 'The Unhandsome Prince' (Neprigozhii tsarevich, 1825) and 'The Gardener and the Nightingale'. The journal was published on a monthly basis in 1832–1833. It was one of the earlier attempts at publishing a pedagogical journal in the Russian Empire. As a rule, the journal was filled with articles and translations by A.I. Bürger himself, including translations of works of Arabic, Persian, and Indian literature. According to scholar A.Yu. Minakov, "a massive public response was triggered by A.I. Bürger's article 'The Destiny of Russia', in which he suggested that Peter I helped bring Russia and Europe closer together so that European civilization could be elevated to the level of Russia's Eastern Orthodoxy" (Minakov, 2011: 137). *Raduga* would carry copious materials of a pedagogical nature (e.g., parts of John Locke's 'Some Thoughts Concerning Education' and 'The Fundamentals of the Pedagogy of Saint Augustine'). *Ostzeyskiye Zapiski* carried a lot of material on the history of public education in the Baltic region.
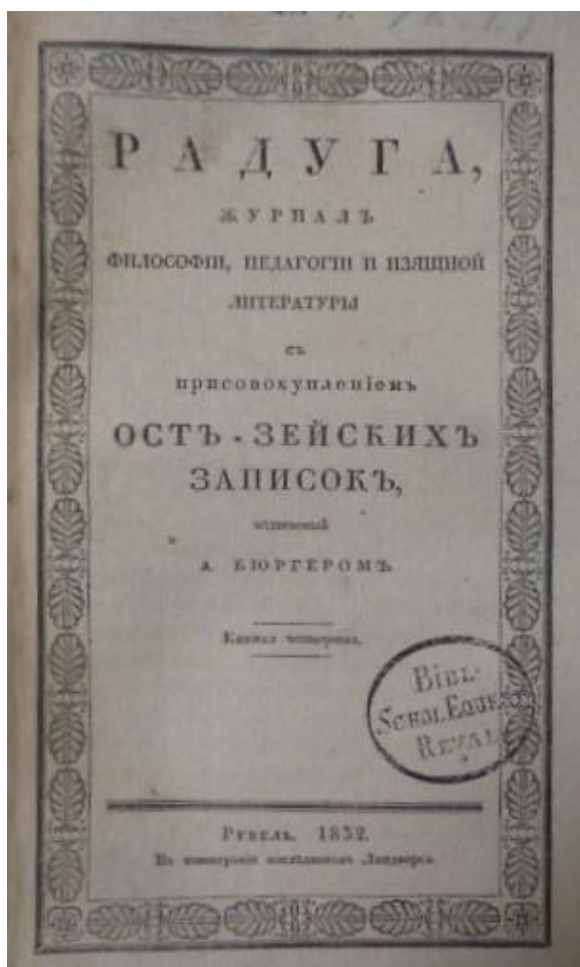

Fig. 1. Cover of the journal *Raduga*

In 1833, a new pedagogical publication was launched in Reval – *Uchebny Matematichesky Zhurnal* ("Educational Mathematical Journal"). Its publisher was another Reval Gymnasium instructor, mathematician Karl Kupfer, a holder of the degree of Doctor of Philosophy from Dorpat University. According to G.V. Kondrat'yeva, *Uchebny Matematichesky Zhurnal* was "Europe's first journal specifically focused on issues of teaching mathematics" (Kondrat'eva, 2011: 97). The journal was published in 1833–1834. Primarily focused on mathematics instruction, it would provide analysis of educational books on disciplines such as arithmetic, algebra, and geometry. The journal had had about 200 subscribers since its launch (Kondrat'eva, 2011: 97). In 1833, four issues of the journal were published, and in 1834 just one. Subsequently, the publication of this journal was discontinued.

In 1866, the Ministry of Public Education launched a periodical organ of its own – *Bulletin of the Dorpat Educational District*. It was produced monthly from 1866 to 1893 in the city of Dorpat. It mainly published ordinances for the educational district reflecting the overall policy of the Ministry of Public Education of the Russian Empire in the Baltic region. In 1893, two issues of this publication were released. That same year, the educational district was renamed as the Riga Educational District and its directorate was moved to the city of Riga. As a consequence, the journal's third issue was released in 1893 in Riga under the title *Bulletin of the Riga Educational District* (Ablov, 1937: 36).

In 1888, a new pedagogical publication was launched in the city of Reval – the journal *Gimnaziya* ("Gymnasium"). A monthly focused on philology and pedagogy, it was published by classical philologist and pedagogue G.A. Yanchevetsky, an Imperial University of St. Vladimir graduate and the head of Reval's Alexander and Nicholas Gymnasiums (Figure 2) (Russkie obshchestvennye..., 2006: 192). Engaged in literary work throughout his service, G.A. Yanchevetsky published numerous articles, most of which were focused on methodology for teaching ancient languages. Overall, it had a steady periodicity, although there were exceptions. Specifically, just four issues of this journal were released in 1891 – versus seven in 1897. The journal had the following rubrics: government ordinances; articles on philology; methodology and didactics; model lessons; school hygiene; gymnasiums abroad; general pedagogy; critiques and bibliographies. A significant amount of attention was paid in the journal to philological issues and translations of ancient classics. Its last issue was released in 1899. The journal was discontinued in 1902 due to health issues faced by its publisher, who eventually would resign as a result. In 1898, Ye.I. Vetnek would release an alphabetical and systematic index of authors and articles for the journals *Gimnaziya* and *Pedagogichesky Yezhenedel'nik* for 1888–1897.

Fig. 2. Grigory Andreyevich Yanchevetsky (1846–1903)

In 1893, G.A. Yanchevetsky began to publish the journal *Pedagogichesky Yezhenedel'nik* ("Pedagogical Weekly") at Reval Gymnasium. A weekly, it was produced in 1893–1895, and later, after a hiatus, in 1899–1900. The periodical had the following rubrics: general pedagogy, methodology, didactics, and school hygiene; articles and short pieces of a historical-literary nature; bibliography. The journal would carry writings by pedagogues on staff with the journal *Gimnaziya*. The bibliographical section would be filled with reviews of works by ancient classical authors. In 1895, the publication of the journal was suspended. After it resumed publication in 1899, the journal would last just 48 issues (37 issues in 1899 and 11 issues in 1900) (Bibliografiya..., 1915: 764).

In 1893, following the renaming of the educational district and moving of its directorate from Dorpat to Riga, they began to publish *Bulletin of the Riga Educational District* in Riga. This publication was produced monthly at least until 1915. It had an unofficial part, which carried articles on pedagogy (Ablov, 1937: 55).

In 1907, an attempt was undertaken to set the publication's unofficial part apart into a separate pedagogical journal – *Shkol'naya Zhizn'*. Serving as an addendum to *Bulletin of the Riga Educational District*, it was edited in Riga by A.A. Fomin. However, this attempt would fail, with the one released in 1907 being the only issue of the journal published. Subsequently, the unofficial part would continue to be published within *Bulletin of the Riga Educational District* (Ablov, 1937: 70).

5. Conclusion
Due to its small population, the Riga Educational District had a relatively small number of pedagogical journals – just seven. A major producer of pedagogical periodicals was Reval Gymnasium (established in 1631). It is at this educational institution that one of Russia's first pedagogical journals, *Raduga*, and Europe's first journal on mathematics instruction, *Uchebny Matematichesky Zhurnal*, emerged in the 1830s. Both were published by the school's instructors. Another two pedagogical journals (*Gimnaziya* and *Pedagogichesky Yezhenedel'nik*) were published in the 1890s – both by G.A. Yanchevetsky, Director of Reval Gymnasium. Unlike the instructors, the director had significant funding at his disposal – and that enabled him to publish the periodicals for nearly 10 years, whereas the former had to discontinue their projects as early as the second year.

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European Journal of Contemporary Education

ELECTRONIC JOURNAL

A History of Everyday Life in Female Schools within the Kharkov Educational District (1860–1862). Part 1

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Abstract

This article explores the history of everyday life in female schools within the Kharkov Educational District of the Russian Empire in the period 1860–1862.

The principal sources for this study are the schools' annual reports for the first year of their operation, which were published in *Bulletin of the Kharkov Educational District*. These reports were analyzed, key similarities and differences were identified between the female schools, and conclusions were drawn as to the extent of the influence of local factors on their operation. The schools were analyzed across the following seven aspects: 1) prehistory; 2) Board of Trustees; 3) staff pay; 4) student composition and tuition pricing; 5) teaching staff and the Pedagogical Council; 6) curriculum; 7) budget.

The first part of the article examined three educational institutions, which operated under significantly different conditions to each other: 1) Mariinsky Kharkov First-Class Female School – the district's largest and richest school; 2) the Female Department of Kupyansk Uyezd School – extremely poor and weak, yet set to be transformed into a second-class female school in the year following its establishment; 3) Lipetsk Second-Class Female School – a stable, successful uyezd school. It was shown that, despite formal unity across the country's laws on female education, in actuality the schools were significantly different from each in key parameters: 1) cost of attendance (Mariinsky Kharkov Female School was not free to attend, Lipetsk School was free to attend for most, and students at the Female Department of Kupyansk School could attend the school's core courses for free and would have to pay to attend its elective ones); 2) staff pay (which in Mariinsky Kharkov Female School was twice what it was in Lipetsk School, while most of the teaching staff in the Female Department of Kupyansk School worked for free); 3) social composition of the student body (Mariinsky Kharkov Female School had many students of noble descent,

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but there were almost no urban commoners, and it was the other way round in Lipetsk Female School). With that said, a key factor determining a school's special nature was the attitude of the local community toward it, as each was managed by a board of trustees composed of representatives thereof and all efforts to make the schools self-sufficient would eventually fail, with each mainly subsisting on donations.

Keywords: history of pedagogy, female education, female schools, history of everyday life, Kharkov Educational District.

1. Introduction

The history of female education in the Russian Empire can hardly be considered a little-researched subject. The latest trends in science, such as the recent interest in gender-related research, have led to the emergence of a body of literature in Russia dealing with female educational institutions, as opposed to the history of Russian education as a whole. Of particular note in this regard is the fundamental work by E.D. Dneprov and R.F. Usacheva, 'Secondary Female Education in Russia', published in 2009 (Dneprov, Usacheva, 2009). However, most of such research by Russian scholars has been characterized by a generalizing approach – as a rule, the primary focus is on female education in fairly large geographic areas or within a fairly wide chronological span. While such an approach may be productive, it may also be worth taking one that is the exact reverse of it – one focused not on national or regional history but on micro-history, such as the history of everyday life, when the researcher seeks to identify not trends that are common across the imperial or regional education system but unique traits of particular educational institutions in the context of a specific historical era. This approach is also important for assessing the degree of differentiation among particular educational institutions and understanding to what degree a country's common educational characteristics and trends may be considered as uncontested and universal for each educational institution of a certain type in it.

A critical stage in the development of female education in the Russian Empire was the time at the cusp between the 1850s and 1860s. According to E.D. Dneprov and R.F. Usacheva, it is during this time that the Empire adopted an education system inclusive of females of all social estates, one oriented toward curricular unification with male gymnasiums at that (Dneprov, Usacheva, 2009: 118). However, in complete alignment with the above-mentioned approach, despite the fact that the above monograph devotes as many as two sections to the emergence of female schools of a new type in the Russian Empire, the operation of specific schools is examined in those sections only episodically, with most of the text being based on various national documents (e.g., those setting out rules for female educational institutions and those containing correspondence between educational district trustees and the Ministry) and the capital's pedagogical press (Dneprov, Usacheva, 2009: 115-144).

Between 1861 and 1862, *Bulletin of the Kharkov Educational District* carried a series of reports from the local female schools. What makes these reports all the more interesting is that they tend to describe a school's activity over the first year of its existence and that there is interest in not only various formal items, such as students' social status, but in facts that today can hardly be retrieved from other sources, such, for instance, as the reasons behind the locals' indifference to female education. With such a source base available, it was decided to look at Russia's early-1860s female education reforms from a rare historiographical angle – not from above but from below, i.e., not from the standpoint of the imperial, district, or even gubernia authorities but that of the actual female educational institutions. How did the first school year go in them? How does one explain the differences in their budgets, tuition fees, curricula, and teaching staff compositions? How great were those differences? All these questions will be answered in detail below.

2. Materials and methods

The situation in the female schools within the Kharkov Educational District was analyzed through the lens of the following seven aspects: 1) prehistory (crucial for understanding the status of an educational institution, yet not covered in some of the reports); 2) Board of Trustees; 3) staff pay (important to consider, as there is an obvious idealization in the literature of free-of-charge education in female educational institutions in the Russian Empire (Dneprov, Usacheva, 2009: 124)); 4) student composition and tuition pricing; 5) teaching staff and the Pedagogical Council; 6) curriculum (the suggestion about the schools' curricula being unified, even partially, with what was offered in the male gymnasiums (Dneprov, Usacheva, 2009: 118) appearing rather inaccurate);

7) budget. The reports examined in the present study contain a lot of other interesting information, overall serving as a highly valuable source in terms of describing the history of everyday life in female educational institutions in the Russian Empire. The caveat must be made here as to why this study does not consider one important narrative that is present in all the reports examined – the one about student successes after the first year of study. The thing is that all these reports were published in the public domain, and they spoke of students' achievements exclusively in a positive light, compared with the aspects examined in the present study, which were described in a fairly impartial manner. With that said, as will be shown later below, the local community did not always understand the significance of female education, so publications about poor student progress could have had a highly negative effect in terms of the community's support of those schools. Hence, since there is little objectivity in the content in those publications that praises students, this kind of material will be left out of account in the present work.

The present study is focused on the operation of female schools within the Kharkov Educational District. It will draw upon reports for three educational institutions of different types that operated under completely different conditions. The report for Mariinsky Kharkov Female School, a first-class female school established in a university city, the capital of an educational district, is the most detailed of all those published in *Bulletin of the Kharkov Educational District*. It sets an example by providing an insight into what local pedagogues and education officials wanted this female school, which was well-to-do and enjoyed the support of the local community, to be (Tsirkulyar…, 1861: 22-47). On the contrary, the Female Department of Kupyansk Uyezd School led a meager existence, with the local community being completely indifferent to its concerns. Its situation can be regarded as the worst a female educational institution in that region and that era could have been in, and that is despite the fact that it was set to be transformed into a second-class female school (Tsirkulyar…, 1862a: 175-180). Finally, Lipetsk Female School, a second-class educational institution, epitomized what could be achieved in an uyezd town if there were a small but sustainable budget and the support of the local community (Tsirkulyar, 1862a: 180).

3. Discussion

A brief characterization of the historiography of female education in the Russian Empire up to the 21st century is provided in the book 'Secondary Female Education in Russia' by E.D. Dneprov and R.F. Usacheva (Dneprov, Usacheva, 2009: 11-12). According to these researchers, prerevolutionary works on female education must be classified as sources rather than academic literature, and the subject was not researched extensively during the Soviet period (Dneprov, Usacheva, 2009: 11-12). Consequently, the majority of research on it was conducted during the post-Soviet period.

This research may be split into the following two groups. The first group addresses female education on an imperial scale and often from an imperial standpoint. Specifically, in the monograph by E.D. Dneprov and R.F. Usacheva, female education is positioned not only as a social phenomenon but as a state one as well. For instance, it is stressed that on the Empire's outskirts female educational institutions acted as an "effective means of national policy" (i.e., Russification and promotion of imperial ideologemes) (Dneprov, Usacheva, 2009: 131). Unfortunately, such an approach is fraught with generalization and oversimplification. For instance, the article 'Female Education in Russia in the Mid-19th and Early 20th Centuries: Its Making and Development. Types of Female Educational Institutions', written by S.P. Vasil'yeva, describes the education reform in question and the process of creation of female educational institutions in Russia in the late 1850s and early 1860s in such a generalized manner that the characterization of the organization of such schools is limited in it to the composition of their boards of trustees (i.e., there is not even information about what was taught in them) (Vasil'eva, 2010: 255-256). Looking at it from an imperial standpoint may also sometimes lead to ideologization and idealization. For instance, in the article 'The History and Social Practices of Female Education in Russia: A Demythologization of the Topic', written by I.V. Gauzer, the difference between male and female educational institutions in the Russian Empire boils down to that girls were not taught the ancient languages and boys were not taught handwork, singing, and dancing, which leads the author to draw the following conclusion: "We are inclined to explain the difference in curriculum not by a desire to downgrade women but by the apparent pointlessness of teaching those subjects [i.e., the ancient languages] in female educational institutions, substantiated by men and women having different socio-

economic roles in society" (Gauzer, 2022: 78). Predictably, issues related to the operation of particular provincial educational institutions are given no attention in that body of research.

The second group of works on female education in the Russian Empire is represented by studies investigating female education in certain regions – most often, governorates. This group, most notably, includes the following articles: O.I. Shafranova's 'Female Secondary Education in the North Caucasus in the Second Half of the 19th and Early 20th Centuries' (Shafranova, 2013: 130-143), M.V. Vorotnikova's 'Female Education in North Ossetia in the Second Half of the 19th and Early 20th Centuries' (Vorotnikova, 2011: 30-33), Ye.N. Khabaleva's "The Evolution of the Systems of Primary and Secondary Female Education in the Russian Empire in the Second Half of the 19th and Early 20th Centuries (The Case of Oryol Governorate)' (Khabaleva, 2017: 103-109), L.V. Arkhangelskaya's 'The Making of Female Gymnasial Education in Perm Governorate (Second Half of the 19th and Early 20th Centuries)' (Arkhangel'skaya, 2015: 95-102). In some cases, it is a particular educational institution that becomes the focus of attention in this body of research, as is the case in the article by A.E. Altayeva, 'The Making of Female Education in Buryatia in the Second Half of the 19th and Early 20th Centuries (The Case of Mariinsky Buryat Female School)' (Altaeva, 2018: 22-28), and the one by S.V. Lyubichankovsky, 'The Making of Orenburg Female Gymnasium at the Cusp Between the 1860s and 1870s' (Lyubichankovskii, 2013: 24-27). However, in exploring a particular female educational institution, most modern-day authors fail to compare its experience with that of other schools of the kind, with the school's successes and failures ending up being assessed based on the author's personal notions and without any linkage to the era's other educational institutions.

Thus, we can see that, while female education in the Russian Empire has been the subject of increasing interest among historians over the last few decades, there has yet to be produced a study comparing several female educational institutions. What has been prevalent is the use of a generalizing approach focused on exploring female education as a whole – nationally or within particular regions; and if modern-day researchers do set out to explore the history of particular educational institutions, they tend to do so in an isolated manner and without taking account of the experience of other schools of the kind.

4. Results
Mariinsky Kharkov Female School (1860–1861)

1) *Prehistory*. Although this school was under the purview of the Ministry of Public Education, it essentially owed its existence to donations from the Kharkov community. The biggest contribution to the cause came from Kharkov's merchants and nobles. Not only did the merchantry offer in the late 1950s to contribute moderate funding to the school for a period of 3 years but also provided it with a house and a reservation was made that, if the building did not suit the school's needs, the authorities could let it out and use the rent income to hire a suitable building for it (Tsirkulyar…, 1861: 22). In 1859, a ball organized by the marshal of the Kharkov nobility helped raise 1,162 rubles for the school (Tsirkulyar…, 1861: 23). Of note in terms of government priority setting here is the fact that the funds allocated toward the needs of this female school had initially been intended for a memorial arch commemorating the visit of Emperor Alexander II to Kharkov (4,500 rubles) (Tsirkulyar…, 1861: 23). Overall, more than 10,000 rubles was gathered by 1860 (Tsirkulyar…, 1861: 23). This helped expedite the opening of the school, which led to the house contributed by the merchantry being not remodeled to serve as a building for the school but let out and another building being hired for it to start operation immediately (Tsirkulyar…, 1861: 23). On July 17, 1860, the school's Board of Trustees appointed its teachers and principal, and on August 16 it began operation (Tsirkulyar…, 1861: 23-24). Thus, as evidenced in the report, the administration of the Kharkov Educational District did not play the decisive role in the opening of this school – a key impetus for that came from the enthusiasm of the local community, whose commitment to the support of the school made it possible to raise the necessary funding through organizing donations from the Kharkov nobility and merchantry, rather than soliciting the government for it.

2) *Board of Trustees*. The school was managed by the Board of Trustees, which had seven members: the emperor-appointed honorary trustee (the governor's wife), four permanent members (the marshal of the gubernia nobility, the city mayor, the principal of the school, and a member appointed by the educational district), and two elective members (elected from among Kharkov's nobles and merchants) (Tsirkulyar…, 1861: 25). It is to be noted that this composition of the Board

of Trustees is somewhat different from what has been furnished by modern-day researchers as statutorily prescribed for female schools. Specifically, here is what E.D. Dneprov and R.F. Usacheva say: "A board's permanent members included the female trustee of the school, the uyezd marshal of the nobility or the person filling in for him, the director of the schools or of the gymnasium (the staff supervisor of the uyezd school where there was no gymnasium), the city mayor, and the female principal of the school. It appointed its elective members – one from among local nobles or officials and the other from among the merchantry" (Dneprov, Usacheva, 2009: 140; Vasil'eva, 2010: 256). As we can see, the Board of Trustees at the female school in Kharkov included the gubernia, rather than uyezd, nobility marshal, which indicates the particularly high status of the school. On the other hand, it was the administration of the educational district that appointed a member of the Board of Trustees from among the directors in a town that had several gymnasiums. In any case, this focus on attracting wealthy and influential individuals to support female education was a factor contributing to the quick opening of the school. Issues related to getting furniture and all necessary classroom supplies and equipment were handled here by a member of the merchantry, while prior to the school's opening and the appointment of its records manager those related to records management were handled by the director of Second Kharkov Gymnasium, who would become the Board of Trustees member from the educational district (Tsirkulyar…, 1861: 24-25). However, this system was not perfect, as it made the operation of the school dependent on decision-making by third-party persons. As early as the school's first year in existence, despite the evident enthusiasm of members of its Board of Trustees, the operation of the latter was completely paralyzed from mid-September to November 24, as during this time Kharkov Governorate was changing its nobility marshal, and the person holding this position at the time was the Board's chairman (Tsirkulyar…, 1861: 25). As a result, there was a delay in resolving an important issue such as letting out the house provided to the school by the merchantry, with the building starting to be let out in an adequate manner only on January 1, 1861 (Tsirkulyar…, 1861: 25-26). The result was a major financial loss – whereas from August 22, 1860, to January 1, 1861, the rent income was just 120 rubles and 72.5 kopecks, from January 1 to July 1, 1861, it was 424 rubles and 97.5 kopecks, a more than threefold increase (Tsirkulyar…, 1861: 33). The Board of Trustees interfered in pedagogical work as well – it would resolve organizational issues, but it also would put out directives as to how to conduct instruction at the school (Tsirkulyar…, 1861: 26-27). The school's 1860–1861 Board seemed reluctant to abuse this right – it had voiced the view that the principles underpinning the work of the school must "stem from actual life and be refined by practice", while directives it issued would have to be adjusted in the future "as necessary and in accordance with what experience suggests" (Tsirkulyar…, 1861: 26). Nevertheless, it must be acknowledged that this way of running the school placed its activity, including in terms of instruction, in complete subordination to the will of local public figures, most of whom had no pedagogical experience.

3) *Staff pay*. Of note is the fact that the school's Board of Trustees, whose ambit included resolving this particular issue as well, was of the view that its principal, educatresses, and teachers must be paid a salary, reasoning that "unpaid labor is the least productive labor" (Tsirkulyar…, 1861: 27). The school's principal and educatresses (concerned with overseeing students' behavior; one per grade) were to be paid a fixed annual salary of 600 and 300 rubles, respectively (Tsirkulyar…, 1861: 27). The size of teacher salaries was based on the number of lessons to be given each week during the school year ("annual lessons") (Tsirkulyar…, 1861: 28). Of note is the fact that the work of instructors in different disciplines was valued quite differently. The largest salary was paid to the teacher of dancing – 80 rubles per "annual lesson", but that involved the obligation to bring performers of music over to each Dancing class (Tsirkulyar…, 1861: 28). For most of the subjects (Religious Education, Russian and Russian Philology, Arithmetic (inclusive of the fundamentals of geometry and physics), Geography, History, Natural History, the foreign languages, and Singing), the annual lesson was valued at 40 rubles (Tsirkulyar…, 1861: 28). The rate of 20 rubles per annual lesson was paid to the instructors of drawing, penmanship, and music, although teachers of music were paid on a per-student basis, meaning that they worked with girls individually, not with whole classes) (Tsirkulyar…, 1861: 28). The lowest rate was paid to the teachers of handwork, just 15 rubles per "annual lesson" (Tsirkulyar…, 1861: 28). If a teacher missed a lesson, their salary would be reduced and the remaining funds would be used to pay the educatress who was with the class and to pay bonuses to the school's top-performing teachers (Tsirkulyar…, 1861: 28). The school's financial statements let us see how often teachers were absent

from school there. For instance, the teachers of arithmetic were to give eight lessons per week (across grades), i.e. their annual salary was based on payment for eight "annual lessons", totaling 320 rubles (8 lessons multiplied by 40 rubles). However, a teacher's final pay being just 240 rubles would have meant that 25 % of lessons failed to be held (Tsirkulyar…, 1861: 36). The school's teachers of German were to hold nine lessons weekly, i.e. their annual salary was to be 360 rubles (9 lessons multiplied by 40 rubles, and in the 1860–1861 school year each was paid the entire amount (Tsirkulyar…, 1861: 36). As regards Arithmetic and Music, approximately 25 % of the lessons were left unpaid. For most subjects at the school, there were few to no teacher absences in that year (Tsirkulyar…, 1861: 36).

4) *Student composition and tuition pricing.* By and large, students had to pay to attend this school. At the instance of the Board of Trustees, parents were to pay 25 rubles per year for each girl if she was taking core subjects only and 50 rubles if she was taking both core and elective subjects (more detail below) (Tsirkulyar…, 1861: 29). Students were to prepay the tuition for a half-year, in January–February and in July–August, with the rules being fairly strict – failure to make payment on time would result in a student getting expelled immediately, and, in the event of leaving the school before the end of the period paid in advance, no money was to be refunded (Tsirkulyar…, 1861: 29). On the other hand, the Board of Trustees had directed that the school admit "females of all social groups, regardless of one's religious affiliation and nationality", limiting enrollment only for reasons of limited classroom capacity and desiring to provide students with quality instruction (Tsirkulyar…, 1861: 28). If parents could pay the tuition fees, they would need to get in touch with the principal. The Pedagogical Council would then test the child's knowledge level to decide on which grade to assign her to (Tsirkulyar…, 1861: 28). If parents could not pay the tuition fees, they would have to file a petition with the Board of Trustees, to which a certificate of poverty would need to be attached, requesting that the Board exempt them from paying their child's tuition (Tsirkulyar…, 1861: 29). Of note is the fact that a number of benefactors would only donate to the school on condition that the money would be used to fund the education of girls from poor families. Overall, by the end of the 1860–1861 school year, the school had 140 paying and 20 non-paying students – 7 non-paying students based on donations from the Kharkov merchantry (the figure was initially supposed to be 20, but the Kharkov merchantry agreed to meet the school halfway on this in its first year of operation); 3 non-paying students based on donations from the Kharkov nobility; 2 non-paying students based on the choice of the school's principal, who were the daughters of poor Ministry of Public Education officials; 4 non-paying students allowed to attend the school for free owing to certain teachers and educatresses doing free work for the school; 4 non-paying students based on donations from particular individuals (Tsirkulyar…, 1861: 44). There also were 2 orphan girls, whose parents were in service with the Ministry of Public Education. These were on the books as "grant-aided students" (their tuition was not free, but it was paid for by third-party persons (employees of Second Kharkov Gymnasium)). It, actually, was specifically stressed in *Bulletin of the Kharkov Educational District* that it would help to expand this practice, as it helped ensure that "society will have more girls with a substantial education" and that "the school has more funds in its budget and does not worry about having to limit the number of non-paying students" (Tsirkulyar…, 1861: 44-45). The school's student body had the following social composition: 24 daughters of hereditary nobles, 54 daughters of personal nobles, 64 girls representing the merchantry, 7 daughters of members of the clergy, 10 urban commoners, and 1 foreigner (Tsirkulyar…, 1861: 44). Thus, it was dominated by daughters of minor officials (personal nobles) and merchants.

5) *Teaching staff and the Pedagogical Council.* The administration of the Kharkov Educational District had final say as to the appointment of teachers in this school, with most appointed from among the teachers of Second Kharkov Gymnasium, with which, as mentioned above, the school worked in close cooperation – the school's two teachers of Russian and its teachers of Religious Education, Arithmetic, German, French, and Drawing (Tsirkulyar…, 1861: 30). An interesting case involved the director of Second Kharkov Gymnasium, a member of the school's Board of Trustees, who agreed to substitute for a sick history teacher. Of note is the fact that on the money he received for this he would purchase magazines and books for the school's library (Tsirkulyar…, 1861: 30). Quite logically and predictably, another source that would provide teaching staff for this school was Kharkov Institute for Noble Maidens – this group included the school's third teacher of Russian and its teachers of Geography, French, and Dancing, who had been in service there; the school's third teacher of French was a graduate of that institute

(Tsirkulyar…, 1861: 30-31). The school hired employees of other educational institutions as well (e.g., an adjunct named F.V. Tikhonovich, who was a Kharkov University instructor), and its staff also included an official from the Office of the Trustee of the Kharkov Educational District, a female home tutor, and a few individuals who did not teach anywhere else (e.g., its Handwork class was taught by the widow of some colonel) (Tsirkulyar…, 1861: 30-31). In terms of gender composition, most of the subjects at the school were taught by males, with only two taught by females – Dancing and Handwork (Tsirkulyar…, 1861: 30-31). On the other hand, there were four educatresses – three single ladies (with two of these being certified to teach by a gubernia schools directorate and one being a silver medal graduate of Kharkov Institute for Noble Maidens) and one married lady (a graduate of Alexander Orphan Institute) (Tsirkulyar…, 1861: 31). The school's principal was a married lady with nearly ten years' experience working for a couple of private female boarding schools (Tsirkulyar…, 1861: 24). Thus, on the whole, the school's pedagogical composition may be considered more than satisfactory, although it was somewhat uneven – from a university instructor to a recent noble maidens institute graduate. The school's Pedagogical Council, which was to be strictly concerned with resolving pedagogical issues, including the design of curricula, was composed of its principal, all of its instructors and educatresses, and the director of Second Kharkov Gymnasium, and it was chaired by the director of Second Kharkov Gymnasium, not the school's principal (Tsirkulyar…, 1861: 38-39).

6) *Curriculum*. The initial plan was to have six consecutive grades (Tsirkulyar…, 1861: 24). However, in the first year of its operation, only the school's first three grades received enough students to launch, and it had so many students enrolled in Grade 1 that the class had to be split in two (Tsirkulyar…, 1861: 24). Thus, although the Pedagogical Council had designed rough curricula based on a six-grade program of study, in actual fact the school would be implementing only those for Grades 1 through 3. As mentioned earlier, the school had core and elective subjects. The core subjects were Religious Education, Russian, Arithmetic, Geography, History (starting in Grade 3), Natural History (starting in Grade 3), Penmanship, and Handwork (Tsirkulyar…, 1861: 39-41). The electives were German, French, Drawing, Music, Singing, and Dancing (Tsirkulyar…, 1861: 41). No curricula had been designed for a number of subjects (Penmanship, Handwork, Drawing, Music, Singing, and Dancing), with the Pedagogical Council limiting itself to directing that those subjects be taught "with proper graduality" (Tsirkulyar…, 1861: 40-41). On the other hand, the rest of the subjects had curricula of a very general nature, with it mostly being left up to an instructor to decide how to teach their course. For instance, the syllabus for Geography class was as follows: "*Grade 1*. Brief mathematics- and physics-based survey of the globe using a model globe and maps of Earth. *Grade 2*. Brief survey of each part of the world. *Grades 3 and 4*. Geography of the Russian Empire. *Grade 5*. Brief survey of European countries. *Grade 6*. Brief survey of countries in other parts of the world. Review" (Tsirkulyar…, 1861: 40). As we can see, this set of subjects covered the major domains of human knowledge. Unfortunately, the number of subjects across grades is not provided in the report, which only states that there were four lessons a day, each 1.25 hours long (Tsirkulyar…, 1861: 41). Student knowledge was evaluated using a 6-point scale (from 0 ("absolutely poor") to 5 ("excellent")) (Tsirkulyar…, 1861: 41). At the end of each month, students' parents or guardians would be handed a sheet listing their grades and absences (Tsirkulyar…, 1861: 41).

7) *Budget*. At first glance, at the end of its first year of operation, the school was in excellent condition, with its overall receipts being 23,434 rubles and 5 kopecks and its expenditure being just 10,928 rubles and 26 kopecks (Tsirkulyar…, 1861: 33, 38). The problem, however, was that the bulk of its receipts, 15,888 rubles and 35 kopecks, came from donations, which included what it received prior to opening up (Tsirkulyar…, 1861: 32). The revenue the school generated on its own was much smaller than its expenditure. The rent income from the house contributed by the merchantry brought it 545 rubles and 70 kopecks, the sale of textbooks to students – 172 rubles and 50 kopecks, and tuition fees – 6,500 rubles (Tsirkulyar…, 1861: 33). As regards its expenditure, just 2,008 rubles and 70 kopecks went to the fit-out work and 8,919 rubles and 56 kopecks was spent to keep it running (Tsirkulyar…, 1861: 38). Even the likely increase in its house rent income would not have prevented a budget deficit for the facility. The school's main item of expenditure was its staffing costs, with 1,582 rubles and 50 kopecks going to pay the salaries of its instructors of core subjects, 2,943 rubles and 50 kopecks – those of its instructors of elective subjects, and 2,288 rubles and 75 kopecks – those of its other staff members (e.g., its principal, educatresses, and housekeepers) (Tsirkulyar…, 1861: 36-37). With that said, the electives were fairly costly for the school – mainly because of Music class, which was taught on an individual basis and, therefore,

required a large number of "annual lessons" (although, as was mentioned earlier, "annual lessons" of Music were valued at half as much as "annual lessons" in most subjects, the school ended up spending 1,867 rubles and 50 kopecks to pay its music teachers, i.e. more than all of its core subject teachers) (Tsirkulyar…, 1861: 36). Having said that, as evidenced in the report, it is Music that the overwhelming majority of the parents of students at the school regarded as the most important of the elective subjects, with just one of the 138 students who paid to attend these courses choosing not to enroll in Music class (Tsirkulyar…, 1861: 38). Consequently, the Board of Trustees saw Music class as the main culprit for its budget deficit, which would lead it to ordain that, starting the following year, Music class would no longer be offered as an elective course and to attend it each willing student would have to pay an additional 15 rubles a year (Tsirkulyar…, 1861: 38).

Let us summarize what has been covered about Mariinsky Kharkov Female School in this work. We know now that the school received a lot of support from the local community and authorities prior to its establishment. This support came in the form of substantial funding, with the school's Board of Trustees including a number of influential individuals and its teaching staff even including an employee of the local university. This helped the school achieve impressive results as early as its first year of operation, which include the following: it did hire a house suitable for itself, launch four grades with a combined enrollment of 160 students, and provide its staff with decent salaries. Nevertheless, its position was not so sustainable – although the school's tuition fees were pretty high, this income was not enough to operate without a budget deficit without relying on external donations. In fact, the school was totally dependent on benefactors, which was also amplified by the fact that its highest authority was not the Pedagogical Council but the Board of Trustees, mainly composed of individuals with no pedagogical experience but with connections to benefactors (e.g., the governor's wife, the marshal of the nobility, and the city mayor). As a result, as early as its first year of operation, the school's administration was paralyzed for over a month due to a change of gubernia nobility marshal. Thus, the school's prospects were directly bound up with how long the Kharkov community and members of the Board of Trustees personally would sustain their interest in the operation of this educational institution. Nevertheless, the school's Board of Trustees did look for ways out of the situation, with the solution found being not to reduce teacher pay but raise the cost of tuition (i.e., charge an additional fee for Music class). Dependence for funds on support from the local community and free labor from teaching staff (something practiced in the other female schools as well, as will be shown later below) at the best female school in the Kharkov Educational District was not viewed as something normal and acceptable – the school's leadership was perfectly aware of the need to pay the teachers decent salaries in order to achieve quality instruction and of the necessity for the school to strive for self-sufficiency. This is of note because some of the related modern-day research contains an idealization of these characteristics of female education in the Russian Empire. Specifically, here is what E.D. Dneprov and R.F. Usacheva say about free instruction in the country: "This noble practice would later become widespread across Russia, essentially going on to turn into an ordinary phenomenon in the life of the nascent female school system" (Dneprov, Usacheva, 2009: 124). As will be shown later below, the other female educational institutions within the Kharkov Educational District did, likewise, try to pay their teachers well enough and derive decent income from their students, and the schools were seen as being themselves to blame for their failures in these areas, which did require some sort of rectification, and not as setting a "noble" example to others (with the exception of some special cases (e.g., a school being free to attend being a condition for entitlement to a large donation)).

Female Department of Kupyansk Uyezd School (1861–1862)

1) *Prehistory.* In Kupyansk, unlike Kharkov, the local community was quite indifferent toward female education, and it was mainly on the initiative of Ministry of Public Education officials that this female school was established. On May 26, 1861, a supervisor at the local uyezd school approached the administration with the idea of opening a female department in it, citing as a reason the fact that "this town has seen several female schools established by private individuals close down as a result of failure to achieve the desired results due to lack of funding" (Tsirkulyar…, 1862a: 175). On August 21, the administration of the Kharkov Educational District gave the green light to opening the female department, and, as early as September 19, it began its classes (Tsirkulyar…, 1862a: 175). Thus, in this particular case, the education authority had decided not to establish a female school using private donations but use a different approach – establish a female

department at a male educational institution, which would make it possible to start educating girls in the area sooner and at less cost.

2) *Board of Trustees*. The Female Department of Kupyansk Uyezd School did not have a board of trustees of its own, with the role of trustee assumed by the wife of a midlevel local official (a collegiate assessor); this lady had also pledged herself to donate to the school 75 rubles yearly (Tsirkulyar..., 1862a: 175-176). Consequently, whereas Mariinsky Kharkov Female School could count on patronage from influential Kharkov residents, who essentially were the ones who ran it, the situation around the female educational institution in Kupyansk developed in a completely different way – for the entire first year, the female department was managed by its female trustee and the Kupyansk Uyezd School supervisor exclusively (Tsirkulyar..., 1862a: 176).

3) *Staff pay*. At the time the Female Department of Kupyansk Uyezd School just opened up, its entire budget must have been made up of the 75-ruble donation from the female trustee and the first payments from students attending French class (Tsirkulyar..., 1862a: 176). It immediately became clear that the majority of the instructors would have to teach for free (for which the head of the Kharkov Educational District, K.K. Voigt, extended to them his "most sincere gratitude") (Tsirkulyar..., 1862a: 176). As a result, the only teacher paid on a per-lesson basis was the instructor of French (75 kopecks per lesson) (Tsirkulyar..., 1862a: 176). On the other hand, the department's only staff member paid an adequate annual salary was its female overseer (concerned with watching over the students), although her annual salary was a mere 60 rubles, and that is considering that she also taught Handwork class (Tsirkulyar..., 1862a: 176). As we can see, pedagogues at the Female Department of Kupyansk Uyezd School taught either for free or for token wages, while it had already been understood in the Kharkov Educational District, as already seen above, that "unpaid labor is the least productive labor".

4) *Student composition and tuition pricing*. The department clearly experienced underenrollment – at the end of the school year, its lower and higher divisions had a combined enrollment of just 21 students (Tsirkulyar..., 1862a: 176). With that said, its core courses, unlike at Mariinsky Kharkov Female School, were provided completely free of charge, with its elective ones costing 10 rubles a year to attend (Tsirkulyar..., 1862a: 178). The institution's income in this respect must have been just 30 rubles, as there were 18 non-paying and 3 paying students (Tsirkulyar..., 1862a: 177). Its social composition of the student body was different from that at Mariinsky Kharkov Female School, too – 9 nobles (both hereditary and personal), 5 daughters of members of the clergy, 2 daughters of members of the merchantry, and 5 urban commoners (Tsirkulyar..., 1862a: 176). Thus, whereas the female school in Kharkov was dominated by daughters of minor officials (personal nobles) and merchants, i.e. people who were not members of the top elite but were fairly rich and influential, the student body of the institution in Kupyansk had a much smaller share of girls representing the rich merchantry and a much larger share of those from the not-so-wealthy ecclesiastic and urban commoner social groups.

5) *Teaching staff and the Pedagogical Council*. The bulk of the pedagogues in the Female Department of Kupyansk Uyezd School were male teachers from Kupyansk Uyezd School itself and from Kupyansk Ecclesiastical School, all teaching for free (Tsirkulyar..., 1862a: 176). Only those subjects were taught for which instructors had been found. Of note is the fact that the teacher of French was hired only 3 months after the department opened up, and that is considering that it was a paid position. The annual report contains no information about the educational background of the female who filled the position on November 20, 1861 (i.e., she may have held no certificate empowering her to teach this discipline) (Tsirkulyar..., 1862a: 176). The post of overseer was, likewise, held by a female whose educational background is not mentioned in the report, the widow of a clergyman (Tsirkulyar..., 1862a: 176). Thus, the overall skill level of instructors in the female department was not very high, especially in the subjects not taught in the school's male department (the institution may have hired any instructor willing to do the teaching for money).

6) *Curriculum*. It was designed with teacher availability in mind. The core subjects were Religious Education, Reading and Grammar, Arithmetic, Geography, Russian History, Penmanship, and Handwork (Tsirkulyar..., 1862a: 178). Of note is the fact that at the much better staffed Mariinsky Kharkov Female School history was taught only beginning in Grade 3. On the other hand, the curriculum of the Female Department of Kupyansk Uyezd School included no natural sciences. The only elective course offered was French (Tsirkulyar..., 1862a: 178). There were plans to introduce Drawing class the following year, as an instructor was found who was prepared to teach it for free (Tsirkulyar..., 1862a: 178). The department was split into the higher

and lower divisions by the Pedagogical Council after the school year was under way "in accordance with the girls' intellectual development", with the higher one offering all subjects in the curriculum and the lower one not offering History and Geography (Tsirkulyar..., 1862a: 178-179). The institution, which had no senior grades as yet at the time, lacked adequate learning programs, but most of the teachers would provide reports on what was covered during the year. For instance, students attending the Reading and Grammar course in the higher division, read Krylov's fables, did dictations, and learnt grammar rules, while those attending it in the lower one were only taught pronunciation and reading (Tsirkulyar..., 1862a: 178-179).

7) *Budget*. Essentially, the picture here was similar to that with the budget of Mariinsky Kharkov Female School, if more contrastive. On one hand, the institution's total receipts amounted to 835 rubles and 39.5 kopecks, surpassing by a huge margin its expenditure (252 rubles and 99.5 kopecks) (Tsirkulyar..., 1862a: 177). On the other hand, its own annual income was limited to the above-mentioned 30 rubles, received for the electives, with the rest of it coming from donations gathered by the female trusteee and the supervisor (Tsirkulyar..., 1862a: 177). Thus, it was more than just a significant budget deficit, as in the case of Mariinsky Kharkov Female School – the department had virtually no income of its own, subsisting strictly on donations from those caring about female education.

As we can see, the Female Department of Kupyansk Uyezd School scraped by, with its lack of popularity within the local community leading to a small student body and perennial funding shortages. There actually was little hope for the situation to improve if nothing was done about it. In that climate, the administration of the Kharkov Educational District resorted to some fairly risky measures. Firstly, it decided to introduce at least a small fee payable by students for attending its core subjects, 3 rubles a year for a start. Secondly, it resolved to transform the department into a second-class female school, making it an independent institution with a full-fledged board of trustees of its own (Tsirkulyar..., 1862a: 180).

Lipetsk Female School (1862)

1) *Prehistory*. Unfortunately, the report provides no information regarding the school's prehistory. What is only known is that it opened up in the middle of a school year – on February 4, 1862 (Tsirkulyar..., 1862b: 187).

2) *Board of Trustees*. The school's Board of Trustees was formed in a fashion standard for female schools at the time – it was composed of the female trustee (the wife of the uyezd nobility marshal), the uyezd nobility marshal, the city mayor, the principal, the supervisor, and two elective members (one from the nobility and the other from the merchantry of Lipetsk) (Tsirkulyar..., 1862b: 188). Unfortunately, the report does not provide any details regarding how successfully the Board members combined their main job with running the school, either. With that said, as will be shown below, at this school the Board of Trustees was vested with even broader functions than its Mariinsky Kharkov Female School counterpart.

3) *Staff pay*. The financial assistance from the community of Lipetsk (this is discussed later below) enabled the school to offer generous salaries to its staff, even though it paid less than Mariinsky Kharkov Female School. It had an annual payroll of 950 rubles – 350 rubles for its teachers, 300 rubles for its principal (200 rubles in salary and 100 rubles in cash bonuses), 150 rubles for its only principal assistant, 100 rubles for its housekeepers, and 50 rubles for its chief clerk (Tsirkulyar..., 1862b: 189-190). Lipetsk Female School paid half as much to some of its staff members as what Mariinsky Kharkov Female School did. Specifically, the principal was paid 300 rubles – versus 600 rubles at the other school, and the principal assistant received 150 rubles – versus 300 rubles paid to each educatress at the other school. A salary of this size was enough to attract teachers capable of adequate instruction and not to be limited to the services of persons prepared to teach for free, as in the Female Department of Kupyansk Uyezd School. However, a teacher could earn more in a large city than what Lipetsk Female School was prepared to offer them.

4) *Student composition and tuition pricing*. This educational institution had the most noteworthy tuition payment system among the three examined in this study. The Lipetsk community, which had chosen not to limit itself to one-off donations, had taken on the obligation to pay the school 1,112 rubles and 80 kopecks a year (Tsirkulyar..., 1862b: 189). In return, the school had agreed to teach girls representing the town's merchantry and urban commoners completely free of charge (Tsirkulyar..., 1862b: 190). Perhaps, it is for this reason that the school had no fixed tuition fees in place – when a girl not from the Lipetsk community enrolled in the school, the Board of Trustees would consider her case individually and the cost of her tuition would

be based on the financial circumstances of her family (Tsirkulyar..., 1862b: 190). At the end of the first school year, the school had an enrollment of 78 girls, with just eight of these paying to attend it (Tsirkulyar..., 1862b: 188, 190). However, of the eight formally paying students, three were later exempted from paying tuition fees by the Board of Trustees due to poverty, with the remaining five getting to pay 42 rubles a year by way of semi-annual payments (Tsirkulyar..., 1862b: 190). Quite expectably, with a tuition payment system like this in place, the social composition of the school's student body was completely different from that at the educational institutions in Kharkov and Kupyansk – it was a lot more democratic, but it was also dominated by girls representing the wealthy merchant social group. It was attended by not a single daughter of a hereditary noble, 4 daughters of personal nobles, 30 girls representing the merchantry, 43 urban commoners, and 1 daughter of a soldier (Tsirkulyar..., 1862b: 188). If we compare this situation with that at the educational institution in Kupyansk, we can see that in the Kharkov Educational District being free to attend alone was not enough for parents to want to send their children to a particular female school, while being free to attend and being cared for by the local community made a school quite attractive to relatively average people.

5) *Teaching staff and the Pedagogical Council*. In this area, the school was similar to the Female Department of Kupyansk Uyezd School – the majority of its teachers were male instructors from the local uyezd school, with only the organizational positions of principal and assistant principal being held by females (the assistant principal combined her post with that of teacher of handwork) (Tsirkulyar..., 1862b: 188). The report says nothing about the educational background of these two staff members.

6) *Curriculum*. Although initially the school had been intended as a three-grade educational institution, it had to limit itself to enrollment in Grade 1 and a special (preparatory) grade due to low levels of knowledge among the initial entrants (Tsirkulyar..., 1862b: 188). In terms of learning programs, the focus may have been on making them as close to those of male uyezd school as possible. Specifically, Grade 1 offered "the same subjects as those offered in Grade 1 at the uyezd school, with the only difference being that girls were to be provided slightly simplified instruction to ensure it matched the time's child-rearing practices used for girls (Tsirkulyar..., 1862b: 188). There were no elective subjects in the curriculum – neither French, nor Drawing. The report for this school says nothing about whether or not there were plans to introduce any there. Other than that, the curriculum was similar to that of the Female Department of Kupyansk Uyezd School. There was History, but there was no Natural History. The school offered the following subjects in both its Grade 1 and preparatory grade: Religious Education, Russian, Arithmetic, History, Geography, Penmanship, and Handwork (Tsirkulyar..., 1862b: 188). The syllabus for the school's preparatory grade may have been not a very well-designed one. For instance, the report does list History and Geography in its lesson distribution section, but it mentions none of these courses in the section concerned with what specifically was covered in that grade (Tsirkulyar..., 1862b: 188-189).

7) *Budget*. Compared with the other two schools, Lipetsk Female School had a surplus budget, although that was mainly owing to annual donations. In addition to the sum of 1,112 rubles and 80 kopecks, received from the city community, 300 rubles was to be annually donated by members of the Board of Trustees and 61 rubles by different private individuals, amounting to annual receipts of 1,473 rubles and 80 kopecks, even exclusive of the school's own earnings (Tsirkulyar..., 1862b: 189). The school's planned annual expenditure was 1,285 rubles for a start (Tsirkulyar..., 1862b: 190). Thus, Lipetsk Female School not only had a surplus of funding at the end of its first year of operation but could also rest assured that its annual revenue would continue to surpass its annual expenditure in the future as well. However, the price to pay for that was its ever-increasing dependence on the local community and members of the Board of Trustees personally – this is whom the school drew almost all of its funding from.

As we can see, during its first year in existence, Lipetsk Female School achieved significant success, in terms of both academic-organizational (the size of its student body reaching 78) and organizational-financial (its fixed annual revenue surpassing its fixed annual expenditure) performance. With that said, the school was dominated by non-paying students, while in terms of social background the overwhelming majority were urban commoners, i.e. members of one of the lower social groups. Thus, the school was successful in spreading female education among members of the relatively poor strata of society and was accessible to them. However, this exclusively was achieved owing to input from the local community, whose members had agreed to

not only fund the opening of the school but provide funding annually toward its operation going forward as well.

5. Conclusion

The study's findings, derived from an analysis of the operation of three educational institutions within the Kharkov Educational District of the Russian Empire, produced the conclusion that in the early 1860s the operation of most female schools in the Russian Empire may have depended not so much on national documents and decisions made in the capital as it may have on local factors. A critical factor was the attitude of a local community toward a school. In the Kharkov Educational District, they by no means considered it normal to have teachers work for free and have a school subsist on donations from people who had chosen to support it. However, none of the schools examined in this part of the study (and none explored in its second part, either) were able to attain self-sufficiency – not even where the bulk of the pedagogues worked for free.

Donations represented a critical contributor to a female school's budget, and their volume depended on how interested members of a local community were in its existence. A local community could have a say in various matters concerning the operation of a school, even including whether or not it would be free to attend for students. For instance, the local community in rich Kharkov did not guarantee annual donations for the female school, but it did manage to enroll enough girls from rich families for payments received from them to cover the bulk of the school's expenditure (there were cases where the education of poor girls was paid for by people who felt pity for them and cases where teachers provided instruction free of charge). Although in *Bulletin of the Kharkov Educational District* this approach was touted as one helping ensure that "the school has more funds in its budget and does not worry about having to limit the number of non-paying students", it was not embraced in the other schools. At the same time, the local community in Lipetsk had agreed to donate annually to the female school a sum covering most of its expenditure on condition that Lipetsk girls representing the merchant and urban commoner social groups (i.e., the majority of the student body) attend it free of charge. As a consequence, the bulk of the school's student body was made up of girls from the relatively poor urban commoner social group.

Consequently, this state of affairs inevitably resulted in each female school in the Kharkov Educational District being tangibly different from the rest in the early 1860s. Depending on the wishes of the local community, each school had a different budget (both in size and in source of funding), a different staff composition, a different social composition of the student body, and even a different set of subjects in the curriculum. More specifically, in some cases (i.e., the extremely poor Female Department of Kupyansk Uyezd School) the actual set of disciplines was formed based on the availability of pedagogues prepared to work for free – the introduction of Drawing class in the Female Department of Kupyansk uyezd school was motivated exclusively by there becoming available an instructor prepared to work for free teaching it. However, it was not always about the financial side of it. Specifically, the Female Department of Kupyansk Uyezd School, which desperately lacked funding, did nonetheless introduce French, a prestigious language to learn at the time, as an elective. By contrast, Lipetsk Female School, which was a much more financially fit educational institution, offered no electives in the prestigious disciplines that would be reflective of one's high status in society. The other schools offered French, German, Music, and Dancing as electives. Quite naturally, the schools differed in the social composition of the student body, too. Specifically, the dear Mariinsky Kharkov Female School, which offered French, Music, and Dancing, was dominated by girls representing the nobility and the merchantry and did not enroll many urban commoners. Lipetsk Female School, which was free to attend and offered no prestigious courses, enrolled almost no noble students but was attended by many urban commoners.

Thus, in the early 1860s, the term 'female school' could be used in the Russian Empire to refer to educational institutions that were fairly different in terms of curriculum, level of teaching, and social composition of the student body. A critical factor determining the image of a school was the attitude of the local community toward it. Unfortunately, most of the reports published in *Bulletin of the Kharkov Educational District* provide little insight into this. Thankfully, there are two exceptions – two school reports offering a fairly detailed look at the complex relationships between a school and a local community. These two reports will be examined in detail in the study's second part.

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Public Libraries in the Russian Empire at the Turn of the 19th and 20th centuries: Key Characteristics of Their Operation

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Abstract

This work explored the operation of public libraries in the Russian Empire at the turn of the 19th and 20th centuries. Consideration was given to the legal-and-regulatory framework for such libraries, their distribution by type, and the key characteristics of how their book stock was funded and built.

The principal sources for the study were relevant collections of materials and those of published documents.

The study's findings revealed that at the turn of the 19th and 20th centuries public libraries served in Russia as an important tool for the self-education of both the nation's young and adults. By the end of the 19th century, a significant amount of experience had been amassed in Russia in terms of educating youth and creating the conditions for fostering citizenship in individual members of society. This education was grounded in the family as the basis on which the state is organized, benevolence, and staying true to one's obligations.

By the start of the 20th century, Russian librarians managed to create the conditions for popularizing public libraries in society. This was done via visual attraction (e.g., attracting young readers via drawing and painting exhibitions) and a diverse repertory, typically dominated by works of fiction. The nation's vast network of libraries provided its population, including those living in the countryside, with an opportunity to self-educate.

Keywords: public library, self-education, literacy, Russian Empire, regulatory framework, sustainable development in education, education policy, education reform.

1. Introduction

At the turn of the 19th and 20th centuries, the government of the Russian Empire undertook a series of measures to spread literacy in Russian society. The focus was not only on reaching as many

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individuals with school education as possible but also creating appropriate conditions for out-of-school education, especially for adults. A significant part of out-of-school education was free public libraries, which operated not only in the nation's cities but its agrarian areas as well. The present work is focused on the characteristics of the operation of such libraries in the Russian Empire.

2. Materials and methods

The principal sources for the study were relevant collections of materials and those of published documents. The former included a variety of recommendations regarding the opening of public libraries, namely 'How to Open and Organize Public Free Libraries, Reading Rooms, School Libraries, and Public Readings' (Kak otkryvat'..., 1900), 'A Handbook for the Organization of Free Public Libraries and Reading Rooms' (Rukovodstvo..., 1895), and the book selection catalog 'School Libraries for Children Aged Under 15' (Shkol'nye biblioteki..., 1908).

The second group included both collected documents (e.g., 'Laws and Reference Information on Primary Public Education' (Zakony..., 1898)) and a set of regulations relating to the work of actual libraries (Pravila..., 1890; Ukazaniya..., 1897; Primernyi ustav..., 1894).

The study was grounded in principles of scholarly historical inquiry such as historicism and objectivity. Use was made of methods such as analysis and summarization. The use of these principles and methods helped take a comprehensive look at the regulatory framework for public libraries and identify the key characteristics of the operation of such libraries in Russia at the turn of the 19th and 20th centuries.

3. Discussion

While the historiography on the subject is fairly extensive, it has been appearing over the last 100 years in quite an uneven manner. The first publications on public libraries began to come out back in the imperial period. For instance, in 1894 M.F. Superansky addressed the subject of creating public libraries and reading rooms (Superanskii, 1894). Around the same time, in 1897, S.G. Smirnov investigated the attitude of the peasantry toward the creation of public libraries (Smirnov, 1897).

During the Soviet period, back at the time of the Civil War in Russia, there came out a work by A.K. Pokrovskaya on the operation of children's and school libraries (Pokrovskaya, 1919). Of note is that in that work the author assumes a fairly liberal stance and you don't really feel the pressure of Soviet ideology. Subsequent to the rise of J.V. Stalin's personality cult, the subject of Russian Empire-period public libraries was given little to no attention, as it did not fit into the Soviet narrative about "illiterate, horse-and-buggy Russia". Nevertheless, even during that time such writings did appear in certain narrowly specialized publications (e.g., 'The First Public Libraries' by M.Ya. Dvorkina, an article published in the magazine *Bibliotekar'* (Russian: "Librarian") (Dvorkina, 1978)).

The early 21st century witnessed the subject's true renaissance. It is during this time that the topic of imperial-period public libraries was investigated in both the national and regional contexts. Specifically, the subject of public libraries in the Russian Empire in the 1850s–1860s was explored by M.Yu. Matveyev (Matveev, 2012). The subject of public libraries run by the Society of Adherents of Russian History at the turn of the 19th and 20th centuries was explored by Yu Jie (Tsze, 2023).

At the same time, the subject has been keenly investigated in the regional aspect. Specifically, N.P. Glukhova explored the operation of free public libraries through the example of Tomsk Oblast (Glukhova, 2006); T.L. Kononova explored similar processes in Kursk Governorate (Kononova, 2013); public libraries in the Far East were explored by I.A. Zemlyansky (Zemlyanskii, 2013); urban public libraries in Saint Petersburg were explored by V.N. Novikov (Novikov, 2008); the emergence of public libraries in Nizhny Novgorod Governorate was explored by Ye.G. Kapranova (Kapranova, 2010); World War I-period public libraries and readings during were explored by Ye.Yu. Semenova through the example of Samara and Simbirsk Governorates (Semenova, 2004); public education in Orel Governorate was explored by Ye.P. Sleptsova (Sleptsova, 2021); secular urban libraries in Tobol Governorates were explored by A.I. Dudkin (Dudkin, 2020); librarianship in Altai District was explored by M.N. Potupchik (Potupchik, 2017); the establishment of public libraries in Transbaikalia was explored by M.I. Sannikova (Sannikova, 2012).

4. Results

Legal-and-regulatory framework for public libraries

In their operation, public libraries and public reading rooms in the Russian Empire were guided by relevant pieces of legislation. Specifically, the main document regulating the operation of public reading rooms was *The Rules on Free Public Reading Rooms and the Procedure for the Oversight Thereof* (Pravila..., 1890). The rules were signed into law by the Minister of Internal Affairs of the Russian Empire on May 15, 1890, and were soon published. There were a total of 11 clauses, and it was clearly specified who would be responsible for the opening of such reading rooms and who would be concerned with overseeing their operation (Pravila..., 1890: 1-4).

The operation of actual libraries or reading rooms was regulated by a charter. A typical charter for a free library (reading room) comprised 19 clauses and listed the place the library was opened, the objectives behind its establishment, the sources of funding for it, the characteristics of how its book stock was built, information relating to the oversight thereof, information relating to the management thereof, and its benefactors (Primernyi ustav, 1894: 1-3).

By the end of the 19th century, numerous documents had been published in the Russian Empire regulating the operation of public libraries. Since many of such documents were open to different interpretations, the government would also work on the provision of comments to accompany the relevant ordinances. For instance, such comments would deal with the opening of public libraries within educational institutions, allowing the peasantry to make free use of rural schools under the purview of the Ministry of Public Education, and procedures for the establishment of public libraries (Zakony..., 1898: 544-548).

Typology

At the turn of the 19th and 20th centuries, there were three types of public libraries in the Russian Empire: 1) libraries under the purview of the Ministry of Internal Affairs; 2) libraries under the purview of the Ministry of Public Education; 3) libraries under the purview of the country's top ecclesiastical authority.

Those in the first group were typically established in private or public buildings and opening them required permission from a local governor. A public library under the purview of the Ministry of Public Education was normally based in the building of a public school, i.e. in a classroom. Opening one would require permission from the Ministry of Public Education. Lastly, establishing a public library in a church, a parochial school, an ecclesiastical school, or a literacy school would require permission from the top ecclesiastical authority (Kak otkryvat'..., 1900: 1).

During the period under review, non-recurrent expenditure on fitting out a public library was relatively not high. For urban libraries, the sum of 200–300 rubles would suffice (exclusive of the librarian's pay and payment for the building), whereas 50 rubles would be enough for rural ones. Where a library included a reading room, additional expenditure on furniture and lighting would be required, whilst where a library could only lend visitors books to take home it would suffice to just have a bookcase, a chair, and a table in order to provide customer service to them (Kak otkryvat'..., 1900: 4).

Funding

Rural libraries were funded via the following:

– special contributions levied for the purpose on local residents;

– fines;

– taxes;

– capital and revenue of banks and lending institutions;

– capital of villages;

– various fees and levies (Kak otkryvat'..., 1900: 5).

In terms of book purchase, it was encouraged in creating a public library to try to spend the funds as economically as possible. Indeed, in light of the provision of only limited funding for the purpose, every saved ruble could buy as many as 10 to 20 good books.

The late 19th century witnessed in the Russian Empire a widespread use of gubernia book warehouses, intended to help boost literacy among the population. Such warehouses contained ready-to-use sets of books for rural and urban libraries and these were 10–15% cheaper due to lower wholesale prices (Kak otkryvat'..., 1900: 6).

In selecting books, it was important to keep in mind that they would be read aloud not only to school-age individuals but to adults as well, both literate and illiterate. No matter how small a library's book stock was, it was recommended for it to include the works of Pushkin, Lermontov,

Gogol, Turgenev, Goncharov, Dostoyevsky, Krylov, and other classical writers. As it had become clear by the late 19th century that most Russian readers preferred works of fiction, most libraries in the Russian Empire had at least half of their book stock represented by this particular genre (Kak otkryvat'..., 1900: 6).

Another noteworthy fact is that in the early 20th century there existed the practice of publishing and republishing catalogs of selected books for children of different ages for school libraries. An example is the catalog 'School Libraries for Children Aged Under 15', compiled by a group of female teachers (D.E. Zevig, M.P. Lopyreva, Ye.Ye. Solov'yeva, Ye.I. Tikheyeva, and L.I. Tikheyeva) (Shkol'nye biblioteki, 1908). Let us take a quick look at the kind of literature that was recommended for a school library back then. Most of the works of fiction were focused on the family, followed by orphans and abandoned children, with the rest of the common topics including "how important children are in our lives", "love for people", "selflessness", "working for the benefit of society", "striving to be morally upright", "striving for freedom", "significance of art", "moral qualms", and "slavery". A standalone category was "remarkable people", which comprised themes such as "people with a strong will power", "people with a strong will power in everyday life", "people of science", "preachers and sages", and "musicians and artists". A separate theme was "writers" – it was focused on writers' biographies, writers' works adapted for children, foreign writers, and collections of literary works and poems. The spiritual-moral section was represented by themes such as "Old Testament", "New Testament", "heroes of the faith", and "pilgrimage to a holy site" (Shkol'nye biblioteki..., 1908: 1-40). Thus, most of the works of fiction recommended for reading were oriented toward nurturing one to be a highly spiritual and patriotic person, with a particular focus being on the family as a major unit in our social structure, benevolence, and service to your country.

The section 'Natural Science' covered botany, zoology, geology, mineralogy, physics, and geography. The section 'Prehistoric Past' comprised general history (ancient Egypt, Greece, and Rome and medieval England, Scandinavia, Bulgaria, Holland, France, Germany, Italy, and America) and Russian history (explored in a retrospective manner and by way of collections of historical documents) (Shkol'nye biblioteki..., 1908: 41-78).

At the end of the catalog was a little section containing the titles of books for free choice by students and books for teachers and a list of children's magazines (Shkol'nye biblioteki..., 1908: 79-95).

The time of giving out books was largely dependent on local conditions. For instance, with rural libraries, it would suffice to designate 2 to 3 days a week and 3 to 4 hours a day for the purpose. If libraries contained a reading room, they would have to operate on a more frequent and lengthy basis, and especially so in winter. Some of the best days for libraries to be open were holidays and market days.

Operation of libraries: registration of books given out, library customers, and reading room visitors

A public library typically had a special book where a librarian would write down information about each customer (full name, address, age, gender, and occupation). The same book would capture information about the giving out of books (the time a book was given out, its number in the catalog, and its title). It was not mandatory to write down the time the book was returned. Based on these records, an annual report would be drawn up containing information such as the number of customers, their distribution by gender, age, education, and occupation, the number of books given out across the various sections of the catalog, the most in-demand books, etc. (Kak otkryvat'..., 1900: 7).

Gathering such data was highly significant for getting an idea of how a library worked. As regards reading rooms, visitor records for them were limited to the following data: number of visitors, visitor distribution by gender and age, and number of books, newspapers, and magazines given out. Such records would form the basis for monthly and yearly reports on the operation of a reading room (Kak otkryvat'..., 1900: 7).

Rural libraries had rules of their own:

"1. Books are given out for reading at home free of charge, with no security or guarantee required.

2. Each customer can take home only one book at a time.

3. A customer can keep a book for no longer than 2 weeks; otherwise, they will have to get permission from the librarian.

4. A customer must treat each library book with care. The librarian reserves the right to fine a customer for a damaged or lost book the amount equal to the cost thereof.

5. A customer who fails to comply with the library's rules may be deprived by the librarian of the right to take books home to read." (Kak otkryvat'..., 1900: 22-23).

In Russian libraries, a fair amount of attention was paid to the issue of lost or damaged books. It was customary for librarians to quickly look through books returned by customers. A book's title page would list the number of colored pictures in it and the pictures themselves would be numbered so that it would be easier to check if they were intact. Some libraries would have a customer look through the book they were borrowing and ascertain it was intact. The rationale behind measures such as control of damaged and overdue books was to keep customers confident that a library strove to treat the books with care and maintain them in good physical condition and try to instill this sense of responsibility in them as well (Pokrovskaya, 1919: 19-20).

In 1916, an organization named the Russian Library Society was established in the Russian Empire on the initiative of attendees of the Moscow Library Courses. It sought to unite the efforts of librarians across the country for the purposes of enhancing librarianship and improving training for members of this professional community and their conditions of employment. As early as 1919, the Society published A.K. Pokrovskaya's 'On Work in Children's and School Libraries (Key Tenets and Practical Techniques)' (Pokrovskaya, 1919). According to the author's characterization of the way the stock of a children's library was typically built back then, of the total number of books in one, around 10 % were to be oriented toward those in the preschool group, 20 % – elementary group, 30 % – junior high group, and 40 % – senior high group. There was to be the following distribution across the key catalog sections: fiction – 60 % (fairytales and legends – 10 %, stories about children – 10 %, adventures and travels – 10 %, poems and plays – 10 %, classics – 10 %, and picture books – 10 %), reference books and magazines – 4 %, philosophy and morality – 1 %, religion – 2 %, social science – 2 %, linguistics – 1 %, exact sciences – 6 %, applied sciences – 4 %, art – 2%, literature – 2%, history – 6%, biography – 4%, and geography – 6% (Pokrovskaya, 1919: 13-14).

The choice of books in a library would have to be such as to be focused on meeting the interests of a child, responding to their practical needs, and helping them learn more about the world around them (Pokrovskaya, 1919: 14).

Interior design of libraries

A fair amount of attention was paid to the interior design of libraries as well. Specifically, in fitting out a children's library, there was a trend toward accentuating aspects such as tone consistency, coziness, cordiality and friendliness, simplicity, and fit-for-purpose design, with a focus on engaging the kids in decorating the library. A practice advised against was hanging the portraits of individuals who were alien to the children. It was recommended to use paintings and portraits that were comprehensible and interesting to them and change such art works on a regular basis in step with what was going on around in life. Librarians were encouraged to display collections of children's drawings, including those gifted by children customers, as a way to encourage children's creativity. An encouraged practice was decorating a library with elements of nature (e.g., bouquets of flowers, tree branches, leaves, flowers grown by a library's visitors, or aquariums looked after by the children (Pokrovskaya, 1919: 20-21)).

5. Conclusion

At the turn of the 19th and 20th centuries public libraries served in Russia as an important tool for the self-education of both the nation's young and adults. By the end of the 19th century, a significant amount of experience had been amassed in Russia in terms of educating youth and creating the conditions for fostering citizenship in individual members of society. This education was grounded in the family as the basis on which the state is organized, benevolence, and staying true to one's obligations.

By the start of the 20th century, Russian librarians managed to create the conditions for popularizing public libraries in society. This was done via visual attraction (e.g., attracting young readers via drawing and painting exhibitions) and a diverse repertory, typically dominated by works of fiction. The nation's vast network of libraries provided its population, including those living in the countryside, with an opportunity to self-educate.

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The System of Public Education in Astrakhan Governorate in the second half of the 19th and early 20th centuries. Part 4

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Abstract

This set of articles relies on a set of reference and memorandum books spanning 1873–1917 to explore the development of the system of public education in Astrakhan Governorate, a region in the Russian Empire. This is the fourth, and final, piece in the set. It addresses the period 1908–1916.

The principal sources used in this work were the Memorandum Books for Astrakhan Governorate spanning 1908–1918, the Most Faithful Reports of the Chief Procurator of the Holy Synod spanning 1908–1916, certain legislation of the Russian Empire (the Law of May 3, 1908), and a set of relevant documents from the Russian State Historical Archive.

In terms of methodology, use was made of the following research methods: historical-comparative, historical-typological, historical-systematic, historical-genetic, historical-statistical, content analysis, and synthesis.

The study's findings revealed that in the period from 1908 to 1914 the size of the student body in the region grew 1.22 times and the number of educational institutions there increased 1.16 times, which vis-à-vis the other regions of the Russian Empire examined is a fairly modest figure. The boy to girl student ratio was 1.75:1 in 1914 – i.e., female students were outnumbered by nearly twice as many male ones. This can be explained by the significant number of Muslim settlements in the region at the time.

In the period under examination, the number of secondary educational institutions in Astrakhan Governorate increased insignificantly and the number of lower educational institutions

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there declined, while the number of students enrolled in them increased, which indicates the region's institutions of this kind becoming significantly larger.

The dynamics of growth in the number of primary educational institutions in the region in the period from 1908 to 1914 were, likewise, fairly modest (an increase of 1.2 times). However, the number of students in this sector increased more noticeably, which may be explained by the passage of the Law of May 3, 1908 (focused on increasing funding for primary educational institutions).

By the end of 1914, the number of Orthodox Christian church schools in the region (not included in the above statistics) was 593, with a combined enrollment of 14,786 students. Most of these educational institutions were one-grade schools. This may be explained by the desire of the governorate's authorities to reach as wide a portion of the population with education as possible.

Overall, by January 1, 1915, of the region's 116,326 school-age children, school was attended by 58,983 individuals, i.e. roughly half of that group.

Keywords: public education, system of public education, public schools, Astrakhan Governorate, education in Astrakhan Governorate, sustainable development in education, education policy, education reform.

1. Introduction
This work is the fourth, and final, piece in the set and explores the timeframe from 1908 to 1916, covering the period when the Law of May 3, 1908, focused on additional funding for primary education, was in effect.

Following the lost Russo-Japanese War and the Revolution of 1905–1907, the policy pursued by the government of Emperor Nicholas II changed in the direction of liberalization of society. Via the Manifesto of October 17, 1905, Russia moved from absolute to constitutional monarchy and adopted a party-based system, with the State Duma become its representative top lawmaking body. The obvious need to modernize the nation's education system, particularly its system of primary education, led the Russian government to adopt the Law 'On the Allocation of 6,900,000 Rubles Toward the Needs of Primary Education' of May 3, 1908. One of the objectives for this paper was to evaluate the effectiveness of this law and assess the degree of development of the region's primary education sector vis-à-vis the previous period.

2. Materials and methods
The principal source used in this work was the Memorandum Books for Astrakhan Governorate spanning 1908–1918 (Pamyatnaya knizhka, 1908; Pamyatnaya knizhka, 1909; Pamyatnaya knizhka, 1910; Pamyatnaya knizhka, 1911; Pamyatnaya knizhka, 1912; Pamyatnaya knizhka, 1913; Pamyatnaya knizhka, 1914; Pamyatnaya knizhka, 1915; Pamyatnaya knizhka, 1916; Pamyatnaya knizhka, 1918), which contain information on all major areas of activity in Astrakhan Governorate, including education.

The Law 'On the Allocation of 6,900,000 Rubles Toward the Needs of Primary Education', of May 3, 1908, was consulted via 'The Complete Collection of Laws of the Russian Empire' (PSZRI, 1911).

In addition, use was made of the Most Faithful Reports of the Chief Procurator of the Holy Synod spanning 1908–1916 (Vsepoddanneishii otchet, 1911; Vsepoddanneishii otchet, 1913a; Vsepoddanneishii otchet, 1913b; Vsepoddanneishii otchet, 1915; Vsepoddanneishii otchet, 1916). This document contains information on the region's ecclesiastical education sector.

Use was also made of certain relevant archival materials from the Russian State Historical Archive (Saint Petersburg, Russia).

In terms of methodology, use was made of the following research methods: historical-comparative, historical-typological, historical-systematic, historical-genetic, historical-statistical, content analysis, and synthesis.

3. Discussion
Among the prerevolutionary works relating to the chronological period under review, of particular note are those by T.N. Ostroumov (Ostroumov, 1914) and V. Kalegulov (Kalegulov, 1918).

Among the works on the subject produced during the Soviet period, of particular note are those by I.M. Bogdanov (Bogdanov, 1964), V.Z. Smirnov (Smirnov, 1963; Smirnov, 1956), and A.G. Rashin (Rashin, 1951) and the essays on the history of pedagogical thought in Russia (Ocherki, 1976; Ocherki, 1991).

Among the modern works covering the history of education in Astrakhan Governorate, of particular note are the works by D.Yu. Arapov (Arapov, 2004), V.M. Viktorin (Viktorin, 2008), I.Ye. Krapotkina (Krapotkina, 2011), A.M. Treshchev, G.V. Alferova, and Ye.A. Tarabanovskaya (Treshchev i dr., 2001), A.B. Olneva (Ol'neva, 1988), I.K. Zagidullin (Zagidullin, 1992), R.M. Islemisova (Islemisova, 2013; Islemisova, 2014; Islemisova, 2015), R.G. Rezakov and F.M. Rekesheva (Rezakov, Rekesheva, 2014), and Ye.A. Tarabanovskaya (Tarabanovskaya, 2016). A significant portion of this research is focused on the ethnic characteristics of education in the region (in particular, that of the Volga Tatars).

As part of the present study, a comparative analysis was also conducted of the development of the system of public education in Astrakhan Governorate during the period under review vis-à-vis a set of other regions of the Russian Empire, including Vologda Governorate (Cherkasov et al., 2019), Penza Governorate (Mamadaliev et al., 2022b), Volyn Governorate (Cherkasov et al., 2022), and certain areas within the Caucasus Educational District (e.g., Magsumov et al., 2020, Magsumov et al., 2021, and Molchanova et al., 2019).

4. Results

A classification of educational institutions in the Russian Empire by type was provided in the second piece of the set. As in each of the previous parts of the study, higher education was outside of the scope of this work.

At year-end 1908, Astrakhan Governorate had the following secondary educational institutions under the purview of the Ministry of Public Education (Pamyatnaya knizhka, 1908: 289-297):

1. Astrakhan Male Gymnasium;
2. Astrakhan Real School;
3. Astrakhan Mariinsky Gymnasium;
4. First-Class Male School of G.S. Sobolev;
5. Astrakhan Female Gymnasium of N.S. Shaverdova;
6. First-Class Female School of N.A. Vutecic;
7. First-Class Female School of Ye.N. Paltseva;
8. Astrakhan Ecclesiastical Seminary;
9. Astrakhan Male Ecclesiastical School;
10. Diocesan Female School;
11. Astrakhan Music School;
12. Astrakhan First-Class School of Gardening;
13. Astrakhan School for Feldshers and Nurse Midwives;
14. Astrakhan School of Short-Distance Navigation;
15. First-Class Obstetric School.

Astrakhan Governorate had the following lower educational institutions under the purview of the Ministry of Public Education at the lower chronological boundary of this study (Pamyatnaya knizhka, 1908: 297-298):

1. Artistic and Technical-Drawing School;
2. Emperor Alexander II Male Tradesman's School;
3. Male Tradesman's School (run by a charitable society);
4. Male Armenian Tradesman's School;
5. Female Tradesman's School (run by a charitable society);
6. School for Deaf-and-Dumb Children;
7. Network of urban three-grade schools;
8. Network of Muslim madrasas.

The region's primary educational institutions included a number of parish schools, primary schools, and Muslim maktabs.

In 1909, the region became home to Urban Commercial School in the city of Astrakhan, as well as Mariinsky Female Four-Grade School. The latter enrolled girls aged 9 to 11, no more than 40 students per grade (Pamyatnaya knizhka, 1913: 338). The four-year course of study was tantamount to that of a progymnasium in the Caucasus Educational District (e.g., Rajović et al., 2022, Cherkasov et al., 2020b, Mamadaliev et al., 2020, and Mamadaliev et al., 2021b).

In 1911, Astrakhan Second Male Gymnasium was opened on the fourth section of the embankment of the River Kutum on Gorodskaya Street. The school had no grant-aided students (Pamyatnaya knizhka, 1913: 336).

In addition, in 1911, Astrakhan School of Short-Distance Navigation was transformed into Urban Four-Grade School, which enrolled "children of all religious and social backgrounds" (Pamyatnaya knizhka, 1913: 342). The school had four core grades and two preparatory grades – i.e., it had a six-year program of study, which made it a secondary educational institution.

In 1912, the city of Astrakhan became home to the region's second male gymnasium. Overall, there were five secondary gymnasium-type educational institutions in the region at the time. The four gymnasiums (2 male and 2 female) and the real school had a combined enrollment of 2,570 students (1,428 males and 1,142 females), an increase of 137 on the previous year (Pamyatnaya knizhka, 1913: 335).

In 1912, the city of Astrakhan became home to First-Class Female School of Z.A. Iodkovskaya.

In 1913, Nikolayevskaya Sloboda, Tsarevsky Uyezd, became home to a female gymnasium (qualifying as such based on the Regulation of May 24, 1874), which was based on a second-class private educational institution that later became a first-class school (Pamyatnaya knizhka, 1913: 335).

The 1914 Memorandum Book touches on the reasons behind the decline in educational institutions and students in the region at the time in the following passage: "Despite the tough economic conditions, caused by the poor harvests there have been over the past few years, public school life does go on, even if slowly. … Most of the governorate's residents are sympathetic to schooling. More and more peasants are advocating for more schools, many ready to contribute to the cause out of their own pocket" (Pamyatnaya knizhka, 1913: 335).

In addition, the source suggests directly that "the development of primary education in the governorate would progress faster if there were a focus on universality in education and regularity; however, to date, there has not been built in the governorate a common school network and no work has been undertaken to implement mandatory education. This highly important and pressing issue is waiting to be favorably resolved through the efforts of the zemstvo institutions in the governorate" (Pamyatnaya knizhka, 1913: 335). Evidently, the source's authors rate the performance of the responsible authorities in terms of implementing mandatory education in the governorate as unsatisfactory.

The source goes on to state the following: "In the accounting year, with the adoption of the Law of June 25, 1912, on higher primary schools, the Directorate received numerous requests from peasant communities calling for the opening of such schools, which is testimony to the peasants' desire to provide their children with both basic literacy skills and a higher primary education. But, unfortunately, requests for the opening of higher-type schools in villages can be fulfilled only if substantial funding is provided toward the construction of new buildings, as there is currently a lack of vacant and suitable spaces in villages for use at least as temporary spaces to house such schools, and to construct such buildings a fairly large amount of time may also be needed apart from funding. Such requests will most likely be fulfilled quickly only in rich villages. . . . No less sympathetic to the public education cause are the governorate's non-Slavs – the Tatars, Kyrgyz, and Kalmyks. According to the [Education] Directorate for the Tatar Communities of the City of Astrakhan and Astrakhan Uyezd, lately there have been received numerous requests for permission to set up Russian-language classes at maktabs and madrasas, with ethnic Russians with the proper teaching qualifications desired to be invited to teach such classes. Many such requests are also coming in from the Kyrgyz community. Unfortunately, far from all of these petitions have been fulfilled, as it is not an easy task to meet such needs in a short period of time for a Kyrgyz population of 350,000" (Pamyatnaya knizhka, 1913: 335). As we can see, this was clearly a situation in which society's educational needs were too high to be met by the authorities. Such was the case in none of the other regions of the Russian Empire examined (e.g., Magsumov et al., 2022, Natolochnaya et al., 2022, Magsumov et al., 2021, and Mamadaliev et al., 2022b), which sets Astrakhan Governorate apart in the development of education.

In 1913, Astrakhan became home to the governorate's first teacher's seminary. The issue of demand for education outstripping supply in the region was not only and not so much associated with funding but rather staffing. And it finally was resolved, with the opening of a facility focused on training primary school teachers (Pamyatnaya knizhka, 1915: 513).

On the eve of World War I, the relevance of the need to implement mandatory education across the Russian Empire was stressed by the authors of the 1915 Memorandum Book in the

following passage: "This process was launched in the governorate by the Astrakhan City Public Administration. A plan for the school network in the city of Astrakhan was presented by the Ministry of Public Education and has been ratified by the Administration. The mandatory education implementation process has been launched in the cities of Krasny Yar, Yenotayevsk, and Cherny Yar. . . . With the introduction of the zemstvo in Astrakhan Governorate, which, in essence, began to operate on September 21, 1913, significant headway has been made on the issue of implementing mandatory education in the uyezds. All the ordinary uyezd zemstvo meetings that took place at the end of the last year resulted in the firm belief that mandatory education is to be implemented in the uyezds within the ten-year timeframe as established by the Ministry" (Pamyatnaya knizhka, 1915: 513-514).

Besides the public educational institutions, Astrakhan Governorate had in 1908–1916 19 private schools and boarding schools.

The Memorandum Books for 1916 and 1918 contain no information on the region's education system, and so the upper chronological boundary of this study stopped at the start of 1914.

Tables 1 through 3 display all the relevant data on the region's education system gathered for this piece of the set.

Of particular note is also the region's fairly extensive network of Orthodox Christian primary church schools, which comprised the following:
– several two-grade primary church schools (urban and rural);
– several one-grade primary church schools (urban and rural);
– several literacy schools (urban and rural);
– several first- and second-class primary church schools (urban and rural).

Table 1. Number of Educational Institutions and the Size of the Student Body in Astrakhan Governorate in the Period 1908–1913 (Pamyatnaya knizhka, 1908: 297, 300-306; Pamyatnaya knizhka, 1909: 290, 303-308; Pamyatnaya knizhka, 1910: 286, 297-305; Pamyatnaya knizhka, 1911: 304, 313-321; Pamyatnaya knizhka, 1912: 312, 321-329; Pamyatnaya knizhka, 1913: 326, 335-344; Pamyatnaya knizhka, 1914: 334-335, 347-356; Pamyatnaya knizhka, 1915: 512-514, 523-537).

| Year | Educational institutions | | | | | Total number of students[1] | | |
	Secondary	Lower	Primary[2]	Muslim religious[3]	Total	Boys	Girls	Total
1908	15	273	383	26/96	671	25,534	14,078	39,612
1909	15	273	402	N/A	690	26,363	14,311	40,664
1910	15	299[4]	425	N/A	739	27,877	15,544	43,421
1911	16	253	441	N/A	710	28,525	16,073	44,707
1912	17	221	460	N/A	698	29,052	17,025	46,077
1913	18	216	485	N/A	719	30,874	17,615	48,489

As evidenced in Table 1, the situation in the region's education sector was quite volatile throughout the period under review. Whereas there was a steady increase in the number of schools up to 1909, there was a decline in the period from 1910 to 1912, and after that the figure increased again. However, the number of students in the region rose all the time. This may be explained by the enlargement of educational institutions and the rise in the number of students per school, with the average figures being 59 and 66 in 1910 and 1912, respectively.

According to the 1913 Memorandum Book, "vis-à-vis 1910, the number of educational institutions dropped by 29, with the combined student body growing by 1,286. As in the previous years, growth in the number of students in the region was significantly ahead of that in the number of schools, leading to the latter being overfilled" (Pamyatnaya knizhka, 1913: 326).

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[1] The data are incomplete, as this information does not factor in the region's Muslim religious primary schools.

[2] This information does not include the region's Orthodox Christian church schools.

[3] The number of madrasas in the region (considered as lower educational institutions based on curriculum content) is shown as the numerator and the number of its maktabs (primary educational institutions) is shown as the denominator (these were part of the system of primary education, and so they are not included in the total above, as they are included in the total for the region's primary educational institutions).

[4] Of these, 13 were top-class public schools.

Compared with the other regions of the Russian Empire examined (i.e., those within the Caucasus Educational District (e.g., Magsumov et al., 2020, Magsumov et al., 2021, Mamadaliev et al., 2022b, and Molchanova et al., 2019), Vologda Governorate (Cherkasov et al., 2019), and Volyn Governorate (Cherkasov et al., 2022), this growth was relatively small, which is what was reflected in the negative reviews by the authors of the Memorandum Books for Astrakhan Governorate spanning 1910–1915.

Overall, by January 1, 1915, of the region's 116,326 school-age children, schools under the purview of the Ministry of Public Education were attended by 44,197 individuals (RGIA. F. 733. Op. 207. D. 39. L. 1). That is, there was a decrease relative to 1913 in the number of students in the region with the start of World War I.

Table 2. Distribution of the Student Body Across Secondary and Lower Educational Institutions in Astrakhan Governorate in the Period 1908–1913 (Pamyatnaya knizhka, 1908: 297; Pamyatnaya knizhka, 1909: 290; Pamyatnaya knizhka, 1910: 286; Pamyatnaya knizhka, 1911: Pamyatnaya knizhka, 1911: 304; Pamyatnaya knizhka, 1912: 312; Pamyatnaya knizhka, 1913: 326; Pamyatnaya knizhka, 1914: 334-335; Pamyatnaya knizhka, 1915: 512-513)

Year	Educational institutions					
	Secondary			Lower		
	Boys	Girls	Total	Boys	Girls	Total
1908	1,097	1,033	2,130	N/A	N/A	18,472
1909	1,215	1,091	2,306	N/A	N/A	19,271
1910	1,253	1,180	2,433	N/A	N/A	21,454
1911	1,212	1,158	2,370	N/A	N/A	21,673
1912	1,428	1,142	2,570	N/A	N/A	21,608
1913	1,397	1,098	2,495	N/A	N/A	21,943

The size of the student body within the region's secondary education sector increased steadily, even if at a minor pace. It is also worth noting that at the study's lower chronological boundary the region had approximately equal numbers of boy and girl students, which is uncharacteristic of the governorates within the Caucasus Educational District (e.g., Cherkasov et al., 2020c, Magsumov et al., 2022, Mamadaliev et al., 2022a, and Mamadaliev et al., 2021b). However, by the start of World War I, male students began to outnumber their female counterparts significantly, with the boy to girl student ratio becoming approximately 1.3:1.

The size of the student body within the region's lower education sector increased at a significant pace in the period from 1908 to 1910. Afterwards, its growth slowed down. However, the number of students in this sector decreased in none of the periods analyzed (unlike in the other regions examined (e.g., Cherkasov et al., 2020a and Mamadaliev et al., 2022b)).

Table 3. Distribution of the Student Body Across Primary and Muslim Religious Educational Institutions in Astrakhan Governorate in the Period 1908–1916 (Pamyatnaya knizhka, 1908: 297; Pamyatnaya knizhka, 1909: 286; Pamyatnaya knizhka, 1910: 286; Pamyatnaya knizhka, 1911: 304; Pamyatnaya knizhka, 1912: 312; Pamyatnaya knizhka, 1913: 326; Pamyatnaya knizhka, 1914: 335; Pamyatnaya knizhka, 1915: 513)

Year	Educational institutions					
	Primary			Religious Muslim (madrasas and maktabs)		
	Boys	Girls	Total	Boys	Girls	Total
1908	N/A	N/A	19,010	3,550	905	4,455
1909	N/A	N/A	19,811	N/A	N/A	N/A
1910	N/A	N/A	21,994	N/A	N/A	N/A
1911	N/A	N/A	23,486	N/A	N/A	N/A
1912	N/A	N/A	25,488	N/A	N/A	N/A
1913	N/A	N/A	27,576	N/A	N/A	N/A
1914	N/A	N/A	N/A	N/A	N/A	N/A

1915	N/A	N/A	N/A	N/A	N/A	N/A
1916	N/A	N/A	N/A	N/A	N/A	N/A

The region witnessed a gradual and fairly substantial (but not compared with the other regions of the Russian Empire examined) increase in the size of the student body in its primary education sector. This trend may be explained by the passage of the Law of May 3, 1908 (focused on increasing funding for primary educational institutions).

As regards the region's religious educational institutions, statistical data on this sector were available only for 1908. The sector was dominated by male students, with the boy to girl student ratio there being approximately 4:1.

Table 4. Number of Parochial Schools in Astrakhan Governorate and the Size of the Student Body in This Sector in the Period 1908–1914 (Vsepoddanneishii otchet, 1911: 218-219, 242-243; Vsepoddanneishii otchet, 1913a: 110-111; Vsepoddanneishii otchet, 1913b: 176-177, 204-205; Vsepoddanneishii otchet, 1915: 120-121; Vsepoddanneishii otchet, 1916: 122-123)

Year	Number of schools				Number of students		
	Two-grade	One-grade	Literacy schools	Total	Boys	Girls	Total
1908	3	220	130	353	9,773	6,007	15,780
1909	3	255	94	352	9,318	6,289	15,607
1910	4	280	64	348	9,262	6,455	15,717
1911	5	270	44	319	9,101	6,584	15,685
1912	5	257	35	297	8,212	6,412	14,626
1913	6	256	35	297	8,195	6,456	14,651
1914	6	258	27	593	8,206	6,580	14,786

By the end of 1914, the number of Orthodox Christian church schools in the region was 593. Most of these were one-grade schools. There were very few two-grade schools. The number of literacy schools in the region was relatively small, too. This may be explained by the desire of the governorate's authorities to reach as wide a portion of the population with education as possible. Primary educational institutions with a more advanced program of study were not in demand.

The size of the student body in the region's sector of church schools was well in line with the proportion in the number of educational institutions – the largest number of students was in one-grade primary schools. The region's literacy schools and two-grade primary schools had fewer students. However, the latter were pretty large – an average of 99 students per school, while it was 52 for their one-grade counterparts. The overwhelming majority of one-grade schools in the region were rural. However, not only did the overall size of the student body not increase in the period under review, but it actually decreased.

5. Conclusion

The study produced the following conclusions:

1. The total number of students in Astrakhan Governorate in 1908 was 39,612 (25,534 boys and 14,078 girls). The boy to girl student ratio was 1.8:1 – i.e., female students were outnumbered by nearly twice as many male ones. This trend was characteristic of the Caucasus Educational District and uncharacteristic of the regions in central Russia and the western part of the Russian Empire. This may be explained by the significant number of Muslim settlements in the region (e.g., Kyrgyz and Tatar), meaning that, given their mentality and traditions, the region's Muslim residents were not particularly inclined to develop female education there. By 1914, the region had 48,489 students (30,874 boys and 17,615 girls). The boy to girl student ratio was 1.75:1 – i.e., the region had just about the same proportions in terms of the gender distribution of its student body as before, which is another distinctive characteristic of the education sector in Astrakhan Governorate.

The total number of educational institutions in the region increased from 617 to 719, which is quite insignificant vis-à-vis the other governorates of the Russian Empire examined.

2. The region had 15 secondary educational institutions, with a combined enrollment of 2,130, in 1908. The respective figures were 18 and 2,495 in 1914. On average, there were 139 students per school.

At the study's lower chronological boundary, the region had approximately equal numbers of boy and girl students. However, by the start of World War I, male students in the region began to outnumber their female counterparts significantly, with the boy to girl student ratio becoming approximately 1.3:1.

3. The region had 273 lower educational institutions in 1908. By the start of 1914, their number dropped to 216. The figure peaked at 299 in 1910. This decline is explained not by the population's declining demand for educational services but by the poor funding of educational institutions in this sector, as well as their significant enlargement. What speaks to the latter is the following important factor: in 1908, the region had a student body of 18,472 in this sector, and the figure was 21,943 by the start of 1914 – i.e., the size of the student body in the region's lower education sector increased nearly 1.2 times, whereas the number of lower educational institutions dropped 1.3 times.

4. The number of primary educational institutions in the region rose from 383 in 1908 to 485 in 1913, an increase of approximately 1.3 times, which is quite modest vis-à-vis the other regions of the Russian Empire examined.

With that said, whereas the number of educational institutions in the region grew insignificantly, and even declined (as was the case with its lower educational institutions), the size of its student body increased all the time, which may be explained by the enlargement of its educational institutions and growth in the number of students per school, with the average figures being 59 and 66 in 1910 and 1912, respectively.

The region's primary education sector, too, witnessed a gradual, and fairly significant, increase (but not vis-à-vis the other regions of the Russian Empire examined) in the size of the student body. This trend may be explained by the passage of the Law of May 3, 1908 (focused on increasing funding for primary educational institutions).

As regards the region's religious educational institutions, statistical data on this sector were available only for 1908. The sector was dominated by male students, with the boy to girl student ratio there being approximately 4:1.

5. The number of Orthodox Christian church schools in the region, which were not included in the above statistics, was 593 by the end of 1914. Most of these were one-grade schools. This may be explained by the desire of the governorate's authorities to reach as wide a portion of the population with education as possible. The overwhelming majority of one-grade schools in the region were rural. The region's two-grade schools were quite large – on average, such schools were attended by 99 students, whereas the figure for their one-grade counterparts was 52. However, not only did the overall size of the student body not increase in the period under review, but it actually decreased.

By January 1, 1915, of the region's 116,326 school-age children, school (ministerial and parochial educational institutions) was attended by 58,983, i.e. half of that group.

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The System of Public Education in Kursk Governorate (1808−1917). Part 2

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Abstract

This paper is the second part of a study focused on the system of public education in Kursk Governorate in 1808−1917. It covers the period 1900−1917.

The primary sources used for this work are archival sources and collections of published documents. The first group is represented by the Russian State Historical Archive (Saint Petersburg, Russian Federation), more specifically records from the Ministry of Public Education containing the numbers of school-age children (ages 8–11) and students as at January 1, 1915, across the regions of the Russian Empire. The second group includes the annual statistical digest *Overview of Kursk Governorate*, *The Most Faithful Report of the Chief Procurator of the Holy Synod*, and certain statistical materials on educational institutions in Kursk Governorate.

The study's findings revealed that the system of public education in Kursk Governorate experienced in 1900−1917 a period of dynamic development. During this period, the region witnessed a sharp increase in the number of secondary educational institutions, with all cities, including uyezd ones, and even some villages, there reached with secondary education. The region's lower education sector witnessed an improvement in the quality of education through a reorganization of uyezd schools into urban ones, and in 1903 there began a real boom in the opening of vocational schools. However, the biggest success was achieved in the region's primary education sector, where school was attended by 1916 by 80 % of its school-age children.

Keywords: system of public education, Kursk Governorate, period 1900−1917, gymnasiums, primary schools, parochial schools, sustainable development in education,

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education policy, education reform.

1. Introduction

At the beginning of the 20th century, Kursk Governorate was part of one of the more progressive educational districts in the Russian Empire – Kharkov Educational District, which also included Voronezh, Penza, Tambov, and Kharkov Governorates and Don Host Oblast. In 1897, this area had a population of more than 14.2 million (Naselenie imperii…, 1898: 27-29), ranking third among the country's educational districts in population size, behind the Kiev Educational District (14.7 million) by a small margin and the first-ranked Moscow Educational District (17.9 million) (Naselenie imperii…, 1898). This part of the work explores the system of public education in Kursk Governorate in the period from 1900 to 1917.

2. Materials and methods

The primary sources used for this work are archival sources and collections of published documents. The first group is represented by the Russian State Historical Archive (Saint Petersburg, Russian Federation), more specifically records from the Ministry of Public Education containing the numbers of school-age children (ages 8–11) and students as at 1 January 1, 1915, across the regions of the Russian Empire. The second group includes the annual statistical digest *Overview of Kursk Governorate*, *The Most Faithful Report of the Chief Procurator of the Holy Synod*, and certain statistical materials on educational institutions in Kursk Governorate (Uchebnye zavedeniya…, 1911).

Methodologically, the work relies on a set of fundamental historical principles (historicism, systematicity, and objectivity). Use was made of research methods such as the statistical method, which is central to conducting historical-statistical research, the content analysis method, which is central to gathering and verifying information, and the retrospective method, which is central to examining the relevant events in their historical sequence. The use of the above principles and methods helped develop a comprehensive insight into the system of public education in Kursk Governorate at the beginning of the 20th century.

3. Discussion

The historiography of the subject under discussion can be divided into two thematic groups: 1) the research devoted to the actual system of public education in Kursk Governorate; 2) the research devoted to the activity of the Kharkov Educational District and other educational districts in the Russian Empire at the beginning of the 20th century.

The first group includes, in addition to those mentioned in the study's first part (Rajović et al., 2023), the following works: the work by V.V. Korovin and A.V. Romanov, which explores the development of the system of public education in Kursk Governorate during World War I (Korovin, Romanov, 2014), and the article by T.L. Kononova, which explores zemstvo public libraries in the period between the late 19th and early 20th centuries (Kononova, 2020).

The second group includes the following works focused on the beginning of the 20th century: the one by A.A. Cherkasov and his colleagues, which explores the system of public education in Voronezh Governorate, Kharkov Educational District (Cherkasov et al., 2020), the one by A.M. Mamadaliyev and his colleagues, which explores the system of public education in Penza Governorate, Kharkov Educational District (Mamadaliev et al., 2022), the one by O.V. Natolochnaya and her colleagues, which explores the system of public education in Vilna Governorate, Vilna Educational District (Natolochnaya et al., 2020), and the one by V.S. Molchanova and her colleagues, which explores the development of primary education in Kuban Oblast, Caucasus Educational District (Molchanova et al., 2020).

4. Results

As at 1900, the system of public education in Kursk Governorate was represented by an extensive network of educational institutions, which comprised 26 secondary, 16 lower, and 1,667 primary educational institutions (811 schools under the purview of the Ministry of Public Education and 856 schools under the purview of the Holy Synod) (Rajović et al., 2023: 259-266).

Secondary education

As at 1900, Kursk Governorate had 26 secondary educational institutions, with a combined enrollment of 1,947 boys and 3,779 girls (Rajović et al., 2023: 259-266). Subsequently, there were increases in the numbers of secondary educational institutions and students in them in the region. Specifically, as early as 1902, while the number of secondary educational institutions in the region did not increase, the number of students in this sector increased nearly 20%, from 5,726 to 6,823 (Obzor Kurskoi gubernii, 1903: vedomost' № 7). By 1904, the number of female gymnasiums and progymnasiums in the region increased by another two, to 17 educational institutions (Obzor Kurskoi gubernii, 1905: vedomost' 7).

By 1906, three male educational institutions were opened in the region – two private real schools in Kursk and Stary Oskol and a private male progymnasium in Grayvoron. On the other hand, a large portion of the region's female progymnasiums were reorganized into female gymnasiums, with their total number there reaching 12 (Obzor Kurskoi gubernii, 1907: prilozhenie № 8). In addition, Kursk became home to a private school for training female teachers (Obzor Kurskoi gubernii, 1907: prilozhenie № 8).

By 1908, the number of students in the region's secondary education sector surpassed 10,000, with more than two thirds of this student body being accounted for by females (Obzor Kurskoi gubernii, 1909: prilozhenie № 9).

By 1914, the region had two teacher's seminaries (one in Kursk and the other in Sudzha) and a teacher's institute (Belgorod) (Obzor Kurskoi gubernii, 1915: prilozhenie № 9). By 1915, Kursk Governorate had secondary educational institutions for boys and those serving girls in all its cities and uyezds, and even in some of its villages (e.g., Borisovka) (Obzor Kurskoi gubernii, 1916: prilozhenie № 9).

Table 1 displays the data on secondary educational institutions and students in them in Kursk Governorate in the period 1900–1915.

Table 1. Secondary Educational Institutions in Kursk Governorate in 1900–1915 (Obzor Kurskoi gubernii, 1901: vedomost' № 6; Obzor Kurskoi gubernii, 1903: vedomost' № 7; Obzor Kurskoi gubernii, 1905: vedomost' № 7; Obzor Kurskoi gubernii, 1907: prilozhenie № 8; Obzor Kurskoi gubernii, 1909: prilozhenie № 9; Obzor Kurskoi gubernii, 1911: prilozhenie № 9; Obzor Kurskoi gubernii, 1912: prilozhenie № 9; Obzor Kurskoi gubernii, 1915: prilozhenie № 9; Obzor Kurskoi gubernii, 1916: prilozhenie № 9)

Year	Type of educational institution							Total	Total number of students		
	Gymnasium		Progymnasium		Real school	Surveyor's school; charity school for girls and boys; feldsher school	Teacher's institute; teacher's seminary; teacher's school				
	Male	Female	Male	Female					Boys	Girls	Total
1900	3	6	1	9	1	4	2	26	1,947	3,779	5,726
1902	3	6	1	9	1	2	2	24	2,421	4,402	6,823
1904	3	6	1	11	1	2	2	26	2,763	5,492	8,255
1906	3	12	2	6	3	2	2	30	2,816	6,630	9,446
1908	4	15	2	6	6	2	2	37	3,281	7,152	10,433
1910	5	19	1	3	7	2	2	39	3,787	7,757	11,544
1914	5	21	1	1	7	2	3	40	4,258	8,425	12,683
1915	7	22	-	-	7	2	3	41	4,831	9,467	14,298

As evidenced in Table 1, in the period from 1900 to 1915, the number of secondary educational institutions in the region increased from 26 to 41, while the size of the student body in

this sector increased nearly 3 times – from 5,700 to 14,200. The sharp increase in the size of the student body was, on one hand, due to an elevation in the status of such educational institutions (in 1900, the region had 10 progymnasiums; in 1915, all of them were reorganized into gymnasiums), and, on the other hand, due to an increase in the number of students attending the schools (e.g., Mariinsky Kursk Female Gymnasium had an enrollment of 1,143 in 1915 versus 488 in 1902). The region's secondary education sector was characterized by a gender imbalance, with girls accounting for 66 % as at 1900. In the following 15 years, despite the opening of a large number of male educational institutions in the region, girls continued to account for the majority of students in its secondary education sector.

Lower education

Despite the already large number of lower educational institutions in the region, the period under review witnessed a further increase in that figure. Of note is the fact that most of the newly-established schools were of a vocational nature and such schools were being opened throughout Kursk Governorate.

More specifically, in 1901 an educational icon workshop was opened in the village of Borisovka, Grayvoron Uyezd, by the Committee for the Care of Russian Icon Painting. The workshop was concerned with training iconographers and muralists, providing students with education in artistic icon painting. The program of study was 4 years long. In 1910, the school had an enrollment of 20 students; by that time, it had graduated 20 masters (Uchebnye zavedeniya…, 1911: 5). That same year, Novooskolsky Uyezd became home to Konshino School for Cattle-Farm Workers in the village of Konshino. This educational institution was concerned with training specialists for raising and looking after cattle (this included teaching one to provide basic first aid assistance to animals). Its curriculum for instruction in general-education subjects was similar to that of a public school. The program of study was 3 years long – 2 years of in-school theoretical learning, and then 1 year of practical training on a farm. In 1910, the school had an enrollment of 15 students (Uchebnye zavedeniya…, 1911: 6-7). Concurrently, there took place a reorganization of the region's three-grade uyezd schools into four-grade urban schools (Obzor Kurskoi gubernii, 1903: vedomost' № 7).

In 1903, the city of Rylsk became home to an urban school of commerce. It had four grades (a preparatory grade and three core grades). In 1910, the school had an enrollment of 72 students (Uchebnye zavedeniya…, 1911: 7).

In 1903, the city of Sudzha became home to a school of weaving under the purview of the Sudzha Uyezd Zemstvo. Its program of study was 2 years long. In 1910, it had an enrollment of 11 female students, with the total number of its graduates being 22 at the time (Uchebnye zavedeniya…, 1911: 8). That same year, 1903, the town of Tim became home to Tim Lower Trades School. Students who completed the entire program of study there would receive the title of Apprentice, and those who completed a three-year practical training program there afterwards would be granted the title of Master. The school had a 4-year program of study. In 1910, it had an enrollment of 49 students (Uchebnye zavedeniya…, 1911: 11).

In 1903, the city of Shchigry became home to a zemstvo school of female labor. It was focused on the development of carpet manufacture and lacemaking via the training of corresponding specialists. The school had a 2-year program of study. In 1910, it had an enrollment of 51 female students (Uchebnye zavedeniya…, 1911: 11). That same year, the village of Nizhny Terebuzh became home to the Trebuzh Practical School of Horticulture of K.F. Orzhelsky. This educational institution had a 4-year program of study. It graduates would receive the title of Horticulture Practitioner. In 1910, the school had an enrollment of 12 (Uchebnye zavedeniya…, 1911: 12).

In 1905, the city of Rylsk became home to handiwork classes organized by a local society for aid to the poor. The focus was on helping disadvantaged female students gain handiwork skills sufficient to earn a living on their own. The operation of this educational institution was partly funded via the sale of items sewn by its students (Uchebnye zavedeniya…, 1911: 8).

In 1906, the town of Shebekino became home to Mariinsky Lower Agricultural School, established by the Main Directorate for Land Management and Arable Farming. The school had a 3-year program of study. In 1910, it had an enrollment of 40 students (Uchebnye zavedeniya…, 1911: 4).

In 1907, the city of Korocha became home to a practical school of horticulture. Concerned with the training of specialists in the area of fruit and vegetable farming, it had a 3-year program of

study. In 1910, the school had an enrollment of 40 students (aged from 14 to 19). There were two workshops at it – basket and carpentry (Uchebnye zavedeniya..., 1911: 5-6).

In 1907, the city of Kursk became home to a rural trades educational workshop, established through the efforts of the Ministry of Commerce and Industry. It was concerned with the training of workers who would help build an efficient agricultural sector, and its 3-year program of study would even enable one to gain skills in servicing and maintaining agricultural machinery. Graduates of this program would receive the title of Rural Master. As at January 1, 1910, the workshop had an enrollment of 40 boys (aged from 14 to 19) (Uchebnye zavedeniya..., 1911: 1).

That same year, 1907, Kursk became home to a school of commerce. Concerned with the training of a workforce for commercial-industrial institutions, it had a program of study comprised of a 4-year core program and a 2-year preparatory program. In 1910, the school had an enrollment of 191 students (Uchebnye zavedeniya..., 1911: 1-2). In addition, Kursk became home to accounting courses under the purview of the Ministry of Public Education, which functioned as a lower educational institution. This institution had a 1-year program of study. By 1910, it had graduated 18 students (Uchebnye zavedeniya..., 1911: 2).

Around the same time, three workshops – carpentry, bindery, and metalworking – were established at Kursk Teacher's Seminary. It was a 3-year program of study. In 1910, each of the workshops had an enrollment of one, with the ages ranging from 16 to 22 years (Uchebnye zavedeniya..., 1911: 2). Kursk also had in operation the vocational courses of Madame Bobrishcheva-Pushkina, concerned with the training of teachers of handiwork, crafts, and fancywork (Uchebnye zavedeniya..., 1911: 2-3).

In 1907, the city of Belgorod became home to a vocational trades female school of sewing, focused on the development of skills in cutting and sewing dresses, linen, upper garments, and hats. The school operated on funding from tuition (30 rubles per year). By 1910, it had an enrollment of 55 female students. It had four grades, with the last one concerned with instruction in a specialized craft (Uchebnye zavedeniya..., 1911: 3).

In 1908, Ye.Ye. Mironova established another vocational trades female school of sewing in Kursk Uyezd. It had a 2-year program of study. Just like the Belgorod school, it operated on funding from tuition (36 rubles per year). In 1910, the school had an enrollment of 26 female students (Uchebnye zavedeniya..., 1911: 3-4).

Belgorod Uyezd became home to a basket workshop, established at Maslovoye Zemstvo Primary School in the village of Maslovaya Pristan. It had a 1-year program of study and was attended by students of the above school (aged from 9 to 15) (Uchebnye zavedeniya..., 1911: 4).

In 1909, Kursk became home to a school of shoemaking and tailoring, established through the efforts of the Ministry of Trade and Industry. In 1910, the school had an enrollment of 27 boys (aged from 12 to 15) (Uchebnye zavedeniya..., 1911: 1).

The data on this sector are displayed in Table 2.

Table 2. Lower Educational Institutions in Kursk Governorate in 1900–1915 (Obzor Kurskoi gubernii, 1901: vedomost' № 6; Obzor Kurskoi gubernii, 1903: vedomost' № 7; Obzor Kurskoi gubernii, 1905: vedomost' № 7; Obzor Kurskoi gubernii, 1907: prilozhenie № 8; Obzor Kurskoi gubernii, 1909: prilozhenie № 9; Obzor Kurskoi gubernii, 1911: prilozhenie № 9; Obzor Kurskoi gubernii, 1915: prilozhenie № 9; Obzor Kurskoi gubernii, 1916: prilozhenie № 9)

Year	Type of educational institution			Total	Number of students		
	Urban school; higher primary school	Uyezd school; commercial school; agricultural school	Trades specialized school; trades school		Boys	Girls	Total
1900	5	9	2	16	1,989	-	1,989
1902	15	-	2	17	2,074	-	2,074
1904	15	-	3	18	2,061	-	2,061
1906	15	9	5	29	2,627	-	2,627

1908	15	11	12	38	2,568	150	2,718
1910	16	10	15	41	2,976	179	3,155
1914	43	12	21	76	3,628	373	4,001
1915	18	12	22	52	3,953	364	4,317

As evidenced in Table 2, the region's lower education sector continued its brisk development during the 15-year period from 1900 to 1915. First all of the uyezd schools were reorganized into urban schools, and later the region witnessed the establishment of vocational schools of varying types on a large scale. In the period under review, the number of schools in this sector increased more than 3 times. The largest increase took place in 1914 – to 76 lower educational institutions. The decline in their number to 52 in 1915 may have been caused by the enlargement of the student body attending the region's higher primary schools. This is supported by the fact that, despite the decline in the number of schools in this sector in 1915, the size of its student body continued to increase (1914 – 4,001 students; 1915 – 4,317 students).

Primary education
Primary educational institutions under the purview of the Ministry of Public Education
By 1900, the total number of ministerial primary educational institutions in the region reached 811. Table 3 displays the data on this particular sector.

Table 3. Primary Educational Institutions Under the Purview of the Ministry of Public Education in Kursk Governorate in 1900–1915 (Obzor Kurskoi gubernii, 1901: vedomost' №6; Obzor Kurskoi gubernii, 1903: vedomost' № 7; Obzor Kurskoi gubernii, 1905: vedomost' № 7; Obzor Kurskoi gubernii, 1907: prilozhenie № 8; Obzor Kurskoi gubernii, 1909: prilozhenie № 9; Obzor Kurskoi gubernii, 1911: prilozhenie № 9; Obzor Kurskoi gubernii, 1915: prilozhenie № 9; Obzor Kurskoi gubernii, 1916: prilozhenie № 10-11)

| Year | Type of educational institution | | | | Total | Number of students | | |
	Model school; two-grade school	Private school	Urban parish school	Rural primary school		Boys	Girls	Total
1900	49	23	41	698	811	50,719	12,185	62,904
1902	22	29	42	763	856	51,268	13,765	65,033
1904	61	3	942		1,006	61,750	17,597	79,347
1906	33	3	40	1,038	1,114	68,455	21,303	89,758
1908	38	5	40	1,135	1,218	71,337	22,889	94,226
1910	48	6	40	1,246	1,340	74,628	27,384	102,012
1914	47	6	41	1,611	1,705	84,006	37,151	121,157
1915	61	13	40	1,648	1,762	89,378	46,028	135,406

As evidenced in Table 3, the government continued its efforts to ramp up the number of primary educational institutions under the purview of the Ministry of Public Education. As early as 1910, the number of students in this sector surpassed 100,000, and there was a twofold increase in the number of primary schools in the region in 1913. There was a sharp increase in the number of primary schools in the region's rural areas, nearly 2.5 times, whereas there was only a small increase in the figure in its cities, which was associated with the latter getting filled with primary and other types of educational institutions back before 1900. The sharp increase in the number of primary educational institutions in the region facilitated an increase in the number of school-age children reached with education. Assuming that the school-age boy to girl ratio in the region was 1:1, in 1900 there were 4 boys attending school per girl, i.e. girls attending school accounted for a fifth of the region's students. In 1915, there was a sharp increase in the number of girls attending

school and there now were 2 boys per girl, i.e. girls accounted now for a third of the region's total number of students.

As regards private educational institutions in the region, their role was minor and this sector was characterized by impermanence.

Of note is the fact that the number of primary educational institutions in the region continued to grow during World War I. According to V.V. Korovin and A.V. Romanov, 42 educational institutions were opened in 1914, 19 in 1915, and 27 in 1916 (Korovin, Romanov, 2014: 165).

Primary educational institutions under the purview of the Holy Synod

By 1900, Kursk Governorate had 856 educational institutions under the purview of the Holy Synod. There were almost equal numbers of one-grade schools and literacy schools in the region – 445 and 402, respectively. Subsequently, the Holy Synod put in significant efforts to make its network of educational institutions as sustainable as possible, with a focus on the gradual closing down of literacy schools and deploying in their place of full-fledged primary schools, with buildings and libraries of their own. The data on this sector are displayed in Table 4.

Table 4. Primary Educational Institutions Under the Purview of the Holy Synod in Kursk Governorate in 1900–1914 (Vsepoddanneishii otchet, 1903: 64-65; Vsepoddanneishii otchet, 1909: 118-128; Vsepoddanneishii otchet, 1911: 214-219; Vsepoddanneishii otchet, 1913: 200-203; Vsepoddanneishii otchet, 1915: 200-205; Vsepoddanneishii otchet, 1916: 122-123)

Year	Type of school			Total	Number of students		
	Two-grade school	One-grade school	Literacy school		Boys	Girls	Total
1900	9	445	402	856	25,706	9,832	35,538
1903	6	589	370	965	28,852	14,244	43,096
1904	6	628	336	970	29,383	14,943	44,326
1908	12	702	181	895	29,577	15,930	45,507
1909	12	702	181	895	29,577	15,930	45,507
1912	12	875	12	899	29,561	18,579	48,140
1913	13	891	5	903	29,654	19,364	49,018
1914	12	905	1	918	30,273	21,204	51,477

As evidenced in Table 4, by 1914 the Holy Synod had virtually completed work on replacing literacy schools with one-grade educational institutions. The period under review did not witness a significant increase in the number of educational institutions, which suggests that the number of schools established by the Holy Synod in the region in the period up to 1900 was close to the highest there. Nevertheless, the number of students increased nearly 70 % – from 35,500 to 51,400.

In terms of the gender balance in this sector in Kursk Governorate, primary schools under the purview of the Holy Synod were traditionally attended by more girls than those under the purview of the Ministry of Public Education. Specifically, in 1900 girls attending the region's parochial schools accounted for nearly 28 % (versus 20 % with its ministerial schools), and in 1915 the figure was now 41 % (versus 33 %). This indicates that reaching all school-age children with parochial school education required bringing the gender balance precisely to half, i.e. enrolling another 9,000 girls or so. This assertion is supported by the fact that from 1903 to 1915 the number of boys remained virtually unchanged, being in line with the slight population increase in the region, and that suggests that virtually 100% of the region's boys attended school where there were parochial schools in place.

Let us summarize what the system of public education in Kursk Governorate had achieved by the time the Russian Empire collapsed. According to the Ministry of Public Education, by January 1, 1915, the governorate had 291,429 school-age children, with 170,115 of these going to school (RGIA. F. 733. Op. 207. D. 39. L. 1). In addition, more than 51,000 children attended parochial schools. Thus, by 1915 school in the region was attended by 221,592 children, or 76 % of its school-age children. Considering that new educational institutions continued to open up in the region during the last prerevolutionary period, the figure may well have been as much as 80 % by the end of 1916.

5. Conclusion
The study's findings revealed that the system of public education in Kursk Governorate experienced in 1900–1917 a period of dynamic development. During this period, the region witnessed a sharp increase in the number of secondary educational institutions, with all cities, including uyezd ones, and even some villages, there reached with secondary education. The region's lower education sector witnessed an improvement in the quality of education through a reorganization of uyezd schools into urban ones, and in 1903 there began a real boom in the opening of vocational schools. However, the biggest success was achieved in the region's primary education sector, where school was attended by 1916 by 80% of its school-age children.

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European Journal of Contemporary Education

ELECTRONIC JOURNAL

A History of the P.A. Cherkasov Fundamental Electronic Library (1992–2023)

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Abstract

This work examines the history of the P.A. Cherkasov Fundamental Electronic Library, which was created and currently operates at Cherkas Global University.

The principal sources for this study are relevant documents from the Archive of Saint Petersburg History Institute of the Russian Academy of Sciences (Saint Petersburg, Russia) and materials from the personal archive of A.A. Cherkasov. In addition, use was made of the publication 'Cherkas Global University (1992–2022): A Collection of Documents'.

The study's findings revealed that over the period from 1992 to 2023 the fundamental library of Cherkas Global University worked its way from a personal library to a full-fledged fundamental electronic library. In 2019–2020, the bulk of the prerevolutionary (antiquarian) holding of A.A. Cherkasov's personal library was donated to the Library of Congress (USA) and the electronic fundamental library was created. In 2022, the library was named after Prokopii Antonovich Cherkasov, who in the early 18th century established a shelter for the visually impaired in Keret'. Today, the P.A. Cherkasov Fundamental Electronic Library numbers over 61,000 items, with this stock continually growing.

Keywords: P.A. Cherkasov Fundamental Electronic Library, Cherkas Global University, history of a library, period 1992–2023, Prokopii Antonovich Cherkasov, sustainable development in education, education policy, education reform.

1. Introduction

A crucial functional unit in any research organization is its fundamental library. For a long time, libraries – in the traditional sense – were mainly made up of printed works and our personal presence was required to visit them, which was not inconvenient. Computerization and the rapid development of digital technology in the early 21st century had a significant effect on librarianship, giving rise to electronic libraries. One such library will be discussed in the present work.

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2. Materials and methods

The principal sources for this study are relevant archival documents and collections of published materials. Use was made of the Archive of Saint Petersburg History Institute of the Russian Academy of Sciences (Saint Petersburg, Russia) to draw upon the 1711 census materials for the village of Keret' in the Tsardom of Muscovy. Another important source is the personal archive of A.A. Cherkasov, which contains materials providing insight into the development of his personal library over the period 1992–2019. The second group includes 'Cherkas Global University (1992–2022): A Collection of Documents' (Cherkas Global University…, 2022), which contains the foundational document for the fundamental electronic library – Decree No. 2 of January 10, 2020.

Since the topic was seen as a fairly narrow one and most of the material related to it had never been published before, wide use had to be made of the descriptive method. The use of the chronological principle, which involves considering the relevant events in a chronological sequence, made it possible to identify two major chronological periods in the library's history.

3. Discussion

The historiography on Cherkas Global University is relatively thin, but it is growing. One of the first publications on the subject was produced in 2018 and was devoted to the operation of a student science club within the university (Ermachkov et al., 2018). As early as the following year, 2019, there came out a work celebrating the fifth anniversary of the International Network Center for Fundamental and Applied Research (INCFAR) (Tarakanov, Ponomareva, 2019). In 2021, K.V. Taran addressed the history of Cherkas Global University between 1992 and 2014 (Taran, 2021). In 2022, I.Yu. Cherkasova released an article celebrating the organization's 30th anniversary – 'Cherkas Global University (1992–2022): Yesterday, Today, and Tomorrow' (Cherkasova, 2022).

In addition, between 2022 and 2023 researchers have addressed topics such as the history of Cherkas Global University Press between 1992 and 1997 (Cherkasova, 2022), the international activity of Cherkas Global University (Cherkasova, 2023), and the history of the Rifle Association at Cherkas Global University (Cherkasova, 2022a).

4. Results

The history of the P.A. Cherkasov Fundamental Electronic Library can be divided into two major periods: 1) operation of the personal library of A.A. Cherkasov (1992–2019); 2) operation of the fundamental electronic library (2020–2023).

First stage (1992–2019)

During this period, the library went through the process of accumulating a large number of printed publications. The all-time high in the size of the stock of A.A. Cherkasov's personal library was nearly 1,500 items (Lichnyi arkhiv A.A. Cherkasova).

In 1997, the owner of the library began to keep track of the books in its growing stock. To this end, a seal with the words 'Personal library of A.A. Cherkasov' was created; it listed each book's registration number and the time and place it was obtained (Figure 1).

Fig. 1. Seal for the personal library of A.A. Cherkasov. 1997

In addition, two electronic catalogues were launched.

At the same time, the library was divided into two holdings: 1) antiquarian (books released between the late 18th century and 1945); 2) modern (from 1946 to the present). With the former, the registration number was preceded by an 'A' (Lichnyi arkhiv A.A. Cherkasova).

In 2006, the seal was replaced. The new one pictured a double-headed eagle holding an open book in its claws (Figure 2).

Fig. 2. Seal for the personal library of A.A. Cherkasov. 2006

By 2019, the personal library of A.A. Cherkasov numbered nearly 1,500 items, with 300 of these being in the antiquarian holding. The library was built through obtaining books in cities across Russia and in other countries. Initially, A.A. Cherkasov would purchase just about any prerevolutionary book he could get his hands on at book stalls across Sochi. As the library grew, the primary focus shifted to periodicals (magazines) and nonfiction (Lichnyi arkhiv A.A. Cherkasova).

Most of the items within the antiquarian holding belonged to the period between the second half of the 19th and early 20th centuries. The oldest book in the library was 'Psaltyr'' (Russian: "Psalter"), published during the later period of the reign of Catherine II, in 1795. It was obtained in the city of Petrozavodsk in 2010.

The bulk of the antiquarian holding consisted of prerevolutionary magazines, including *Zhurnal Ministerstva Narodnogo Prosveshcheniya*, *Russkoye Bogatstvo*, *Russkaya Starina*, *Russky Arkhiv*, and *Ogonek*. There were a few dozen issues of the illustrated magazine *Niva*. Another prerevolutionary magazine represented by a large set of issues in the holding was *Voyenny Sbornik*. In 2013, Cherkas Global University Press resumed the publication of this magazine. Significant effort was put into making as many prerevolutionary issues of the magazine available on its website as possible. To this end, the personal library was enriched with a few dozen previously undigitized prerevolutionary issues of *Voyenny Sbornik*. These issues were scanned and then added onto the website – https://vs.cherkasgu.press/.

The library's modern holding, which numbered nearly 1,200 items, consisted of books in Russian covering the period between the late 18th and mid-20th centuries. The most common topics were the history of the Caucasus and the Caucasian War (1801–1864), the history of World War I, and the history of World War II. The items included both historical research studies and documents of private origin (diaries, letters, and memoirs) (Lichnyi arkhiv A.A. Cherkasova).

Some of the items obtained formed entire book series. For example, a large one was 'Tiraniya' ("Tyranny") (Figure 3).

Fig. 3. 'Tiraniya' book series

The 'Tiraniya' book series included the following items: 'Jacques Delarue: Istoriya Gestapo' ("Jacques Delarue: A History of the Gestapo"), 'Christopher Creighton: Zagadka Bormana' ("Christopher Creighton: The Bormann Mystery"), 'Joachim von Ribbentropp: Memuary Natsistskogo Diplomata' ("Joachim von Ribbentropp: Memoirs of a Nazi Diplomat"), 'Albert Speer: Vospominaniya' ("Albert Speer: Recollections"), 'Josip Broz Tito: Vlast' Sily' ("Josip Broz Tito: The Power of Power"), 'Joseph Goebbels: Posledniye Zapisi' ("Joseph Goebbels: Final Entries"), and a few others.

The library contained almost all the books in the series 'Mir v Voynakh' ("The World in Wars") (Figure 4).

Fig. 4. 'Mir v Voynakh' book series

The 'Mir v Voynakh' series covered both World War I and World War II. The library also contained many items from the series 'XX Vek v Voynakh' ("The 20th Century in Wars"). The non-series items included numerous narrowly-specialized books on the history of rebel movements and military propaganda.

In 2019, A.A. Cherkasov, who was about to move, had a large portion of the books in his personal library scanned and then gave them out to his colleagues. The bulk of the antiquarian holding and many of the rare books in his personal library were donated in late 2019 to the Library of Congress (USA), one of the largest libraries in the world. A total of six parcels, weighing a combined 80 kg, were shipped to the US. In February 2020, a letter was received confirming receipt of the books by the Library of Congress (Figure 5).
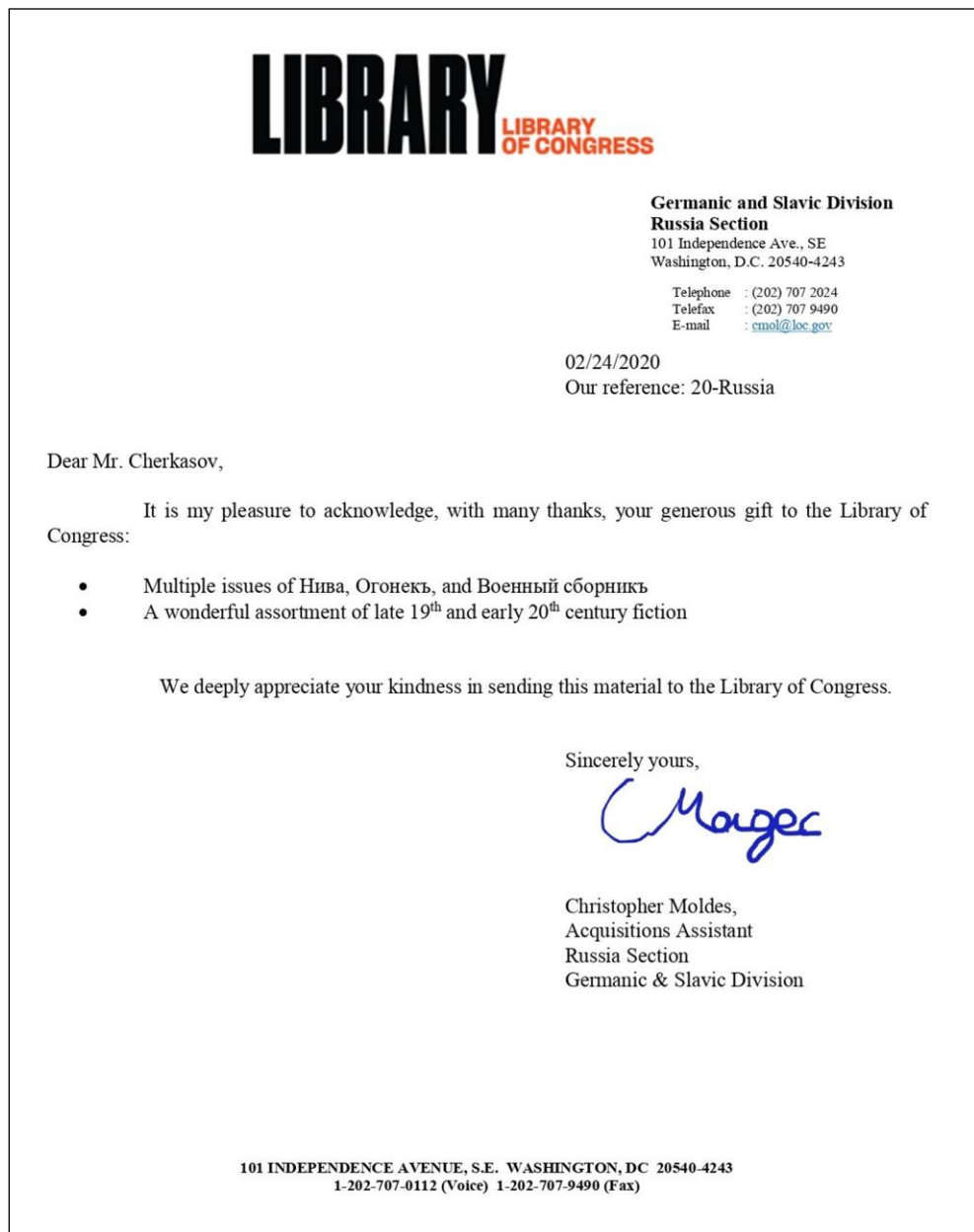
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Telefax   : (202) 707 9490
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02/24/2020
Our reference: 20-Russia

Dear Mr. Cherkasov,

It is my pleasure to acknowledge, with many thanks, your generous gift to the Library of Congress:

- Multiple issues of Нива, Огонекъ, and Военный сборникъ
- A wonderful assortment of late 19th and early 20th century fiction

We deeply appreciate your kindness in sending this material to the Library of Congress.

Sincerely yours,

Christopher Moldes,
Acquisitions Assistant
Russia Section
Germanic & Slavic Division

101 INDEPENDENCE AVENUE, S.E. WASHINGTON, DC 20540-4243
1-202-707-0112 (Voice) 1-202-707-9490 (Fax)

Fig. 5. Letter from the Library of Congress. 2020

Second stage (2020–2023)

In 2020, it became obvious that the organization needed a library of its own. Considering that the geography of Cherkas Global University's workforce spanned seven countries, the library would have to be an electronic one. Consequently, on January 10, 2020, A.A. Cherkasov signed a document (Decree No. 2) creating a fundamental electronic library within the organization. The decree covered the appointment of those responsible for putting the library together and set

February 10, 2020, as the deadline for creating the library's website (Cherkas Global University..., 2022: 58).

By February 10, 2020, the work on the library's website was completed and those responsible for working on its holding were appointed.

The following sections were gradually created within the library: Atlases, Military History, General History, Journal Hall, Russian History, Regimental Stories, Travels and Land Descriptions, Document Collections, and Encyclopedias and Dictionaries. All materials were uploaded to the platform as PDF files.

Each section is outlined below.

The Atlases section included cartographic materials.

The Military History section was concerned with military history and conflicts.

The General History section included general historical works, exclusive of those on Russian history.

The Journal Hall section provided access to magazines and newspapers.

The Russian History section was concerned with books on the history of Russia exclusively.

The Regimental Stories section included works on the history of imperial-period Russian regiments.

The Travels and Land Descriptions section was concerned with travel and descriptions of places.

The Document Collections section included collections of documents.

The Encyclopedias and Dictionaries section was concerned with encyclopedic works.

Works were selected for inclusion in the library collection based on the areas of expertise among the staff of Cherkas Global University – primarily, prerevolutionary Russian history, the history of slavery, and military history. As a consequence, the library included a large number of periodical press materials concerned with military conflicts, including those dealing with World War II collaborationism. Among the rare publications included in the library collection, of particular note is the newspaper *Vestnik Leib-Gvardii* (almost all of its issues for 1992–1997 included).

The bulk of the work on putting together the library holding was completed as early as 2020, when the stock surpassed 50,000 items.

On August 1, 2022, the day marking the 30th anniversary of Cherkas Global University, the fundamental electronic library was named after Prokopii Antonovich Cherkasov (1659–1725). In the early 1700s, Prokopii Cherkasov set up a shelter for the visually impaired in his backyard in the village of Keret' (Tsardom of Muscovy) (Arkhiv SPb II RAN. F. 10. Op. 3. D. 20. L. 135-135ob.). That is, members of the Cherkasov family performed an important social function in the life of Russian society as early as the 18th century.

Prokopii Antonovich Cherkasov was a member of the Cherkasov (Keretsky) family. Cherkasov had a fairly large farmstead, which in 1711 accommodated a total of 12 people (4 households). The census book for Kolsky Uyezd mentions him as a crippled, visually impaired person (Arkhiv SPb II RAN. F. 10. Op. 3. D. 20. L. 135).

As of 2023, the fundamental library of Cherkas Global University numbers over 61,000 items. Access to the library's resources is restricted and is only allowed to staff members via logins and passwords.

5. Conclusion

Over the period from 1992 to 2023, the fundamental library of Cherkas Global University worked its way from a personal library to a full-fledged fundamental electronic library. In 2019–2020, the bulk of the prerevolutionary (antiquarian) holding of A.A. Cherkasov's personal library was donated to the Library of Congress (USA) and an electronic fundamental library was created. In 2022, the library was named after Prokopii Antonovich Cherkasov, who in the early 18th century established a shelter for the visually impaired in Keret'. Today, the P.A. Cherkasov Fundamental Electronic Library numbers over 61,000 items, with this stock continually growing.

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