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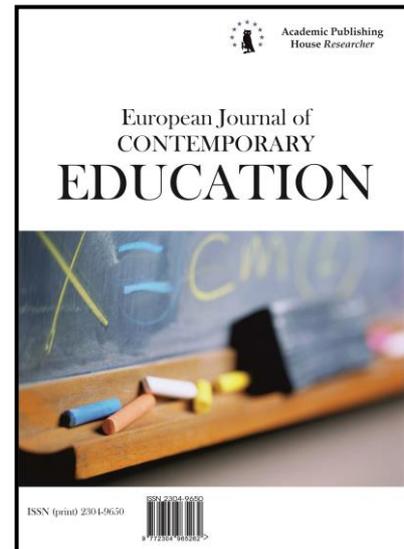
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The Problems of Contemporary Education

Critical Thinking Development in the Milieu of High School Education

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Abstract

The need for developing critical thinking (CT) has been broadly discussed and its importance acknowledged in a myriad of disciplines. This quantitative study attempts to investigate the level of critical thinking skills as well as the impact of grade level, gender, and nationality on the development of these skills among 279 Bosnian-Herzegovinian and Turkish high school students. The instrument used for this research is a survey questionnaire which consists of 17 items made up of four subscales: Convictions that inhibit critical thinking development (CICTD), Application of critical thinking (ACT), Class activities that prevent critical thinking (CAPCT), and Teacher support for critical thinking development (TSCTD). The findings reveal that students' nationality and grade level significantly impact critical thinking development, whereas students' gender does not have a significant effect on the development of CT skills. These findings are widely applicable as they can be used by language teachers and teachers of general courses to contribute to their students' critical thinking development by structuring their syllabi accordingly. The findings also point to an urgent need to revise the existing curricula and design more adequate ones which would include a greater number of activities fostering critical thinking skills.

Keywords: critical thinking, EFL classes, nationality, grade level, gender, effect, Turkey, Bosnia & Herzegovina.

1. Introduction

The importance of critical thinking has been recognized since the earliest documentation of this concept around 2,500 years ago in the teachings of Socrates and it has been explained, researched, defined and approached from different academic perspectives ever since. Critical

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thinking entails “judging in a reflective way what to do or what to believe” (Facione, 2000: 61) and requires “the use of those cognitive skills or strategies that increase the probability of a desirable outcome” (Halpern, 1998: 450). Thus, it has been widely acknowledged as a common educational goal and researchers in the field of educational sciences have strived to create a good working model which will aid students in developing critical thinking skills and competencies needed in their future endeavors. Accordingly, different instructional approaches to critical thinking were proposed (Ennis, 1989), varying in terms of teaching critical thinking skills either as an independent course or incorporating them into a regular course, and clear evidence of the positive impact of instructional intervention in the domain of critical thinking emerged (Abrami et al., 2008; Halpern, 1998; Kennedy et al., 1991; etc.).

Still, some authors maintain that no dramatic improvements in critical thinking are expected to be produced as a result of formal instruction (Halpern, 1998) as typical school instruction is believed not to enhance the development of these skills (Paul, 1992) since it equates reproduction with knowledge. Thus, researchers started looking into possible connections between critical thinking skills and some other skills and linked critical thinking to metacognition (Kuhn, 1999; Flavell, 1979), creativity (Ennis, 1985; Paul, Elder, 2006) and motivation (Facione, 2000; Halpern, 1998; Paul, 1992) acting as supporting skills facilitating the development of critical thinking. In addition to that, the relationship between personality traits and critical thinking ability has also been found (Nosratinia, Sarabchian, 2013) and the impact of some other socio-demographic factors on the level of critical thinking has been assessed and found significant (Bataineh, Zghoul, 2006).

The current study is designed to compare the level of critical thinking in two traditional educational milieus, namely the Turkish and Bosnian milieu, in which such skills do not seem to be fostered through official curricula and formal instruction (see Alagözlüa, Süzer, 2010; Kaya, 1997; Vanci-Osam, 1998 and etc. for Turkey and Soldo et al., 2017 for Bosnia and Herzegovina). Education in Bosnia and Herzegovina is still ‘at a standstill’ (Initiative for Monitoring the European Integration of B&H, n.d.: 1) even so many years after the war and no evolvement of teaching methods has been observed (Initiative for Monitoring the European Integration of B&H). Teaching is conducted by means of students writing down basic facts and later on, reproducing them through written or oral expression whereby reproduction is equated with knowledge and grades are viewed as sole indicators of students’ performance (Initiative for Monitoring the European Integration of B&H). Curricula lack critical thinking components and as a consequence B&H students achieve rather low scores on problem-solving tasks which do not entail mere knowledge reproduction on some internationally recognized tests (Initiative for Monitoring the European Integration of B&H). Likewise, Turkish education system has not made much progress in the last few decades, and mere memorization and repetition of the content covered in the class have been prevalent (Kizilçelik, 2015). Learners are passive, lack thinking skills and consequently cannot produce or demonstrate knowledge (Çınar, 2012) and there have been multiple calls to the government to change the education policies (Kizilçelik, 2015). As the systematic analysis of the impact of different factors on critical thinking might establish a solid base for producing a sustainable model for the development of critical thinking skills and thus improving the quality of education, this research sets out to explore whether gender, grade level and nationality, independently or in interaction, contribute to a rise in the level of critical thinking in these two cultural contexts.

2. Literature review

Despite the fact that the literature on critical thinking is grounded in three distinct academic disciplines, namely philosophy, psychology and education (Lewis, Smith, 1993; Sternberg, 1986), these three approaches have similar underlying goals, i.e. to name and classify all the components of critical thinking focusing on the activities a critical thinker can perform (Lewis, Smith, 1993) and identify behavioral traits and characteristics a critical thinker ought to possess (Facione, 2000; Sternberg, 1986). While the researchers working in the domain of philosophical approach focus on the qualities of pure thought and personal characteristics of critical thinkers and thus believe that critical thinking is “disciplined, self-directed thinking that exemplifies the perfections of thinking appropriate to a particular mode or domain of thought” (Paul, 1992: 9) and “skillful, responsible thinking that facilitates good judgment because it 1) relies upon criteria, 2) is self-correcting, and 3) is sensitive to context” (Lipman, 1988: 39), the researchers in the field of psychology, cognitive

psychology in particular, tend to formulate their definitions based on the types of actions critical thinkers can perform and thus state that critical thinking encompasses “the mental processes, strategies, and representations people use to solve problems, make decisions, and learn new concepts” (Sternberg, 1986: 3), which is often viewed as being reductionist in nature by the researchers across the philosophical approach (Sternberg, 1986). As for the educational approach, critical thinking is believed to be a principal concept in education and a fundamental goal of learning (Moon, 2008). Thus, the aim of that approach is setting out clear guidelines on how to teach and assess critical thinking.

However, researchers across the disciplines agree upon the importance of possessing critical thinking skills as through that mode of thinking, the thinker “improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them” (Scriven, Paul, 2004, paragraph 10). Critical thinking is not necessarily synonymous with good thinking, but it is a “pervasive and self-rectifying human phenomenon” (Facione, 1998: 26) and to enhance the quality of thinking and to learn successfully the thinker ought to pause to reflect on the content being studied rather than just read the content from the top to the bottom of the page without deep reflection (Facione, 1998). Whether such skills are acquired through individual exploration and social interaction or through formal instruction has been a point of wider debate (Choy, Cheah, 2009) and two different stances have been taken. Thus, some researchers maintain that critical thinking need not be taught as it is a natural process everyone undergoes (Sternberg, Williams, 2002), whereas some others maintain that students can be taught critical thinking terms and strategies and thus taught how to think more creatively and critically which will eventually contribute to the improvement of their thinking skills (Black, 2005; Nickerson, 1994). Thus, Tottier (2009) firmly believes that learning critical thinking skills is imperative for students and their lifelong learning as well as for their profound and proper understanding of the world. As these skills are believed to be transferable from the classroom to the workplace (Murawski, 2014), by acquiring them, students will be able to compete in the global job market (Tottier, 2009). These skills ought to be part of the official curricula, taught from an early age and practiced a lot (Tottier, 2009) and students’ curiosity and their inquisitiveness need to be aroused and encouraged (Knodt, 2009). Thus, some studies strived to come up with the best teaching strategies for the promotion of critical thinking (Halpern, 1998; Tsui, 2002).

The importance of the presence and promotion of critical thinking skills in foreign language teaching has also been highlighted (Brown, 2004; Chamot, 1995; Thadphoothon, 2002) and it is claimed that the objectives of English language program curricula ought to be directed at developing critical thinking skills besides language skills (Brown, 2004). Students who develop good critical thinking skills are believed to be more likely to become self-directed, autonomous language learners and thus succeed both academically and professionally (Qing, 2013). Shirkhani and Fahim (2011) explain the importance of critical thinking in foreign language learning by stating that if foreign language learners monitor their own thinking, they will be able to successfully evaluate their own learning. These authors also assign critical thinking a core role in expanding learners’ foreign language learning experience and emphasize that critical thinking correlates with learners’ language achievement and as such ought to be part of FL curricula (Shirkhani, Fahim, 2011). The correlation between critical thinking and learners’ language achievement has been highlighted in other studies as well. Renner (1996), Liaw (2007) and others maintain and their results confirm that these skills contribute to students’ overall language proficiency, while Rafi’s findings (2011) indicate that reasoning skills can be significantly improved by incorporating critical thinking in teaching English essay writing. Thus, all the aforementioned indicates that language competence and criticality as gradual, continuous and never-ending processes can be refined through the use of thought-provoking, stimulating materials (Báez, 2004; Rizvić, Bećirović, 2017). Through the use of such materials, teachers can contribute to the students’ development of their critical thinking skills along with their language skills, which points to the pivotal roles they have in students’ overall language and thinking development (Lipman, 2003). Teachers’ preparation of well-structured, interactive, stimulative critical thinking based activities will help students to correctly understand the learning process and improve their communicative competence (Harizaj, Hajrulla, 2017). Though the incorporation of critical thinking in teaching has been strongly advocated in literature, it still seems to be considered peripheral (Pica, 2000) in practice and language learning and thinking skills are commonly viewed independently.

With the aim of promoting critical thinking skills development, different studies set out to explore how this development is impacted by different socio-demographic factors. Thus, several studies researched the development of critical thinking in the course of students' university education and found that the level of critical thinking increases during study years with the greatest progress observed in the first two study years (Arum, Roksa, 2011; Bers et al., 1996; Burris, Garton, 2006; Hagedorn et al., 1999; Miller, 1992 and etc.). Still, that growth in CT is rather small (Evens et al., 2013; Giancarlo, Facione, 2001; Hagedorn et al., 1999; Lehmann, 1963; Miller, 1992; etc.) and some authors (Arum, Roksa, 2011; Pascarella et al., 2011) admit that there were a number of students who did not demonstrate any increase in CT. Study field has also proved to be a factor impacting the level of critical thinking (Arum, Roksa, 2011; Evens et al., 2013). Thus, Arum and Roksa's findings (2011) clearly indicate that the students majoring in humanities/social sciences as well as students majoring in mathematics/science achieved higher scores on CLA (Collegiate Learning Assessment, which assesses critical thinking, analytical reasoning, problem solving and writing) than the students majoring in business, education work/social work, engineering/computer science, communications, health and other. The lowest results were obtained by the students in the field of business and education/social work. Evens, Verburch and Elen, (2013) explored how study field in secondary education impacts the higher education entrance performance in CT. The findings indicate that students majoring in classical languages, mathematics, and human sciences achieved significantly larger results than students from the technical/artistic field. However, no conclusive results as to which study field majors have or acquire the best CT results can be obtained from the literature. The results related to gender also vary. Thus, Wilson (1989), using the Watson-Glaser test and ACT College Reports, indicated that gender was a significant predictor of critical thinking skills. In addition to that, Giancarlo and Facione's findings (2001) found statistically significant gender differences in the overall California Critical Thinking Disposition Inventory (CCTDI) as well as on two subscales, namely the Open-mindedness and Maturity of Judgment subscales, with females scoring significantly higher than males. Using the same instrument, Rudd, Baker, and Hoover (2000) also measured whether gender is a significant variable in critical thinking disposition of 174 students enrolled in the College of Agriculture and Life Sciences and they found that females achieved a significantly better score overall and on three subscales, namely Open-mindedness, Maturity of Judgment and Truth-seeking. On the contrary, in some other studies gender did not prove to be a significant factor impacting critical thinking (Browne et al., 1989; Salahshoor, Rafiee, 2016; etc.). Thus, Browne et al. (1989) revealed insignificant differences between males and females in applying critical thinking skills, which was also confirmed in the Iranian context through Salahshoor and Rafiee's findings (2016), which indicated that differences between females and males in critical thinking scores were insignificant. The difference in critical thinking development among various nationalities, races, etc. have also been researched and the findings indicate that the level of critical thinking differs based on those variables (Rear, 2017; Roksa et al., 2017; etc.). Thus, Rear (2017) examined the differences in critical thinking among Asian and Western students and pointed to the lack of critical thinking skills among international Asian university students. Asian students tend to act as uncritical and passive learners in the classes when compared to their Western classmates, since they come from large class sizes and teacher-centered modes of learning, and are also known to be disciplined, silent, which is quite the opposite of their Western classmates. Still, Rear (2017) argues that Asian students possess good thinking abilities and are willing to engage critically and creatively with academic content in different fields. He claims that the lack of critical thinking skills amongst international Asian students can be assigned to the fact that they study in a foreign language, which has been shown to have a significantly negative impact on their academic performance. Moreover, following African American, Hispanic, Asian and White students in a longitudinal study, Roksa et al. (2017) found considerable inequality in the development of critical thinking skills over four college study years between African American and White students, which was assigned to their experience with diversity. The differences in critical thinking assessment were also found between Hispanic and White students, but much smaller in magnitude than the differences between African American and White students. On the other hand, the difference between Asian and White students was almost non-existent and was found to be statistically insignificant.

3. The current study

The current study is particularly important for two reasons. Firstly, its importance arises from the fact that critical thinking skills and foreign language knowledge are of great significance for academic and post-academic achievements and secondly, no similar studies which simultaneously measure the level of secondary students' critical thinking skills in two different EFL contexts, namely Bosnia and Turkey, and analyze the impacting factors have been conducted. Hence, the purpose of this research was to evaluate the extent to which variables such as, gender, grade level, and nationality affect the critical thinking development of students in Bosnian-Herzegovinian and Turkish secondary education. Therefore, the following hypotheses were tested:

1. There will be a significant interaction effect of gender X grade level on critical thinking development in the EFL classroom.
2. Furthermore, combined dependent variables of critical thinking development in the EFL classroom will significantly differ based on gender and grade level.
3. Combined dependent variables of critical thinking development in the EFL classroom will significantly differ by nationality with age influence being controlled.

3.1. Participants

The research sample consisted of 279 high school students. The random stratified method of participant selection was employed and the participants were randomly selected from different grade levels. Students from six high schools located in Sarajevo Canton, Bosnia and Herzegovina and six high schools located in Istanbul, Turkey participated in the survey. The sample comprised 166 female (59.5 %) and 113 male (40.5 %) participants, with the age span from 14 to 20 ($M = 16.4$, $SD = 1.10$). 147 (52.7 %) participants were Bosnian students, 124 (44 %) were Turkish students and 9 students of other nationalities (3.53 %). As for the participants' grade level, the most represented were juniors ($n = 108$, 38.7 %), followed by freshmen ($n = 86$, 30.8 %), sophomores ($n = 50$, 17.9 %), and seniors ($n = 35$, 12.5 %). The demographic information of the research sample is displayed in [Table 1](#).

Table 1. Descriptive analysis of the research sample

		N	Percent
Nationality	Bosnian	147	52.7
	Turkish	123	44
Gender	Female	166	59.5
	Male	113	40.5
Grade Level	Freshman	86	30.8
	Sophomore	50	17.9
	Junior	108	38.7
	Senior	35	12.5
Total		279	100

3.2. Measures and procedures

The data for this research were collected by administering a survey as a measurement tool. The questionnaire used in the survey was developed and validated by the authors of this research and it includes 17 items, each of which uses a five-point Likert scale ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"). The questionnaire is composed of four subscales including: TSCTD (Teacher support for critical thinking development), e.g. "The teacher allows students to make personal connections to the lesson", ACT (Application of critical thinking), e.g. "I enjoy

learning new vocabulary and practicing it in class or some real situations”, CICTD (Convictions that inhibit critical thinking development) all items are reverse coded, e.g. “I usually blindly accept what is written in a textbook”, and CAPCT (Class activities that prevent critical thinking) all items are reverse coded, e.g. “The English language is based mainly on the rote memorization method”. Cronbach’s alpha reliability analysis was performed for all items ($\alpha = 0.87$). This study’s instrument comprises two sections, section I containing items related to demographic variables, and section II items related to critical thinking development.

Having obtained informed consent for surveying high school students in Bosnia and Herzegovina and Turkey from the corresponding ministries of education, the researchers distributed the survey among randomly selected students and properly explained the procedure for its completion to the students. The students were politely asked to read each statement carefully and mark the number they find most appropriate on the scale from one to five. The average time needed for completing the survey was 25 minutes. The survey was distributed in the class in the school milieu with the permission of lecturers.

3.3. Data analysis

Statistical Package for the Social Sciences (SPSS), version 23.0 and AMOS 23.0, was used for the analysis of the data gathered from the participants. Exploratory factor analysis (EFA) was performed to examine the underlying factor structure. Confirmatory factor analysis (CFA) was employed to examine the factor structure extracted in the EFA. The hypotheses were tested by applying inferential tests. Since all the assumptions were met, a two-way MANOVA was performed to determine the effect of gender and grade level on critical thinking development in EFL classrooms. According to Stevens (2001), there are many advantages of using MANOVA as opposed to repeating many simple analyses of variance and any important treatment will affect participants in more than one way. Thus, the inclusion of more than one dependent variable will yield a more holistic picture (Stevens, 2001). A one-way MANCOVA was employed to determine the effect of nationality on the combined variables of critical thinking development with the variable of the participants’ age being controlled.

3.5. Factor analysis

The underlying factor structure of Critical Thinking Development in EFL classrooms was firstly examined by the Exploratory Factor Analysis (EFA) on 55 Critical thinking items. Bartlett’s test of sphericity revealed that the data were multivariate normally distributed and acceptable for factor analysis ($\chi^2(1485) = 6197.82, p < .001$). The KaiserMeyer-Olkin indicated that it was appropriate to proceed with factor analysis (KMO = .86). Based on this presumption, four factors were extracted with principal components analysis (with varimax rotation) accounting for 46.7 % of the total variance in the data. The items that failed to load .50 or higher were deleted, as well as the items that significantly loaded on two or more factors. A four-factor model was obtained with 17 items. As a follow-up, Confirmatory factor analysis was employed (CFA). After inspecting the modification index, few covariances were suggested to be freely estimated and we adopted these suggestions and modified the model which was then improved. Finally, a good model fit was obtained with following values: $\chi^2(113) = 164.270 (p = .001)$, RMSEA = 0.044, CFI = 0.960, TLI = 0.952, and AGFI = 0.899, PCLOSE 0.758. Table 2 displays constructs reliability and validity.

Table 2. Construct reliability and validity

	CR	AVE	MSV	MaxR (H)	CICTD	ACT	CAPCT	TSCTD
CICT	0.725	0.397	0.295	0.726	0.630			
ACT	0.817	0.473	0.408	0.821	0.308	0.688		
CAPCT	0.794	0.491	0.295	0.798	0.543	0.098	0.701	
TSCTD	0.816	0.528	0.408	0.824	0.242	0.639	0.272	0.727

Note: CICTD = Convictions that inhibit critical thinking development; ACT = Application of critical thinking; CAPCT = Class activities preventing critical thinking; TSCTD = Teacher support for critical thinking development.

4. Results

4.1. The effect of gender and grade level on critical thinking development in EFL classroom

A two-way MANOVA was performed to determine the effect of gender and grade level on critical thinking development in the EFL classroom. The results of MANOVA indicated that there is no statistically significant interaction effect between gender and grade level on the combined dependent variables of critical thinking development Wilks' Lambda $\lambda = 0.925$, $F(12, 550.6) = 1.38$, $p = .173$, $\eta^2 = .026$. However, the multivariate MANOVA test showed a significant main effect of grade level Wilks' Lambda $\lambda = 0.850$, $F(12, 550.6) = 2.90$, $p = .001$, with an almost medium effect size $\eta^2 = .053$ and an insignificant main effect of gender Wilks' Lambda $\lambda = 0.959$, $F(4, 208) = 2.20$, $p = .070$, $\eta^2 = .041$ on the combined dependent variables of critical thinking.

ANOVA and Tukey HSD post hoc test were employed as follow-up tests and indicated that grade level significantly affects ACT $F(3, 211) = 7.53$, $p < .001$. The effect size was moderate $\eta^2 = .097$ and the differences between the second grade and all the other grades were observed. Likewise, grade level significantly affected TSCTD $F(3, 211) = 6.62$, $p < .001$ and the univariate effect size was again moderate $\eta^2 = .086$. A significant difference was found between the second grade and all the other grades. Grade level also had a significant effect on the total development of critical thinking $F(3, 211) = 3.90$, $p = .010$. The effect size was small $\eta^2 = .052$ again and the post hoc test showed differences between the second grade and all the other grades. On the other hand, grade level does not have a significant effect on CICTD $F(3, 211) = 7.53$, $p = .447$, $\eta^2 = .012$, and CAPCT $F(3, 211) = .29$, $p = .833$, $\eta^2 = .004$, whereas gender in interaction with grade level had a significant effect only on ACT $F(3, 211) = 3.04$, $p = .030$. The Univariate effect size was small, $\eta^2 = .041$. The Univariate test did not measure a significant effect of gender on total critical thinking development or on any of its subscales.

Table 3. Adjusted and Unadjusted means of critical thinking development for grade level and gender

	CICTD		ACT		CAPCT		TSCTD		Total	
	Adj. M	Unad. M								
Grade level										
Freshman	2.24	2.25	2.63	2.59	2.48	2.47	2.58	2.56	2.49	2.46
Sophomore	2.33	2.38	3.56	3.51	2.29	2.33	3.40	3.34	2.89	2.89
Junior	2.40	2.41	2.61	2.61	2.44	2.45	2.34	2.33	2.44	2.45
Senior	2.04	2.11	2.22	2.36	2.39	2.34	2.10	2.07	2.19	2.22
Gender										
Female	2.41	2.40	2.78	2.63	2.43	2.48	2.42	2.38	2.51	2.47
Male	2.09	2.23	2.73	2.76	2.37	2.38	2.79	2.68	2.49	2.51

Note: CICTD = Convictions that inhibit critical thinking development; ACT = Application of critical thinking; CAPCT = Class activities preventing critical thinking; TSCTD = Teacher support for critical thinking development.

4.2. The effect of nationality on the combined variables of critical thinking development with the participants' age controlled

A one-way MANCOVA was employed to determine the effect of nationality on the combined variables of critical thinking development with the age of participants controlled. The main effect of nationality Wilks' Lambda $\lambda = 0.882$, $F(4, 213) = 7.15$, $p < .001$, on the combined variables of critical thinking development was significant. The multivariate effect size was moderate $\eta^2 = .118$. The main effect for years of age was insignificant Wilks' Lambda $\lambda = 0.980$, $F(4, 213) = 1.07$, $p = .372$, $\eta^2 = .020$. Univariate ANOVA results indicated that nationality significantly affected all dependent variables, namely CICTD $F(1, 216) = 17.9$, $p < .001$, with a moderate univariate effect

size $\eta^2 = .076$, ACT $F(1, 216) = 10.4, p = .001$, with a small effect size $\eta^2 = .046$, CAPCT $F(1, 216) = 10.2, p = .002, \eta^2 = .045$, TSCTD $F(1, 216) = 9.07, p = .003$, in both cases with a small effect size $\eta^2 = .040$ and critical thinking development overall $F(1, 216) = 26.7, p < .001$. The univariate effect size was moderate $\eta^2 = .110$. The covariate of age did not significantly affect any of dependent variables of critical thinking.

Table 4. Adjusted and Unadjusted means of critical thinking development for Bosnian and Turkish students

	CICTD		ACT		CAPCT		TSCTD		Total	
	Adj. M	Unad. M								
Bosnian students	2.09	2.09	2.47	2.47	2.26	2.25	2.28	2.28	2.27	2.27
Turkish students	2.56	2.56	2.89	2.89	2.62	2.62	2.72	2.73	2.70	2.70

Note: CICTD = Convictions that inhibit critical thinking development; ACT = Application of critical thinking; CAPCT = Class activities preventing critical thinking; TSCTD = Teacher support for critical thinking development.

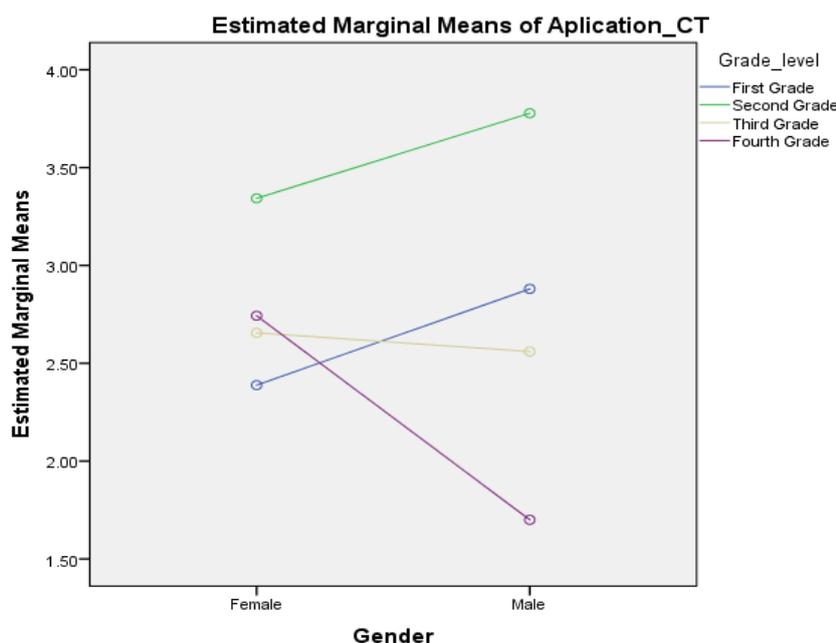


Fig. 1. Gender Differences between Grade Level Groups in Critical Thinking Development

5. Discussion

This study aimed at assessing critical thinking development of Bosnian-Herzegovinian and Turkish high school EFL students and exploring whether that development is impacted by different socio-demographic factors, such as gender, grade level, and nationality, individually or in interaction. Thus, the hypothesis predicting that there will be a significant interaction effect of gender X grade level on critical thinking development was refuted as no significant interaction effect of these two variables was measured on the combined dependent variables and three subscales, namely CICTD, CAPCT and TSCTD. The interaction effect of gender X grade level was significant only on the ACT subscale, which indicates that the effect of gender on the application of critical thinking depends on the students' grade level. Moreover, the results showed that grade level significantly affected the combined dependent variables of critical thinking, whereas the effect of

gender proved to be insignificant. As for grade level, the differences were mainly found between the second and all the other grades overall and on two subscales, i.e. ACT and TSCTD, as sophomores achieved the highest scores overall and on these two subscales. It is rather intriguing that senior students achieved the lowest score overall and on three subscales, namely CICTD, ACT and TSCTD, and that the common pattern which was observed was that the fourth-year students achieved the lowest score, followed by the third-year students, whereas the highest score was achieved by the second-year students, with the first-year students following. This indicates that the students' level of critical thinking skills is higher at the beginning of their secondary education than in the end and that the first two years seem to be crucial for critical thinking development as that process diminishes in two final study years, in the fourth year in particular. Such results are not fully aligned with some other studies that assess the critical thinking development of university students (Arum, Roksa, 2011; Bers et al., 1996; Burris, Garton, 2006; Hagedorn et al., 1999; Miller, 1992 and etc.), as they point to the gradual development of students' critical thinking ability in the course of their four-year studies. However, these authors also observed that the greatest development occurs in the first two years, which is in line with the conclusions we have drawn. Likewise, contrary to our findings, Burris and Garton (2006) also point to the increase in critical thinking among secondary-school students, since the upperclassmen participating in their study outperformed the lower classmen. The results of the current study were not fully aligned with the Ay and Akgöl's (2008) results as well. These authors conducted research among 1379 high school students from Düzce and indicated that the second grade students had the most limited critical thinking abilities when compared to the students from other grades and that the increase in grade level did not result in the increase in their critical thinking ability. However, close alignment can be established between our research findings and the findings of Zhou, Jiang & Yao (2015), who researched the critical thinking level of university-level freshmen and sophomore students taking College English and showed that the sophomores' critical thinking ability in English reading is significantly higher than the freshmen's. The fact that the first-year students in the current study achieved better scores overall and on all four subscales than the fourth-year students might be indicative of the teachers' ineptness to cope with the growing intellectual demands of young people, which might result in their not providing enough encouragement to students in the final years of their secondary education. This is clearly substantiated by the fact that the lowest results were achieved by the fourth-year students on the TSCTD subscale. Moreover, a possible reason could also be that instructors invest more efforts in working with freshman and senior students as they believe that junior and senior students are more independent learners and require less support than freshmen and sophomores. Furthermore, such regression of critical thinking during secondary education might also be attributed to the absence of activities promoting critical thinking in the official high-school curricula as well as to the lack of thought-provoking and stimulating materials arousing students' curiosity and inquisitiveness. Thus, this matter should be deeply analyzed and some measures ought to be taken as the development of critical thinking skills should be strongly and effectively stimulated at the end of secondary education in particular since some of the students finishing high schools enter the global job market. As for gender, its impact on critical thinking development is insignificant. Female students achieved a better score overall and on three subscales, namely the CICTD, ACT and CAPCT subscales, than male students. It is rather interesting that male students achieved a better score on the TSCTD subscale, which indicates that they believe that they receive more support from their teachers for critical thinking development. Such results are in line with some other findings (Browne et al., 1989; Salahshoor, Rafiee, 2016; etc.), which also point to the fact that gender does not play a significant role in critical thinking development. Thus, Browne et al. (1989) revealed that males and females do not significantly differ in applying critical thinking skills and Salahshoor and Rafiee (2016) also found that gender does not affect the learners' critical thinking level. Our research findings are not in accordance with the findings of Leach and Good (2011), who found out that the main effect for gender was significant with the mean for males significantly higher than the mean for females as well as with the results presented in Wilson (1989), who found gender to be a significant predictor of critical thinking skills.

Moreover, the hypothesis stating that the combined dependent variables of critical thinking development in EFL classrooms will significantly differ based on the participants' nationality when the age influence is controlled was supported, as the effect of nationality on the combined variables of critical thinking development was significant. The high school students from Turkey achieved a

significantly higher score overall and on all subscales of critical thinking development than the high school students from Bosnia. Rather low results of Bosnian students achieved overall and on all the subscales of critical thinking development point to the lack of representativeness of critical thinking in formal education in the Bosnian EFL context, which is in line with Soldo et al. (2017). Still, even the Turkish high school students' score in critical thinking development was not assessed as high, which indicates the lack of critical thinking skills in that context as well, which is in line with the results of Alagözliüa and Süzer (2010), Çınar (2012), Kizilçelik (2015), Kaya (1997), Vanci-Osam (1998) etc. It might be concluded that the results of the current study are to some extent aligned with the results of other studies researching the differences in critical thinking development based on nationality or race (Rear, 2017; Roksa et al., 2017; etc.), as all of these studies clearly indicate that people of different nationalities demonstrate different thinking abilities and have different thinking patterns and thus achieve different scores in measuring critical thinking skills. When the results of the current study are compared to the results of other studies conducted in the Bosnian context among Bosnian and Turkish participants studying at international universities in Bosnia and Herzegovina, some interesting conclusions can be drawn. Namely, investigating metacognitive strategy awareness of Bosnian university-level students of different nationalities, namely Bosnian, Turkish and others, both Bećirović, Brdarević Čeljo and Dubravac (2018) and Bećirović, Brdarević Čeljo and Sinanović (2017) found that the impact of nationality on the use of metacognitive strategies was insignificant. On the other hand, nationality proved to be a significant factor in cross-cultural sensitivity and intercultural effectiveness (Bećirović, Brdarević Čeljo, 2018; Bećirović et al., 2019). In these studies, Bosnian students achieved better results both in measuring metacognitive strategy awareness, on the one hand, and cultural sensitivity and intercultural effectiveness, on the other hand, than Turkish students (Bećirović et al., 2017, Bećirović et al., 2018, Bećirović, Brdarević Čeljo, 2018 and Bećirović et al., 2019), but the difference is significant only when their cross-cultural sensitivity and intercultural effectiveness are measured. The conclusions that can be drawn from the aforementioned and are not in concordance with some previous findings (Rear, 2017; Roksa et al., 2017; etc.), are that when students of different nationalities study in the same educational milieu the differences based on nationality do not seem to arise in their development and use of different cognitive processes, which is the case with Turkish students studying in Bosnia and Herzegovina, who, being treated equally as domestic students, and taking participation in the same EFL teaching and learning activities normally get adjusted to that learning context.

The current research investigating a few factors that influence the critical thinking development in EFL classes, such as gender, grade level, and nationality, is exposed to a few limitations. Firstly, additional investigation could be done to disclose other potential factors affecting critical thinking development, such as learning styles, self-efficacy, learning motivation, language proficiency, and participants' prior knowledge. Secondly, it would be very beneficial to conduct some more studies on critical thinking development in the Bosnian EFL context and in general, to include a much larger number of high school students to see whether the overall level of critical thinking among high school students is generally that low and whether Bosnian students are less productive critical thinkers than the students of other nationalities, in particular Turkish.

6. Conclusion

The present study has some important practical implications and the results need careful further exploration. As they indicate that there exist some flaws in the educational systems of both countries, they might help raise awareness of them as well as of the pressing problems ensuing in the process. Thus, some changes corresponding to the problems observed might be made in the official curricula and, accordingly, teachers can modify their individualized syllabi by including a larger number of activities promoting critical thinking development. Since grade level proved to be a significant factor impacting students' critical thinking development in EFL classes, teachers are expected to carefully consider the potential obstacles that obstruct language learning and prevent students' progress in that respect. After examining the barriers, teachers ought to select the methods which would be appropriately used in each grade, in order for students to advance both in critical thinking development and EFL proficiency.

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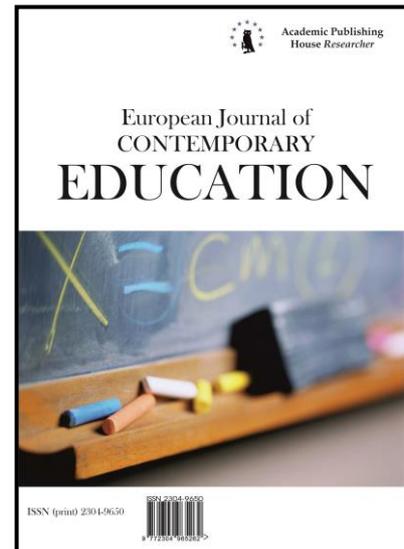
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Improving Self-Esteem Levels among Ghanaian Junior High Students Using Designed Activities

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Abstract

The study explored the self-esteem levels of Junior High School students in Ghana. The researchers used designed classroom activities with local sociocultural themes to improve students' self-esteem levels. Also, we examined students' gender difference and association with their self-esteem scores. A total number of 40 students were selected using simple random sampling. The participants were made up of 21 females and 19 males, who were between the ages of 12 and 17 years old. At Phase 1 of the study, all the 40 participants undertook the pre-test assessment. Based on their scores, 11 of them who had low self-esteem scores were selected for both Phase 2 (intervention) and 3 (post-test). By means of a simple random sampling, 6 and 5 students were again assigned into Experimental and Control Groups respectively. Results at Phase 1 showed that there was no significant difference and association between students' gender and self-esteem scores. However, there was a significant difference between the Experimental and Control Groups' self-esteem scores following the intervention phase. Consequently, we recommend that the curricula for basic schools should incorporate self-esteem oriented topics and activities. In addition, future studies should employ a longitudinal approach to study students from the primary level until they reach high school.

Keywords: designed activities, Ghana, junior high school, self-esteem, students.

1. Introduction

Over the years, self-esteem has been considered as one of the important and popular psychological concepts among researchers (Balley, 2003; Robins et al., 2010; Roman et al., 2008).

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Self-esteem among children is very crucial as this is seen as a crucial period for self-esteem development (Bleidorn et al., 2016). Several factors have been associated with the development of self-esteem. Atindanbila et al. (2012) and Bleidorn et al. (2016) for example indicated that males consistently reported higher self-esteem than females. Nonetheless, Jain and Dixit (2014) found no association between gender and self-esteem.

Another factor that has been identified as important in influencing self-esteem is age. Notwithstanding the gender, levels of self-esteem were associated with age groups (McMullin, Cairney, 2004). Similar to previous studies, Bleidorn et al. (2016) noted age-related increases and male gender to report higher self-esteem levels across cultures. Apart from these variables, body image, self-efficacy, socioeconomic factors, and academic performances have also been indicated to affect self-esteem (Bittle et al., 2001; Bruce, 2016). According to a study by Fortman (2006), self-esteem correlated with their body image and self-efficacy of females rather than males. Also, Crocker et al. (2002) identified that academic performances are associated with self-esteem while Bhardwaj and Agrwal (2013) noted that subjective social experiences of children, whether good or bad have predispositions of affecting their self-evaluations. According to Leary and Baumeister (2000), self-confidence is attained when children receive social acceptance which can lead to high self-esteem while peer rejection and loneliness lead to poor self-image, self-doubt, and low self-esteem.

Though the role of self-esteem has been noted as an essential concept over the years (Bleidorn et al., 2016; Falk, Heine, 2015), little has been done with regards to the use planned classroom activities as interventions to improve self-esteem in Ghana (Cudjoe, 2017). The purpose of the study is to determine the self-esteem rate of Junior High School students and help improve the self-esteem of those with low self-esteem through designed activities (intervention).

2. Materials and methods

Research Design

An experimental design with a pre-and-post-intervention method was adopted for the study. The pre-intervention test was used to assess participants' levels of self-esteem levels. Following that, those with low self-esteem were identified and re-grouped into Experimental and control Groups for the intervention phase. The post-intervention test was then used to measure the extent to which the self-esteem levels of students changed after they had received the intervention.

Population and Sample

The population for this study comprised Junior High School students in Ghana from the heterogeneous background; different socio-economic backgrounds and academic abilities. The initial sample size for **Phase 1** was made up of 40 students; 52.5 % females and 47.5 % males. This selection had no intended researcher bias for a particular gender as the volunteers had more female representation than males. The ages of participants ranged between 12 and 17 years with a mean age of 14-years-old. The proportion of participants' educational background included 30 % Junior High School Form 1 students, 32.5 % Junior High School Form 2 students, and 37.5 % Junior High School Form 3 students.

Additionally, 55 % of the participants were within the top 10 ranks when compared with their mates. Generally, 45 % of the participants had a good view of their physical appearance, 37.5 % of them were not sure whether they looked good or bad, and 17.5 % reported a poor perception of physical appearance. Overall, the majority (75 %) of all participants at **Phase 1** came from families with a middle socioeconomic class. Notably, participants indicated 37.5 % low, 27.5 % moderate, and 35 % high confidence levels.

Sampling Technique

The simple random sampling method was used in choosing the sample for the study at both Phase 1: Screening Stage and Phase 2: Intervention Stage. The simple random sampling method was adopted to select samples for these two stages because of its adequacy for classroom and pedagogical research (Clark, 2015; Diemer et al., 2015).

Data Collection Instrument

This study made use of a 16-item questionnaire which was made up of three sections (A, B, and C). Section A measured students' demographics such as gender, age, and class. Section B measured factors like previous class ranking, satisfaction with physical appearances, and family's economic status. Section C was made up of adopted items from Rosenberg's Self-Esteem Scale

(Rosenberg, 1965). The Rosenberg’s Self-Esteem Scale is a 10-item scale with answers on a 4-point Likert scale, ranging from strongly agree to strongly disagree. It is designed to assess individuals feeling of self-worth and has an internal consistency that ranges from 0.77 to 0.88 with a content validity of 0.55 (Rosenberg, 1965; Westaway et al., 2015).

Data Collection Procedure

The study was conducted according to the standards of the Declaration of Helsinki (6th revision, 2008), local institutional protocols, and parental permission. Following these, students were briefed on the nature of the research and debriefed afterward.

Phase 1: Pre-intervention

Questionnaires were used to gather data on student’s demographics and self-esteem levels. Data were analysed to identify students with low self-esteem. Eleven participants with low scores on self-esteem were separated from the total sample for the next stage.

Phase 2: Intervention

A simple random sampling was again used to assign 6 and 5 students into the Experimental and Control Groups. The Experimental Group was introduced to 3 intervention sessions which lasted between 35 to 45 minutes with a mix of both educational activities and support. The Control Group had reading and mathematics classes during the sessions as a placebo.

An overview of the sessions are as follows:

Session 1 consisted of activities that introduced participants to the purpose of the program, expectations and a discussion of the activities that would be undertaken. It also focused on educating participants on what self-esteem is and its implication.

Session 2 also focused on activities meant for self-reflection like my strength and quality tests, the mirror exercises and other self-description exercises based on their culture.

Session 3 included self-evaluation booster activities like changing negative self-talk exercises, visualization exercises, and listing my wins-exercises with local Ghanaian themes.

Phase 3: Post-intervention

Another set of questionnaires that measured self-esteem levels were administered to the students 3 weeks for a test-retest evaluation after the intervention-placebo sessions.

Data Analysis

Data from Phases 1 and 3 were analysed using requisite statistical tools following data cleaning. Specifically, descriptive statistics (frequencies and percentages), Pearson Chi-Square, and Independent *t*-Test in the Statistical Package for the Social Sciences was used (IBM Corp, 2012).

3. Results

Relationship Between Gender and Self-Esteem

To assess the relationship between gender and self-esteem, Pearson Chi-Square was selected for the analysis. Finding in Table 1 showed no significant associations relationship between gender and self-esteem of students at Phase 1, [$\chi^2 (1) = .025, \rho = .873$].

Table 1. Chi-Square Relationship Between Gender and Self-Esteem

Variables	Gender		Total	χ^2	ρ
	Male	Female			
Low Self-Esteem	5	6	11	.025	.873
High Self-Esteem	14	15	29		
Total	19	21	40		

Gender Differences in Self-Esteem

At Phase 1, an analysis was again conducted to test the effect of gender difference in self-esteem. To test this effect, an Independent *t*-Test was selected. Finding showed that there was no significant difference among the mean (standard deviation) of both male and female self-esteem scores in Table 2, [$t (38) = .527, \rho = .602$].

Table 2. Independent *t*-Test of the Influence of Gender on Self-Esteem

Gender	N	Mean	Std. Deviation	<i>t</i>	<i>df</i>	ρ
Male	19	18.1579	3.70080	.527	38	.602
Female	21	17.5238	3.89383			

Post-Test Self-Esteem Scores among Groups

The Independent *t*-Test was conducted at the end of **Phase 3** to determine the effect of the classroom intervention on test-retest self-esteem scores of participants in Experimental and Control Groups. As summarised in [Table 3](#), there was a significant difference among the mean (standard deviation) of these two groups [$t(38) = .527, \rho = .602$].

Table 3. Independent *t*-Test of the Influence of Intervention on Self-Esteem

Groups	N	Mean	Std. Deviation	<i>t</i>	<i>df</i>	ρ
Experimental Group	5	18.8571	1.34519	7.055	9	.000
Control Group	6	14.1000	.10000			

4. Discussion

Results in the study indicated that gender had no statistically significant effect on self-esteem. Additionally, the analysis showed no significant effect of gender differences in performance of participants before the intervention phase. A similar trend was also reported by Jain and Dixit (2014) among Indian youth. They confirmed in their study that gender may not have much effect on self-esteem in recent times. However, this assertion is opposite to findings of researchers like Atindanbila et al. (2012) in Ghana and Bleidon et al. (2016) among several countries. According to Josephs et al. (1992), the gender differences in self-esteem observed by researchers may be attributed to the approach self-esteem is measured considering factors like “culturally mandated, gender-appropriate norms” (p. 391). Furthermore, school environment and socio-cultural perceptions concerning body image may affect the self-esteem evaluation in adolescent girls leading to a possible gender effect on self-esteem (Cribb, Haase, 2016).

The study’s finding also suggested that the use of group activities with local cultural themes can help boost students’ self-esteem. Group therapy had been reported as effective as opposed to standard care in improving self-esteem (Chen et al., 2016). In a study among selected government schools in Haryana, group assertive training offered to adolescent girls was observed to significantly affect their self-esteem (Sonia et al., 2016). Additionally, Tirlea et al. (2016) suggested group-based, low-dose intervention as effective for enhancing self-esteem in both primary and secondary school-aged participants.

5. Conclusion and Recommendations for Future Research

This goal of the study was to employ locally designed activities to increase the self-esteem levels of students with low self-esteem. Results from the study noted that gender played no significant role in influencing the levels of students’ self-esteem among selected participants in Ghana. Also, the results showed a significant difference among the mean (standard deviation) of the Experimental Group and the Control Group. Accordingly, the Experimental Group who were exposed to the intervention had higher self-esteem scores than the Control Group. The study concluded that designed activities which include local cultural themes should be used to assist students to improve their self-esteem.

The researchers suggest the Ghana Education Service should ensure that curricula for students incorporate self-esteem interventions or activities for students. In addition, future studies should also focus on longitudinal studies, beginning from primary schools to determine the extent of their self-esteem.

6. Conflicts of Interest

The authors declare the work has no conflicts of interest.

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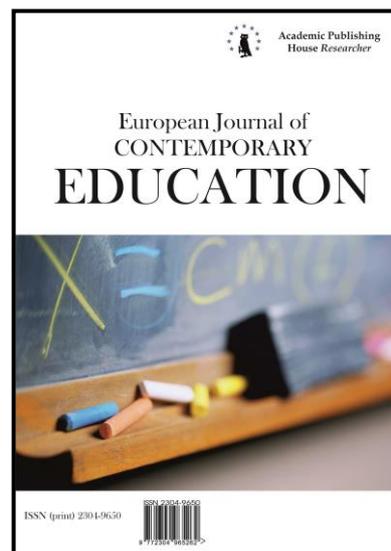
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Investigation of the Reasoning Styles of the Teacher Candidates in terms of Decision Making Styles, Learning Modalities and Gender (Süleyman Demirel University Education Faculty Case)

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Abstract

Aim: The main aim of this study is to investigate the reasoning styles of teacher candidates in terms of their gender, decision making styles, and learning modalities. **Methodology:** The study is a quantitative study based on correlational survey model. **Population:** The population consists of 4th-grade students (teacher candidates) in social studies education in Süleyman Demirel University who are in Formal Operational Stage of Cognitive Development of Piaget. **Results:** No significant difference was found in terms of gender for reasoning styles. No significant difference was found in terms of gender for those styles except avoidant decision making styles and visual learning modality both for parametric and non-parametric dimensions of decision making styles and learning modalities. Rational decision making style is correlated all the sub-dimension of reasoning styles at moderate or weak level, whereas other decision making styles are partially correlated with them except avoidant decision making style and spontaneous decision making styles. It was found that there was a significant weak correlation among the sub-dimension of the reasoning styles with learning modalities. It was found that there was a significant weak correlation among rational decision making style and intuitive decision making style among physical, auditory and visual learning modalities. However, dependent decision making style and avoidant decision making style has only weak correlation with physical and auditory learning modalities. No correlation was found among learning modalities with spontaneous decision making style. **Discussion:** Findings have strong indication regarding the content validity of reasoning styles model in this regard.

Keywords: reasoning style, teacher candidate, learning modalities, gender.

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1. Introduction

A style of reasoning is a pattern of inferential relations that are used to select, interpret, and support evidence for scientific results or specific phenomena. Reasoning styles model is a model developed by Duran and Şentürk (2019), Duran (2019), Duran and Özer (2017), Duran (2017), Duran (2014) to classify the reasoning skills in the context of styles. According to this model there is an inference plane which consists of four dimensions; representations, assumptions, resemblances, and appearances. There is also organization axes for inductive and deductive reasoning.

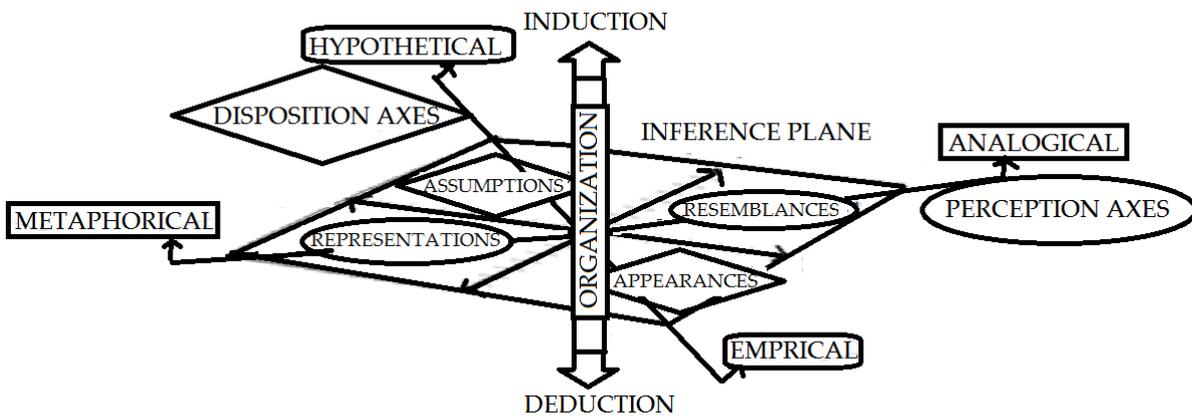


Fig. 1. Reasoning styles model (Duran, Şentürk, 2019)

The model also consists of three axes such as perception, disposition, and organization axes. Perception axes have two dimensions defined as representations or resemblances. The reason why it is called perception axes is that human cognition is fundamentally either based on sensations – the outward orientation or the ideas – inward orientation. Therefore, inferences based on representations are defined as metaphorical whereas inferences based on the resemblances are analogical. Again, they are located in the opposite corner of the inference plane as assumptions and appearances. There is also disposition axes where two inferences patterns as hypothetical and empirical are located in the opposite corner of the inference plane. This is because these assumptions are disposed based on the ideas created in abstract ways whereas appearances are fundamentally based on the data through the senses.

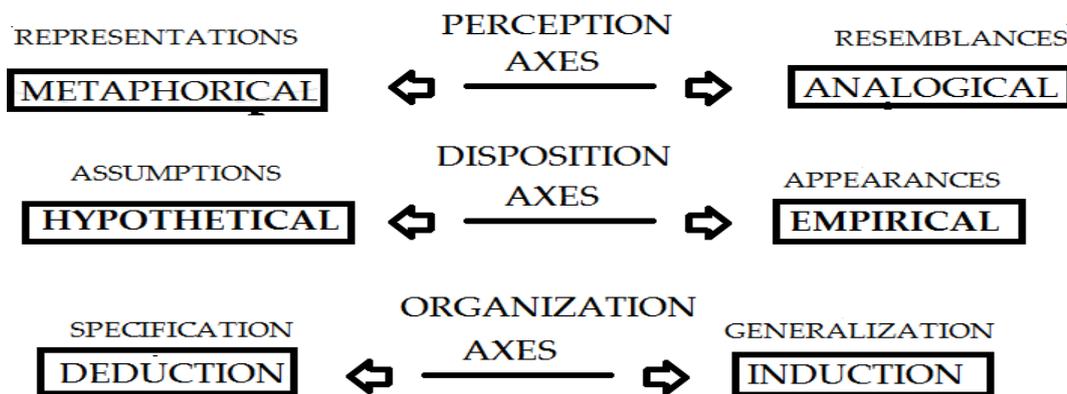


Fig. 2. Formation of the axis in the reasoning style model (Duran, Şentürk, 2019)

To sum up, inference plane consists of empirical and analogical part because the analogical and empirical inferences are tangible and concrete. Also, there is an opposite inference dimension which is hypothetical and metaphorical because they are abstract and idea-oriented. As for the

dimension of organization of reasoning, it is considered as inductive and deductive where induction is based on generalizations whereas deduction when based on specification of the inferences.

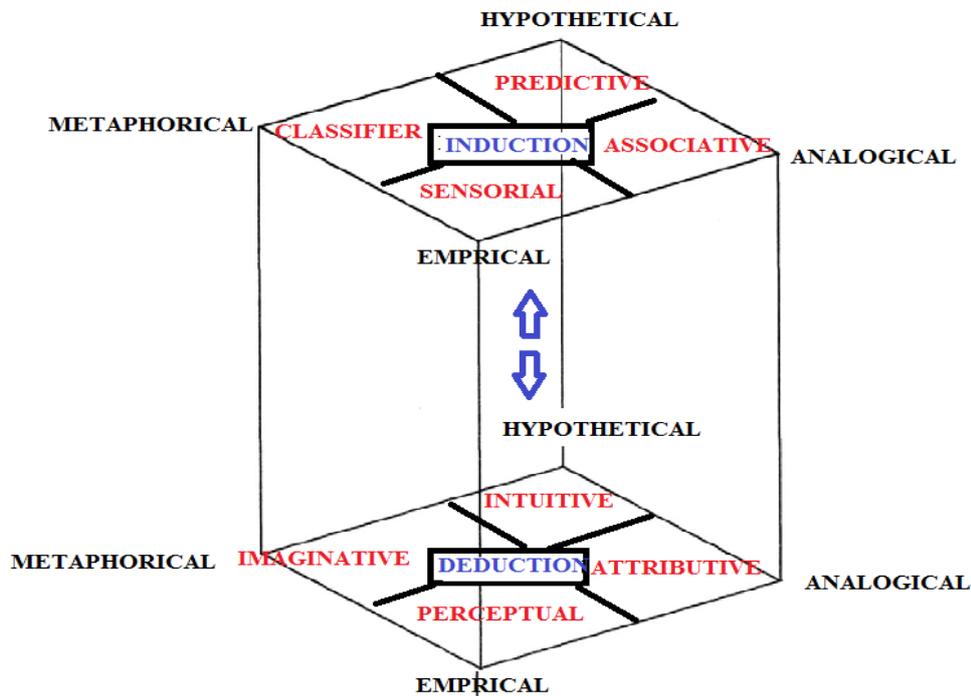


Fig. 3. Reasoner types according to reasoning styles model

As mentioned above, the intersection of three axes which include perception, disposition, and organization results in different reasoner types. The reasoner types are grouped mainly in two different planes where deduction and induction are the centers of those opposite planes.

As for the induction plane, individuals who are hypothetical-inductive are called as predictive reasoners, because their hypothetical inferences are aiming at making generalizations and predictions in an inductive way. In other words, if an inductive organization of the information is based on hypothesis, it is defined as predictive. Individuals who are empirical-inductive are also called sensorial reasoners because they make generalizations based on empirical and sensible (i.e. data from the senses) information, in other words they are sensorial dependent. Individuals who are metaphorical-inductive are classifiers because making metaphors means representing the information via subjective names, symbols, and signs. In other words, metaphorical-inductive individuals are labeled as classifiers because they use figure of speech in which a word or phrase used to make generalizations regarding an object or idea is not literally applicable. Individuals who are analogical-inductive are associative reasoners because they cite accepted similarities between two systems to support the conclusion that some further similarity exists, hence they make associations based on similarities.

As for the deduction plane, individuals who are hypothetical-deductive are known as intuitive reasoners, because they make deductions based on their assumptions and hypothesis. Individuals who are empirical-deductive are perceptual reasoners because their deductions are based on the empirical knowledge where the main sources of the deductions comes from tangible information. Individuals who are metaphorical-deductive are imaginative reasoners because they use their imagination to create a new form of information labelling the objects as well as the ideas. Individuals who are analogical-deductive are attributive reasoners because they attribute the similar or common characteristics of objects and ideas in a way that they centralize main identical features.

Decision-making style refers to the way individuals process information in order to solve problems. It is defined as a stable learned habitual response pattern based on cognitive abilities

used in decision situations (Gettinger et al., 2013). The decision-making style is a response that an individual has previously learned and made a habit of when he/she is confronted with a decision-making situation (Ehtiyar, Tekin, 2010: 3399). Scott and Bruce (1995) define five behavioral dimensions based on DMs' self-evaluation: (i) a rational, (ii) an intuitive, (iii) a dependent, (iv) an avoidant, and (v) a spontaneous style. Studies have shown that even though an individual may have a predominant style, decision styles are not mutually exclusive (Loo, 2000; Spicer, Sadler-Smith, 2005; Thunholm, 2004).

Table 1. Description of General Decision-Making Styles (Fischer et al., 2015)

Core decision process

Rational – Thorough search for information and logical evaluation of optional alternatives

– Analytic, sequential information processing and systematic appraisal

Intuitive – Strong reliance on emotions, presentiments, hunches, and gut feelings

– Simultaneous information processing

Spontaneous – Sense of immediacy and desire to finish the decision process as quick as possible

Decision-regulatory process

Dependent – Extensive advice seeking, consulting, and directions from relevant others

Avoidant – Attempt to escape the choice situation and thereby avoid or delay the decision

According to this model, “a rational style characterized by a thorough search for and logical evaluation of alternatives; an intuitive style characterized by the use of hunches and feelings in decision making; a dependent style characterized by a reliance on the advice of others, and avoidant style characterized by attempts to avoid decision making, spontaneous style characterized by a sense of immediacy and desire to complete decision making as soon as possible” (Erol Öngen, 2014). In this regard, it is thought that reasoning styles and decision-making styles are correlated at least some dimension such as rational decision-making style or intuitive style.

Learning modality described, as learners’ relatively permanent preferences about perceive the information. As one of the basic dimensions of the learning style, there are three generally accepted types of learning. These are kinesthetic, auditory and visual modalities (Şimşek, 2002). Concepts such as body, balance, dexterity, activity, sport, dance, drama, theater, movements are critical in the definition of kinesthetic modality. A student with this style usually has a special interest in expressing his emotions and thoughts in body language, using tools and making concrete things. Rather than, listening or observing things. Students with auditory style are sensitive to music and audible stimuli. Talking, discussing, listening, telling, tone of voice, language, melody, different voices, poetry are things that the students of this style care about and prefer. Students with visual style can visualize what they read or hear. They can remember visually and in detail the events that have taken place. Painting, drawing, map, line, color, direction, plan, and attract those students (Şimşek, 2002).

In this article it is thought that there shouldn't be any significant correlation particular for a specific decision making style or reasoning style. Hence, the main aim of this study is to investigate the reasoning styles of the teacher candidates in terms of their gender and their decision making styles, learning modalities.

The main problems of the study can be given as below:

1. Is there any significant difference for reasoning styles, decision making styles and learning modalities of the students in terms of gender?
2. Is there any significant correlation among the sub-dimensions of reasoning styles, decision making styles of the students?
3. Is there any significant correlation among the sub-dimensions of reasoning styles, learning modalities of the students?
4. Is there any significant correlation among the sub-dimensions of decision making styles, learning modalities of the students ?

2. Method

The study is a quantitative study based on correlational survey model. The spearman correlation test was performed to investigate the relationship among the reasoning styles, decision making styles, learning modalities. T-test and Mann Whitney-U test were performed to investigate whether the reasoning styles, decision making styles, learning modalities varied in terms of gender.

Population

The population of the study consists from teacher candidates in the branches related with social sciences (as 182 of them in primary school teacher candidates, 130 of them social studies teacher candidates that sums up 312 in total – Turkish Language Teachers and English Language Teachers were regarded as the part of Language Teaching) in Süleyman Demirel University (Egitim.sdu). The sample was selected in terms of convenience sampling technique that are 141 students studying in the branches related with social sciences. Because convenience sampling is a specific type of sampling method that relies on data collection from population members who are conveniently available to participate in study in terms of time and cost, the sample group was chosen as the most available group of individuals in the 4th-grade students (teacher candidates) in social studies education and primary school teaching in Süleyman Demirel University. Additionally, in order to determine the size of the sample, the formula of Yamane (2010) was used as follows:

$$n = \frac{Nz^2pq}{(N-1)d^2+z^2pq} = \frac{312(1.96)^2 0.5 \cdot 0.5}{(311)(0.07)^2 + (1.96)^2 (0.5)(0.5)} = \frac{299.645}{2.4843} = 120,62$$

Where N= the number of individuals in the population as 312 individuals

z = 1.96 (standard normal distribution table value for the desired reliability level (95 %))

d = 0.07 (sensitivity)

p: the ratio of individuals with the desired feature in the stack (p + q = 1, p = q = 0.50 to make the maximum sample diameter)

As a result of the procedure, it is assumed that the sample of 121 students can represent the universe and this value is accepted as the lower limit for the sample size. Therefore because our sample consisting from 141 students, it is appropriate representing for the population.

Additionally for correlational survey models, the number of sample size is taken into consideration as a result of the calculation made with the following formula ([Tabachnick, Fidell, 2007](#)):

$$N > 50 + 8m$$

N: Number of participants m: number of independent variables where m= 11 (4 independent variables from reasoning styles, 4 from decion making styles and 3 from learning modalities)

N > 138 where The target sample size for this study is 141 which meet the requirement.

Age distribution shows that they are compatible with the aims of measurement tools of this research because when the age distirbution was investigated, it could be seen that most of them are in Formal Operational Stage of Cognitive Development of Piaget. Hence it indicates that students participating in this study can think about abstract and theoretical concepts as well as have cognitive skills such as logical thought, deductive reasoning, and systematic planning. Therefore, the population is thought to be suitable for the cognitive development level of the students in this regard.

Table 2. The distribution of the population according to their age

		Frequency	Percent
Valid	18	5	3,5
	19	15	10,6
	20	30	21,3
	21	33	23,4
	22	28	19,9
	23	19	13,5

	24	7	5,0
	25	1	,7
	26	1	,7
	28	1	,7
	32	1	,7
Total		141	100,0

Measurement Tools

There are three measurement tools used in this study. These are reasoning style scale developed by Duran (2019), The Decision Making Styles Scale (CTRS) developed by Scott and Bruce (1995), Big16 Learning Modality Inventory developed by (Şimşek, 2002).

Reasoning Style Scale Developed by Duran (2019)

The Reasoning Styles Scale was developed by Duran (2019). There are four dimensions for this scale as Metaphorical-Deductive, Emprical, Analogical Inductive, Hypotetical, hence it doesn't encompass all the dimensions of the model given in Figure 1. Metaphorical-Deductive style corresponds to imaginative reasoner according to this model given in Figure 3. Analogical Inductive style corresponds to associative reasoner style in this scheme. There are also Emprical and Hypotetical that are conceptually opposed to each other also in this scheme. Therefore, The Reasoning Styles Scale was developed by Duran (2019) could be regarded as the limited version of this model. However, because it is reliable and valid scale, it can be used as a measurement tool for the investigation of the some reasoning styles in this respect.

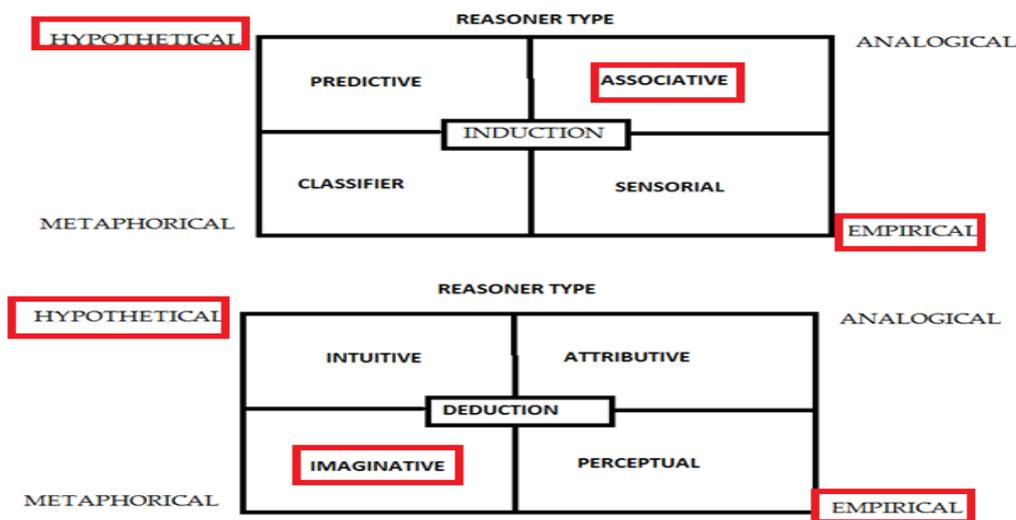


Fig. 4. Reasoning style scale only partially corresponds to reasoning style model

There are 17 items in this scale for four dimensions. Likert type scale items are scored according to options as strongly agree (1), agree (2), partially agree (3), disagree, (4), strongly disagree (5).

The Decision Making Styles Scale (CTRS) developed by Scott and Bruce (1995)

The Decision Making Styles Scale (CTRS) was developed by Scott and Bruce (1995) to measure individual differences in decision-making styles that individuals use to approach problems in decision-making processes. There are five dimensions of this scale as (i) a rational, (ii) an intuitive, (iii) a dependent, (iv) an avoidant, and (v) a spontaneous style. Likert type scale items are scored according to options as strongly agree (1), agree (2), partially agree (3), disagree, (4), strongly disagree (5) (Taşdelen, 2002; Kurban, 2015).

Learning Modalities Inventory

Big16 Learning Modality Inventory developed by Şimşek (2002). The items in the inventory are collected in 3 factors explaining 42,923 % of the total variance. There are 48 items in this

inventory for three dimension as kinesthetic, auditory and visual modalities. Likert type scale items are is scored according to options as storngly agree , agree, partially agree, disagree, strongly disagree. The Cronbach Alpha value for the whole inventory was calculated as .844. The findings regarding the reliability of the inventory show that the results can be considered sufficient.

3. Analysis of the Data

The data must be cleaned before being analyzed because duplication or unusual data will reduce the validity and reliability of the study. Therefore, before the data of 148 people participating in the study were analyzed, the unusual cases of the participants deviated from the norms were screened in SPSS (data screening method). Data screening method is a process that takes place before data data analysis to ensure the integrity of data. Data screening method means checking for and removing data from undesired errors. The aim is to maximize the characteristics of the structure to be obtained and to minimize "noise" by identifying and repairing errors. First, it is intended to correct the lost data before analyzing the data. For this, the missing data was recovered by using the mean of the series mean method. In the second stage, it is ensured whether there is any out-of-range value in the options of the items through investigating the maximum and minimum values of each item. Out of range values are defined as the values that are below the minimum or above the maximum possible value for each item. When the data were examined, it was seen that no item has such a value for any of the three scales. In the third stage, it is examined whether there are unexpected cases. Unusual cases occur when the answers of a case are very different from the responses given by most of the other responders. The Unusual cases tab in SPSS was used for this purpose. In this context, firstly unexpected situations were examined for three styles.

When the [Table 3](#) was investigated, the Anomaly Case Index List For Reasoning Styles shows that there are five cases as shown below.

Table 3. Anomaly Case Index List For Reasoning Styles

Case	Anomaly Index	Variable Impact	Variable Value	Variable Norm
117	3,256	,087	5,00	1,9826
147	2,308	,116	5,00	1,7733
137	2,192	,583	5,00	1,1667
116	2,133	,133	5,00	1,9826
136	2,071	,695	5,00	1,3056

When the [Table 4](#) was investigated, the Anomaly Case Index List For Decison Making Styles shows that there are one cases as shown below.

Table 4. Anomaly Case Index List For Decison Making Styles

Case	Anomaly Index	Variable Impact	Variable Value	Variable Norm
146	2,074	,089	5,00	2,2500

No anomaly was found for the Anomaly Case Index List For BIG 16 Learning Modalitiy Inventory. Finally after the elimination of the unusual cases, 141 individuals' results will be analyzed.

When the test of normality was investigated, it is seen that all the dimensions of Reasoning Styles Scale was not normally distributed. Similarly, except for dependent decion making style all the dimensions of Decion Making Styles were not normally distributed also. However, as for the learning modality inventory, except visual dimenion, the other two dimensions are normally distirbuted. Hence it can be said that it would be proper to use non-parametric tests for the analysis of the data.

Table 5. Tests of Normality

		Tests of Normality					
		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Reasoning Styles	Metaphoricaldeductive	,196	141	,000	,811	141	,000
	Emprical	,163	141	,000	,886	141	,000
	Analogicalinductive	,146	141	,000	,900	141	,000
	Hypotetical	,098	141	,002	,949	141	,000
Decision Making Styles	Rationaldecionmaking	,122	141	,000	,914	141	,000
	İntuitivedecionmaking	,105	141	,001	,938	141	,000
	Dependentdecionmaking	,067	141	,200*	,971	141	,005
	Avoidantdecionmaking	,110	141	,000	,956	141	,000
Big 16 Learning Modalitiy Inventory	Spontaneousdecionmaking	,112	141	,000	,960	141	,000
	Physical	,054	141	,200*	,978	141	,021
	Auditory	,058	141	,200*	,978	141	,025
	Visual	,076	141	,044	,959	141	,000

a. Lilliefors Significance Correction
*. This is a lower bound of the true significance.

When the correlation analysis was done, the range values of correlations as taken given below table (Akoğlu, 2018).

Table 6. Interpretation of correalation values for the analysis (Akoğlu, 2018)

+/- 1	Perfect
+/- 0.7-0.9	Strong
+/- 0.4-0.6	Moderate
+/- 0.1-0.3	Weak

4. Results

Result of the first question as “Is there any significant difference for reaoing styles, decion making styles and learning modalities of the students in terms of gender?”

When Mann-Whitney-U test was performed on the non-parametric dimensions of reasoning styles scale, no significant difference was found in terms of gender for those styles as given Table 7.

Table 7. Mann-Whitney U test results for the resoning styles

	Metaphorical-Deductive	Emprical	Analogical Inductive	Hypotetical
Mann-Whitney U	1674,500	1807,000	1772,000	1886,000
Wilcoxon W	7030,500	7163,000	7128,000	2627,000
Z	-1,336	-,706	-,867	-,333
Asymp. Sig. (2-tailed)	,181	,480	,386	,739

a. Grouping Variable: Gender

When Mann-Whitney-U test was performed on the non-parametric dimensions of decision makin styles scale and visual learning modality, no significant difference was found in terms of gender for those styles except avoidant decion making styles and visual learning modalitiy as given Table 8.

Table 8. Mann-Whitney U test results for non-parametric dimensions of decision making styles scale and visual learning modality

	Rational Decion Making	Intuitive Decion Making	Avoidant Decion Making	Spontaneous Decionmaking	Visual
Mann-Whitney U	1589,000	1814,500	1216,000	1710,500	1,442E3
Wilcoxon W	2330,000	2555,500	1957,000	2451,500	6,798E3
Z	-1,725	-,665	-3,450	-1,148	-2,398
Asymp. Sig. (2-tailed)	,085	,506	,001	,251	,016

When the mean ranks were investigated it was found that females have more higher mean rank for avoidant decion making but males have more higher mean rank for visual learning modality (Table 9).

Table 9. Mean rank values for avoidant decion making style and visual learning modality in terms of gender

	Ranks			
	Gender	N	Mean Rank	Sum of Ranks
avoidant decion making	Female	103	78,19	8054,00
	Male	38	51,50	1957,00
	Total	141		
visual	Female	103	66,00	6797,50
	Male	38	84,57	3213,50
	Total	141		

When the parametric independent sample test was performed for the dependent decion making style and physical and auditory learning modalities, no significant difference was found for those sub-dimensions.

Table 10. The parametric independent sample test was performed for the dependent decion making style and physical and auditory learning modalities

		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	
Dependent decion making	Equal variances assumed	,020	,886	,400	139	,690	,31604	,78963	-1,24520	1,87729	
	Equal variances not assumed			,398	65,341	,692	,31604	,79428	-1,27008	1,90217	
Physical	Equal variances assumed	,104	,747	,055	139	,957	,09107	1,66800	-3,20685	3,38900	
	Equal variances not assumed			,056	68,521	,956	,09107	1,63724	-3,17554	3,35769	
Auditory	Equal variances assumed	,081	,776	-1,345	139	,181	-2,12704	1,58160	-5,25414	1,00005	

		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
Dependent decion making	Equal variances assumed	,020	,886	,400	139	,690	,31604	,78963	-1,24520	1,87729
	Equal variances not assumed			,398	65,341	,692	,31604	,79428	-1,27008	1,90217
Physical	Equal variances assumed	,104	,747	,055	139	,957	,09107	1,66800	-3,20685	3,38900
	Equal variances not assumed			,056	68,521	,956	,09107	1,63724	-3,17554	3,35769
Auditory	Equal variances assumed	,081	,776	-1,345	139	,181	-2,12704	1,58160	-5,25414	1,00005
	Equal variances not assumed			-1,350	66,553	,182	-2,12704	1,57568	-5,27249	1,01841

Result of the second question as “Is there any significant correlation among the sub-dimensions of reaoning styles, decion making styles of the students?”

When the spearman correlation analysis done for among the sub-dimensions of reaoning styles, decion making styles of the students, it is found that the relationship between rational decision making style with metaphorical-deductive reasoning style as well as analogical style is in moderate level. However, the relationship between rational decision making style with emprical and hypothetical reasoning styl is in weak level. The relationship between intuitive decision making style with analogical-inductive and hypothetical reasoning style is found to be weak level. Furthermore, the relationship between depedent decion making style with hypothetical reasoning style is also weak level. Nevertheless, no correlation was found to be among avoidant decision making style and spontaneous decion making style with all reasoning styles.

Table 11. The correlation among decion making styles with reasoning styles

		Metaphorical-Deductive	Emprical	Analogical Inductive	Hypotetical
Rational Decision Making Style	Correlation Coefficient	,447**	,283**	,481**	,289**
	Sig. (2-tailed)	,000	,001	,000	,001
	N	141	141	141	141
Intuitive Decision Making Style	Correlation Coefficient	,140	,163	,263**	,327**
	Sig. (2-tailed)	,097	,053	,002	,000
	N	141	141	141	141
Dependent Decision Making Style	Correlation Coefficient	,111	,124	,160	,220**
	Sig. (2-tailed)	,190	,144	,058	,009
	N	141	141	141	141
Avoidant Decision Making Style	Correlation Coefficient	-,072	,079	-,161	,130
	Sig. (2-tailed)	,394	,352	,056	,125
	N	141	141	141	141
Spontaneous Decion Making Style	Correlation Coefficient	-,149	-,037	-,063	,097
	Sig. (2-tailed)	,077	,663	,457	,254
	N	141	141	141	141

		Metaphorical-Deductive	Empirical	Analogical Inductive	Hypothetical
Rational Decision Making Style	Correlation Coefficient	,447**	,283**	,481**	,289**
	Sig. (2-tailed)	,000	,001	,000	,001
	N	141	141	141	141
Intuitive Decision Making Style	Correlation Coefficient	,140	,163	,263**	,327**
	Sig. (2-tailed)	,097	,053	,002	,000
	N	141	141	141	141
Dependent Decision Making Style	Correlation Coefficient	,111	,124	,160	,220**
	Sig. (2-tailed)	,190	,144	,058	,009
	N	141	141	141	141
Avoidant Decision Making Style	Correlation Coefficient	-,072	,079	-,161	,130
	Sig. (2-tailed)	,394	,352	,056	,125
	N	141	141	141	141
Spontaneous Decision Making Style	Correlation Coefficient	-,149	-,037	-,063	,097
	Sig. (2-tailed)	,077	,663	,457	,254
	N	141	141	141	141

** . Correlation is significant at the 0.01 level (2-tailed).

Result of the third question as “Is there any significant correlation among the sub-dimensions of reasoning styles, learning modalities of the students?”

When the spearman correlation was performed among the sub-dimension of the reasoning styles with learning modalities, it was found that there was a significant weak correlation among them.

Table 12. The spearman correlation was performed among the sub-dimension of the reasoning styles with learning modalities

		Metaphorical-Deductive	Empirical	Analogical Inductive	Hypothetical
Physical	Correlation Coefficient	,280**	,244**	,243**	,336**
	Sig. (2-tailed)	,001	,004	,004	,000
	N	141	141	141	141
Auditory	Correlation Coefficient	,321**	,292**	,251**	,288**
	Sig. (2-tailed)	,000	,000	,003	,001
	N	141	141	141	141
Visual	Correlation Coefficient	,380**	,360**	,388**	,192*
	Sig. (2-tailed)	,000	,000	,000	,023
	N	141	141	141	141

Result of the fourth question as “Is there any significant correlation among the sub-dimensions of decision making styles, learning modalities of the students?”

When the spearman correlation was performed among the sub-dimension of the decision making styles with learning modalities, it was found that there was a significant weak correlation among rational decision making style and intuitive decision making style among physical, auditory and visual learning modalities. However, dependent decision making style and avoidant decision

making style has only weak correlation with physical and auditory learning modalities. No correlation was found among learning modalities with spontaneous decision making style.

Table 13. Correlation among the sub-dimensions of decision making styles, learning modalities

		Physical	Auditory	Visual
Rational Decision Making Style	Correlation Coefficient	,286**	,352**	,302**
	Sig. (2-tailed)	,001	,000	,000
	N	141	141	141
Intuitive Decision Making Style	Correlation Coefficient	,351**	,362**	,249**
	Sig. (2-tailed)	,000	,000	,003
	N	141	141	141
Dependent Decision Making Style	Correlation Coefficient	,194*	,311**	,142
	Sig. (2-tailed)	,021	,000	,092
	N	141	141	141
Avoidant Decision Making Style	Correlation Coefficient	,168*	,169*	-,040
	Sig. (2-tailed)	,047	,045	,635
	N	141	141	141
Spontaneous Decision Making Style	Correlation Coefficient	,119	,102	,017
	Sig. (2-tailed)	,160	,231	,839
	N	141	141	141

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

5. Discussion

Discussion of the first question as “Is there any significant difference for reasoning styles, decision making styles and learning modalities of the students in terms of gender?”

When Mann-Whitney-U test was performed on the non-parametric dimensions of reasoning styles scale, no significant difference was found in terms of gender for those styles as given. It is difficult to interpret this result because there are so scarce findings regarding reasoning styles in the context of gender except Duran (2019) study showing that no significant difference found in terms of gender except empirical dimension. Therefore it would be useful to investigate similar concepts such as thinking styles, cognitive styles in the context of gender. Many studies in relation with thinking styles shows that gender doesn't make significant difference for thinking styles (Balkis, 2003; Jahanshahi, 2006; Kadim, 2017; Kayani, 2003; Mahdavi Shakib, 2011; Önkuzu, 2013; Çubukçu, 2004; Durdukoca, 2011; Özbaş, Uluçınar Sağır, 2014; Pour Kayani ve Shahilou, 2010; Shokri et al., 2006; Yaşar, Erol, 2015). Similarly, there are literature indicating that cognitive styles doesn't significantly differ in terms of gender (Gacar et al., 2015; Murphy ve Casey, 1997; Çakan, 2003; 2005; Çubukçu, 2004a; Horzum ve Alper, 2006; Pithers, 2002; Tinajero ve Paramo, 1997). Although there are contrary literature regarding this issue (Atasoy, 2004; Altıparmak, 2009; Riding ve Agrell, 1997) it can be said that reasoning styles should be independent of gender if the gender is socially constructed in a culture where both genders are treated equally.

When Mann-Whitney-U test was performed on the non-parametric and parametric dimensions of decision making styles scale and visual learning modalities, no significant difference was found in terms of gender for those styles except avoidant decision making styles and visual learning. When the mean ranks were investigated it was found that females have more higher mean rank for avoidant decision making but males have more higher mean rank for visual learning modality. There are literature support the idea that decision making styles are of having no significance in terms of gender (Fischer et al., 2015; Kurban, 2015). Similarly, empirical research contends that gender has no influence on the preferred decision making style (Loo, 2000; Spicer,

Sadler-Smith, 2005). Similarly, recent research indicates that gender differences in adoption and use of technology do not exist anymore for younger subjects (Morris et al., 2005; Gettinger et al., 2013). Therefore except for avoidant decision making style, the result of this study is supported by the literature. Avoidant decision makers tries to avoid to making decisions, hence the males in this sample are more avoidant than the females because the less point means the higher values in terms of scales. This can be explained by sample differences because it is thought that that gender differences should be disappeared because of educational and cultural changes that promote equality between the sexes (Loo, 2000).

Except for visual learning style, there is no significant difference among learning modalities with gender. Some studies shows that there is no significant differences in terms of gender for learning styles (Coşkun, 2011; Çağlayan, 2007). It is thought that gender shouldn't be significantly related with learning modalities also, the differences should be related samples indicating that social constructs somehow affects genders shows this kind of differences. However, there are literature supporting the finding of this results. For example Mahiroğlu (1999) found that auditory and visual, kinesthetic preferences was differentiated for male students, while visual learning was preferred to kinesthetic learning in female students in terms of gender. Therefore it is debatable whether these differences are natural result of sexual differences or gender differences.

Discussion of the second question as “Is there any significant correlation among the sub-dimensions of reasoning styles, decision making styles of the students?”

When the spearman correlation analysis done for among the sub-dimensions of reasoning styles, decision making styles of the students, it is found that the relationship between rational decision making style with metaphorical-deductive reasoning style as well as analogical style is in moderate level. However, the relationship between rational decision making style with empirical and hypothetical reasoning style is in weak level. Whether it is moderate or weak, in all the dimensions of reasoning styles, it is found that there is a positive correlation between rational decision making with reasoning styles. Rational reasoning style is related with exhaustive information search, systematic evaluation of alternatives, hence it is expected that reasoning styles are related with rational reasoning style in this context. Weak or moderate values indicate that although students consider they have some reasoning preferences, they don't reflect it in actual setting such as decision making processes.

The relationship between intuitive decision making style with analogical-inductive and hypothetical reasoning style is found to be weak level. Intuitive is related with unsystematic information processing and reliance on premonitions and feelings (Allwood, Salo, 2012). Hence it is expected that there should be correlation with hypothetical and analogical-inductive reasonings because they also depend on intuition to some degree. It should be noted that individuals who are hypothetical-deductive are called as intuitive reasoners hence this finding is partially supports the labelling of reasoning styles.

Furthermore, the relationship between dependent decision making style with hypothetical reasoning style is found to be weak level. This can be explained by the fact that hypothetical reasoning styles might be depended upon the advice from others to some little bit degree and this is the reason why there is a weak correlation found between them.

Nevertheless, no correlation was found to be among avoidant decision making style and spontaneous decision making style with all reasoning styles. Avoidant decision makers tries to avoid making decisions (Allwood, Salo, 2012). Therefore it is natural to observe no significant correlation between avoidant decision making with reasoning styles, because reasoning styles requires making logical decision whereas avoidant decision makers not. So negative or no correlation can be expected between the correlations of these styles.

Spontaneous decision makers wants to reach a decision quickly so it is expected that there should be no correlation with any of reasoning styles with this dimension (Allwood, Salo, 2012).

“Cognitive scientists generally believe that “rational” or “intuitive” decision-making styles lead to improved life decision outcomes, whereas “avoidant” and “spontaneous” decision-making styles affect them negatively. “Dependent” decision making, on the other hand, has not proven to be related to decision outcomes” (Fischer et al., 2015). Similarly, it is also expected that preferring reasoning styles should be related with improved life decision outcomes because they are logical, systematic and more grounded. Therefore, the correlation with rational and intuitive decision making styles with reasoning styles confirmed this inference.

Discussion of the third question as “Is there any significant correlation among the sub-dimensions of reasoning styles, learning modalities of the students?”

When the spearman correlation was performed among the sub-dimension of the reasoning styles with learning modalities, it was found that there was a significant weak correlation among them. This indicated that to some degree, there is no preferred learning modalities for reasoning styles, but correlation among them they are related and not independent from each other. It can be seen that empirical reasoning is at the highest value for the visual learning modality so that they are compatible to each other. Similarly analogical-inductive reasoning style is also at the highest level for the visual learning modality indicating that analogical-inductive reasoning is more based on visual or empirical outcomes than others. Likewise, metaphorical-deductive reasoning is also having highest value with visual learning modality indicating that visual inputs such as symbols, signs are more effective than others in terms of reasoning styles. However, interesting result where hypothetical is at highest level for physical learning modality shows contradicted result based on the conceptual characteristics of its relation with visual and auditory information because hypothetical inferences are mostly based upon those inputs. This might be explained sample differences or other factors that don't taken into account.

Discussion of the fourth question as “Is there any significant correlation among the sub-dimensions of decision making styles, learning modalities of the students?”

When the spearman correlation was performed among the sub-dimension of the decision making styles with learning modalities, it was found that there was a significant weak correlation among rational decision making style and intuitive decision making style among physical, auditory and visual learning modalities. It should be noted that rational decision making style and intuitive decision making style are regarded as the core decision processes, hence they should be mainly related with all learning modalities to some degree. Akyürek and Güney (2018) support this data by finding learning styles and are partially effective on the decision-making styles and the locus of control is effective on the learning style of participants.

However, dependent decision making style and avoidant decision making style has only weak correlation with physical and auditory learning modalities. This is compatible with their definitions also because dependent decision making style is related with extensive advice seeking, consulting, and directions from relevant others and avoidant decision making style is related with the attempt to escape the choice situation and thereby avoid or delay the decision. Those are always mainly done in auditory and physical spheres more dominantly than the visual one.

No correlation was found among learning modalities with spontaneous decision making style. It can be inferred that because spontaneous decision making style is based on sense of immediacy and desire to finish the decision process as quick as possible, it is natural to see no preferential connection between any of the modalities.

It can be seen that all the learning styles have highest values for rational and intuitive decision making styles indicating that individual having those styles are more prone to use learning modalities than the other.

6. Conclusion

Findings have strong indication regarding the content validity of reasoning styles model in this regard because the characteristics of reasoning styles model is compatible with the decision making styles and learning modalities in many ways. For instance, if they are not compatible, the rather than positive correlation among all the dimensions of reasoning styles with rational decision making style, there should be negative or no correlation. Similarly, rather than finding no correlation was found to be among avoidant decision making style and spontaneous decision making style with all reasoning styles, it should be find positive correlation. Hence findings support the reasoning style model in this regard.

7. Recommendations

As for the future research, different samples consisting from different age groups as well as different demographic variables can be used to investigate reasoning styles.

Different design methodologies such as qualitative, quantitative or mixed designs can be used to investigate reasoning styles.

Different measurement tools or different versions of learning styles and decision making styles can be used for the subsequent researches.

More broad scales based on reasoning style scale can be used to investigate reasoning styles.

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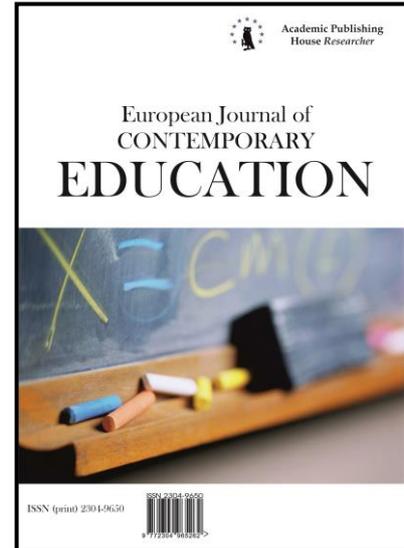
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Anxiety Toward Mathematics: Empirical Evidence on High School Students

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Abstract

In Mexico there is a complicated situation regarding the subject of mathematics, especially in the high school students who have shown low performance in the results of the tests applied by international and national organizations. Therefore, the aim of the study is focuses on testing whether the variables of the scale proposed by Fennema and Sherman (1976), measure level anxiety towards mathematics in of high school students, in the Mexican context. The study is carried out from the hypothetical-deductive paradigm, of non-experimental design and cross-sectional. For the analysis of the data, a structural equation model (AMOS) is used. The main findings show significant weights only in five of the twelve variables proposed by the theoretical model of Fennema and Sherman. These findings correspond to variables that measure anxiety towards solve mathematical problems, which makes that the student in a situation of nervousness and irritation.

Keywords: anxiety toward math, problema solve, high school students.

1. Introduction

Nowaday, mathematics has a transcendental role in all areas of knowledge. Its importance lies in the significant role it has in human activities because it promotes the development of skills in quantitative, logical and analytical thinking. These skills allow to the student who is the subject of study, to successfully enter the workplace (Larrazolo et al., 2013; Guagcha, 2017).

In relation to the subject of mathematics, in Mexico there is a complicated situation, especially in the high school students, who have shown low yields in the results in the PISA tests (Programme International Students Assesment) as well, in the Assessment of Learning (Planea,

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2017; SEP, 2017). The results indicated that in Mathematics, 6 of each 10 students are located in level I (66 %); almost 2 of each 10 are at level II (23 %); at level III, only 8 of each 100 students (8 %); at level IV, 3 of each 100 (2.5 %).

On the same idea, the OECD report (2014) indicates that students have anxiety levels above average. Figure 1 shows each factors that cause anxiety in school assignments. Also, the report presented by the OECD shows data that indicates that girls have higher levels of anxiety than boys, they also point out that anxiety is common among high performance students. Another data indicates that 82% of high performance girls, sayed worry about qualifications.

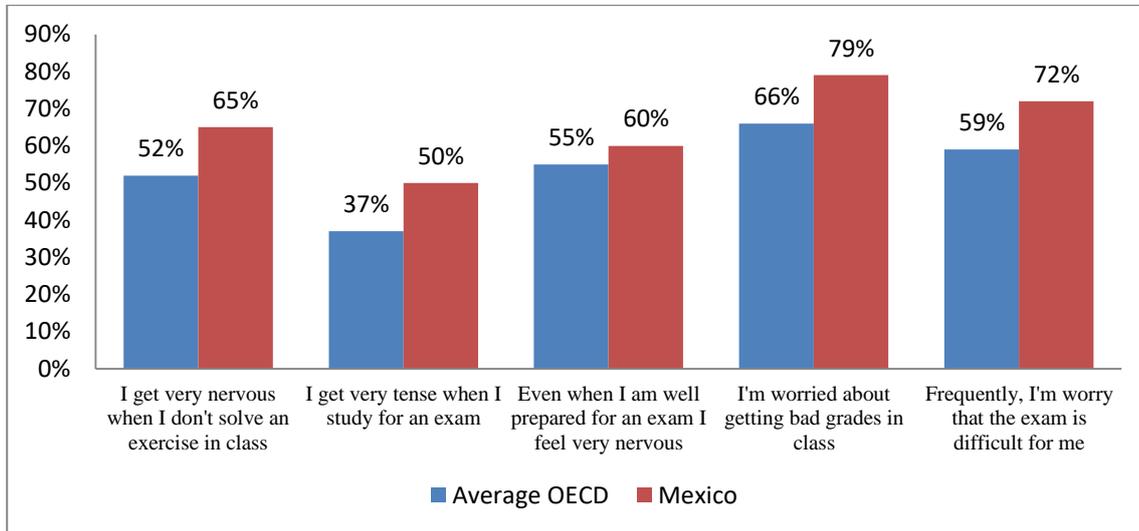


Fig. 1. Anxiety toward task (source OECD, 2017)



Based on the data reported by international and national institutions about the problem of anxiety towards mathematics, it is established as the main purpose: to prove the factor validity of the scale that measures anxiety towards mathematics proposed by Fennema and Sherman (1976), in high school students. With the findings of the study, it is expected to be able to provide empirical evidence about the anxiety towards mathematics presented by the students. The above is intended to provide information for professors and academic authorities to develop new teaching strategies that contribute to improving the quality of education in high school students and thus be competent internationally.

3. Literature review

Al-Fraidan and Al-Khalaf (2012) cited by Dedeen et al. (2014) point out that, in almost all countries the tests are used as a tool for evaluating their achievements. As a result, there is great concern for both students and teachers around the world to get better test results. However, a determining factor in the level of performance in the student is the anxiety that the student shows in certain situations where mathematics is used.

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While a reasonable level of anxiety is useful for motivating a student, a high level of anxiety can interfere with the way students perform (Strand, 2003). Many students suffer from mathematical anxiety which causes their performance to be low, even they do not even feel able to solve situations that involve mathematical processes. In addition, students with mathematical anxiety try to avoid careers and environments that require mathematical skills (Armstrong, 1985; Wigfield, Meece, 1988, Ashcraft, 2002).

Mathematical anxiety describes feelings of nervousness, tension or irritability that many students experience when performing mathematical operations in a mathematical context (Richardson, Suinn, 1972, cited in Pérez et al., 2013). On the other hand, Tobias and Weissbrod (cited in Pérez et al., 2013), state that "mathematical anxiety describes the panic, impotence, paralysis and mental disorganization that emerge when a student is required to solve a mathematical problem".

The results reported by Muñoz and Mato (2007) showed that exams are a main cause for the level of anxiety in the student be high. This evidence is consistent with Zeidner (1998, cited by Macías and Hernández, 2008), who pointed out that mathematical anxiety is an important cause for students to obtain poor performance in mathematical learning. Also noted that the anxiety caused by the exams is significantly associated with the low academic performance of the students. In this idea, Stuart, (2000) has pointed out that very often the lack of confidence in mathematical skills may cause anxiety, this added to other factors that can also cause anxiety such as the attitude that teachers usually have in teaching process, as well as the attitudes of classmates and the attitudes of family members.

In the same idea Dursun (2015) makes a difference between students' attitude towards mathematics and their anxiety levels, according to the types of school. An example of this, in vocational high schools they have lower levels, while in high school of sciences, the level of anxiety is higher. Escalera et al (2016) show evidence that the anxiety towards mathematics is different according to the level of study: either at the elementary level, secondary, high school and college where professional training is given.

Hence, anxiety towards evaluation is the variable that most contributes to increase the level of anxiety in students at the school level of: secondary, high school and professional, but not in students of the elementary level, who will not show some type of anxiety towards math.

About anxiety towards mathematics, it has been studied by many researchers. Some pioneering works are attributed to Fenneman and Sherman (1976) who designed a scale that measures this phenomenon. Their findings have indicated that affective variables, including attitudes, have an impact on the effort the student is willing to make to achieve mathematical learning.

The scale designed by Fenemma and Sherman (1976) has been replicated in several studies, for example: (Kloosterman, Stage, 1992; Martin, 2002; Leedy et al., 2003; Pérez-Tyteca, 2007) among others. For this reason, we have selected this scale to measure the level of anxiety in high school students in the municipalities of Querétaro and San Luis Potosí, within the Mexican context. Thus, in order to carried out the empirical study, the method that will be used for this purpose is described below:

Methodology design

The study is carried out applying the hypothetical-deductive method. The hypothesis to be tested in the study seeks to demonstrate whether the structure of items of the mathematical anxiety scale proposed by Fennema and Sherman (1976) can be explained with the data of the sample under study.

The study is quantitative, non-experimental, cross-sectional, confirmatory because it is our interest to see if the model proposed by Fennema and Sherman (1976), measures anxiety towards mathematics in high school students. The sample is not probabilistic since the selection of cases to survey was chosen according to the authorization given by the academic authorities.

Sample. Were survey 264 students face to face from the first and third semester of high school level, belonging to the three schools in the municipalities of Rioverde S.L.P, Ciudad Fernández S.L.P, and Arroyo Seco Queretaro. The inclusion criterion establishes that the student surveyed must be enrolled and also must be in some course, relating to mathematics.

Instrument/questionnaire. The Fennema and Sherman scale (1976) was applied, which is composed of 12 items, structured on a Likert scale with 5 possible answers ranging from 1 (totally disagree) to 5 totally agree and the score of the questionnaire goes from 12 to 60 points

4. Results

The results obtained from the data analysis are shown below: [Table 1](#) describes the sociodemographic characteristics of the sample under study.

Table 1. Socio-demographic data of the sample

Variable		%	Variable		%
Gender	Male	50	Semester	First	50
	Female	50		Third	50
Age	14 years old	4.5	Municipalities	Arroyo Seco	32.2
	15 years old	40.9		Rioverde	33.3
	16 years old	38.6		Cd. Fernández	34.5
	17 years old	14.4			
	18 years old	1.5			

Source: own

The sample data described in table 1 indicate that 32.2 % of the students belong to the municipality of Arroyo Seco, Querétaro, 32.2 % to the municipality of Rioverde San Luis Potosí and 34.5 % to the municipality of Ciudad Fernández San Luis Potosí. It is also observed that the gender is made up of 50 % men and 50 % women, the age ranges from 15 to 18 years, 40.9 % is 15 years old and only 1.5 % is 18 years old. Finally 50 % corresponds to the first semester and the other 50 % to the third semester.

Through the confirmatory analysis with structural equations, the relationship between the variables proposed by Fenemma and Sherman scale (1976), could be explored, hence the sequence diagram for the confirmatory factor analysis is shown in [Figure 1](#).

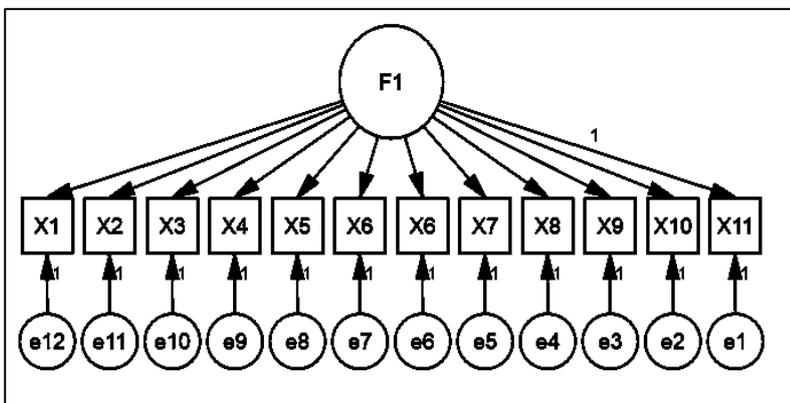


Fig. 1. Secuence Model (source: [Fennema, Sherman, 1976](#))

Afterward, the diagram becomes a structural equation model, as shown in [Table 2](#).

Table 2. Notation for measurement model

Exogenous indicator		Exogenous construct	Error
X ₁	=	$\lambda^{X_{1,1}} \xi_1$	+ e ₁
X ₂	=	$\lambda^{X_{2,1}} \xi_1$	+ e ₂
X ₃	=	$\lambda^{X_{3,1}} \xi_1$	+ e ₃
X ₄	=	$\lambda^{X_{4,1}} \xi_1$	+ e ₄
X ₅	=	$\lambda^{X_{5,1}} \xi_1$	+ e ₅
X ₆	=	$\lambda^{X_{6,1}} \xi_1$	+ e ₆
X ₇	=	$\lambda^{X_{7,1}} \xi_1$	+ e ₇
X ₈	=	$\lambda^{X_{8,1}} \xi_1$	+ e ₈
X ₉	=	$\lambda^{X_{9,1}} \xi_1$	+ e ₉
X ₁₀	=	$\lambda^{X_{10,1}} \xi_1$	+ e ₁₀
X ₁₁	=	$\lambda^{X_{11,1}} \xi_1$	+ e ₁₁
X ₁₂	=	$\lambda^{X_{12,1}} \xi_1$	+ e ₁₂

Source: own

For the data entry, a correlation matrix was used, hence [Table 3](#) shows the correlation matrix of the twelve variables proposed by Fennema and Sherman (1976).

Table 3. Correlations matrix

Item	X12	X13	X14	X15	X16	X17	X6	X7	X8	X9	X10
X12	1										
X13	0.55	1									
X14	0.45	0.43	1								
X15	0.31	0.32	0.39	1							
X16	0.33	0.39	0.31	0.47	1						
X17	0.51	0.49	0.49	0.54	0.594	1					
X6	0.35	0.23	0.3	0.29	0.286	0.29	1				
X7	0.17	0.14	0.14	0.23	0.153	0.2	0.27	1			
X8	0.16	0.07	0.13	0.06	-0.01	0.05	0.16	0.14	1		
X9	0.23	0.28	0.22	0.24	0.295	0.3	0.39	0.09	0.21	1	
X10	0.27	0.29	0.22	0.22	0.223	0.26	0.39	0.07	0.18	0.7	1
X11	0.26	0.38	0.2	0.2	0.23	0.28	0.31	0.15	0.05	0.46	0.47

Source: own

In order to estimate the model, asymptotically distribution free was used to measure the fit of the model. In [Figure 2](#) shows the estimation of the parameters and in [Table 4](#), it shows the indexes of goodness of fit of the obtained model. We can observe the value of Chi square is 4.477 with significance level of 0.345 above the minimum level of 0.05 indicating an acceptable fit. Also, the goodness of fit Index (GFI) is presented, which shows a value of 0.990 that is high and the value of the Root Mean Square Error of Approximation (RMSEA)

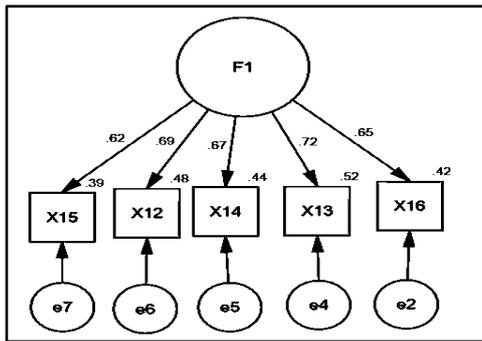


Fig. 2. Sample data model (source: own)

Table 4. Adjusted index of the model

CMIN	DF	P	CMIN/DF	GFI	CFI	RMSEA
4.477	4	0.345	1.119	.990	.995	0.022

Source: own

In the sample data model, significant weights were obtained only in five of the twelve variables proposed by Fennema and Sherman (1976), which correspond to variables that measure mostly, anxiety towards problem solving mathematicians, which gives us evidence to think that this generates a situation of nervousness and irritation in the student. Likewise, the reliability and variance extracted from the construct that integrates the five variables were evaluated. The Table 5 shows a reliability of 0.871, this value is greater than recommended (0.50) and the variance extracted is also greater (0.76) than 0.50.

Table 5. Reliability and variance of the construct

	Estimate	Error	Reliability	Squared weights	Variance	RVE
X ₁₆	0.646	0.354		0.417		
X ₁₃	0.719	0.281		0.517		
X ₁₄	0.665	0.335		0.442		
X ₁₂	0.695	0.305		0.483		
X ₁₅	0.622	0.378		0.387		
	3.3470	1.6530	0.8714	2.246	0.58	0.76

Source: own

5. Conclusion

The study was carried out with the purpose of validating a measuring instrument about anxiety towards mathematics proposed by Fennema and Sherman (1976), in high school students.

According to the results in this work, we may say that the students feel anxiety towards mathematics. Furthermore, the results show that the model proposed by Fennema and Sherman (1976), only five of the twelve variables are significant in the field studied.

These variables provide evidence that students at this school level suffer anxiety towards problem-solving, which causes them nervousness and irritability. Regarding the variables that showed the most significant statistical values in this study, it can be a guide for academic authorities to develop teaching and learning strategies for high school students that help improve academic performance.

This strategic plan seeks to reduce the poor performance in the subjects of mathematics, science and reading, which are evaluated by national and international organizations (Planea, 2017; OECD, 2014; SEP, 2017).

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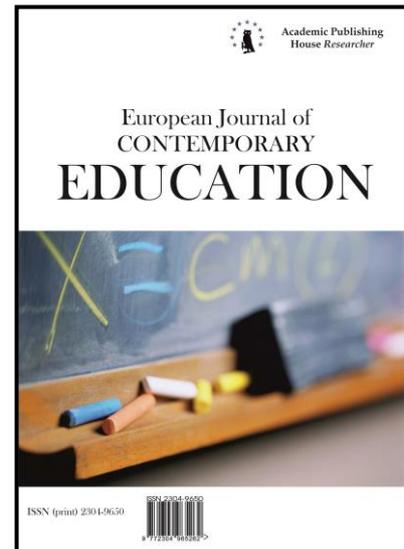
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Factors of Conflict in the Educational Environment of the Modern School

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Abstract

The effectiveness and quality of the educational process in modern school depend, among other things, on the level of conflict in the team, on the confidence of interactions in the teacher-student-parent system. In order to analyze the factors of conflict in the educational space of the modern school, the authors conducted a study. The leading method was the survey of Moscow school teachers (N = 127). The study was split into blocks according to the types of interactions: teacher-student, teacher-teacher, teacher-administration, teacher-parent. In order to verify the obtained data, the method of focus groups was used (N = 11).

The study revealed that the greatest likelihood of conflict situations is typical for teacher and student interactions. The dependencies between the occurrence of conflict situations in the educational environment on the teacher's work experience, leadership style, and the level of interaction with parents were also identified. The main factors for the emergence of conflicts were limiting the ability of the teacher to apply legitimate disciplinary actions, reducing the authority of the teacher, the insufficient level of relevance of the content of educational material, forms and methods of conducting the level of training of students, their educational needs. During the interaction between the teacher and the administrative building of the educational organization factors for conflict situations are dysfunctions of the teacher's work organization, lack of conditions for teacher's professional development, uneven and/or unfair distribution of training and additional workload, redundancy of control, authoritarian management style. The one-sided nature of the interaction between the family and the school, the lack of effective feedback, the contradiction between the parents' expectations of the quality of education and the actual learning outcomes in the modern school, the commercialization of the educational space largely contributes to the development of conflicts in the process of interaction between the teacher and the parent community.

Keywords: school, conflict, conflict risks, teacher, educational environment.

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1. Introduction

The development of the education system refers to one of the most significant strategic objectives of society (Dinham, 2013), and is a factor of the implementation of the potential of young people, the formation of strategies for their adaptive behavior during socio-economic transformations (Kylgydai, 2018).

Harmonization of interactions of key actors in the educational environment helps to overcome such modern risks and threats as family distress, the destructive impact of computer games and social networks (Kutianova, 2018); interethnic disunity, cultural maladjustment (Kotovskaia, Yudina, 2018), increasing aggression and crime among adolescents (Nussio, 2019). The process of schooling ensures the process of socialization of the individual, its social and professional development, the implementation of creative potential (Gundry et al., 2014), the reproduction of integrating social attitudes and values (Hansen et al., 2009).

Education is not only an activity aimed at personal development but also aid in changing the inner emotional and cognitive experience of the student. The success of personal development depends on the well-being of the psychological situation at school (Podliniaev, Ivanov, 2018).

In the new conditions, the priorities of modernization of the school system are the mechanisms for consolidating the interests and needs of key actors in the educational space, building trust between them, conditions ensuring the implementation of professional initiatives, and harmonizing teacher-student relations (Vesina, 2010; Rogach et al., 2018; Kabanova, Vetrova, 2018: 511-520).

An integral part of the pedagogical process at school is the involvement of the teacher in building interactions with various participants in education - students, colleagues, administration, social partners (Iarychev, 2011). As the results of modern studies show, the frequency and specificity of these interactions, contradictions in values, norms, and expectations of subjects of the educational process, determine the nature of the flow of conflicts in the school system. Management dysfunctions, which determine the occurrence of conflict situations, are associated with the distribution of powers, workload, organizational hierarchy, leadership style, level of readiness to accept innovations. Socio-psychological factors of conflict in the school environment due to differences in communication skills, behaviors, goals, interests of participants in the educational process. Economic factors of conflict in the system of school education are usually associated with the general trends in the development of the Russian educational services market and the macroeconomic situation in the country as a whole, as well as with the private characteristics of individual educational organizations: their financing, the level of teachers' salaries compared with average values, attraction of additional funds and sponsorship. A separate factor in the emergence of conflicts is the high level of commercialization of school education. According to experts, the impact of this factor leads to the deformation of institutional forms of interaction in the "student-teacher" system, the emergence of corrupt practices of imposing tutoring services, reproduction of social inequality in Russian society, limiting the number of unprotected and vulnerable social groups in access to quality education (Frolova, Rogach, 2017; Kabanova, Vetrova, 2018: 710-716).

The assessment of the nature and consequences of the conflict is ambivalent. On the one hand, conflict situations are a source of development, a way of resolving contradictions, a transition to a qualitatively new state of social systems. On the other hand, conflicts in the school environment can acquire a rather destructive character, having a negative impact, primarily, on students' perception of educational material (Skelton, 2012), the effectiveness of individual training programs (Forman, 2016). At the same time, the inadequacy of conflict prevention and coordination contributes to building up the destructive potential of conflicts in the system of school education (Cha, 2016).

Conflict behavioral stereotypes lead, in particular, to dequalification of the teacher, contribute to the increase of tension, emotional exhaustion, depression (Ivakhnenko, 2015).

The process of overcoming the negative consequences of conflict shall focus on cooperation technologies, collaborative design of the educational environment (Minchin, 2009), mechanisms for introducing child-friendly methods of conflict management at schools (Gellin, 2018). Of particular importance is the democratic style of pedagogical communications, the implementation of the principles of parity in the interactions of participants in the educational process (Gonchar, 2011).

Analysis of research on the emergence and development of conflicts in the system of school education demonstrates the significant interest of researchers to this issue. The typology of conflicts in education, their specificity is discussed in the works by G.S. Berezhnoi, A.M. Magdeeva, V.R. Mukhadinova, L.B. Hendry (Berezhnaia, 2012; Hendry, 1978). Conflict management techniques are the subject of scientific analysis in the works by Iu.L. Astakhova, I. Hakvoort, K. Larsson, A. Lundström (Astakhova, 2013; Hakvoort et al., 2018).

The scientific works analyze the manifestations of the conflict: the presence of contradictions that reflect the difference between the goals, interests, values, motives or roles of the subjects of the conflict; opposition (confrontation) of the subjects of the conflict, their desire to harm the opponent; negative emotions and feelings towards each other as background characteristics of the conflict interaction (Saraliev, 2011).

The greatest attention in modern scientific literature is given to conflicts arising during student interaction, the causes of adolescent aggression, bullying, and tendencies of growing school violence (Grigorieva, 2014; Cha, 2016; Fernandez-Fuertes, 2019). American researchers are focusing on an increase in cyberbullying cases, demonstrating concern about hiding a significant part of schoolchildren's life from the attention of parents and teachers, the inability to provide timely support and psychological assistance in case of conflict escalation (Aftab, 2011; Giumetti et al. 2012). Recently, actions of a destructive nature became more frequent with the participation of adolescents of middle and senior school age, whose activities were coordinated through the global Internet (Kowalski, 2011). At the same time, the scientific and expert community still does not have reliable data on trends and patterns in the development of schoolchildren's conflicts in social networks.

It should be noted that the research devoted to the analysis of trends, characteristics, and factors of conflict situations, the subject of which is the teacher, is much less represented today. At the same time, due to the increase in the teaching load, continuous reform in terms of the content of educational programs, modernization of the foundations of the secondary education system, the teacher is in a particularly vulnerable position. The situation is aggravated by the fact that the teacher is the key figure of the educational process, implementing the functions of the educational system (educational, educational, etc.); participating in the processes of interaction with students, their parents, colleagues, and administration. Teacher productivity determines the effectiveness of achieving the ultimate goals of the educational process – raising a person as a harmoniously developed personality with a high creative potential of self-development.

2. Materials and methods

The objective of the research is to analyze the factors of conflict in the educational environment of the modern school. In particular, the authors aim to study the causes of conflicts in the following types of interactions: teacher-student, teacher-teacher, teacher-administration, teacher-parent; identify key problems determining the occurrence of conflict situations in the educational environment, consider the associated conflict risks.

The study used a set of theoretical and empirical methods, including the analysis of scientific literature and statistical data, classification and grouping, factor and correlation analysis.

The leading method of research was the survey of teachers in Moscow schools, carried out by sending a questionnaire via e-mail, which allowed for the representation of all administrative districts of Moscow, as well as the diversity of existing types of educational institutions. The research sample was N=127. Age and gender characteristics of the sample are as follows: women – 79.1 %, men – 20.9 %. The average age of respondents in the sample was 48.55 years, with a range of 35-59 years. In addition, the indicators of the educational level of respondents are as follows: 10.1% of teachers have academic degrees of candidates of sciences; 1.3 % – doctors of science; 32.6 % – have two or more graduate degrees.

The questionnaire consisted of 4 blocks, allowing to identify the specifics and factors of conflict in the following types of interactions: teacher-student, teacher-teacher, teacher-administration, and teacher-parent. It is important to note that the findings of the study are relevant to the context of large cities and should not be interpreted neglecting a number of assumptions suitable for small urban or rural settlements.

The study also used such research methods as the Spearman's rank correlation method and Pearson's χ^2 test. Statistical significance was set at $p < 0.05$.

In order to verify the obtained data, the method of focus groups was used, which involved 11 teachers. During the focus groups, issues related to conflict risks in the work of the teacher, the specifics of the course and conflict resolution in modern schools were discussed.

3. Research results

The research found that according to the pedagogical community, conflict situations most often occur in the school environment when a student and teacher interact. 60 % of the surveyed teachers have participated in conflict with students.

One of the factors in the emergence of conflict situations between teacher and student is the decrease in student motivation to learn (62 % of teachers noted this factor). Students are mostly guided by the formal results of the assessment in the form of USE points. Teachers consider the student's refusal to perform a learning task or its poor quality performance to be the most characteristic form of this conflict. The majority of respondents noted that the level of preparation of students for classes can be called only average (42 %), or even low (31 %).

It should be noted that these negative trends are associated not only with the students' personality, their level of responsibility and motivation. The scientific literature has a number of factors that cause a decline in interest in learning. The key factors are: lack of flexibility in setting and achieving the goal of the lesson, the lack of material and psycho-physiological means of the lesson's tasks on the part of the trainees, the irrelevance of the content of the educational material to the level of students' preparation, lack of availability in the presentation of the material, violation of pedagogical ethics, mistakes in the process of interaction with students, subjectivism, discrimination against individuals, lack of competence of the teacher in updating the material, its touch with real life, increase of student interest in the subject (Berezhnaya, 2012).

The research results indirectly confirm these findings. According to the interviewed teachers, the risk of conflict is inversely proportional to the length of service and experience of the teacher. Thus, 78 % noted that the number and intensity of conflict situations are significantly higher among young specialists. During the interview, the following views were expressed:

“As practice shows, young teachers, as a rule, cannot cope with the rudeness of students. They often react aggressively, can speak rudely and incorrectly. Undoubtedly, some students deserve to be taught manners, but such teacher's behavior only provokes further conflicts”.

The results of the study also showed that teachers quite critically evaluate the effectiveness of their interaction with students. Only 50 % of teachers believe that they have high performance in their work, 43 % know how to present their subject in a clear and accessible manner to their students. Almost half of the respondents noted that they are faced with the problem of meeting the requirements the modern students and their parents place thereon. On the one hand, schoolchildren are mostly aimed at successfully passing unified exams (USE, GSE), which requires memorization of a large amount of information and hard work of a teacher. On the other hand, modern schoolchildren focus on new higher educational standards – they are interested in interactive, innovative forms of lessons (Rogach et al., 2017). Such diverse requirements, according to teachers, are quite difficult to combine in the school curriculum. Individual requests increase under the influence of various factors: specific scientific interests of students, social expectations of the family, degree of difficulty in learning programs, forms of conducting lessons and organizing the educational process, individual psychological characteristics of students' personality, etc. (Shatova, 2014).

Conflicts also result from a narrowing of the authority and capabilities of the teacher in terms of responding to the destructive behavior of the student. The teachers' answers often included the following statements: *“whatever happens, the teacher will always be to blame: could not cope with the class, could not teach, could not earn credibility, and so on”*; *“no one in the school administration will understand whether there is a teacher's fault or not, in order not to inflate the scandal with the student's parents, they will blame us for everything”*; *“any criticism or remark of the teacher may be perceived by the students as a violation of their rights”.*

Today, teachers mentioned only a few of the means of influence they could apply to a student: a ban on using a mobile phone during a lesson; in case of violation of discipline, call someone from the school administration or call parents. Thus, according to teachers, *“in virtually any conflict situation in a classroom, a teacher cannot make an independent decision without the involvement of parents or school management”.*

It should be noted that the ideas about the qualities of the “ideal teacher” have certain discrepancies among students and teachers. Students primarily focus on the personal, individually-unique features of the teacher, while teachers believe that professional skills and abilities determine the assessment of their effectiveness, the perception among students. For adolescents, the human qualities of a teacher (sociability, benevolence, the ability to understand others, etc.) have significantly more weight than professional ones. This dissonance can also serve as a factor in the conflict.

Approximately half of the interviewed teachers note the negative impact of the Internet on the quality of the educational process (constant use of a mobile phone, cheating, ready-made answers), and on the behavior of students (increase in aggression, rudeness). The majority of teachers (84 %) have been faced with an open manifestation of aggression among students.

The problem of the influence of modern information networks and mass media is becoming increasingly negative. Viewing violence scenes leads to irreversible changes in the psyche and behavior of schoolchildren, increasing their aggressiveness. Teachers note that the influence of such an information flow has a cumulative effect. Episodes in the media, the Internet, and propaganda of violence form negative experiences in adolescents, thanks to which students at the subconscious level reproduce aggressive behavioral models and accumulate aggressive attitudes.

The results of the study illustrate a more favorable situation in teacher-teacher interactions. Most teachers feel their own value in the school team (91 %), can count on the support of their colleagues in the cooperation process (91 %). Psychological incompatibility is rare, 96 % of teachers claim that there are no teachers in the school personally unpleasant to them. Most of the teachers surveyed would not like to change their place of work, associating it with the existing teaching team they feel comfortable to work in (89 %).

Characterizing the specifics of conflict situations with colleagues, 53 % of the teachers noted an increase in the workload and a lack of time as a destabilizing factor. About 62 % of respondents noted that sometimes they have to engage in disputes with their colleagues because of the scheduling, distribution of additional unsociable workload, however, these situations rarely escalate to serious conflicts.

Work experience and service in the process of communication with colleagues, similar to the system of student-teacher interaction, also act as a very significant factor in reducing the level of conflict tensions (Table 1). 64 % of respondents believe that the higher the experience of a teacher is, the less often he/she comes into conflict with his/her colleagues. This judgment is supported by the results of Pearson’s χ^2 test. The relationship between teacher experience and the frequency of conflicts with colleagues is statistically significant at $p < 0.05$. This is often due to the adaptation of teachers to teaching activities and the team in general.

Table 1. The relationship of frequency of conflicts to work experience ($\chi^2=24,209$, the number of degrees of freedom is 12)

The frequency of conflicts with colleagues	Teaching experience					Total
	less than 5 years	5-15 years	15-25 years	25-35 years	Over 35 years	
very often	2	7	4	2	1	16
often	6	11	8	3	1	29
rarely	2	10	15	13	4	44
very seldom	0	7	14	9	8	38
Total	10	35	41	27	14	127

Opinions were expressed that “Experienced teachers understand the price of a conflict and its destructive consequences for each of the participants”, that “experience forms the skills of non-conflict resolution of problems”.

The conflict in the process of interaction between the teacher and the administration is characterized by a high level of complexity; the resolution requires efforts both from individual teachers, from the whole team, and from the leader. The personality of the head of the pedagogical

team, the level of his/her competence to a large extent determines the effectiveness of prevention and resolution of conflict situations.

The lack of attention of the head to the psychological and social aspects of the management of the organization may cause open and latent conflicts in the school. In the process of creating a favorable social and psychological climate at school, the interests, needs of members of the teaching staff, their individual psychological and professional characteristics, behavioral patterns, and specific motivations should be taken into account (Tselutina et al., 2015). Thus, according to the results of the study, one of the factors of motivation, the basis of productive work in school, respondents consider the existence of conditions for professional growth and personal development. However, approximately every tenth teacher (11 %) noted the absence of these conditions, 47 % agree that only the formation of prerequisites for the teacher's professional and personal development proceeds at school. Opinions were expressed that *"today the teacher's profession is devoid of creativity"*, *"paperwork and constant monitoring leave no time for improving the quality of their work, mastering new educational technologies, using creativity in teaching"*, *"the administration treats the teacher as a replaceable cog in the wheel"*. Many teachers say that they do not have access to discussion and management decisions that contribute to the development of the educational process (62 %).

Additional sources of conflict risks are dysfunctions of the management of teachers' work, in particular, an inconvenient timetable, uneven distribution of study load, insufficient clarity in defining functions and roles. Thus, 27 % of teachers are not satisfied with the mode of their work, 53 % noted that they often receive contradictory instructions from the school administration, which hinder the educational process. Such conflicts occur "vertically" since the interests of teachers most often collide with the interests of the heads and the principal.

Authoritarian management style, excessive managerial control, lack of an individual approach can also provoke "vertical" conflicts in the school environment. More than half of the respondents expressed their dissatisfaction with the school's leadership style in general (58 %). At the same time, opinions were expressed that *"today a new type of leader has come to the school's leadership – a professional manager who, at the same time, has no degrees in pedagogy, has not worked at school, does not know it from the inside"*, *"many administration representatives oppose themselves to the team of teachers rather than work with them to achieve a common goal"*, *"representatives of the school administration, as a rule, inadequately assess the level of their managerial competence, do not understand that their leadership style does not find support in the team and causes rejection"*.

Table 2. The relationship of the level of conflict between the administration and the teacher to management style

Evaluation of management style at school	The level of conflict between the administration and the teacher			Total
	high	medium	low	
authoritarian	25	25	9	59
democratic	10	22	36	68
Total	35	47	45	127

The study revealed a direct relationship between the support of an authoritarian style in school and the estimates of conflict between the administration and teachers ($\chi^2 = 22.294$; $df=4$; $p < 0.01$). It should be noted that these conflicts are rather latent in nature. During the interview, respondents, describing the tension in interaction with the administration, noted the absence of open confrontation. This conflict has its own characteristics: criticism from the leadership, its unwillingness to take into account the opinion of the teacher, lack of conditions for the implementation of professional initiatives. The perception of these situations is characterized by a high level of stress for the teacher.

When answering the question of what exactly causes the negative assessments in the activity of the educational organization, different opinions were expressed. The overwhelming majority

(91 %) does not satisfy the high academic workload (an excessive amount of study hours, additional classes, etc.); 42 % believe that the school does not have an adequate resource and technical base (computers, equipment, laboratories, etc.); 40 % note difficulties in relationships with management. As for wages, 56 % of teachers are not satisfied with their size. This indicator in determining the key negative characteristics in the education system turned out to be less significant than the high level of workload.

The study of conflicts in the “teacher-parents” system has shown that the core of such conflicts is disagreements related to the model of education and training of schoolchildren. Most often they relate to the goals, methods, tools that are used by teachers and parents. Parents' claims to school or to a specific teacher are associated with various aspects of the organization of the educational process.

Today, teachers estimate the interaction of school and family in the process of teaching and educating students as ineffective (76 %). 49 % believe that not all modern parents are ready for constructive dialogue.

Table 3. The relationship between estimates of the level of interaction between parents and the school and the onset of conflict

Assessment of the level of interaction between parents and the school	The level of conflict between the teacher and parents of students		
	high	medium	low
high	7	9	17
medium	12	26	11
low	31	10	4

The study shows the inverse relationship between estimates of the level of interaction between parents and the school and the onset of conflict ($\chi^2 = 36.581$; $df=4$; $p<0.01$). A tighter communication schedule reduces the risk of misunderstanding and serves as prevention to conflict interactions between parents and the teacher.

These findings are supported by other studies that emphasize the effectiveness of creating and maintaining partnerships between school and parents. The establishment of regular and constructive interaction has contributed to both reducing conflict and improving the performance of schoolchildren (Mereoiu, 2016).

Many teachers noted that it is extremely difficult to improve relations with the parents of students because today the teacher’s work is perceived as one of the services to be provided to everyone (67 %). The high rhythm of life, the workload of parents contributes to the fact that the school is perceived as a “luggage room”, and the family at the same time completely relinquishes its responsibility for upbringing their children. The majority of teachers (74 %) noted that parents practically do not participate in the educational work of the school. Family involvement is characterized only by attending parent meetings. The one-sided nature of the interaction between family and school is one of the key problems in modern Russian conditions. At the same time, teachers acutely feel the need for support from the parent community. The overwhelming majority of respondents noted that the family should not only create the material conditions for the life of the child, but also instill respect for the elders (91 %), educate the moral person (91 %), and directly help the child in the learning process (87 %).

During the survey, 80 % of respondents expressed the opinion that over the past few years both the teacher’s authority and the level of respect from the parents have decreased. Articulation of negative assessments of the teacher in the family and their transmission in educational institutions contributes to the formation of certain stereotypes, their negative impact on the educational process.

Conflicts between a teacher and a parent are perceived most painfully and are distinguished by a high level of personal perception. In the course of the study, teachers expressed their opinions that “parents do not hear teachers”, “parents believe that teachers understand better how they should teach their children”, “parents shift the upbringing of their children to teachers”, “parents

began to build their relationship with the teacher similarly to the salesman-client relations, and accordingly, the client is always right”, “parents are not ready to listen to constructive criticism, overestimating or idealizing their children”, “a poor assessment and remark is perceived as child’s belittling”.

4. Discussion

The teachers noted the frequent conflicts with students, instances of schoolchildren’s aggression against teachers. This conclusion is confirmed by the results of other studies. The high level of conflict, the increase in the aggressiveness of adolescents is characteristic of the modern Russian education system. According to the study of the Higher School of Economics, every second Russian teacher at least once in his practice had to face threats or harassment from students, and about 6 % of respondents said that this happens very often. It can be concluded that about 75 thousand teachers are victims of bullying by their students. At the same time, about 50 thousand are subject to cyberbullying – bullying on the Internet*. The situation is complicated by the growing threats of the aggressive information space, the development of Internet addictions, the negatively stable dynamics of deviations, and the promotion of consumer lifestyles. The limited disciplinary and organizational mechanisms for influencing students, reducing the authority of a teacher in modern Russian conditions, limits the school’s ability to prevent and combat the deviations of students.

Also as a factor in the emergence of conflict situations between teacher and student is the gap between the increasing needs of students to the quality of the educational process, innovative forms of classes and the teacher’s limited capabilities associated with objective factors (high load, the need to prepare students for a unified exam) and subjective factors (lack of competence of the teacher, dysfunction of his/her motivation).

Teacher-teacher interactions have the lowest level of conflict. According to the respondents, a fairly favorable socio-psychological climate has been formed in the teaching staff. The factors causing conflicts in this interaction are the uneven distribution of the volume of extracurricular activities among colleagues, organizational difficulties in scheduling, the subjective distribution of the bonus fund. According to experts, different levels of teachers' workload with public tasks and additional responsibilities, biased or uneven distribution of resources are among the most significant factors contributing to conflicts in the school community (Berezhnaia 2012).

In the interaction of the teacher and the administration, the following organizational and managerial dysfunctions pose conflict risks: control redundancy; authoritarian leadership style; conflicting directions; ambiguity and/or injustice in the distribution of the volume of additional extracurricular activities.

During the interaction between parents of students and teachers, conflict situations have a high level of their emotional perception and are largely associated with a low level of trust in each other of these subjects of the educational environment (Kylgydai, 2018). The factor of conflict in this interaction is the ambiguity of the perception of the functions of the family and the school in the process of training and raising a child. Each of the parties underestimates the contribution of each other; teachers often distance themselves from the fulfillment of the educational function, considering it to be the prerogative of the family. At the same time, the parent community is extremely negative about the role of the school in the educational process. According to the results of the survey of Russians, conducted by the All-Russian Public Opinion Research Center, half of the respondents (54 %) consider the volume of school knowledge to be insufficient for admission to a university/institute based on the Unified State Examination (USE)†. At the same time, 70 % of Russians believe that today students are being trained only for passing tests, which leads to the

* Researchers were horrified by the statistics of bullying teachers: every second is a victim [Electronic resource]. URL: <http://www.tech24news.ru/issledovatelej-uzhasnula-statistika-travli-uchitelej-muchayut-kazhdogo-vtorogo/> (accessed date: 17.10.19).

† All-Russian Public Opinion Research Center. VCIOM. Press release No. 2945 EGE: how to measure knowledge? 06.10.2015 [Electronic resource]. URL: <http://wciom.ru/index.php?id=236&uid=115418> (access date: 17.10.19).

deterioration of the quality of knowledge*. In modern conditions, there is a certain contradiction between the expectations of parents to the intellect, social and communicative skills, moral qualities of students and the actual learning outcomes in the modern school.

Additional factors for the emergence and development of conflict situations in the educational environment are the commercialization of the educational space and the lack of conditions and opportunities for the teacher to be included in the decision-making process. Considering educational services as a “product” and parents as “buyers” transforms the sociocultural attitudes of the school and the teacher, whose image is not associated with high authority. While excessive pressure on teachers affects their ability to use innovative methods in the educational process, to improve the quality of student preparation, and develop professionally.

5. Conclusion

The authors have studied the factors of conflict in the educational process in the context of interactions such as teacher-student; teacher-teacher; teacher-administration; and teacher-parents.

The study found that the dyadic interaction has the greatest potential for conflict: the teacher and the student in the framework of the educational process. The relationship of the frequency of occurrence of conflict situations to the experience of the teacher was established. Most often, young professionals and teachers with less than 15 years of experience are faced with conflicts.

According to the respondents, the range of legitimate educational opportunities for students is highly limited. This does not allow leveling the destructive behavior of adolescents. The factors initiating conflicts between the teacher and the student are contradictions between the growing needs of modern students for the forms of conducting classes, the ability of the teacher to present the material and specifics of the educational process in an interesting way, based on the need to memorize a large amount of information and prepare for a unified state exam.

The interaction of teachers with each other showed to have the lowest conflict risks. The factors causing conflicts in this interaction are the uneven distribution of the volume of extracurricular activities among colleagues, organizational difficulties in scheduling, the subjective distribution of the bonus fund.

The main factors causing conflicts between the teacher and the administration are authoritarian management style, low level of involvement of the teaching staff in management decision making, lack of conditions for professional growth and personal development, and dysfunctions in the distribution system of additional work.

Conflicts between the teacher and the parent community are caused by disagreements in assessing the role and functions of the family and school in raising the younger generation. The inflated educational expectations of the parents come into conflict with the attitudes of the teacher, focused on helping the family in the process of educational activities. The decline in the authority of the teacher, the commercialization of the educational environment, the low level of parental involvement in the educational process, and school management practices are additional factors in conflict situations.

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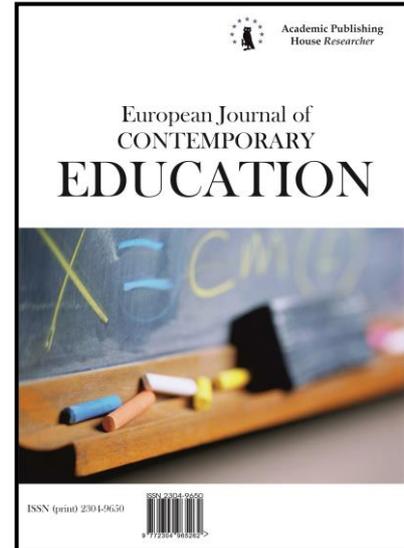
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The Use of Modern Electronic Gadgets in the Educational Process of the University

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Abstract

Recently, humanity has become a prisoner of electronic technology. Regardless of gender, age, level of education, ethnicity, economic status, modern people actively use gadgets in their life, having quick access to any information, being constantly in touch with their friends, relatives, colleagues, regardless of their location. It is no surprise that, at present, modern electronic technologies have become firmly embedded in education. With the development of the functionality of mobile devices, an increasing number of students cannot imagine their study at the university without gadgets.

This article presents data from the results of a sociological study that reveal the degree of importance of the use of gadgets in the educational process for students. It reveals the advantages and disadvantages of electronic media used in the educational activity.

Keywords: electronic gadgets, higher education institution, Internet, digital technologies, information, educational process, smartphone, students, innovations, electronic information educational environment.

1. Introduction

The modern world is inconceivable without electronic gadgets; they are various small devices whose functions improve and simplify a person's life, make it more pleasant and comfortable. A feature of these devices is their small size, making them easily portable in your pocket, fitted in your wrist, your finger, or connected to a computer or smartphone.

In the modern era of digital devices, the activity of using gadgets in all spheres of human activity is increasing rapidly. The emergence of new technologies in the global arena contributes to the introduction of new technologies in the educational environment (Goloviashkina, 2018).

Possession of modern information technologies and means of communication is a prerequisite for the implementation of educational activities, even in universities.

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Dean Hamer, BrainPop project manager, said that “It is important to understand and realize the significance of the fact that children have gadgets in their hands. Children have the opportunity to learn, wherever they are”. This quote applies not only to children. Many teachers have a negative attitude toward the use of smartphones by students during lectures. However, this phenomenon can be channeled in a different direction and used in the educational process. There are a huge variety of Android and Apple-based applications, which help solve a lot of problems. But the majority of students, as well as teachers, are not aware thereof. Proper use of mobile applications during the lecture allows you to address challenges and direct students' attention to the object being studied (Orlov, 2016).

The use of gadgets by students in the educational process not only opens up great opportunities for the acquisition, transfer, and preservation of knowledge but also has its negative consequences.

Let us turn to the main opportunities the gadgets offer in the educational process. These include the following:

- easy and quick access to information;
- visualization of educational information of a different nature (virtual and natural objects of study);
- a programmed solution of information retrieval and computational problems;
- the possibility of communication with the teacher at the right time and in several different ways;
- simplification of monitoring performance for the teacher and student;
- prompt access to relevant educational materials;
- archival storage of significant amounts of textual and graphical information (Goloviashkina, 2018).

Let us appeal to history in order to understand what kind of disadvantages the gadgets introduce into the educational process. At the end of the XX century, the learning process in higher educational institutions was structured as follows: a student, a teacher, and a teaching tool. The teaching tool at that time was a paper textbook, available either from the library fund of an educational institution or bought, a notebook for lecture notes and a blackboard, which was used to explain the material under study.

Together with the XXI century, mankind entered the information age – the era of computers and the development of electronic devices, digital and telecommunication technologies. Training has been digitalized. Electronic textbooks, e-books, an electronic library, and electronic educational resources have appeared.

“Computers and computer networks actually assumed the function of information storages with additional service capabilities, up to contextual and semantically organized search. At the same time, they “removed” students from traditional data instruments – from the “craft” component of the process of education and self-education using elementary tools of labor – hands, ballpoint pens, and paper: lecture and textbook noting, structuring and reproducing material based on what they heard completely transformed into electronic format.

For example, a lecture can be available in either paper or electronic form, a language exercise can be performed by inserting the missing letters, historical events can be arranged in the correct order by touching a button on the screen, etc. Are there too many powers to the technologies, excluding our own active participation? Is saving the time and physical resources always justified when it comes to the process of memorizing, processing information, developing the skill of applying the knowledge acquired? What kind of work should be entrusted to technical training tools, and what – to a person? This discussion question requires separate consideration. Unfortunately, the “copypaste” technology does not insert information directly into the brain. Just as before, photocopying, which has already become customary, did not do this. While the usual rewriting made us reflex and “pass” information through ourselves (Pankratova, Znatnov, 2018).

The twenty-first century is certainly the century of information technology. To keep up with the times, we are starting to use more and more new, improved technologies; new ample opportunities occur to freely transmit, receive, and accumulate information, as well as instant access to the knowledge gained and to any information.

Currently, the range of gadgets is expanding very rapidly. The emergence of new achievements of science and high technology causes hype, and some time after its presentation,

this gadget seems to us like something ordinary and routine. This is how quickly gadgets fit into our lives and push out our usual pencils, pens, notebooks, printed books, and textbooks.

2. Discussion

The use of modern electronic gadgets by students of higher educational institutions in the educational process is considered in many works by Russian and foreign researchers.

M.Iu. Orlov (2016) cites the problems of providing access to data and applications from mobile devices, as well as the use of information technology in the process of teaching students. M.A. Goloviashkina (2018) in her works considers the main advantages of using gadgets at different stages of students' educational activities and also pays special attention to the negative manifestations of their use during classes. Using mobile devices to organize distance learning, V.K. Kukhareenko (2011), V.A. Kuklev (2009) in their studies analyze the conditions for the implementation of the process of mobile learning in the system of open distance education. I.N. Golitsyna and N.L. Polovnikova (2011) consider the electronic information educational environment as a pedagogical reality. Such authors as S.Iu. Znatnov (2018) and A.V. Kudriavtsev (2016) consider the main directions for using mobile learning in modern education. They note that, despite the widespread availability of mobile phones among students, mobile learning is not common in domestic universities. It is concluded that the majority of modern students are technically and psychologically ready to use mobile technologies in education and it is necessary to consider new opportunities for more efficient use of the potential of mobile learning. A.V. Kudriavtsev (2016) considers mobile devices as one of the means of information and communication technologies in education. Thus, the problem of organizing mobile education in modern society is highly important today.

3. Materials and methods

The empirical base of the study was the results of a sociological study conducted by the authors in September 2018 on the basis of the Federal State Budgetary Educational Institution of Higher Education of the Russian State Social University. The authors interviewed students of the faculty of management of the FSBEI HE Russian State Social University.

The objective of this study is to identify and evaluate the role of the practice of using modern electronic gadgets by students of higher educational institutions in the educational process, their advantages, and disadvantages.

According to a specially designed questionnaire, 100 undergraduate 1st-4th-year students, faculty of management of the Russian State Social University were surveyed, 26 of which were boys and 74 – girls aged 18–22 years (average age – 20 ± 2).

The questionnaire included such questions as whether it is possible to use electronic gadgets in the educational environment of the university, which gadget is most effective for use in the educational process of the university, how often you use the gadget, for what purposes you most often use your gadget during your studies, whether your academic performance depends on using gadgets.

The results of the study were analyzed by analyzing the relationship between the age of students and their gender stereotypes.

Gender stereotypes are understood to mean standardized ideas about behaviors and character traits, corresponding to the concepts of “male” and “female”. Gender stereotypes are opinions about personality traits and behavioral patterns of men and women (Bern, 2001).

4. Results

At different ages, students' attitudes towards using electronic gadgets differ according to gender stereotypes:

- from 18 to 19 years, boys are more likely to use electronic gadgets in the educational process than girls;
- from 19 to 21, there are almost no differences;
- from 21 to 22 years, girls are more likely to use electronic gadgets in the educational process.

Analysis of the results of a sociological survey of students showed that almost all participants (98 %) were in favor of using gadgets in the educational process, that their mobile devices are a valuable helper in achieving educational goals.

Almost every student (95 %) pointed out that a mobile phone is the most effective electronic gadget that can be used in the educational process. 2 % of students prefer using a laptop as a modern device in the course of training. In turn, only 1 % of the respondents preferred the tablet.

The overwhelming majority of respondents (98 %) indicated that they often use an electronic gadget in the educational process and only 2 % of the students do not use it in their studies at all.

Students' answers to the question about the purposes of using gadgets during studies showed that a relatively small proportion of respondents prefer to print lectures using gadgets (12 %), every third respondent (31 %) uses an electronic textbook to study instead of a paper one. 47 % of the surveyed students answered that they often use gadgets during classes in order to quickly find an answer to a certain question or as a cheat sheet.

The fact that 8 % of the students surveyed admit that they use gadgets to communicate in social networks, directly during the classes gives rise to concern. Only 2 % of the students surveyed do not use electronic devices at the university.

The authors used the calculation method for the Pearson chi-square test (Table 1).

Table 1. Analysis of contingency tables using the chi-square test

Factorial feature	Effective feature		Total
	Yes	No	
Use gadgets in the educational process	98	2	100
Phone as the most efficient gadget	95	5	100
Use gadgets to record lectures	12	88	100
Use gadgets to read textbooks	31	69	100
Use gadgets to search for cheat sheets	47	53	100
Use gadgets to communicate in social networks	8	92	100
Often use gadgets	96	4	100
Laptop as a more efficient gadget	2	98	100
Tablet as a more efficient gadget	1	99	100
Total	390	510	900

The number of degrees of freedom is 8. The value of the chi-square test is 583.493. The critical value of the chi-square test at a significance level $p = 0.01$ is 20.09. The relationship between factorial and productive features is statistically significant at a significance level $p < 0.01$.

The reasons for the use of gadgets in the educational process of students of the faculty of management of RSSU are presented in Tables 2, 3, 4, 5.

Table 2. Analysis of the reasons for the use of electronic gadgets in the educational process by the girls of the faculty of management of RSSU (in age 18–20 years, in %)

№	Reasons for the use of electronic gadgets in the educational process (Factorial feature)	Effective feature	
		Yes	No
1	Speed of obtaining information	86	14
2	The simplicity of doing e-learning page	64	36
3	Ease of use and accessibility	58	42
4	Minimizing possible errors during job execution	38	62
5	Ability to store large amounts of data	73	27

The calculation method for Pearson criterion χ^2 was used in the analysis.

Analysis of conjugacy tables using the Chi-square test showed. The number of degrees of freedom is 4. The value of the criterion χ^2 is 55.283. The critical value of χ^2 at significance level $p = 0.01$ is 13.277. The relationship between factorial and resultant features is statistically significant at a significance level of $p < 0.01$. Significance level $p < 0.001$.

Table 3. Analysis of the reasons for the use of electronic gadgets in the educational process by the girls of the faculty of management of RSSU (in age 21–22 years, in %)

№	Reasons for the use of electronic gadgets in the educational process (Factorial feature)	Effective feature	
		Yes	Yes
1	Speed of obtaining information	76	24
2	The simplicity of doing e-learning page	56	44
3	Ease of use and accessibility	60	40
4	Minimizing possible errors during job execution	42	58
5	Ability to store large amounts of data	68	32

The calculation method for Pearson criterion χ^2 was used in the analysis.

Analysis of conjugacy tables using the Chi-square test showed. The number of degrees of freedom is 4. The value of the criterion χ^2 is 27.560. The critical value of χ^2 at significance level $p = 0.01$ is 13.277. The relationship between factorial and resultant features is statistically significant at a significance level of $p < 0.01$. Significance level $p < 0.001$.

Analysis of the reasons for the use of gadgets by girls (Tables 2, 3) shows that the great importance for them is the speed of obtaining data and the ability to store a large array of data, most likely this is due to the psychological differences between the sexes and the influence of the rapidly changing world.

Table 4. Analysis of the reasons for the use of electronic gadgets in the educational process by young men of the faculty of management of RSSU (in age 18–20 years, in %)

№	Reasons for the use of electronic gadgets in the educational process (Factorial feature)	Effective feature	
		Yes	Yes
1	Speed of obtaining information	78	22
2	The simplicity of doing e-learning page	52	48
3	Ease of use and accessibility	66	34
4	Minimizing possible errors during job execution	76	24
5	Ability to store large amounts of data	73	27

The calculation method for Pearson criterion χ^2 was used in the analysis. Analysis of conjugacy tables using the Chi-square test showed. The number of degrees of freedom is 4. The value of the criterion χ^2 is 20.757. The critical value of χ^2 at significance level $p=0.01$ is 13.277. The relationship between factorial and resultant features is statistically significant at a significance level of $p < 0.01$. Significance level $p < 0.001$.

Table 5. Analysis of the reasons for the use of electronic gadgets in the educational process by young men of the faculty of management of RSSU (in age 21–22 years, in %)

№	Reasons for the use of electronic gadgets in the educational process (Factorial feature)	Effective feature	
		Yes	Yes
1	Speed of obtaining information	82	18
2	The simplicity of doing e-learning page	64	36
3	Ease of use and accessibility	46	54
4	Minimizing possible errors during job execution	86	14
5	Ability to store large amounts of data	75	25

The calculation method for Pearson criterion χ^2 was used in the analysis.

Analysis of conjugacy tables using the Chi-square test showed. The number of degrees of freedom is 4. The value of the criterion χ^2 is 49.874. The critical value of χ^2 at significance level $p = 0.01$ is 13.277. The relationship between factorial and resultant features is statistically significant at a significance level of $p < 0.01$. Significance level $p < 0.001$.

Analysis of causes shows (Tables 4, 5) the importance of rapidly obtaining data and minimize the possible errors boys of the faculty of management. Gadgets open up great opportunities for students, providing an opportunity to quickly and accurately calculate mathematical formulas and various dependencies, as well as to minimize possible errors in the educational process.

As we can see from the above data, there is a certain problem in the use of modern electronic gadgets by students of higher educational institutions in the educational process, in particular, their use for the intended purpose.

5. Discussion

The production technology of electronic gadgets is rapidly developing and has become engrained in the life of students. Mobile wireless devices are used as a means of mobile learning.

“Mobile learning gives a new quality to learning, most fully reflects the trends in the education of a modern person, providing constant access to information at any time; it is a new toolkit in the formation of a person of the information society, where a new learning environment, independent of place and time, forms (Kuklev, 2009).

Actual trends and patterns of development of the educational industry predetermine the use of various gadgets (Rogach, 2017). It should be noted that the use of mobile devices solves problems such as:

- Provides quick access to training and reference resources of local networks and the Internet. Teachers and students can get the necessary reference information at any time without the use of additional devices. Often, during the lecture, the teacher must not only answer the students' questions, but also demonstrate the answers that may contain photo, video, and audio data. Students during practical and laboratory work can get access to background information necessary to do tasks. Mobile devices provide Internet access, independent of the local network, local servers, and gateways.

- Organizes real-time interaction of teachers with students. A large audience keeps most students off asking a question and immediately get an answer. Mobile systems equipped with a special application able to ask a question and get a short, unambiguous answer in real time, will improve the feedback in the educational process.

- Provides an opportunity to demonstrate lecture material. Today, not all classes are equipped with modern means for demonstrating educational material: projectors with a connected computer, monitors, interactive whiteboards. Mobile devices allow demonstrating lecture material, transferring data directly to the phones of students or on the screen of the projector or TV. In the latter case, the teacher does not need to carry a laptop or request the administration of the educational institution to provide a computer.

–Provides an opportunity to study everywhere, and in some cases, at any time regardless of the classes. The solution to this problem will significantly improve the efficiency of distance learning.

Thus, the use of gadgets allows you to easily and quickly find the necessary information, save time, develop and progress, fix a certain moment, and organize fast and convenient communication. However, mobile learning can be complicated by such circumstances as:

- lack of technical equipment with the required set of functions;
- low methodological skills of teachers for the introduction of mobile devices in the educational process;
- the incompleteness of mobile resources and programs in various areas of educational activities;
- Small size and low resolution of the screen.

Despite the fact that the use of electronic gadgets simplifies the acquisition of knowledge by university students, and makes their life more comfortable, there are some negative consequences:

1. Escape from reality. Young people in the modern world have internal diffidence, lots of fears and anxieties that literally wrap and force them to escape from reality with the help of electronic gadgets. Constant viewing of social networks, watching videos or listening to music helps them drown out their inner voice and creates the illusion of well-being;

2. Addiction. Most users of electronic gadgets become addicted. They waste their time on social networks, e-mail, news feeds, posting their photos and monitoring “likes” they have collected, and comments. The timing shows hours a day aimlessly wasted due to gadgets.

Moreover, a growing number of students and schoolchildren using gadgets during the educational process for other purposes, in particular, playing, chatting, watching entertaining video and audio resources;

3. Life in the virtual world. Nowadays, electronic gadgets and the Internet has made most of the communication virtual. Communication with friends takes place via Skype and chatting - in the free instant messaging systems such as Viber or WhatsApp. Blogging on YouTube, or pages on social networks: Instagram, Vkontakte, Facebook, etc. Live communication is dying out, giving way to a virtual one.

4. Race for novelties. The developers of electronic gadgets get huge profits, as a result of the release of more and more new, more advanced and functional models. Especially young people are prone to this psychosis, chasing after new gadgets, which cost quite a lot of money and depreciate fairly quickly, as a result of the release of new, more advanced models.

5. Personal degradation. Waste of time on daily “likes” of photos and comments to them on social networks, useless games, correspondence with friends “about nothing”. All these actions on the Internet using a gadget do not develop logic, enrich intelligence but rather promote personal degradation.

Undoubtedly, gadgets have a profound impact on the lives of university students. Is this influence good or bad? It depends on the purpose they are used for. It is necessary now to decide whether they will contribute to the development or degradation of young people. University teachers shall play a certain role in this matter.

The concept of universality is set in the system of basic general education and includes the formation of universal learning activities for students (hereinafter referred to as ULA). ULAs are, in a broad sense, “learning ability”, i.e. the ability of the individual to self-development and self-improvement through the conscious and active acquisition of new social experience, and not only the development of specific subject knowledge and skills within individual school subjects (Asmolov, 2017).

Based on this definition, the universality of educational actions means their inter- and over-disciplinary nature, ensuring the integrity of development, continuity of all levels of education, and underlying any type of students’ activity (Znatnov et. al., 2018). Throughout the history of social development, the institute of education has been the main instrument for educating the younger generation, the most significant factor in the development of human potential. The essence of this function is to transfer to the younger generation through the institution of education cultural values, interpreted in the broadest sense: scientific knowledge, achievements in literature and art,

norms of behavior and moral values, knowledge, and skills inherent in various types of professional activity (Rogach, 2018).

The teacher builds the environment and is the "center of crystallization" of the educational process. The actual result depends on the activity of the student and can be obtained after the completion of the course (Kukharensko, 2011).

American psychiatrist Dale Archer believes that nomophobia, or the syndrome of permanently being online, can be soon included in the official list of mental disorders (Morozova, 2016). A fuss over smartphones or their absence only confirms these concerns. People can be addicted to everything, even to gadgets. Our generation, more tech-savvy, experiences "high tech hunger" – a constant need for new technologies that will facilitate our lives. It should be noted that more and more areas appear where the use of telephones is prohibited. Signs appear in some cafes asking not to use a mobile phone when staying there: "No free wi-fi", "No cell phone use", but that's all (Schwenk, 2015). This is because the generally accepted rules of courtesy simply lose their meaning when we start talking or chatting with someone during a friendly, personal, or business meeting. We don't want to listen, it's easier for us to hide behind an invisible wall.

The above examples prove that gadgets and the like have become an integral part of the daily practice of a modern person. All this is like a social campaign. The problem of the influence of gadgets is relevant around the world. And Russia is not an exception (Morozova, 2016).

"It is worth pointing out that, despite the active use of gadgets in the learning process, some students consider them as good assistants and ultimately improve their results, while for others they perform the role of "disservice" and negatively affect their learning outcomes. It is interesting to understand why some do a quantum leap in their learning efficiency, and others only degrade and make poor progress in the curriculum" (Protopopova, Makarenko, 2017).

6. Conclusion

Summing up, it is worth noting that "modern gadgets play an important role both in the field of communication at different levels and in the process of education at the university, as shown by the results of the study.

They help students acquire new information, record lectures, prepare for classes, and use mobile learning applications that positively affect the quality of their learning. Mobile technology, however, has both positive and negative effects on the learning process (communication in social networks during lectures and cheating during the tests and examines). Nevertheless, considering the results of the student survey and our own experience, we decided that the assessment of the identified advantages and disadvantages of using gadgets in the educational process suggests that they have a greater positive effect on the educational process and the development of modern youth" (Goloviashkina, 2018).

Given the above, it becomes obvious that the use of modern electronic gadgets by students in the educational process of higher educational institutions is relevant and promising. Thus, in modern conditions of active development of information technologies, higher educational institutions need to create an information and communication environment (Vetrova et al., 2019).

The growing diversity of gadgets offers great opportunities for students. It should be noted that the use of electronic gadgets in the educational process allows students to significantly save their time to study the material, and also increases the online supervision efficiency of teachers.

At the same time, a higher educational institution can assume the provision of students with information to their electronic gadgets from a registered account; the university will be able to post schedules, tasks for students, and connect students to a scientific library.

The results of the study showed that students of the faculty of management of the Russian state social University often use gadgets in the educational process, and often it is the phone as the most popular and effective gadget. The main reason for the use of the gadget is the use of the gadget as a search for the necessary information to answer the lesson, but for recording lecture material or reading a textbook phone as a gadget is practically not used, because it is quite complex in this field of application. Use gadgets in the educational process, both girls and boys, and the reasons for their use are almost the same age and gender.

The use of modern electronic gadgets by students of higher educational institutions in the educational process is a positive or negative experience can not be said unequivocally. However,

it is necessary to build a process of teaching students subject to new opportunities of the age of information technology.

The learning process must be built subject to new opportunities, in order to ensure the innovative development of the education sector based on the challenges of modern society and, therefore, it is necessary to introduce the practice of applying modern electronic gadgets to students in the educational process of higher educational institutions.

In order to achieve a high quality standard of higher education, a prerequisite is the introduction of electronic gadgets into the educational process, which allow students to form competences in accordance with set standards, modern views on life in the context of universal accessibility of information, understanding of information technologies as an integral part of everyday life.

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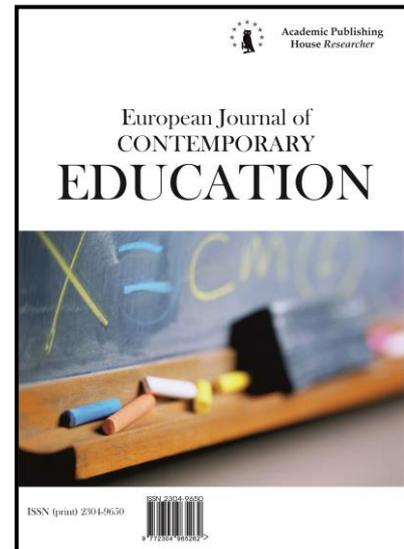
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Dynamics of Students' Axiological Orientations in the Learning Process at Pedagogical University

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Abstract

The system of axiological orientations determines the content direction of the personality and forms the basis of its views on the world around, other people, oneself, basis of world outlook, core of motivation and "philosophy of life". Axiological orientations are considered as the most important component of the internal structure of the personality. They provide stability and continuity of its behaviour and activities, and are reflected in the worldview, moral ideas, principles, and beliefs. The author presents the results of a case study to identify the dynamics of students' axiological orientations in the process of teaching at a pedagogical university and to determine the possibility of optimizing the development of individual axiological orientations through targeted psychological impact and training. Under the influence of such training, there is a change in the perceptions of subjects on the values associated with future life and professional activity. The study involved 58 people – third- and fourth-year students. There were used such surveys as the Rokeach Value Survey (RVS), the Schwartz Value Survey (SVS) and S.S. Bubnova's survey "Diagnosis of the real structure of individual's axiological orientations". The obtained experimental data indicate that the system of students' axiological orientations has a dynamic nature, and the formation of students' axiological orientations is one of the most important ways of solving the problem of training a specialist.

Keywords: axiological orientations, students, learning process.

1. Introduction

Axiological orientations are considered as the most important component of the internal structure of the personality. They provide stability and continuity of its behaviour and activities, and are reflected in the worldview, moral ideas, principles, and beliefs. Today, the higher education

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system requires training of highly professional elite of society, specialists characterized by a high common culture level, development of the axiological orientations system and capable of translating them into practice of life and professional activity. From this point of view, the student age is the most sensitive in terms of forming a system of axiological orientations.

The matter of values and axiological orientations of young people is interdisciplinary in nature and is the focus of many sciences such as philosophy, sociology, psychology, pedagogy. Its significance is determined by the fact that axiological orientations function as regulators of human behaviour and all types of human activity (Vinokurova, 2007). Studies of such philosophers as S.F. Anisimov, A.G. Zdravomyslov, L.P. Buyeva, Yu.A. Zamoshkin, M.S. Kagan, L.P. Fomin, V.N. Sagatovskiy, I.T. Frolov, V.P. Tugarinov and others, has formed a categorical apparatus, which includes the concepts of "value", "axiological relations", "axiological orientations". Up to the present axiological aspects of personality development have not ceased to be the subject of close attention of all specialists working in the field of human knowledge.

The science of psychology has developed theoretical background for the development of the issues of axiological orientations formation at students. First of all, these are works by K.A. Abulkhanova-Slavskaya, L.I. Antsyferova, A.V. Brushlinskiy and others, which formulated the provisions on the formation of person as a subject of their life and their inner world. Typology of human values is considered in the papers by M.S. Burgin, V.A. Vasilenko. The issue of axiological orientation of personality is reflected in the works of domestic and international scholars (D.A. Leontiev, K. Rogers, V. Frankl et al) (Kulikova, 2015).

Axiological orientations are the most important components of the personality structure, according to the degree of which one can judge the level of personality development (Terentyeva, 2013). Axiological orientations and personal values have always been one of the important objects of psychological research. A great contribution to the study of the value orientations of young people was made by V.A. Yadov, V.G. Lisovskiy, A.G. Zdravomyslov, S.L. Rubinstein, E.S. Volkov and many others.

Axiological orientations are regarded by V.A. Yadov as "social values shared by the individual, serving as goals of life and main means of achieving them" (Yadov, 1970). According to A.G. Zdravomyslov, axiological orientations are "a relatively stable, selective attitude of a person to a set of material and spiritual goods and ideals, which are regarded as objects, goals, or means for satisfying the needs of a person's life activity" (Zdravomyslov, 2007). From the point of view of S.L. Rubinstein, value is the significance for a person of something in the world, but only a recognized value is capable of serving as a guideline for behaviour (Rubinstein, 2001).

According to D.A. Leontiev, personal values "are reflected in the structure of specific motives, in their semantic characteristic" (Leontiev, 2003: 225). D.A. Leontiev clarifies that the hierarchy of personal values is constant; the motivating force of needs is constantly changing; their system is characterized by a "dynamic hierarchy"; and the change of personal values is a crisis in the development of personality (Leontiev, 2003: 226).

As realized by B.S. Bratus', values are conscious and accepted by a person general meanings of their life. As the author notes, "it is common sense formations (in case of their understanding – values), which are the main constituting units of the individual, determine the main and relatively constant human attitudes to the main areas of life - to the world, to others and to oneself (Bratus', 1981: 50).

M. Rokeach, author of the most common in the international and domestic research methods for studying values and the personal ones, in particular, operationalized the view on values as the guiding principles of life, types of beliefs. According to M. Rokeach, values occupy a central position in the individual belief system and are the guiding principles of life. They determine how to behave and what state or lifestyle is worth conforming to and striving for.

The most developed concept of values is the one by Sh. Schwartz and W. Bilsky (Schwartz, Bilsky, 1987). According to the scholars, values are (1) ideas or beliefs on (2) desired final states, which (3) are manifested in a wide range of situations, (4) control the selection and evaluation of actions and events, and (5) are ordered according to their relative importance.

S.S. Bubnova distinguishes three hierarchical levels in the system of value orientations of the individual, corresponding to three levels of their studying: 1) the most generalized, abstract values: spiritual, social, material; 2) values that are enshrined in life activities and manifested as personal

qualities: sociability, curiosity, activity, dominance, etc.; 3) the most typical ways of individual behaviour as a means of implementing and consolidating property-values (Bubnova 1999: 38-39).

Values are the initial mental formations for setting goals and justifying their professional activities by a specialist. Values are both motivational and cognitive formations; they guide, organize, orient human behaviour towards specific goals and at the same time define cognitive work with information.

Axiological orientations are a subsystem of consciousness, which reflects the values recognized by person as strategic life goals and common world outlook. In other words, the system of axiological orientations includes, first of all, the principles of behaviour in society, as well as the principles of understanding their own behaviour and behaviour of other people. Studying at a university is one of the first stages of entering life activities, and it certainly has an impact on the hierarchical structure of axiological orientations (Kulikova, 2011).

Modern society recognizes the need to prepare graduates with a high level of culture and rich spiritual inner world. Formation of social position and axiological orientations of students is one of the most important ways to solve the problem of training a specialist with a high level of culture and a rich spiritual world (Golovakha, 2000).

Features of the axiological and motivational structure of the personality determine the direction and position of a person in relation to certain manifestations of reality. Axiological orientations play an important role in the regulation of human social behaviour, including the disposition of a person, goals and attitudes, interests, motives and even the “meaning of life” (Golovakha, 2000).

Student age in psychology is recognized as a sensitive period for the development of axiological, motivational and semantic formations of the personality of the future teacher. When choosing a profession, an individual unwittingly chooses the methods to regulate their behaviour that are closest to them, thereby, one way or another, they associate this choice with the values most significant for them. The most significant changes in the system of axiological orientations occur under the influence of professional activity (Seryy, 2009).

Axiological orientations of students are largely due to their professional orientation, the system of these orientations, as well as the system of values and personal meanings of a particular professional group have their own peculiarities.

L.G. Desfontaines says that the prevailing for the majority of the 1st-year students' values are ones of achieving, preserving their own individuality, developing themselves and establishing social contacts. This is explained by the fact that admission to the university coincides with the second period of adolescence and the first period of maturity, when students realize their individuality, uniqueness, development of self-awareness and formation of the “Self” image (Desfontaines, 2013).

For the 3rd-year students, motives of achievement remain dominant, and the importance of financial position additionally appears. The motives for mastering a profession and acquiring knowledge are manifested in the growing importance of studying, education, and professional life. This can be explained by the fact that gradually with the acquisition of knowledge, students more and more deeply comprehend the subtleties of their future job, they form a certain attitude towards their future work activities. Family life also becomes significant for the 3rd-year students, which is associated with the desire to find a life partner (Desfontaines, 2013).

For the 5th-year students, values of achievement and high financial position prevail. The sphere of professional life and the sphere of family life dominate, which is explained by the formation of clear practical guidelines for future activities. There are new, becoming more relevant values associated with the material and family status, position; students move away from the collective life forms at the university (Desfontaines, 2013).

In the transition from year to year, there is a weakening of focus on oneself and on interaction in axiological consciousness, while the orientation of the individual on organizational activity remains constant, increasing to the final year. This is due to the fact that the graduate students' motivation changes and the main thing for them is not the motivation in studying, but the motivation in their professional affiliation consisting in the expression of the motive to master the profession and get a degree to test the knowledge gained at the university, and becoming oneself as a specialist (Zinevich, Lise, 2008).

In this context our research problem has been formulated as follows: “Is it possible to optimize the process of developing students' axiological orientations in the learning process at a pedagogical university?”

2. Materials and methods

In order to investigate the dynamics of students' axiological orientations, we conducted a case study based on Tula State Lev Tolstoy Pedagogical University. The sample of subjects includes three natural educational groups consisted of 3rd- and 4th-year university students at the age of 19 to 22, enrolled in "Pedagogical education" as their major. The selection of subjects has been due to the curriculum specifics, involving the study of elective courses since the 5th term, which provided the opportunity to implement the authors' course "Axiological Orientations of Personality". The quantitative composition of the experimental sample is 58 people. When conducting a case study, a plan with preliminary and final testing of one group has been chosen. The control group was not formed.

We assumed that the axiological orientation of students is dynamic in nature. The process of developing an individual system of axiological orientations can be optimized through targeted psychological impact and training.

To identify priority axiological orientations of students, the Rokeach Value Survey was used (Karelin, 2000: 25-29). The system of axiological orientations determines the content direction of the personality and forms the basis of its attitudes to the world around, other people, oneself, basis of world outlook, core of motivation and life activities.

The dynamics of values has been determining using the Schwartz Value Survey (Karandashev, 2004: 35-46). The Schwartz Value Survey (SVS) consists of two parts. The first part of the questionnaire is designed to explore the values, ideals and beliefs that affect the person, but not always manifested in social behaviour. The second part of the Schwartz Value Survey is designed to study the values most often manifested in the social behaviour of an individual.

The study of the implementation of the axiological orientations of the individual in real life conditions has been carried out using S.S. Bubnova's survey "Diagnosis of the real structure of individual's axiological orientations" (Fetiskin et al., 2002: 18-20). The method is based on the idea that significant values are formed in the process of socialization of the individual as a result of common cultural values interiorization. The internalization process result is ambiguous, which leads to a significant spread of axiological orientations.

Statistical data processing has been carried out using correlation analysis with the r-Pearson correlation coefficient.

At the formative stage of the research, the authors' course “Axiological Orientations of Personality” was carried out. The content of this course assumed the development of ideas about the system of axiological orientations, its dynamics. The course program contributed to the formation of correct ideas about the essence of terminal and instrumental values (what is the *meaning, goal of being*, and what is the optimal *means* to achieve this goal). Overall logic suggests that the course “Value Orientations of the Personality” is presented in several main sections:

- 1) Theoretical aspects of values and axiological system;
- 2) Structure of axiological orientations of the individual;
- 3) Dynamics of axiological orientations. Structurally, the course program includes two units: theoretical and practical. In the process of getting acquainted with the main topics of the course, students were able not only to gain knowledge and ideas on the system of axiological orientations, but also to analyze their own system of values.

3. Results and discussion

In order to establish in the process of studying the dynamics of students' value orientations, we have conducted the final stage of the study after the implementation of the course program “Axiological Orientations of Personality”. Comparative analysis of the results of the preliminary and final stages is given below.

Analysing the results of the Rokeach Value Survey, we draw attention to the value, ranked in the preliminary stage of the experiment ranking positions below 4 and at the final stage risen to 50 % of subjects in the triad of the priority values. First of all, it is a group of *values of professional self-realization*, which includes an active life, interesting work, social recognition, productive life,

and development. The most striking dynamics can be seen in the values of "productive life" and "education" (Table 1).

Table 1. Subjects distribution dynamics by preferred values ranks by the Rokeach Value Survey (RVS)

Research stage	Distribution of subjects (n) by value ranks					
	Productive life			Education		
	Rank	\bar{x}	n (%)	Rank	\bar{x}	n (%)
Preliminary	1st rank	10.3	5.22	1st rank	10.5	9.86
	2nd rank	11.1	6.96	2nd rank	10.7	11.02
	3rd rank	9.7	9.86	3rd rank	11.1	15.66
	4 th and below	11.7	77.96	4 th and below	12.1	63.46
Final	1st rank	10.7	9.28	1st rank	11.7	15.66
	2nd rank	12.1	11.02	2nd rank	11.1	18.56
	3rd rank	10.3	9.28	3rd rank	11.7	29.58
	4 th and below	11.1	70.42	4 th and below	12.1	36.2

The "productive life" value distribution analysis (Table 1) allows us to state that at the final stage the number of subjects has increased, putting this value on the 1st and 2nd places by 4.06 % for each rank. Accordingly, there was a negative dynamic distribution test on the 3rd, 4th and lower ranks. These indicators show that after the implementation of the course "Axiological Orientations of Personality" students have become more reasonable to treat the value of "productive life". Young people may have simply begun to associate life productivity with future personal and life success.

Positive dynamics is also observed by the value "Education" (Table 1). At the final stage, the number of subjects who put this value in first place has noticeably increased (by 5.8 %). The number of students putting the value under consideration in the 2nd place has also increased (by 7.54 %). There is a significant increase (by 13.92 %) in the number of subjects who put this value in third place.

According to the Schwartz Value Survey, we can state the dynamics of the value of "social recognition" (Table 2).

Table 2. Subjects distribution dynamics by "social recognition" value ranks by the Schwartz Value Survey (SVS)

Research stage	Distribution of subjects (n) by rank		
	Social recognition		
	Rank	\bar{x}	n (%)
Preliminary	1st rank	6.5	15.66
	2nd rank	5.9	18.56
	3rd rank	5.2	12.18
	4 th and below	4.9	53.6
Final	1st rank	6.7	26.68
	2nd rank	6.2	29.58
	3rd rank	5.9	30.74
	4 th and below	5.7	13.0

At the final stage, the number of subjects with a high level (1st and 2nd ranks) at this value has increased by 22.04 % compared with the preliminary stage. It can be said that these subjects have an awareness of the social recognition importance for their future professional life. This value, if it is relevant for a particular person, has a strong influence on a number of personal characteristics:

character, interests, inclinations and even abilities. The expressed value of social recognition allows people to organize themselves, take leadership positions, become active and goal-oriented individuals.

The dynamics of the value of "social activity" is determined by S.S. Bubnova's survey "Diagnosis of the real structure of individual's axiological orientations" (Table 3). By analysing the results obtained by S.S. Bubnova's survey "Diagnosis of the real structure of individual's axiological orientations", it can be argued to reduce the number of subjects with low level at social activity value in order to achieve positive change in society and, consequently, increase the number of subjects with a high level at the value, which indicates a growth in motivation to achieve positive change in society through their social activity, and their desire to improve their professional life as a whole.

Table 3. Subjects distribution dynamics by "social activity" value ranks by S.S. Bubnova's survey "Diagnosis of the real structure of individual's axiological orientations"

Research stage	Distribution of subjects (n) by rank		
	Social recognition		
	Rank	\bar{x}	n (%)
Preliminary	1st rank	3.5	27.16
	2nd rank	3.1	30.74
	3rd rank	2.9	42.10
Final	1st rank	4.7	42.82
	2nd rank	3.9	31.9
	3rd rank	3.5	25.28

In order to establish the relationship and dynamics of axiological orientations of students in the period of study at a pedagogical university, a correlation of r-Pearson has been carried out. This calculation is made using the program *Statistica*. As a result of analysis of correlation results (Table 4) directly proportional strong positive relationship between "productive life" and "education" was found ($r = 0.75$); between "productive life" and "social recognition" ($r = 0.64$); between "social recognition" and "social activity" ($r = 0.63$), with $p = 0.05$.

Table 4. Correlation matrix of interrelation of students' axiological orientations (level of statistical significance $p < 0.05$)

VALUES	r- Pearson			
	Productive life	Education	Social recognition	Social activity
Productive life	x	0.75	0.64	0.55
Education		x	0.55	0.48
Social recognition			x	0.63
Social activity				x

These relationships are expressed in the following statement: the higher the level of education, the higher the rate of productive life is, i.e. students realize that their success in life is directly related to the level of education, and successful productive life and social activity will provide them with social recognition.

4. Conclusion

Our study allows us to state that the formation of axiological orientations of students is one of the most important ways to solve the problem of training a specialist with a high level of professional and personal culture and motivation for productive life. The data obtained in the course of the study confirm the fact that the system of axiological orientations of students has a dynamic character.

The dynamics study of students' axiological orientations in the learning process has shown that the development process of the individual system of axiological orientations can be optimized through targeted psychological impact and learning. Under the influence of such training, there is a change in the perceptions of subjects on the values associated with future life and professional activity.

Thus, the study of the structure, hierarchy and dynamics of students' axiological orientations seems to us very productive to determine the orientation and professional success of the individual, the formation of professional consciousness of students, their psychological well-being, etc.

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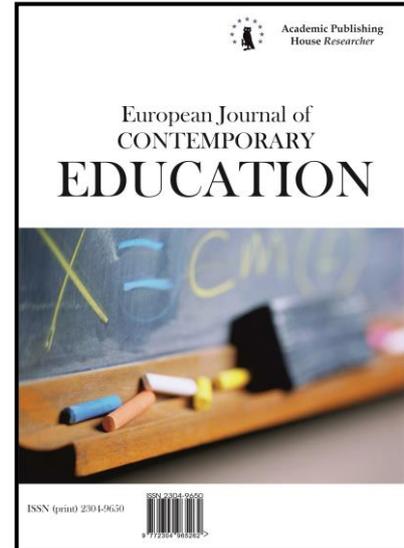
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Social Self-Efficacy and Prosocial Behaviour Among Students of High and Youth Schools

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Abstract

In this study, the differences in social self-efficacy and prosocial behaviour between students of high and youth schools were investigated. The random sample consisted of 394 students. Participants comprised 213 male and 181 female students; 198 of them were high school students, and 196 of them were youth school students. A Social Self-efficacy Scale (SSES) and a Revised Prosocial Tendencies Measure (PTM-R) were used. The findings indicated that students' social self-efficacy and prosocial behaviour scores were higher in high schools than in youth schools. The social self-efficacy of girls was found to be significantly higher than those of boys, however girls and boys did not differ significantly in overall scores of prosocial behaviour.

Keywords: social self-efficacy, prosocial behaviour, students, high school, youth school.

1. Introduction

Students' problematic behaviour in the school environment has been tackled with great attention by many scientists (Van Ouytsel et al., 2017). Not surprisingly, parents and teachers believe that students are primarily concerned to satisfy their individual needs what is caused by their egoistic and selfish actions (Kudinov et al., 2018). On the other hand, society's formal standards and rules do not always ensure prosocial behaviour (Carlo et al., 2010), teachers should help students develop social self-efficacy and positive social skills that underlie prosocial behaviour (Sukys et al., 2017; Knight et al., 2018). The current study explored two constructs (social self-efficacy and prosocial behaviour) in the context of two different types of schools (high and youth schools) and strives to answer the question what are the differences in social self-efficacy and prosocial behaviour between students of high and youth schools.

The present study is based on the social cognitive theory (Bandura, 2001), which highlights learning from the social environment and punctuates reciprocal interactions among personal, behavioural, and social (environmental) factors. Self-efficacy with respect to Bandura (1993) is

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defined as one's belief in one's ability to effectively direct one's actions to achieve the set goals and succeed in completing a specific task. Self-efficacy refers to a person's perceived capability, as distinct from functional ability, to perform a particular action or course of action. According to Bandura (1993) self-efficacy beliefs have a major role in changing behaviours, as these beliefs determine the decision making in performing a behaviour, the effort spent, and the problems that arise throughout the process. One aspect of self-efficacy little explored is social self-efficacy (Zullig et al., 2011; Malinauskas, 2017). Social self-efficacy includes such skills as social boldness, participation in a social group or activity, friendly behaviours, and getting and giving help (Connolly, 1989). The level of social self-efficacy plays a determinant role in the student's positive relationships and constructive interaction (Malinauskas et al., 2018). Persons with high social self-efficacy use more effective ways to solve problems because they have self-confidence about their ability to handle problem situations (Malinauskas et al., 2018). Students with poor social self-efficacy are more at risk of experiencing learning difficulties and engaging in such behaviours as anti-social behaviour, violence and criminality, and to leave school without any certification or vocational skills, with consequently poor employability opportunities (Akelaitis, Lisinskiene, 2018). Valid and reliable measures of social self-efficacy are essential for research and evaluation of efforts to suppress problematic behaviour, and to foster prosocial behaviour among students (Malinauskas et al., 2018). In our opinion, it is particularly relevant to investigate this phenomenon in the context of two different types of schools (high and youth schools) because teaching is known to have a major role in personality's development.

Prosocial behaviours have been defined as voluntary actions aimed at sharing, comforting, and helping others (Batson, 2011). Since prosocial behaviour is defined as voluntary behaviour intended to help or benefit another (Batson, 2011), scientists underline that studies about prosocial behaviour as an important phenomenon can be useful for a better understanding of overall psychosocial development during adolescence (Carlo et al., 2010). Substantial evidence supports the idea that prosocial behaviour is learned through observation and verbal behaviour (Akelaitis, Lisinskiene, 2018). Research on students' prosocial behaviour has produced somewhat inconsistent findings. Some studies have found that prosocial behaviour increases during adolescence period (Eisenberg, Fabes, 1998), whereas others indicate a recession (Carlo et al., 2007), and still others researchers do not support the idea that prosocial behaviour increases with age (Foulkes et al., 2018). However, the available data in the field of gender differences in prosocial behaviour have been more consistently reported. These data indicate that girls exhibit more prosocial behaviour than boys (Kuhnert et al., 2017).

Youth schools are described in the present study as schools designed to provide specialized instruction to students that have discontinued their enrolment in conventional schools. It should be noted, that enhancing of prosocial behaviour could be mostly important for students of youth schools (students of youth schools often need higher educational aspirations, higher intrinsic motivation with respect to schoolwork) because the youth schools are those that generally serve a special population, such as students with unique learning interests or disabilities, potential dropouts, violent individuals, or court-adjudicated youths and those in juvenile detention systems (Malinauskas, 2019). Such schools are designed to return youths who have dropped out of high school to mainstream high schools, assist in credit recovery for youths who are behind in academic credits, or to facilitate the attainment of alternative educational credentials (Dunning-Lozano, 2016).

The following research questions guided this study which is based on the integration of social self-efficacy and prosocial behaviour in the context of two different types of schools: 1) Do social self-efficacy and prosocial behaviour differ in students of high and youth schools? 2) Are there gender differences in social self-efficacy and prosocial behaviour levels in students of high and youth schools?

Study hypothesis – we hypothesize that students' social self-efficacy and prosocial behaviour scores will be higher in high schools than in youth schools.

The aim of the study was to determine the differences in social self-efficacy and prosocial behaviour between students of high and youth schools.

The significance of research. This study makes a novel contribution to the literature, because other research in this field has only evaluated social self-efficacy in sport schools students (Malinauskas et al., 2018), social self-efficacy in alternative (youth) schools students (Grunbaum et

al., 2000), prosocial behaviour in high schools students (Márquez et al., 2006), prosocial behaviour in alternative schools students (Herndon, Bembenuity, 2014), whereas we investigated both social self-efficacy and prosocial behaviour in students of high and youth schools. We evaluated also multiple aspects of prosocial behaviour (help in case of emergency, anonymous, public and altruistic prosocial behaviour) in order to provide a comprehensive assessment of prosocial behaviour. We analyzed social self-efficacy and prosocial behaviour with respect to gender in the present study, because gender is among the important considerations in social skills social and self-efficacy development (Zsolnai, Kasik 2014; Malinauskas, 2019).

2. Methods

Sample and Procedure. The random serial sampling method was used for this investigation. Three hundred ninety four participants were recruited from different high and youth schools in Kaunas region for this study. Participants comprised 213 male and 181 female students; 198 of them were high school students, and 196 of them were youth school students. The mean age of the students was 15.67 years (SD = 0.98). There were no gender differences in age between students of high and youth schools ($t(392) = 1.03$, n.s.). Participants completed the questionnaire during scheduled class time, with no time limit. The researcher introduced the study and gave the participants information about the study aims prior to administering the questionnaire. The study was approved by the Committee for Social Sciences Research Ethics of Lithuanian Sport University. The research was conducted in accordance with ethical guidelines and the legal code of the country in which the study was conducted. The questionnaire contained the instruments listed below.

Instruments. Social Self-efficacy Subscale (SSES). We measured social self-efficacy using six-items from the scale developed by Sherer *et al.* (1982), to evaluate the belief of individuals in their own social competence. The SSES items are rated on a 5-point Likert type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A high score for the subscale indicates strong social self-efficacy. In Sherer *et al.* (1982), SSES' coefficient alpha was .71. The Lithuanian version of the SSES shows internal consistency value .82 and a test-retest reliability coefficient of .84 for the present sample (Malinauskas, Brusokas, 2013). The value of the Cronbach's alpha coefficient for this sample was 0.77.

Revised prosocial tendencies measure (PTM-R *et al.*, 2003). The PTM-R comprised 21 item that measure how likely students were to engage in prosocial behaviours across a variety of situations. This scale was adapted to the Lithuanian population using back-translation procedures and was validated in previous studies (Šukys, Šukienė, 2015). The PTN-R assesses six types of prosocial behaviours: public, anonymous, dire, emotional, compliant, and altruistic. The subjects had to rate each statement using a 5-point Likert-type scale (1 = *does not describe me at all*, 5 = *describes me greatly*, except for altruism, which used reverse scoring). Higher scores on each of the subscales reflected a stronger tendency to engage in prosocial behaviour. Public prosocial behaviour was defined as behaviour intended to benefit others enacted in the presence of others. Anonymous behaviour was defined as the tendency to help others without other people's knowledge. Dire behaviour involves helping others during emergency or crisis situations. Emotional behaviour is intended to benefit others enacted under emotionally evocative situations. Compliant behaviour involves helping others when asked. Altruistic behaviour involves helping others when there is little or no perceived potential for a direct, explicit reward to the self. A higher score on each of these scales reflected a stronger endorsement. In Lithuania, the four forms of prosocial behaviour were distinguished during the process of questionnaire adaptation: help in case of emergency, anonymous, public and altruistic prosocial behaviour (Šukys, Šukienė, 2015). The four forms of prosocial behaviour were evaluated taking into consideration the factor of different cultures in this data analysis (Kromerova, Šukys, 2018). Cronbach alpha ranged from 0.61 (for altruism) to 0.84 (help in emergency).

Statistical Analysis. Research data were statistically processed using SPSS 24.0 (*Statistical Package for Social Sciences*). Descriptive statistics, namely means, standard deviations, were calculated. Skewness (the symmetry of a distribution) and kurtosis (the homogeneity of a distribution) coefficients were calculated to assess univariate normality because Student *t* test requires normally distributed data. Skewness and kurtosis coefficients between +1 and -1 indicated that data were normally distributed. We calculated the reliability of each dimension given by the

index of Cronbach's alpha internal consistence. Data analysis used the Student *t* test for independent samples, comparing the high and youth schools students and boys and girls. Effect sizes were expressed as Cohen's *d*. Cohen's *d* effect sizes are generally defined as small ($d = .2$), medium ($d = .5$), and large ($d = .8$).

3. Results

The results of the independent samples *t*-tests were used to determine the differences between students of high and youth schools can be seen in Table 1. It was found that high school students' social self-efficacy levels ($t(392) = 2.06; p < .05$) and overall prosocial behaviour levels ($t(392) = 2.26; p < .05$) were higher than those of youth school students. Statistical analyses revealed that high school students reported greater scores in altruistic ($t(392) = 1.97; p < .05$), anonymous ($t(392) = 1.98; p < .05$), public ($t(392) = 2.09; p < .01$) prosocial behaviours, and help in emergency situations ($t(392) = 1.97; p < .05$).

Table 1. The statistical indicators of social self-efficacy and prosocial behaviour among students of high and youth schools ($M \pm SD$)

Variables	High schools students (n = 198)	Youth schools students (n = 196)	<i>t</i> -test score	Cohen's <i>d</i>
Social self-efficacy	3.54 ± .69	3.40 ± .66	2.06*	.21
Altruism	2.88 ± .81	2.72 ± .80	1.97*	.20
Anonymous	2.79 ± .89	2.61 ± .91	1.98*	.20
Public	2.82 ± .78	2.65 ± .83	2.09*	.21
Help in emergency	3.31 ± .84	3.15 ± .77	1.97*	.20
Overall prosocial behaviour	2.96 ± .71	2.79 ± .78	2.26*	.23

Notes: ($M \pm SD$) – mean and standard deviation; Cohen's *d* – effect size; * - $p < .05$.

The results of the independent samples *t*-tests also were used to determine the differences between girls and boys. These results are summarised in Table 2. It was found that female students' social self-efficacy levels ($p < .05$) were higher than those of male students.

There were the significant differences between adolescent girls and boys in terms of some of their prosocial behaviours: girls reported greater involvement in altruism ($t(392) = 2.05; p < .05$) and help in emergency situations ($t(392) = 2.00; p < .01$) than boys. Meanwhile, the independent samples *t*-test showed that there no significant differences between girls and boys in terms of their anonymous ($t(392) = .34; p > .05$), public prosocial behaviours ($t(392) = .46; p > .05$), and overall score of prosocial behaviour ($t(392) = 1.26; p > .05$).

Table 2. The statistical indicators of social self-efficacy and prosocial behaviour among girls and boys ($M \pm SD$)

Variables	Girls (n = 213)	Boys (n = 181)	t-test score	Cohen's <i>d</i>
Social self-efficacy	3.49 ± .64	3.35 ± .72	2.02*	.21
Altruism	2.97 ± .80	2.81 ± .75	2.05*	.21
Anonymous	2.77 ± .88	2.74 ± .86	.34	.03
Public	3.01 ± .81	2.97 ± .89	.46	.05
Help in emergency	3.56 ± .85	3.39 ± .83	2.00*	.20
Overall prosocial behaviour	3.03 ± .56	2.96 ± .54	1.26	.13

Notes: ($M \pm SD$) – mean and standard deviation; Cohen's *d* – effect size; * - $p < .05$.

4. Discussion

The purpose of the present study was to investigate differences in social self-efficacy and prosocial behaviour between students of high and youth schools. This study revealed differences in social self-efficacy and prosocial behaviour between high and youth schools students' as well as some differences between male and female students. Our first hypothesis that high school students' social self-efficacy and prosocial behaviour are significantly higher than those of youth school students was confirmed. The current study has shown that high schools students' social self-efficacy levels were higher than those of youth schools students (effect size was week, Cohen's $d = .21$) t– is in agreement with the data obtained by Malinauskas et al. (2014), where high schools students' had higher level of social skills like indicators of social self-efficacy: another-acceptance, emotional comfort and internality among students of high schools was higher than among students of youth schools (effect size was also week and varies from Cohen's $d = -.18$ to Cohen's $d = -.24$). The present research data may be explained by the self-efficacy theory (Bandura, 1993), which emphasises that methods for enhancing (building, maintaining, regaining) social self-efficacy based on the information from the four major self-efficacy sources (i.e., mastery experiences, vicarious learning, verbal persuasion, and psychological arousal).

The present study revealed that overall prosocial behaviour levels were higher than those of youth school students (effect size was week, Cohen's $d = .23$). The current study findings suggest that school type could influence students' personality development (i.e., prosocial behaviour). It was also established that high schools students' act more prosocially compared to youth schools students by helping others in emergency situations and demonstrate more altruism towards others (effect size was week, Cohen's $d = .20$). These results reflect previous research, which has indicated that prosocial behaviour is a relatively supple variable that can be stimulated through appropriate educational environment (Mesurado et al., 2019). In addition, for the enhancement of social self-efficacy and prosocial behaviour, teaching/learning conditions have high importance, during which students have the opportunity to communicate and cooperate (Malinauskas, 2019). For instance, researchers (Akelaitis, Lisinskiene, 2018; Vazne et al., 2018) emphasized that participation in sports can lead to positive experiences and beneficial outcomes such as increased self-efficacy, confidence, identity development, and decreased delinquency. Youth school students of lower levels of social self-efficacy and prosocial behaviour can also be explained by the students' personal characteristics because youth schools are designed to provide specialized instruction to students that have behavioural problems, truancy, poor academic performance.

Continuing the discussion we identified whether students gender has a difference on social self-efficacy and prosocial behaviour. Analyses indicated that female students' social self-efficacy levels were higher than those of male students. The effect size for observed differences was weak (Cohen's $d = .21$). This finding was similar to the findings of Vantieghem, Vermeersch, and Van Houtte (2014) whose effect size was small (Cohen's $d = .28$).

The present study revealed the significant differences between adolescent girls and boys in terms of two types prosocial behaviours: girls reported greater involvement in altruism (effect size was weak, Cohen's $d = .21$) and help in emergency situations (effect size was weak, Cohen's $d = .20$). These results are consistent with a study by Carlo and Randall (2002), showing that helping others in emergency or crisis situations and altruistic behaviour are two correlated types of behaviour. Study by Tuncel (2010) and by Kromerova and Šukys (2018) also supports our findings that in adolescents period female students are more likely to report prosocial behaviours (altruism and help) than male students (weak effect sizes varies from Cohen's $d = .20$ to Cohen's $d = .34$). It was revealed that there were no significant differences between girls and boys in terms of their anonymous, public prosocial behaviours, and overall score of prosocial behaviour. This finding is consistent with previous research (Kromerova, Šukys, 2018), which identified no differences between girls and boys in terms of their anonymous and public prosocial behaviours. As girls are more sensitive to emotional situations when help is needed (Carlo et al., 2010) and have higher levels of empathy (Wentzel et al., 2007), revealed effect of gender on altruism and help in emergency situations was not unexpected. The authors (for instance, Kromerova, Šukys, 2018) consider, if gender differences are in fact constructed by the gender factor itself arising from stereotypes, the latter are likely to be sufficiently strong rooted in order to influence their true behaviour. In conclusion, our findings could be explained by the fact that the educational environment could play an important role, and the different activities of boys and girls could encourage them to develop different skills, could influence different attitudes, which could be reflected in adolescents' prosocial behavior (altruism and help).

Limitations and future prospects. Our results were limited to 15–16-year-old students. This analysis did not cover students of other age, and as a result, the conclusions cover only social self-efficacy and prosocial behaviour of this particular age of group students. It would be appropriate to conduct similar study by examining late adolescence age. The present study is a cross-sectional rather than experimental study, and the correlational nature of the study design makes it difficult to draw cause-and-effect conclusions, i.e., that school type and gender cause social self-efficacy and prosocial behaviour. Longitudinal study design might be used in future to examine students' social self-efficacy and prosocial behaviour in the context of two different types of schools (high and youth schools), and how these indicators occur over time.

5. Conclusion

Statistical analysis showed main effect of the school type on social self-efficacy and prosocial behaviour in students. The study results revealed that students' social self-efficacy and prosocial behaviour scores were higher in high schools than in youth schools. The social self-efficacy of girls was found to be significantly higher than those of boys, however girls and boys did not differ significantly in overall scores of prosocial behaviour.

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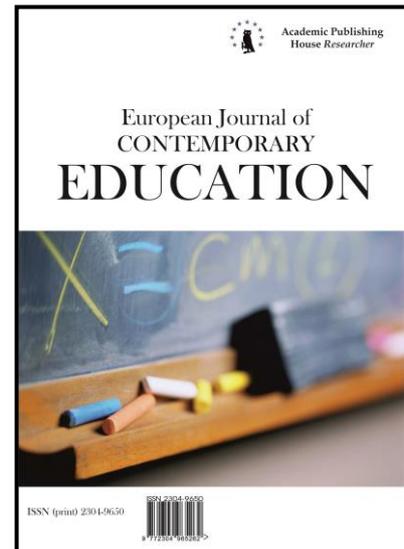
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Educational Potential of Educational Trails in Terms of Their Using in the Pedagogical Process (Outdoor Learning)

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Abstract

Educational trails are marked in landscape by tourist or excursion routes of varying lengths, content focus and technical realization. The aim of the study was to create the method of evaluating the usability of educational trails in the pedagogical process in outdoor teaching. In the article, methodological procedures are presented for the creation and evaluation of educational trails intended also for pedagogical purposes. In the presented method educational potential of educational trails (EPET) is an expression of the information quality provided on phenomena and objects on the educational trail and its surroundings through information panels. The qualitative analysis according to the set of parameters points to the quality and quantity of information provided in the information panels of the educational trail according to the criteria of visual quality and interpretative quality. The educational potential of educational trails was expressed as a percentage by the proposed formula. The methodology is presented on the example of the nature trail around the Žitavský luh Nature Reserve, which represents large complex of alluvial meadow and marsh communities. The educational potential of the Žitavský luh educational trail reached 77%, which means a good educational value in the overall assessment and good usability for outdoor teaching.

Keywords: educational trails, educational potential, pedagogical process, outdoor learning.

1. Introduction

Education for a positive relationship to nature and the environment has a long and rich history. Initially, it was based primarily on the gentle approach and attachment of people with nature, and later expanded in the context of increasing environmental concerns to new environmental issues related to environmental pollution, the need to protect nature and human health. In the 1970s, environmental education arises as an education to protect and create the environment, or as an education to protect nature (Šimonovičová, Šudý et al., 2008; Cviková et al.,

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2010). Educational trails as a suitable educational, informational and promotional means have recently become an integral part of the landscape. The network of nature trails in Slovakia and the surrounding states seems to be a suitable means of bringing science to the public in the field. Improvement of the information system in relation to the pedagogical public is a condition for efficient use of educational paths.

Educational trails represent one of the important motivational incentives for visiting the territory and through information panels they become a source of important information about the landscape, cultural-historical monuments, nature protection, and the environment and human activities. The problems that arise towards their use by the pedagogical, but also the general public, are related to their content, which is often disproportionate and very demanding for ordinary visitors, including teachers and pupils.

On the base of the above, it is necessary to create a methodology for evaluating educational trails in terms of their possibilities for the needs of pedagogical practice. One of the possible solutions is the evaluation according to the set of indicators, which point to the quality and quantity of provided information within the information panels of educational trails and the possibilities of their use for pedagogical practice.

According to the World Resource Institute (WRI, 1995), indicators provide a quantitative form of higher type information. Indicators provide a simpler, easier-to-understand way of information compared to complex statistics or other types of scientific data. On the one hand, the indicators quantify the information so that it is explicit and comprehensible, and simplify information about complex phenomena, making communication easier. Indicators represent an empirical model of reality, but they must be scientifically justified and obtained by a simple and understandable methodology. They also perform a certain social function because they improve communication.

According to Laža (1997), indicators are selected information reflecting the state of a large system. They tell us in what direction the system is moving, whether it is improving or getting worse or remain more or less unchanged.

2. Methodical procedures for evaluating educational trails as interpretive means

Evaluation of educational trails and possibilities of their use for pedagogical practice is based on several methodologies (Medek et al., 2016; Tilden, 2007; Ham, 2013; Moldan, 1996).

The starting point for thematic interpretation is the effort to communicate successfully in the environment of non-formal education, attracting the attention of the visitor until the moment of presentation of the program point so that it is convincing (Ham, 2013).

Interpretation, evaluation, quality indicators

Ham (2013) defines the 4 qualities to be interpreted in order to meet both of the above objectives. According to Ham (1992, 2013), a prerequisite for successful communication is an interpretation that has the following characteristics: strong key-sharing (T-thematic); it is presented simply understandable (O-organized); has a personal relevance to the program participant (R-relevant); is enjoyable.

Key sharing simplifies program preparation, reduces the tendency to encyclopedia, eliminates interruption of participants' attention, or directs it in one direction, creating a logical framework for program participants' experiences. It is easy to understand the interpretation that follows previous information or participants' experiences, avoiding new unknown terms. Ham (2013) draws on the conclusion of Cowan's experiments, Cowan (2001) found that at a time a person is able to receive 3-5 meaningful information units.

The key to remembering new information is the ability of an individual to create a meaningful unit of information that can be related to information stored in long-term memory (Revlin, 2012).

Interpretation has a personal meaning if it is meaningful, that is understandable and resonant with the knowledge of the program participant while fulfilling the first, second and fourth of the Tilden principles below:

1. Any interpretation that is not perceived by the visitor, his personality, or life experience will be useless;
2. Interpretation is not the provision of the information; the interpretation clarifies the deeper meaning of information and context;

3. Interpretation is an art that combines a number of other disciplines – for example, introduces scientific, historical or architectural materials. And to every degree it is possible to learn to some art;

4. The main purpose of interpretation is not just to teach but to provoke;

5. Interpretation should be a whole rather than an individual. It should also apply to all parts of the visitor's personality;

6. Interpretation for children (up to about 12 years old) is not a simple simplification for adults. It follows fundamentally different principles (Tilden, 2007).

Pleasant experience means providing an experience that is considered appropriate and (or) appropriate to expectations. In terms of evaluating a particular interpretation, it is important to understand the inclusion of a particular resource in the hierarchy of territory interpretation or phenomenon. For example, it would be a mistake to rank tables on individual cultural sites or in individual zoos and omit other elements of the information system in which these resources are included (information pylons, brochures and mobile apps for visitors, information boards explaining a closer group of objects). The evaluation of the visitor's experience is based on the knowledge that although there may be a whole range of providers in the territory, the visitor's experience is only one. Also, distracting the visitor's attention by interpreting different providers is reflected in his perception of each individual interpretation. Therefore, the interpretation plans always include analysis of other elements of interpretation and visitor experience audit.

One of the means used in the interpretation of natural elements and events are information panels. An important principle is that the means of interpretation are planned to be concluded. Only when we know who we want to say, what we will report, what will be the information and the means to maintain the interpretation, after that we can selectively select the specific means of interpretation or their combinations (information boards, guide service, descriptions, leaflets, expositions, web pages, models, interactive elements, etc.) (Medek et al., 2016).

Advantages and disadvantages of information panels as a means of interpretation are reported by Medek et al. (2016), as well as the advantages and disadvantages of other individual types of interpretative means. Information panels are very common, and are therefore associated with interpretation, which can lead to their search or ignoring visitors. Their advantage is simple design and production; wide selection of techniques; relative resistance; low operating costs; they may be spatially undemanding and placed near the objects of interpretation; they work 24 hours a day. The disadvantage is less information (max 200 words); mostly low visitor involvement (passive interaction); they become part of the scenery; subject to time and vandalism; at a time, only a limited number of visitors can read the panel. The purpose of the panel determines its content and form. Ludwig (2003) divides panels into orientation panels (map, site orientation), control panels (information about rules and consequences of their omission), information panels (notification, program information, current dangers) and interpretation panels.

Apart from the inclusion of panels and educational trails in the context of interpretation, the methodology of their processing plays an important role.

Among the generally accepted criteria for the selection of indicators are significance, representativeness, uniqueness, measurability, availability, financial (un)difficulty corresponding to the benefit, comparability, transparency, comprehensibility, testimony, timeliness, effective usability (Moldan, 1996).

Overview of educational trails quality evaluation methods

It is always possible to evaluate the quality of educational trails or individual panels only on the basis of a methodological approach. The currently most recommended methodology is the TORE Thematic Interpretation Model (Ham, 2013). The relative effectiveness of the TORE has been little verified. Research by Tarlton and Ward (2006) verified this model, comparing the effectiveness of a personal interpretation program with a thematic and non-thematic variant.

In addition, it is possible to rely on research to verify the importance of individual interpretative means for attracting attention to determine the individual evaluation criteria. Certain, though not very clear, role is played by the number of words and font size (the best result was a combination of 60 words and 18 or 36 points font size).

The methodology of Masters and Carter (1999) provides a comprehensive view of the evaluation of the individual means of interpretation, taking into account their specifics. When evaluating non-guided nature trails based on (numbered) panels, Masters and Carter recommend

that they evaluate the nature trail as a single unit. However, such an assessment is tailored to an educational trail (interpretive trails, educational trails) without a guide, which is about 800 meters long and mostly holds a limited number of themes.

Qualitative analysis follows the following criteria: interconnection, encouragement, exploration, orientation, familiarity, availability, illustration, design, and maintenance. The link expresses whether the panel clearly links the interpretative object to the phenomena, objects or events in the immediate surroundings. Encouragement evaluates whether the panel encourages visitors to explore surroundings. The study highlights the possibilities of exploring the objects of interpretation in more detail. Orientation evaluates how strongly the interpretation turns to readers. This is an analysis of whether the panel contains one or a limited number of key information about the object of interpretation. Availability evaluates whether the visitor panel is available. Illustration illustrates the effectiveness of using illustrations (photos, images, graphic). The design evaluates the attractiveness and stimulation of the overall design object of the interpretation. Maintenance assesses the level of maintenance of objects (panels), protection against vandalism and functionality of interconnected electronic media (web page). For each of these questions it is possible to answer yes/no, or a four-level scale of assessment: at all (0), a little (1), alternately (2), abundantly (3). Three evaluation questions consist of a set of several sub-questions that can be answered yes/no/undetected.

As part of the quality assessment of the information panels (IPs), Bizubová, Nevřelová (2006) report the following quality indicators: total number of IPs, input information panel, names of information panels, suitability of IPs names, attractiveness and attractiveness of IPs, IPs aptitude in terms of educational trails focus and content, IPs placement in the landscape, IPs clarity, IPs content page, IPs overall benefit, IPs clarity, technical terms from IPs texts. In terms of overall evaluation of educational trails, these are indicators of quality assessment: type of educational trail, thematic focus, the aim, the educational trail focus, difficulty of the surface, length, quality parameters, suitability of the name, equipment, which is worth seeing on the route, respectively around him and promoting the educational trail.

Divišová (2015) in her work presents criteria for evaluation of educational trails in the forest territories Český les and Hornofalcký les. The author introduces 4 basic parameters according to which educational trails can be assessed: difficulty, availability, educational value and orientation on the educational path. Length, profile and surface were included in the parameters of difficulty. Availability includes transport and information – information centers and connection of other educational or tourist trails. The learning value has criteria such as denominational value and panel clarity. The last evaluation criterion was the orientation, where the author investigated field marking, accessible map data and other information about the route.

According to Růžička (2011), the success of the panel can be measured in two ways: the attractiveness and strength of the panel. The panel's appeal (%) is expressed as the ratio of the number of visitors who stop at the panel to the number of visitors who passed the panel. This result is then multiplied by a hundred to obtain the required percentage. The panel strength (%) is expressed by the average time spent by one visitor to the time it takes to read in detail. Again, this result is multiplied by one hundred, which in turn yields the percentage of panel strength.

3. Materials and Methods

In the presented method educational potential of educational trails (EP_{ET}) is defined as the quality of clarity and the interpretative quality of individual information panels in terms of their use in the pedagogical process. Educational potential of educational trails is an expression (evaluation) of the quality of information provided on phenomena and objects on the educational trail and its surroundings through information panels. The qualitative analysis follows the following criteria: visual quality (VQ) and interpretative quality (IQ). Visual quality (VQ) is based on evaluated parameters such as text readability (Tr), the text clarity (Tc), the graphic value (Gv) and maps quality (Mq). Interpretative quality (IQ) is based on evaluated parameters such as information level (Il), panel position (Pp) and the presence and functionality of the QR code (QRc). Individual parameters and their scaling are based on the characteristics below (Figure 1).

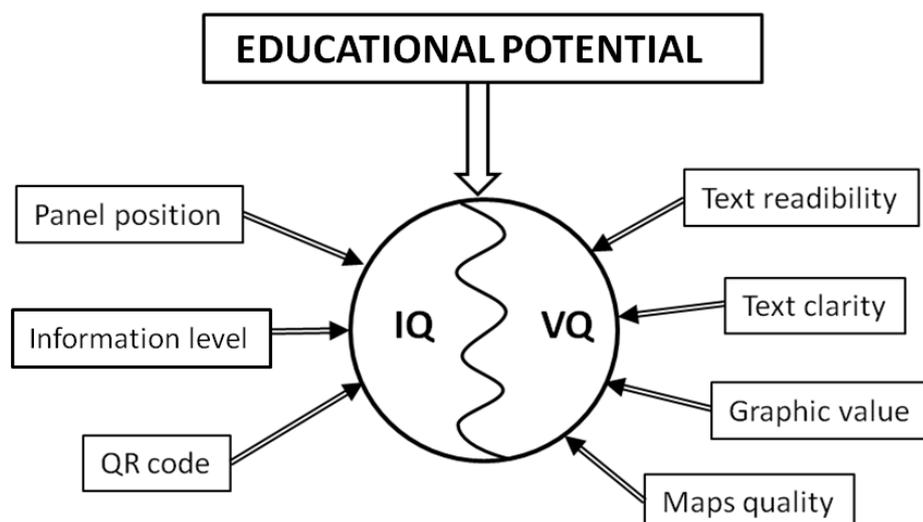


Fig. 1. Educational potential in terms of educational trails quality evaluation

The text readability (Tr) indicates whether the text is hierarchically structured, using headings and subheadings, whether the font size and text density are appropriately selected, whether the text is easy to read and whether the text is misspelled (3 – very good – all the above conditions are met, 2 – good – some attributes are not met, but overall the text is easy to read, 1 – well – the text is legible, but many of the above attributes are missing, 0 – deficient – the text is not readable with understanding).

Text clarity (Tc) indicates whether the information panel contains one or a limited number of key information about an object or phenomenon around the information panel and whether the text clearly and accurately describes the information provided (3 – very good – the key information are understandable and can be applied to identify the panel area, 2 – good – not all key information is clearly understood, but in principle the panel provides sufficient information, 1 – well – the panel contains little key information and not all of them can be used to explore the surroundings, 0 – deficient – the panel provides information that is not clearly explained and therefore cannot be used to identify the surroundings and acquire individual objects and phenomena directly around the panel).

Graphic value (Gv) evaluates the attractiveness and stimulation of the overall design of the subject of interpretation, the graphic is clearly linked to the text and the text on the panel is good reading (3 – very good), the graphic is linked to the text and the text on the panel is more or less good reading (2 – good), the graphic is less linked to the text and the text on the panel is more or less good (1-well), the graphic is not linked to the text at all and the text on the panel is poor (0 – deficient).

Maps quality (Mq) indicates the presence or absence of at least one map in the information panel, it means quality maps, where individual stops are marked, the scale relative to the route gives a perfect overview (1 – suitable), in the latter case, there is no map on the information panel, respectively an unclear map or a map that does not correspond to the actual state is listed (0 – unfit).

Panel position (Pp) expresses whether the panel clearly links the interpretation subject to phenomena, objects or events in the nearest surroundings (1– suitable) or it is not suitably located and the facts on it do not correspond to the phenomena and objects around it (0 – unfit).

Information level (Il) expresses the information level and precision of the panels, the information potential of the panel with respect to the location and objectives of the nature trail, the degree of representation of key information using graphs, diagrams, or images and photos with appropriate descriptions indicates whether the panel contains several well-described key information about the interpretation object (3 – very good), at least one well-described key information about the interpretation object (2 – good), a limited number of inferior key information about the interpretation object (1 – well), the panel is missing interpretation object information (0 – deficient).

QR code (QRc) expresses existence (1 – yes) or absence (0 – no) QR code on an information panel.

Tables 1 and 2 shows the individual evaluation criteria and the range of values used in educational trails evaluation.

Table 1. Evaluation of information panel visual quality (VQ)

Text readability (Tr)	Text clarity (Tc)	Graphic value (Gv)	Maps quality (Mq)	VISUAL QUALITY (VQ) =Tr + Tc + Gv + Mq
3 – very good	3 – very good	3 – very good	1 – suitable	maximum value: 10
2 – good	2 – good	2 – good	0 – unfit	
1 – well	1 – well	1 – well		
0 – deficient	0 – deficient	0 – deficient		

Table 2. Evaluation of information panel interpretation quality and educational potential

Panel position (Pp)	Information level (Il)	QR code (QRc)	INTERPRETATION QUALITY (IQ) = QRc + Il + Pp	EDUCATIONAL POTENTIAL (EP = VQ + IQ)
1 – suitable	3 – very good	1 – yes	maximum value: 5	*maximum value: 15
0 – unfit	2 – good	0 – no		
	1 – well			
	0 – deficient			

* For a given range of values for each parameter, the educational significance maximum value of information panel is 15

Interpretive quality index of trail panels was calculated by Masters & Carter (1999) as a sum of the points earnings in individual criteria according – encouragement, exploration, orientation and design rated on a scale of 0/3 (0 indicates by no means and 3 to a large extent) + connection, message, availability and illustration rated on a scale of 0/1 (0-no, 1-yes). This methodology was the inspiration for our evaluation of the educational potential of information panels. Given that a quality of the nature trail should meet all the above-mentioned parameters (Table 1 and Table 2); the resulting evaluation is based on the calculation of individual assessments of these parameters. The educational potential of information panels is the sum of the criterion values of the visual quality and the interpretative quality of the educational trail information panels. On the basis of these parameters we expressed the educational potential of educational trails (EP_{ET}) with the following formula:

$$EP_{ET} = \frac{\sum EP_{IP}}{15 \times \sum IP} \times 100$$

The parameters in the formula are: EP_{ET} means the educational potential of the entire educational trail and EP_{IP} means the educational potential of each panel. Evaluation scale of the educational potential of the educational trail (EP_{ET}) is as follows:

- 100 %–80 % very good educational potential of the educational trail
- 79.9 %–60 % good educational potential of the educational trail
- 59.9 %–40 % well educational potential of the educational trail
- < 39.9 % deficient educational potential of the educational trail.

The higher value of the educational potential means greater usefulness of educational trails in the pedagogical process. The good text readability and clarity as well as graphics with the high quality are the basis for the possibility of use in the external teaching process. Also, the placement and interconnection of text content with the environment (panel position) provides good opportunities for educational activities on the educational trails. The existence of a QR code with tasks is now a desired addition to the use of educational trails in the teaching process.

4. Results

According to the methodology, educational trails can be evaluated in terms of their use in the pedagogical process. Here is an example of an evaluation of a specific educational trail that can be used during outdoor lessons. Educational trail “Žitavský luh” is located on the route around the Žitavský luh Nature Reserve, also known as Gedrian meadows (Figure 2).

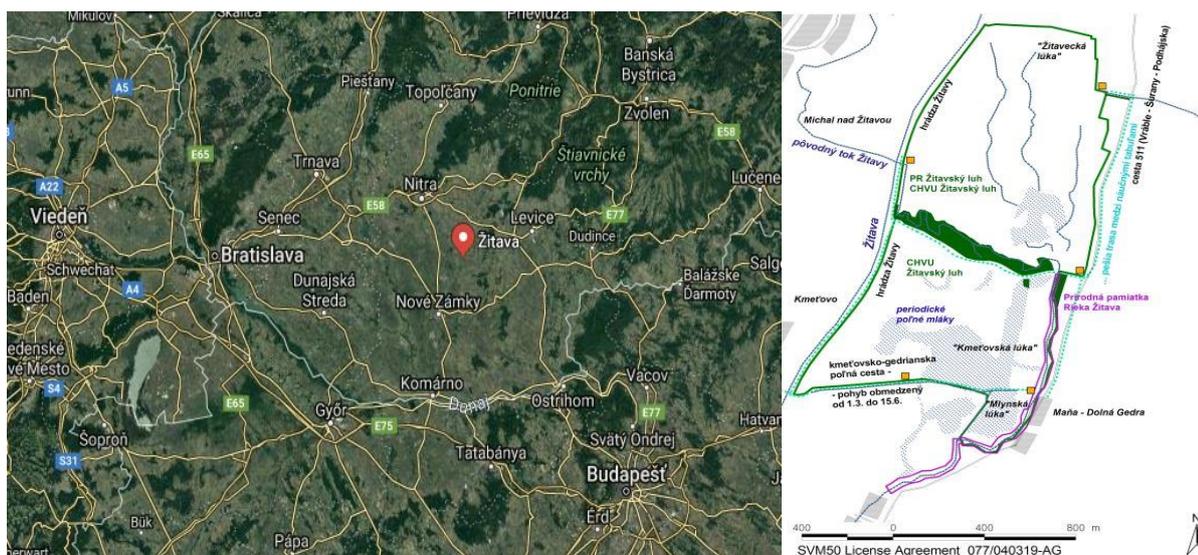


Fig. 2. Nature Reserve “Žitavský luh” (map of the area and map of educational trail route)

The aim of the educational trail is to make the movement in the protected area legally accessible, to minimize disruption to the life of the Gedrian meadows while allowing the inhabitants to see the territory belonging to the European network of protected areas NATURA 2000. The aim of protecting the territory is to maintain or improve the condition of species, their communities and habitats bound to alluvium of the river Žitava. Nature Reserve Žitavský luh represents the largest complex of alluvial meadow vegetation and marsh communities in the area Požitavie.



Fig. 3. Educational trail “Žitavský luh” (the area and informational panel)

Currently there are 6 informational panels on the educational trail (Figure 3). Individual panels contain the following topics: Žitavský luh (IP1), Meadows management (IP2), Žitavský luh: Birds of the Gedrians' meadows (IP3), Žitavský luh: Animals of the Gedrians' meadows (IP4), Lower Gedra and Gedrians' mills (IP5) and Kmeřovo village (IP6). Tables 3 and 4 show the individual evaluation criteria and their values of the educational trail Žitavský luh.

Table 3. Panel visual quality (VQ) evaluation of the Žitavský luh educational trail

IP	Text readability (Tr)	Text clarity (Tc)	Graphic value (Gv)	Maps quality (Mq)	VISUAL QUALITY (VQ)
1	2	3	3	1	9
2	2	3	3	1	9
3	2	1	2	1	6
4	2	2	2	1	7
5	2	2	2	1	7
6	2	3	2	1	8
	12	14	14	6	46

Table 4. Evaluation of information panels interpretation quality and educational potential of the Žitavský luh educational trail

IP	QR code (QRc)	Information level (Il)	Panel position (Pp)	INTERPRETATION QUALITY (IQ)	EDUCATIONAL POTENTIAL (EP = VQ + IQ)
1	1	3	1	5	14
2	1	3	1	5	14
3	0	3	1	4	10
4	0	1	0	1	8
5	0	3	1	4	11
6	0	3	1	4	12
	2	16	5	23	69

The educational potential of Žitavský luh educational trail (EP_{ET}) reaches 77 %, which means a good educational value in the overall assessment and good usability in the pedagogical process. Within the educational potential of the above-mentioned educational trail, the graphic value and maps quality parameters of the informational panel were evaluated above (Table 5). There was also a QR code on some panels, but it was missing on older informational panels. The placement of all informational panels was appropriately chosen, as well as the linking of the text content to the environment on the vast majority of informational panels was very good.

Educational potential (EP)

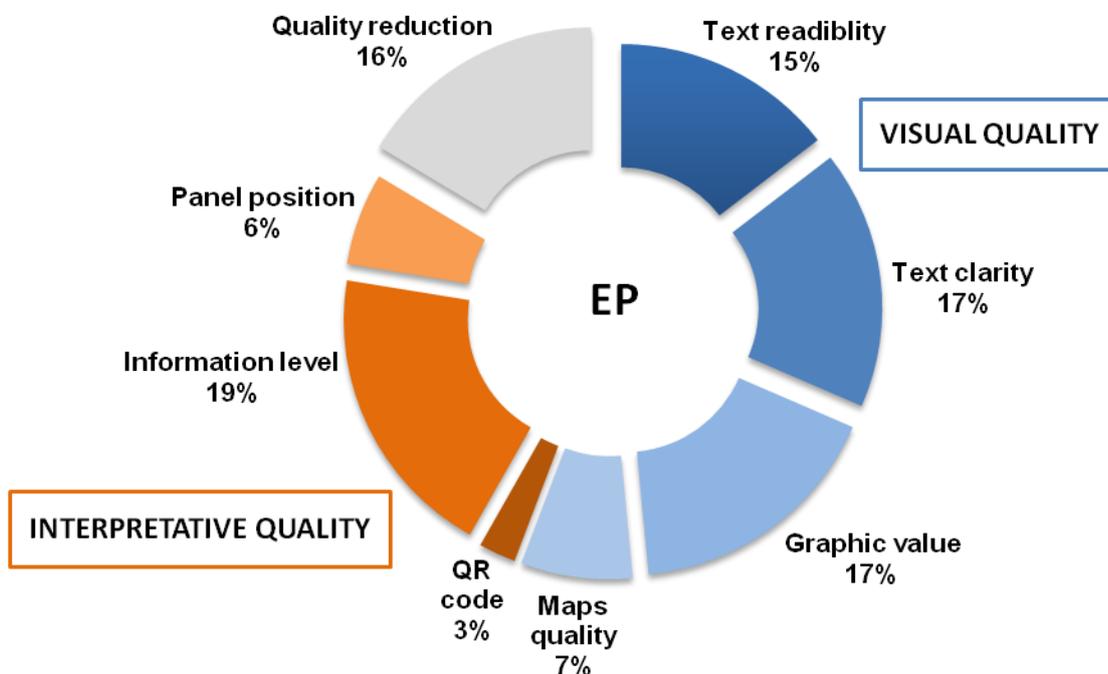


Fig. 4. Evaluated parameters of educational potential of Žitavský luh educational trail (EP_{ET})

Figure 4 shows the evaluated parameters of educational potential of the educational trail. Overall, the educational trail can be used in the teaching process, educational trail is well accessible and the route is easy and accessible for all ages.

5. Discussion

Růžička (2011) draws attention to the possibilities of interpretation of the natural heritage where it presents methods of interpretation that can be applied also in case of evaluation of educational trails. From the point of view of the educational value of the already existing educational trails, it is possible to apply in particular the aspects of site selection (the correct place of the panel location), the overall concept of the whole educational trail project (the main idea), the notice value of the individual panels (what the reader should know what to feel if what the panel should inspire him for). Based on the findings of developmental psychology, the authors compiled a table of recommended and questionable methods from which we selected school age categories for our study needs.

The basic rules of interpretation (explanation, clarification, mediation, and theme) are presented by Carter (2001) as follows: selection and brevity, target audience interpretation, use of common language, clarity of instructions and warnings.

Masters and Carter (1999) report on the quality of educational pathways, evaluating the following parameters: the possibility of reviewing an object based on explanation, designing sites related to the subject of interpretation, the availability of panels, the effectiveness of used illustrations (graphics), the attractiveness of overall design. Interpretive quality index of trail panels Masters and Carter (1999) calculated as a sum of the points earnings in individual criteria – encouragement, exploration, orientation and design rated on a scale of 0/3 (0 indicates by no means and 3 to a large extent) + connection, message, availability and illustration rated on a scale of 0/1 (0-no, 1-yes).

The results of the evaluation study of the educational trail in the National Park Vysoké Tatry (Slovakia) were implemented by Švajda and Činčera (2017). On the base of the observation, the attractiveness and strength of the individual panels were evaluated in the research and the related analyzes carried out evaluating the importance of other factors such as the placement of the panels.

Any further research should, in addition to the properties of the panels, also focus on other parameters related to visitors, their demographic characteristics (age, gender, groups of children, etc.), motivation to visit and their interaction with the tables (Falk et al., 2009; Gyllenhaal et al., 2012). Similarly, in the conditions of Central Europe, the impact of different ways of influence on the behavior of visitors should be investigated (Cialdini et al., 2006), as well as the use of, for example, Fry's Readability Test (Masters, Carter, 1999).

Educational trail routes are often supplied with panels presenting long technical texts which are not able to address in the best sense of the word ordinary visitor. Růžička (2012) reviews the significance of educational trails as a highly effective nature conservation tool in communicating with, education of and awareness among the general public. He highlights mistakes made by authors of information panels and posters on educational paths and sets guidelines on how to develop them so that they provide visitors with appropriate information in an understandable way, raising nature awareness among them.

Another obvious deficiency is the lack of connection between the panels and their surroundings, resulting in insufficient encouragement for visitors to actively explore these surroundings. Poor design of the panels may cause relatively low attention capture and holding power of the panels (Švajda, Činčera, 2017).

The statistically significant relationship between the width of the trail and the strength of the board is interesting, as this could indicate that this factor plays a role in the readers' readiness to read the whole panel.

A relatively easy solution for evaluating nature trails is to compare the level of attention capture and the holding power of panel with a predetermined desirable level. However, there is a question about the basis on which such levels can be determined. In the studies published by Medek et al. (2016), the attention capture of panels on various nature trails ranges in a wide range from one to seventy percent.

6. Conclusion

Outdoor learning is an important part of education, because it is a complex teaching form that contains different teaching methods and different organizational forms, while the focus of outdoor learning lies in the field outside school (Hoffman, 2003). One of the possibilities of outdoor learning is the use of nature trails and thus the recognition of the landscape in situ. Educational trails play a very important role in pedagogical practice. As stated by Bizubová (2001), students should, as part of the educational process of environmental education, make the most of their stay in nature, outside the interior, where they may have direct contact with the objects and phenomena. Educational paths are therefore an ideal means of realizing environmental education in a real environment. By learning the natural environment in the field, students create a better and stronger relationship with them (Bizubová, 2001).

The problems that arise towards the use of educational trails by the pedagogical as well as the general public are to a large extent related to their content, which is often unreasonable and highly demanding for ordinary visitors, including teachers and pupils. On the base of the above, it was necessary to create a methodology for evaluating educational trails in terms of their potential use for the needs of teaching practice, their educational potential. One of the possible solutions is evaluation according to set parameters, which point to the quality and quantity of provided information within the information panels of educational trail and the possibilities of their use for pedagogical practice. These parameters are applied in the evaluation of the educational potential of educational trails, which points to the presumption of using educational trails by the pedagogical public.

The good readability and clarity of the text as well as the high quality graphics are the basis for the possible use of information panel of educational trail within the external teaching process. Also, the placement and interconnection of text with the environment gives good opportunities for other activities that can deepen the knowledge of the educational trail environment.

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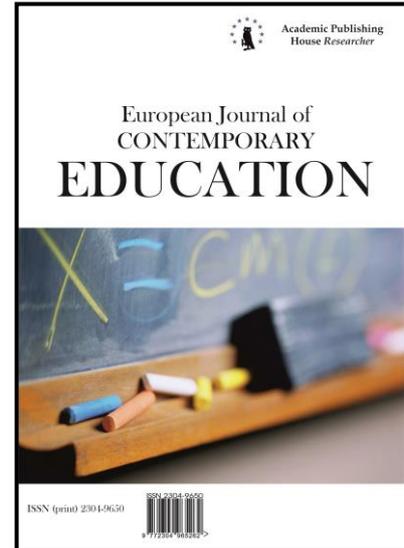
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Three Scientific Facts about Ukrainian and Polish Law-Students: Verification of Statistical Hypotheses about their Preferences of Learning at Lectures

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Abstract

The aim of the study was a verification of statistical hypotheses about the preferences of Ukrainian and Polish Law-students related the method of learning at lectures. There were two groups of Ukrainian Law-students and one group of Polish Law-students.

The main research methods were the methods of sociological research.

There are statistically proved three scientific facts in the study:

1. The general population of Ukrainian and Polish Law-students does not prefer the auditory learning method at lectures.

2. There is no a difference in the preferences of Ukrainian Law-students of 1 and 2 levels from the statistical viewpoint. So, the difference might not be taken into account.

3. There is a difference in the preferences of Ukrainian and Polish Law-students from the statistical viewpoint. So, the difference must be taken into account.

All of the results are highly statistically significant (99.0 %).

The results of the study have a great practical importance: they will help to adapt the forms of lectures to the needs of Law-students. Adaptation benefits both sides – both students and teachers.

Keywords: students' preferences, Law-students, method of teaching at lectures, auditory method, visual method.

1. Introduction

Universities nowadays are subject to pressures of the marketplace (Abubakar, 2018). The Dearing Report (Dearing, 1997) first identified students as the principle customers of universities and, as a result, HEIs have become increasingly subject to commercial pressures.

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Significant modifications in the competition have made universities adopt the thought process of a corporate business to the extent that students are currently being treated as customers (Abubakar, 2018; Hilman, 2017; Zwain, 2012). In order to attract and retain students, universities must identify and meet student expectations (Elliott, 2001).

During our work, we discussed the preferences of students in the process of teaching/learning at lectures.

On the one hand, there are many classes in higher education that are not equipped with visual means of education. We write about the universities we have seen. This means that in these universities the main part of the lectures is conducted by auditory means.

On the other hand, it is well known that new sources of visual information have entered the life of modern youth. TV, internet, mobile phone, social networks, etc. for the last 50 years. Social media has been gaining a foothold in education (Wang, 2016). Students use social media to complete homework-related tasks and maintain friendship (Weeden, 2013). The youth has changed. The youth use the achievements of technical progress. Their way of thinking changes after the emergence of new gadgets.

Should higher education be changed following the technical progress?

A lecture (from Latin *lectio* – reading) is logically consistent presentation of certain scientific knowledge to students (Formi i metodi, 2018).

A lecture (from Latin *Lectio* – “reading”) is one of the main forms of study in higher educational establishments, which is a systematic, consistent presentation by the teacher of a specific section of a particular science or academic discipline (Vidy lektzii, 2018).

A lecture is one of the main forms of the educational process and the main method of teaching at the university. Lectures appeared in the practice of teaching in ancient Greece and other ancient states, then they received wide circulation in medieval universities and retained their leading role in higher education to the present day (Formi i metodi, 2018).

There are two alternative methods of teaching in lectures – auditory and visual.

It is important to note that for several hundred years the auditory method of information transmission dominated at the lectures. The visual teaching method was also used. However, from the point of view of the authors the technical means of training which were available 50 years ago don't correspond to modern opportunities any more. Various studies report that visual information is better displayed in the minds of students (Williams, 2009). And it is quite possible that students do not prefer the auditory method of teaching now.

The auditory teaching style allows auditory students to learn by ear or through verbal communication (Carnevale, 2018). Auditory learners are good at remembering what they hear when they learn information through the auditory presentation (Kayalar, 2017). Auditory learning is a learning style when a person learns through listening (Kostelnik, 2004).

Visual education is a style in which a student uses graphs, diagrams, maps and diagrams (Visual learning, 2018). The style of visual training which is often called the style of spatial training is way of training in which information is connected with images.

Understanding how audiences differ in their preferences and accuracy are starting points for identifying what helps stakeholders be comfortable interpreting and using data in graphical forms, which is a prerequisite to having data-informed conversations and decisions (Alverson, 2016).

The lectures differ in their structure, methods of presentation of the material, the character of generalizations and conclusions. Depending on the method of conducting, the following types of lectures can be distinguished (Formi i metodi, 2018).

The aim of the work (Kayalar, 2017) was to evaluate the views of students on auditory learning and learning strategy for the interactive and communicative classroom environment. To assess and compare the views of students, studying a foreign language, on the auditory learning strategy the qualitative research method was used. The students' opinions, obtained during the interviews, show that their skills, attitude and predisposition to auditory learning style are significant and determining factors for effective teaching.

The article (Raiyn, 2016) introduces a new concept for enhancing students' analytical thinking skills based on visual learning strategies. The author's results showed that visual learning tools enhance the students' skills.

Although learning styles have “enormous popularity”, there is no evidence that specific student learning styles give the best results (Pashler, 2009). Teachers use social media to create an

alternative platform of instruction (Aydin, 2012; Kurtz, 2009) and build professional learning communities (Cho, 2013).

Therefore, we will not study the results of teaching at lectures. We will study the priorities of Ukrainian students in the process of gaining knowledge at the lectures.

The aim of the research was a verification of statistical hypotheses about the preferences of Ukrainian and Polish Law-students related the method of learning at lectures.

2. Materials and Methods

The study was carried out since January 2018 till February 2019. When planning an ascertaining experiment, we have relied on the results of previous studies. The practical part of the study was focused locally, in Ukraine and Poland. From a theoretical point of view, we relied on studies carried out in different countries before that.

We use the methods of sociological research (Kravchenko, 2014; Volkov, 2003), although Tsvetkova (2018) have found 15 disadvantages of the sociological methods of the study of reading, as a result of which, science can get a false picture. For some statistical calculations we used the methods of social statistics (Vasil'eva, Lyalin, 2012; Minashkin, 2008).

The study was performed in several stages:

- information research;
- planning the ascertaining experiment;
- statistical observation;
- primary processing and grouping of results;
- verification of statistical hypotheses;
- writing the text and correcting the text according to the reviewers' comments.

Information research.

At the first stage, the description of the state of research in this field was made. More than 100 scientific sources were studied, including those published in the journals: European Journal of Contemporary Education, European Journal of Higher Education, Higher Education, Higher Education in Europe, Higher Education Pedagogies, International Journal for Academic Development, Journal of Higher Education Policy and Management, Journal of Marketing for Higher Education, Polish Journal of Management Studies, Research in Higher Education, Studies in Higher Education, etc. The publications that are the closest to the topic of the study were selected for a thorough analysis later. So the literature review includes about 10 publications in journals indexed in databases WoS and SCOPUS. After the information research the aim of the research was formulated.

Planning the ascertaining experiment.

Then the plan of the ascertaining experiment was created.

The object of the statistical study is the statistical population of Law-students in separate countries. The unit of the population is each Law-students. In our case, they were students from Ukraine and Poland.

The subject of the study is the preferences of Ukrainian and Polish Law-students related the method of learning at lectures.

This was used serial (nested) sampling in the study (Vasil'eva, Lyalin, 2012). Serial (nested) sampling assumes that the series or groups of units of the population are to be selected. In our study, the series were selected randomly. These were selected two universities in the cities of the regional level. Then continuous observation was carried out in each selected series. In our case, the selected series in Ukraine and Poland contain the same number of observation units.

The plan of the experiment included a comparison of preferences in two pairs:

- Law-students of 1 and 2 levels (master study and bachelor study),
- Law-students from Ukraine and Poland.

The theory of experiment planning is a strong research tool. This theory allowed us to compare the preferences of students in two pairs and got three new scientific facts. At this stage, the students of Volodymyr Dahl East Ukrainian National University and Pedagogical University of Cracow were questioned.

The characteristics of the respondents are presented in [Table 1](#).

Table 1. General characteristics of the respondents

Nr	Speciality and level	Amount (M/F/Tr)	Training form	University
1	Law; 1 level	25 (7/18/0)	full-time	Volodymir Dahl East Ukrainian National University
2	Law; 2 level	15 (3/12/0)	full-time	
3	Law; 1 level	43 (17/26/0)	full-time	Pedagogical University of Cracow
	Total number of respondents:	83 (27/56/0)	-	-

Source: Own survey

In total, 83 respondents from two Poland and Ukrainian Universities took part in the statistical observation. Among them were two groups of Ukrainian students (40) and one group of Poland students (43).

Statistical observation.

Then one-time statistical observation was organized (Васильева, Лялин, 2012). The purpose of statistical observation is to obtain reliable information to identify the preferences related the method of learning at lectures in the study population. Statistical observation was a one-time event, organized in Ukraine and Poland.

In our statistical observation we used the method of survey. According to the method of obtaining data, it was a method of self-registration, in which the respondents gave the necessary information, independently filling out pre-distributed registration forms. Here the registration form was used.

The registration form was created at Pedagogical University of Cracow. The registration form contained 9 questions. The main question was number five. It was a question:

- What method of learning do I prefer at the lectures?

Three possible answers were provided:

1. The teacher has a presentation, and I write from slides.
2. The teacher dictates, and I write the lecture.
3. The teacher tells, and I note.

The first variant of the answer refers to the visual way of obtaining information at the lectures. The second and third options relate to the auditory method of obtaining information at the lectures. So, in our observation attribute features were studied (Vasil'eva, Lyalin, 2012). Further, attribute features were converted to numeric values.

Primary processing and grouping of monitoring results.

The study used the second group of methodological techniques and statistical indicators, combined on the basis of the unity of cognitive functions and calculation algorithms (Textbook, 2010). They were:

- 1) methods for determining average values;
- 2) methods of studying the variation of the characteristics of the population;
- 3) a tabular method of presenting the statistical information;
- 4) graphical method of presenting the statistical information.

First, we calculated the expected value, \bar{X} ; the standard deviation for the sample, δ_x ; the standard deviation for the population, δ_{x-1} .

Let X be a discrete random variable which takes the values $x_1, x_2 \dots x_n$ with respective probabilities $p_1, p_2 \dots p_n$. Then mathematical expectation of X denoted by \bar{X} is defined as (Васильева, Лялин, 2012):

$$\bar{X} = x_1 \times p_1 + x_2 \times p_2 + \dots + x_n \times p_n \tag{1}$$

$$\delta_x = \sqrt{[(x_1 - \bar{X})^2 + (x_2 - \bar{X})^2 + \dots + (x_n - \bar{X})^2] / (n - 1)} \tag{2}$$

$$\delta_{x-1} = \sqrt{[(x_1 - \bar{X})^2 + (x_2 - \bar{X})^2 + \dots + (x_n - \bar{X})^2] / n} \tag{3}$$

- n - the total number of data points.

After the determining the average values and the variation of the characteristics, the data were presented in the tabular and graphical form for the further analysis.

Verification of statistical hypotheses.

After that, statistical hypotheses were formulated and verified (Textbook, 2010).

Firstly, it was verified the statistical hypotheses for determining students' preferences.

The Research hypothesis: mathematical expectation of the general totality is equal to the null.

The Research hypothesis $H_0: \mu = 0.0$.

The Research hypothesis asserts that the unknown average $\mu = 0.0$ for the general populations, if one does not take into account random deviations.

The Alternative hypothesis: mathematical expectation of the general totality is not equal to the null.

The Alternative hypothesis $H_1: \mu \neq 0.0$.

The Alternative hypothesis asserts that the unknown average $\mu \neq 0.0$ for the general populations, if one does not take into account random deviations.

Secondly, it was estimated the difference between two mathematical expectations (Что такое z-otsenka, 2018). The data of table 2 allows to make comparisons based on the sample mean (\bar{X}) and on the mathematical expectation of the General population (μ).

The statistics, which form the basis of the criterion for testing the equality of the mathematical expectations of two general totalities, are based on the difference between the sample averages $\bar{X}_1 - \bar{X}_2$. To estimating the differences between two mathematical expectations, we used a formula (Что такое z-оценка, 2018):

$$z = [(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)] / \sqrt{(\hat{S}_1^2 - \hat{S}_2^2)}, \quad (4)$$

where \bar{X}_1 - average sample value from the first general totality,

μ_1 - mathematical expectation of the first general totality,

\hat{S}_1 - average sample error taken from the first general totality,

\bar{X}_2 - average sample value from the second general totality,

μ_2 - mathematical expectation of the second general totality,

\hat{S}_2 - average sample error taken from the second general totality.

The Research hypothesis: there are no significant differences between two independent samples.

The Research hypothesis is $H_0: \mu_1 - \mu_2 = 0.0$.

The Research hypothesis asserts that there are no significant differences in the preferences of students, if one does not take into account random deviations.

The Alternative hypothesis: there are significant differences between two independent samples.

The Alternative hypothesis is $H_1: \mu_1 - \mu_2 \neq 0.0$.

The Alternative hypothesis asserts that there are significant differences in the preferences of students, if one does not take into account random deviations. For the standard significance level of 99.0 % ($p = 0.01$), $z_{\text{tabl}} = 2.58$ (Что такое z-otsenka, 2018).

And, at last, after discussion of the received results, authors have made the conclusion. Correcting the reviewers' comments helped to improve the quality of the paper.

3. Results

Step 1. Primary processing and grouping of monitoring results

The results of the determining the average values and the variation of the characteristics are given in Table 2. The main question of the registration form was: What method of learning do I prefer at lectures?

Three possible answers were provided:

1. The teacher has a presentation, and I write from slides.
2. The teacher dictates, and I write the lecture.
3. The teacher tells, and I note.

For the determining the average values and the variation of the characteristics, the value "0" was assigned to the auditory method of learning at lectures. Answers No. 2 and No. 3 relate to the auditory method of obtaining information at the lectures. So, they were combined before the

calculation. The value "1" was assigned to the visual method of learning at lectures.

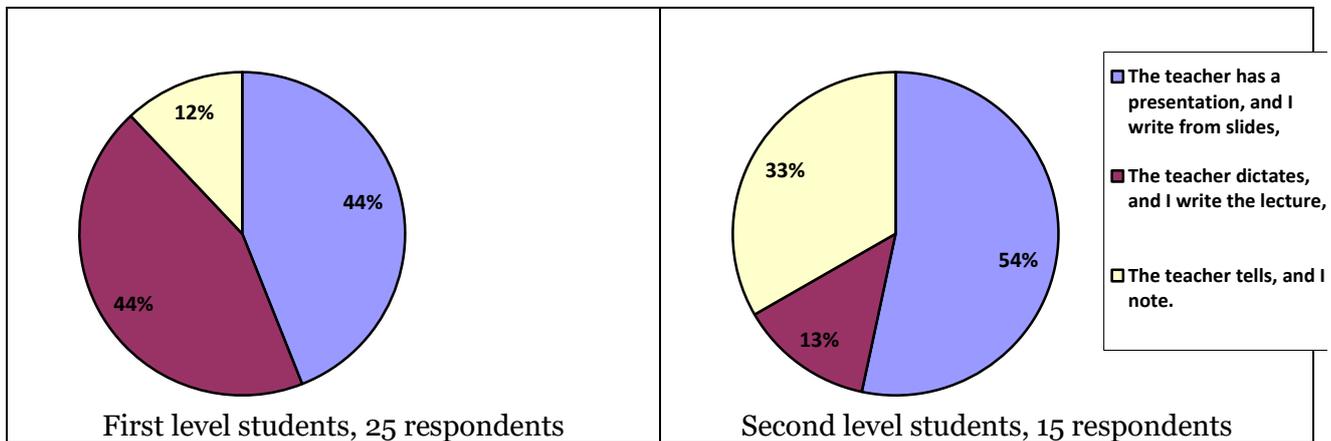
Table 2. Results of determining the average values and the variation of the characteristics (number of variants of different answers)

№	Speciality and level	The number of choices			\bar{X}	δ_x	δ_{x-1}
		response 1	response 2	response 3			
1	Law, 1 level	11	11	3	0.44	0.50	0.51
2	Law, 2 level	8	2	5	0.53	0.50	0.52
3	Law, 1 level	43	0	0	1.00	0.00	0.00

Source: The results of own calculations

The Table 2 shows the total results of the initial assessment of respondents' preferences when they receive information at the lectures.

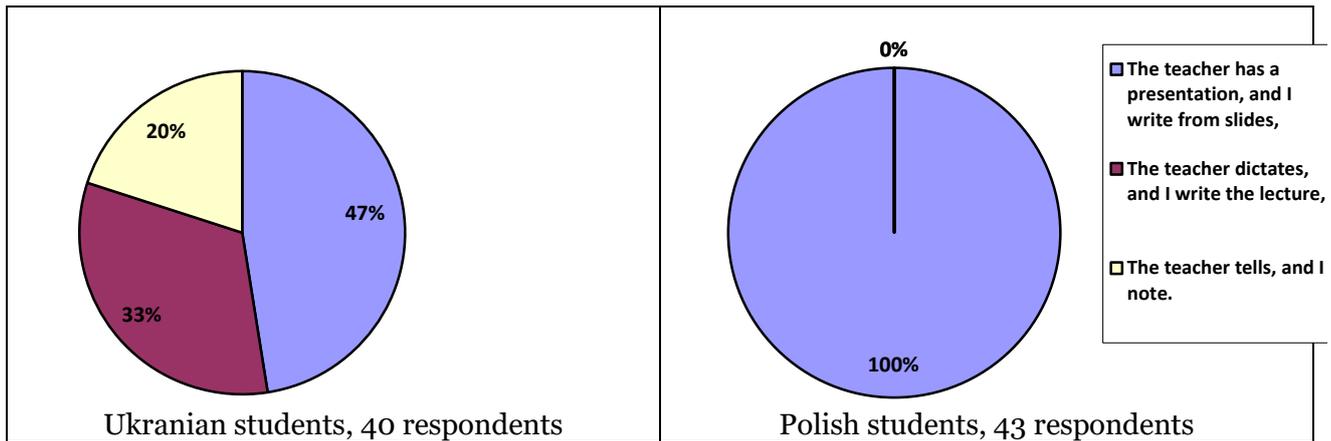
The authors compared the preferences of students of the first and second levels. The comparison results are shown in Figure 1. Here are the preferences of the Ukrainian students of the specialty "Law". There is group 1 for the first-level students. There is group 2 for the second-level students. It was 40 respondents in total.



Source: The results of own calculations.

Fig. 1. The number of choices of the way of learning at lectures, the first and second levels, %

Then the authors compared the preferences of the Ukrainian students and the Polish students. The comparison results are shown in Figure 2. These are group 1 and group 2 for the Ukrainian students. There is group number 3 for the Polish students. It was 83 respondents.



Source: The results of own calculations

Fig. 2. The number of choices of the way of learning at lectures, Ukrainian students and Polish students, %

Figures 1 and 2 show that the visual method of learning dominates at the preferences of the Polish students. It is shown that the auditory method of learning does not dominate at the preferences of the Ukrainian students. In this situation, Table 2 is not a basis for strong evidence. So, next we made a verification of three pairs of statistical hypotheses.

Step 2. Verification of statistical hypotheses for determining students' preferences: Ukrainian and Polish students prefer the auditory learning method at lectures

At this stage of verification of statistical hypotheses, two alternatives were considered:

1. Ukrainian and Polish students prefer the auditory learning method at lectures.
2. Ukrainian and Polish students do not prefer the auditory learning method at lectures.

The Research hypothesis: Ukrainian and Polish Law-students prefer the auditory learning method at lectures.

The Research hypothesis $H_0: \mu = 0.0$.

The Research hypothesis asserts that the unknown average $\mu = 0.0$ for the general populations of Law-students in Ukraine and Poland. The Research hypothesis is as follows: Ukrainian and Polish students prefer the auditory learning method at lectures, if one does not take into account random deviations.

The Alternative hypothesis: Ukrainian and Polish Law-students do not prefer the auditory learning method at lectures.

The Alternative hypothesis $H_1: \mu \neq 0.0$.

The Alternative hypothesis asserts that the unknown average $\mu \neq 0.0$ for the general student populations of Law-students in Ukraine and Poland. The Alternative hypothesis is as follows: students do not prefer the auditory learning method, if one does not take into account random deviations.

Table 3 shows the calculated data for verification of statistical hypotheses at $\mu_0 = 0.0$.

Table 3. Data for verification of statistical hypotheses

№	Indicator	Group number		
		1	2	3
1	Sample size, n	25	15	43
2	Selective average, \bar{X}	0.44	0.53	1.00
3	Standard deviation for sample, δ_x	0.50	0.50	0.00
4	Average error, $\hat{S}_x = \delta_x / \sqrt{n}$	0.100	0.129	0.00
5	Value $ t_{stat} $ for $\mu_0 = 0.0$, $(\bar{X} - \mu_0) / \hat{S}_x$	4.400	4.109	∞
6	Value t_{tabl} for significance level 99.0, %, Table 9.1.1 (Textbook, 2010, 42)	2.797	2.977	2.576
7	Result, $t_{stat} > t_{tabl}$	Yes	Yes	Yes

Source: The results of own calculations

Table 3 shows that the t_{stat} value is greater than the t_{tabl} value for the 99.0 % significance level. Therefore, we accept the Alternative hypothesis: the unknown average for the general population of students $\mu \neq 0.0$. This means that students do not prefer the auditory method of learning at lectures, if one does not take into account random deviations.

For 99.0 % significance level (Textbook, 2010: 75), we accept the following result: Ukrainian and Polish Law-students do not prefer the auditory learning method at lectures. This means that university teachers and professors should use visual methods of lectures more widely.

The result is the first scientific fact: the general population of Ukrainian and Polish Law-students does not prefer the auditory learning method at lectures. This fact should be taken into account when reforming Ukrainian and Polish higher education.

Step 3. Verification of statistical hypotheses for estimating the differences between two independent samples: a comparison of the preferences of students of the first and second levels

Figure 1 showed the difference between the preferences of students of 1 and 2 levels. So, the authors estimated the difference between two mathematical expectations at a confidence level of 99.0 (Table 4).

Table 4. Data to verification of statistical hypotheses

№	Indicator	Group number	
		1	2
1	the size of a sample, n	25	15
2	the expected value, \bar{X}	0.44	0.53
3	$\bar{X}_1 - \bar{X}_2$	0.09	
4	$\mu_1 - \mu_2$	0.00	
5	the standard deviation for the sample, δ_x	0.50	0.50
6	average error, $\hat{S}_x = \delta_x / \sqrt{n}$	0.10	0.13
7	\hat{S}^2	0.010	0.017
8	$\hat{S}_1^2 - \hat{S}_2^2$	0.007	
9	$\sqrt{(\hat{S}_1^2 - \hat{S}_2^2)}$	0.084	
10	$ z_{stat} $	1.071	
11	the value z_{tabl} for the level of significance 99.0	2.58	
12	Result, $z_{stat} < z_{table}$	Yes	

Source: The results of own calculations

For the standard significance level of 99 % ($p = 0.01$), $z_{tabl} = 2.58$ (Chto takoe z-otsenka, 2018).

In our case, $|z_{stat}| = 1.071$. Since z_{tabl} is higher than $|z_{stat}|$, then the Research hypothesis is accepted: there are no statistically significant differences between two independent samples.

That is why, the difference in the preferences of students of 1 and 2 levels of education must

not be taken into account.

The result is the second scientific fact: the difference in the preferences of Ukrainian Law-students of 1 and 2 levels must not be taken into account.

Step 4. Verification of statistical hypotheses for estimating the differences between two independent samples: a comparison of the preferences of Ukrainian students and Polish Law-students

Figure 2 showed the difference between the preferences of Ukrainian students and Polish students. So, the authors estimated the difference between two mathematical expectations at a confidence level of 99.0 (Table 5).

Table 5. Data to verification of statistical hypotheses

№	Indicator	Group number	
		1-2	3
1	the size of a sample, n	40	43
2	the expected value, \bar{X}	0.47	1.00
3	$\bar{X}_1 - \bar{X}_2$	0.53	
4	$\mu_1 - \mu_2$	0.00	
5	the standard deviation for the sample, δ_x	0.50	0.00
6	average error, $\hat{S}_x = \delta_x / \sqrt{n}$	0.079	0.00
7	\hat{S}^2	0.006	0.000
8	$\hat{S}_1^2 - \hat{S}_2^2$	0.006	
9	$\sqrt{(\hat{S}_1^2 - \hat{S}_2^2)}$	0.079	
10	Z_{stat}	6.709	
11	the value Z_{tabl} for the level of significance 99.0	2.58	
12	Result, $Z_{stat} < Z_{table}$	No	

Source: The results of own calculations

For the standard significance level of 99 % ($p = 0.01$), $Z_{tabl} = 2.58$ (Choto takoe z-otsenka, 2018).

In our case, $|Z_{stat}| = 6.709$. Since Z_{tabl} is not higher than $|Z_{stat}|$, then the Alternative hypothesis is accepted: there are statistically significant differences between two independent samples. That is why, the difference in the preferences of Ukrainian students and Polish students must be taken into account.

The result is the third scientific fact: the difference in the preferences of Ukrainian and Polish Law-students must be taken into account.

4. Discussion

Is there any innovative idea in the study?

First of all, it was a new idea to study the preferences of Law-students in two countries. The study of the three groups of respondents from two countries with different cultures helped to get an interesting picture.

Secondly, the results are new scientific facts. The results are not a new theory, a new scientific Law, a new scientific conception. It is the first time that independent student opinions were transformed into real scientific knowledge. These real scientific facts should be taken into account when reforming higher education in Ukraine and Poland.

Thirdly, on the basis of new scientific knowledge about the student preferences the real recommendations could be given for the Top-management of Ukrainian and Polish Universities: university teachers should use visual ways of teaching students at the lectures. Innovative ideas, reflected in the recommendations could be used for improving of teaching-technologies in Ukrainian and Polish Universities.

Can we trust the received results?

First, 83 students took part in our study. Is this number of respondents enough or not enough?

For example, in the survey (Guluță, 2016) only 50 Romanian managers were interviewed. The author did not interview all Romanian managers. However, the statistical processing methods allowed to show a stable correlation for the whole Romania. In the paper (Kayalar, 2017), the study was carried out only with the participation of 15 university students. In the paper (Özdemir, 2018) the study was carried out only with the participation of 40 respondents. And, in the paper (Pavlova, 2016) there were 48 respondents only.

That's why, we are sure that 83 respondents are sufficient to get a reliable result in the study.

Second, at the step of verification of statistical hypotheses about the preferred method of learning at the lectures, for the standard significance level of 99.0 % the Alternative hypothesis was accepted: Ukrainian and Polish Law-students do not prefer the auditory method of learning at the lectures, if one does not take into account random deviations. The results are highly statistically significant (99.0 %). The result shows that the solution will be correct approximately in 99.0 % of cases and incorrect only in 1.0 % of cases. In this sense, we have a decision-making process with accurate, controlled probability. Despite the fact that the auditory learning method has dominated in higher education institutions for more than 500 years, we are sure that the general population of Ukrainian and Polish Law-students does not prefer the auditory method of learning at the lectures. These are new requirements of students for university teachers to change the method of teaching.

At the step of verification of statistical hypotheses about the existence of significant differences between two independent samples, for the standard significance level of 99.0 % the Research hypothesis was accepted: there are no statistically significant differences in the preferences of Ukrainian Law-students of 1 and 2 levels, if one does not take into account random deviations. The result shows that the solution will be correct approximately in 99.0 % of cases and incorrect only in 1.0 % of cases. In this sense, we have a decision-making process with accurate, controlled probability.

At the step of verification of statistical hypotheses about the existence of significant differences between two independent samples, for the standard significance level of 99.0 % the Alternative hypothesis was accepted: there are highly statistically significant differences in the preferences of Ukrainian and Polish Law-students, if one does not take into account random deviations. The result shows that the solution will be correct approximately in 99.0 % of cases and incorrect only in 1.0 % of cases. In this sense, we have a decision-making process with accurate, controlled probability.

The theory of statistics gives no reason to doubt the correctness of our results. The theory of statistics frees the authors from the need to prove the correctness of the results. Anyone who disagrees with our results can only refute the results. S/he should organize a new study and must use a large sample or higher statistical significance (Textbook, 2010).

The results of the study have a great practical importance. The systems of higher education in Ukraine and Poland cannot ignore the interests of Ukrainian and Polish Law-students who do not prefer the auditory method of learning at the lectures. This means that Ukrainian and Polish higher education needs reform. This reform in higher education should reflect new requirements of Law-students:

- First of all, it is necessary to equip lecture halls with visual teaching aids.
- Secondly, it is necessary to teach Law-lecturers for the use of visual teaching aids.

This will help to adapt the forms of lectures to the needs of Law-students. Adaptation benefits both sides – both students and teachers.

5. Conclusion

It was studied the preferences of Ukrainian and Polish Law-students related the method of learning at lectures. The aim of the study is achieved. Verification of statistical hypotheses helped to prove three scientific facts about Ukrainian and Polish Law-students in the research:

1. The general population of Ukrainian and Polish Law-students does not prefer the auditory learning method at the lectures. The result is highly statistically significant (99.0 %). The result shows that the solution will be correct approximately in 99.0 % of cases and incorrect only in 1.0 % of cases. This means that we have a decision-making process with accurate, controlled probability.

2. There is no a difference in the preferences of Ukrainian Law-students of 1 and 2 levels from the statistical viewpoint. So, the difference might not be taken into account. The result is highly statistically significant (99.0 %). The result shows that the solution will be correct approximately in

99.0 % of cases and incorrect only in 1.0 % of cases. This means that we have a decision-making process with accurate, controlled probability.

3. There is a difference in the preferences of Ukrainian and Polish Law-students from the statistical viewpoint. So, the difference must be taken into account. The result is highly statistically significant (99.0 %). The result shows that the solution will be correct approximately in 99.0 % of cases and incorrect only in 1.0 % of cases. This means that we have a decision-making process with accurate, controlled probability.

The results of the study have a great practical importance. The scientific facts should be taken into account when reforming higher education in Ukraine and Poland. Among other things, we recommend to form new training programs for university teachers. University teachers should learn to use visual ways of teaching students at the lectures. Adaptation benefits both sides – both students and University teachers.

The task of the next study is to assess the preferences of Law-students in other European Countries.

6. Acknowledgements

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7. Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

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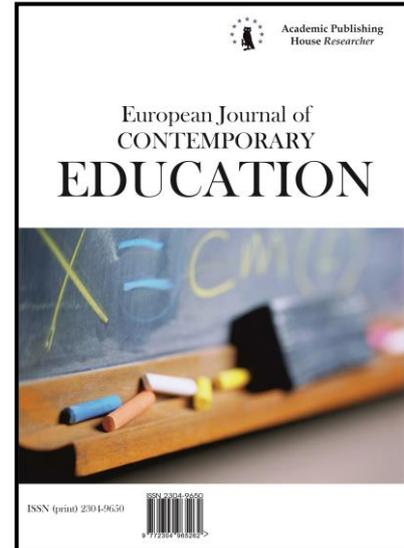
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The Russian Market for Exported Educational Services: the Shanghai Cooperation Organization (SCO) Network University

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Abstract

The research reported in this paper seeks to assess the potential of the Russian market for exported educational services through the example of the Shanghai Cooperation Organisation Network University (SCOU). The authors share the findings from their analysis of a set of educational models for the SCOU, provide an assessment of the role of backbone Russian and Chinese colleges in and their contribution to the implementation of priority areas for the training of specialists from SCO member states, share the findings from their statistical analysis of demand for joint export educational programs (JEEPs), and examine some of the key forms and characteristics of the academic mobility of students attending school via a JEEP, which they view as an indispensable part of today's international educational process. The paper shares the findings from a sociological study which was conducted by the authors in the form of a questionnaire-based survey of students from top Chinese and Russian colleges participating in the SCOU program for the purpose of exploring the motivation of students in the context of planning out their individual educational path based on the pursuit of studies overseas. The work makes use of SCOU-related data from the Ministries of Education of China and Russia and various statistics websites on the Internet to analyze the results from the implementation of SCOU JEEPs and also explore the foreign student body attending school in Russia. In putting this work together, the authors employed a set of traditional methods of research, including classification, comparative analysis, summarization, juxtaposition, forecasting, and surveying by questionnaire. The authors' assessments of the potential of the Russian market for export educational programs, based on the example of the Shanghai Cooperation Organisation Network University, have helped put together a set of recommendations on boosting the competitiveness and efficiency of the market for the export of educational projects and programs.

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Keywords: SCO Network University, academic mobility, joint educational program, export of educational programs.

1. Introduction

Without question, a key role in the development of the market for educational services in the first quarter of the 21st century across the Eurasian educational space will be played by network universities. Above all, these are the network universities of the Commonwealth of Independent States (CIS), the BRICS (Brazil, Russia, India, China, and South Africa), and the Shanghai Cooperation Organisation (SCO) (Filippov, Yuhua, 2015). One of the initiators and organizers of and active participants in these international projects is the Peoples' Friendship University of Russia (RUDN). The SCO Network University (SCOU) was established in October of 2008, bringing together higher-education institutions from Kazakhstan, China, Kyrgyzstan, Russia, Tajikistan, Uzbekistan, and Belarus (Agreement, 2006; Charter, 2011). Since 2012, the SCOU's International Rectorate has been headed by RUDN Rector V.M. Filippov, Academician of the Russian Academy of Education (Efremova, Fedorov, 2017).

The SCO Network University incorporates 21 Russian universities, which represent various regions of Russia (SCOUR). Among them are the following colleges with a high standing in the QS world university rankings: Lomonosov Moscow State University (MGU) (QS ranking – 84), Saint Petersburg State University (234), Novosibirsk State University (242), Tomsk State University (268), Moscow State Institute of International Relations (MGIMO University) (366), Ural Federal University (364), Kazan Federal University (392), RUDN University (392), and others.

In May of 2012, China's Ministry of Education appointed Rector of Dalian University of Foreign Languages Sun Yuhua Chairman of the National Rectorate of the SCOU of China. Among the key objectives for the Rectorate on China's part is coordinating the operation of the 20 Chinese colleges participating in the SCOU, as well as conducting strategic research on the SCOU's development (Sun, 2017; SCOU). Some of the key Chinese colleges participating in the SCOU include the following: Tsinghua University (QS ranking – 16), Beijing University (22), University Science and Technology of China (89), etc. (data as at June 26, 2019) (www.usco.edu.cn/RUS/dxgk/). In addition to colleges from Russia and China, the SCOU incorporates 14 Kazakh, 8 Kyrgyz, 10 Tajik, and one Belarus colleges (<http://uni-sco.ru/country/6.html>).

It would be safe to assume that the popularity of an organization, technology, product, service, and other outcomes of activity may be assessed via Internet portals. As was found by the authors, the SCO University and its member colleges are quite popular today. For instance, hashtags related to the phrase 'Russian SCOU colleges' turned up 14 million in Russian and 6 million results in English, respectively, with those related to the phrase 'Chinese SCOU colleges' turning up 12 million and 3 million, respectively, and 'RUDN as a SCOU member' – 15 million and 4 million results, respectively (all data as at June 25, 2019). SCOU member colleges operate across the following key seven areas: Regional Studies, Environmental Protection, Power Generation, IT, Nanotechnology, Economics, and Pedagogy. Among these, the most sought-after academic area is Regional Studies (MESRF). There are a total of 27 Regional Studies-related specialties offered in 43 % of all the Russian and 70 % of all the Chinese universities. By popularity, the academic areas are currently ranked with Russian and Chinese SCOU member colleges as follows (respectively): Economics – 48 % and 25 %; Environmental Protection – 38 % and 25 %; Energetics – 19 % and 35 %; IT – 28 % and 40 %; Nanotechnology – 19 % and 25 %; Pedagogy – 24 % and 10 %.

The RUDN is a participant in the following five priority academic areas: Nanotechnology, Pedagogy, Regional Studies, Economics, and Environmental Protection. Some of its key partners include the following institutions: Heilundzian University, Dalian University of Foreign Languages, Harbin Institute of Technology, and Hainan Tropical Ocean University.

1.1. SCO University model

The SCOU offers the following types of academic program: (1) Preparatory Language Courses; (2) Bachelor's Program (4 years); (3) Master's Program (2 years); (4) Postgraduate Program (3 years); (5) Doctoral Program (3 years); (6) Advanced Training Program, Vocational Retraining Program, Distance Learning Program, and On- and Off-Site Learning Program. The principal language of study within the SCO University is the state language in the country of study and/or the SCO's official languages – Russian and Chinese.

1.2. Joint academic programs within the SCOU

When it comes to international educational programs, one of the common forms of international educational cooperation today is joint educational programs (JEPs). Programs of this kind are becoming increasingly popular today in the Eurasian educational space. Russia is currently engaged in cooperation in the area of the development and promotion of joint educational programs both with European and Asian nations. Russia and China have been engaged in nearly 125 Chinese-Russian projects, with the number of Russian-Chinese JEPs being about the same (Guruleva, Bedareva, 2019). There is an agreement entered into as part of the SCOU that permits students attending school via a University's program to continue their studies in any term at a backbone college participating in the program. The minimum period of study in a participating foreign college is one term. The condition for getting two diplomas (one from one's home university and one from the foreign college) after having completed the educational program is having to attend a foreign college for a certain period of time – no less than 30 % of a JEP's length, which is a key competitive advantage with the SCOU.

A phenomenon that is part of the implementation of international JEPs is student academic mobility. Academic mobility is an indispensable, immanent form of the existence of intellectual potential, which reflects the fulfillment of the inherent need for it to continually change and move across the space of cultural, social, economic, and political relations and relationships (Burmam, Delius, 2017). There is geographic, social, professional, sociocultural, cultural, personal, and academic mobility (Waters, 2017). There is also credit mobility, which implies attending one or more terms of school at a university in the territory of another state after having provided documentation on credits earned at the person's home college in order to continue their studies (Gulson, 2017). Certain researchers also use the term 'institutional mobility' (Larionova, 2013). Thus, there is occurring a transformation of the actual conceptual meaning of what academic mobility is. Today, the processes of academic mobility involve not only students, teaching staff, and researchers but cross-border programs on the pursuit of a degree (a diploma) that are created by university branches in developed and developing nations throughout the world. Some of the key forms of academic student mobility include the following: joint double-diploma programs; exchange programs as part of inter-college cooperation; academic traineeships and internships; summer schools; language schools; joint research and development; research traineeships and internships; seminars and conferences; scientific-technical exhibition activities; international student contests and Olympiads (Grigashkina, 2015).

Scholar N.V. Krasilnikova (Krasilnikova, 2015) employs the term 'mobility of curricula', which may imply the following: incorporating into the curriculum "international" disciplines (e.g., international law, world economics, etc.); expanding the curriculum through the supplementation of the content of traditional disciplines with international problems and topics; developing curricula for foreign students; developing curricula related to the training of national and foreign residents for work at international companies; developing curricula in foreign languages for intercultural communication that will contain intercultural knowledge; developing interdisciplinary curricula covering in the informational aspect two or more nations; developing curricula conducive to joint or double diplomas that will be recognized in two or more countries; developing curricula with a mandatory "international" section which the student will be able to master in a different country under the guidance of instructors at a college there.

In the view of scholar T.L. Guruleva, the international educational space is characterized today by the following two major forms of academic mobility – outbound and inbound. Subjects of inbound mobility are citizens of foreign states who are recipients of exported national educational services. Inbound mobility is the principal form of implementation of international joint educational programs (Van, Baranova, 2017). The active development of AR and VR electronic technology may have facilitated the emergence of the term 'virtual mobility' (Yalalov, 2014), whose potential in export of educational programs and courses is still highly underestimated for now.

Sports and culture are an indispensable part of the life of a student. Not only during school – these two areas will matter throughout life. One can do either amateur (i.e., a focus on education, first, and sports, second) or professional sports (sports, first, and education, second). When it comes to doing sports with an aim for major achievements, one could later take part in the Universiades, Olympics, Paralympics, World Championships, Championships of Europe, Championships of Asia, etc. Students and college graduates who become champions or win a medal

at a sports competition are the pride of their university. As revealed by the study's findings, in choosing a college, an educational program, a level of education, or a further education program, such students tend to prioritize the availability at the educational institution of a sports team of a certain level or a comfortable environment in which it would be possible to do their favorite type of sports throughout the period of study. Russia possesses a state-of-the-art, world-level sports infrastructure for winter, summer, and team sports. Consequently, where schoolchildren and students want to do sports and there is potential for student sports mobility there can form the groundwork for a segment of the international market for educational services such as exported educational services. This fact helps isolate into a separate category a variety of student mobility such as student sports mobility (SSM). Unfortunately, in Russia there is currently a paucity of research devoted to SSM (Pestereva, 2015; Fedotova, All Hussini, 2017).

Thus, academic mobility in all its varieties and forms is not just about the cross-border movement of students and instructors but about the opportunity for the learner to design, based on a joint educational program, their own academic path by choosing whatever subjects, courses, institutions of learning, study schedules, or study modes they deem right for themselves based on their proclivities and aspirations, i.e. design an individual learning pathway for themselves with elements of sports and culture incorporated into it.

What makes a student choose a certain educational program? What kind of motivation do students have today? What is the best way to organize the marketing strategy in an attempt to boost the competitiveness of the domestic market for educational programs for students who do sports? What is the best way to attract foreign students who are active in sports? These questions can be answered substantively only based on some real sociological research.

Thus, a joint educational program (JEP) is the main "service" or "product" in the export educational market. A JEP's relevance, quality, sought-afterness, originality, and innovativeness is what the economic efficiency of the export of education will depend on.

As commonly known, all markets, including the market for the export of educational services, are formed based on the opposite interests of the Seller and the Buyer. Some of the first research studies devoted to assessing the market for the export of educational services include research by A.N. Lunev (Lunev, 2014), J. Ma and K. Zhao (Ma, Zhao, 2018), and K.G. Krechetnikov and N.M. Pestereva (Krechetnikov, Pestereva, 2017). Theoretical issues related to the market for the export of educational services have been investigated in works by T.N. Guryanova and L.Z. Fatkhullina (Guryanova, Fatkhullina, 2014), T.I. Chinaeva (Chinaeva, 2017), and others. Some of the key priorities at the current stage of the development of the Russian market for the export of educational services include: conducting in-depth research into the matter and putting together a generalized "portrait" of the potential "buyer of Russian educational programs", segmenting the consumer market, developing specialized JEPs not only for undergraduate- and graduate-level education but further education and advanced training as well, factoring in the characteristics of regional investment programs for development.

2. Materials and methods

2.1. The work's source information is grounded in open data from the official websites of universities in Russia and China, national websites on education, articles from journals indexed in WoS and Scopus, and a scientific electronic library built based on the Open Science paradigm.

2.2. The authors also made use of data from the websites of:

- UNESCO Institute of Statistics Data Centre (<http://data.uis.unesco.org/>);
- Ministry of Education of China (<http://www.crs.jsj.edu.cn/index>);
- Shanghai Cooperation Organisation University in China (www.usco.edu.cn);
- Shanghai Cooperation Organisation University in Russia (<http://uni-sco.ru/>);
- Ministry of Education and Science of the Russian Federation (<https://minobrnauki.gov.ru/ru/activity/statan/stat/highed>);
- National Bureau of Statistics of China (<http://www.stats.gov.cn/english/Statisticaldata/AnnualData/>);
- Overseas Chinese Network (<http://www.chinaqw.com/hwjy/2017/04-24/138500.shtml>).

2.3. The work employed the results from a questionnaire-based survey of Russian and Chinese students who are on the basketball teams of the following colleges: Saint Petersburg State University, Ural Federal University named after the First President of Russia B.N. Yeltsin, Harbin

Institute of Technology, and Zhejiang University. All of these institutions are a part of the SCO University. A total of 48 Russian and Chinese students were surveyed.

2.4. The work employed a set of methods of sociological research, including surveying by questionnaire and statistical and graphical processing of the data obtained. The study's principal purpose is to gain insight into the motivation and intentions of students in their choice of educational program, university, and country of study.

2.5. The work employed a set of traditional methods of research, including classification, comparative analysis, summarization, juxtaposition, and forecasting.

The statistical data and articles from Chinese sources in Chinese used in this paper had been translated into Russian by Wang Qi, Candidate of Pedagogical Sciences, an Assistant Professor in the Russian Language Institute at Heilundzian University, who also helped prepare an analytical background report on the subject of research.

3. Results

3.1. Analysis of the potential of the Russian market for educational services for students from China.

The information base was put together on the strength of open data from the Russian and Chinese websites for the SCOU, the websites of the Ministries of Education of China and Russia, and a few other information sources on the Internet. A summarized analysis of SCOU JEPs revealed the following figures on Bachelor's degree programs: double diplomas account for 14 % of all joint programs offered by the institution, student exchange programs – 86 %, and joint degree programs – 0 %. There are a total of 117 programs. The SCOU is also offering Master's-degree (double diplomas (only Russian degrees offered)), postgraduate, and doctoral programs.

The bulk of the Chinese student body attending Russian colleges is made up of residents of China's northeastern and eastern provinces. The number of students from Beijing and other regions of China is currently no more than 9 % (Table 1).

Table 1. Number of Chinese Students Attending School in Russia, with a breakdown into Areas of Their Permanent Residence in China

	Region	Province
1	Northeast China – 77 %	Heilongjiang – 69 %
		Jilin – 8 %
2	South Central China – 8 %	Henan – 8 %
3	East China – 6 %	Jiangsu – 4 %
		Shandong – 2 %
4	Direct-controlled municipalities Beijing and Tianjin, provinces Zhejiang, Sichuan, and Hunan, and autonomous regions NMAR and XUAR – 1.3 % each (9 %).	

The geographic whereabouts of foreign students in Russia is distinguished by a high degree of concentration: a third of all foreign students is accounted for by Moscow (25 %) and Saint Petersburg (9.7 %). Omsk Oblast and Tomsk Oblast account for about 4.5 % [MESRF]. The Peoples' Friendship University of Russia is a recognized leader in Russia in number of foreign students. The RUDN currently provides instruction to 5.139 individuals (data as at June 26, 2019). Given the rich history of its development, the high caliber of its teaching staff, its decent QS world ranking, its advanced material-technical and technological capacity, its well-developed infrastructure, and its comfortable campus environment, the university looks pretty strong in terms of potential in the market for the export of educational services.

3.2. Assessment of the export potential of top colleges in Russia

A group of researchers at the RUDN University headed by V.N. Kholina, Head of the Department of Regional Economics and Geography, undertook a research project devoted to the analysis of the potential of 39 colleges chosen by the Ministry of Science and Higher Education for participating in 'The Development of the Export Potential of the Russian System of Education' priority project: 23 are in Moscow, 3 – in the Tomsk region, 2 – in St. Petersburg and the Republic

of Tatarstan, one each in the Belgorod, Saratov, Sverdlovsk, Novosibirsk, Tambov, Rostov and Chelyabinsk regions, Primorsky and Krasnodar regions (Kholina et al., 2016).

Based on the results from ranking the universities by the Internationalization parameter, the way is led by the following institutions: Peoples' Friendship University of Russia, Higher School of Economics National Research University, Lomonosov Moscow State University (MGU), MEPhI – National Research Nuclear University, and National Research Tomsk Polytechnical University. With the Best Colleges by Conditions for Getting a Quality of Education category (top 20), the leaders were as follows: Lomonosov Moscow State University (MGU), Moscow State Institute of International Relations (MGIMO), Moscow Physics and Technology Institute, Higher School of Economics National Research University, and National Research Tomsk Polytechnical University.

The preparedness of a college for implementing inbound JEPs is assessed by the sum of points awarded to it across the following criteria: share of foreign students in total students; availability of a program or a facility for teaching foreigners Russian; availability of top research schools; availability of summer schools; availability of conferences for young researchers; share of students not provided with dormitory accommodation in total students in need thereof. The degree of preparedness for taking part in the Russian market for exported educational services was assessed as follows: high (over 12 points); medium (7–12 points); below medium (0–6 points). The study helped formulate the following key measures for colleges to undertake in order to boost their export potential: increasing the number of higher-education academic programs implemented jointly with foreign colleges and conducive to the receipt of two diplomas; galvanizing work on the establishment of new research schools; increasing the share of foreign students in total students.

One of the key players in the global market for educational services today is China – over 700,000 Chinese students attend school overseas, with 30,000 of them (4.3 %) attending school in Russia. On the one hand, there are quite a number of top Russian universities with high potential for the export of educational services at the level of world standards, while, on the other hand, there is China, one of the world's largest markets for educational services, which is Russia's partner both geographically and historically.

3.3. Organization and results of the sociological study

September of 2019 will mark the 70th anniversary of the establishment of diplomatic relations between Russia and China. In commemoration of this special inter-country event, Russia and China have been organizing various activities related to this. In June of 2019, Harbin hosted an international student basketball tournament among top colleges within the SCOU. The competition was organized by the Government of Harbin, Heilundzian University, the Harbin Institute of Technology, the Harbin Association of International Sports Cooperation and Exchanges, the Student Basketball Association of Russia, and the Peoples' Friendship University of Russia. The authors took part in organizing the tournament and conducted a sociological study in the form of a questionnaire-based survey. The questions were designed by N.M. Pestereva. They were translated into Chinese by Wang Qi.

Based on the survey's results (Table 2), the overwhelming majority of high school graduates doing basketball in Russia and China would like to attend a college that would guarantee them the chance to continue playing basketball. At the same time, the future students appeared to be in no particular rush to go with a foreign college with a highly-ranked basketball team (11–21 %).

Given that, in assessing the potential for the Russian export of educational services, of primary significance are questionnaire data from Chinese students, regardless of which university team they are on, the entire original sample was divided into two groups: Russian students and Chinese students (Table 2 and Table 4). To assess the significance level P (likelihood) of the results obtained, the authors employed the well-known Pearson's chi-squared test (χ^2). As commonly known, the distribution of χ^2 statistics does not depend either on the expected value of the chance quantity X or the dispersion σ^2 but depends just on the size of the sample N . Each group had 24 questionnaires. For each group the authors computed the values of the empirical frequency χ^2_{emp} , the critical values $\chi^2_{0.05}$ and $\chi^2_{0.01}$ and tested the null hypothesis H_0 .

Table 2. Student Preferences in the Choice of College and Educational Program depending on the Possibility of Playing Basketball

Question: Were you planning to continue to play basketball after finishing high school (a vocational training program)?						
Answer	Russian students, %			Chinese students, %		
	SPSU	UFU	Mean	HIT	ZU	Mean
No	-	8	4	16	-	7
Yes	67	59	63	33	47	41
In choosing a college, I factored in its team's ranking	8	-	4	8	53	33
In choosing a college, I factored in the possibility of playing basketball there	25	33	29	42	-	19
H_j^i	$H_1^{0.01}$ $\chi^2 emp = 22.08; \chi^2 0.01 = 9.21$			$H_0,$ $\chi^2 emp = 5.01; \chi^2 0.05 = 7.81$		
Question: Were you planning to enter a foreign university whose basketball team has a high ranking?						
Answer	Russian students, %			Chinese students, %		
	SPSU	UFU	Mean	HIT	ZU	Mean
No	67	82	75	75	100	89
Yes	25	18	21	25	-	11
Undecided	8	-	4	-	-	-
H_j^i	$H_1^{0.01},$ $\chi^2 emp = 19.00; \chi^2 0.01 = 9.21$			$H_1^{0.01}$ $\chi^2 emp = 32.25; \chi^2 0.01 = 9.21$		

Note. Acronyms in Tables 2-5: SPSU – Saint Petersburg State University, UFU – Ural Federal University named after the First President of Russia B.N. Yeltsin, HIT – Harbin Institute of Technology and ZU – Zhejiang University.

Designations in Tables 2 and 4: H_j – null hypothesis ($j = 0$, difference between the distributions is not statistically significant, H_0 ; $j = 1$, difference between the distributions is statistically significant, H_1); $\chi^2 emp$ – empirical frequency, $\chi^2 0.05$ – critical value of the theoretical frequency, significance level $P = 0.05$; $\chi^2 0.01$ – critical value of the theoretical frequency, significance level $P = 0.01$.

The survey revealed a difference in the preferences of Russian and Chinese students in terms of the choice of educational program (Table 3). Russian student picked Physical Education and Sports in 50 % of cases. At the same time, all the members of the basketball team at Zhejiang University are enrolled in the Economics and Management program (baccalaureate-level education). Also, nearly 60 % of members of the team at UFU are graduate students.

Table 3. The Student’s Status at the University (Professional Area of Training, Educational Program, and Mode of Study)

Professional area of training, share of students, %						
	Russian students			Chinese students		
	SPSU	UFU	Mean	HIT	ZU	Mean
Engineering-technical	-	32	17	-	-	-
Humanities	25	-	8	83	-	37
Natural sciences	16	-	8	-	-	-
Physical education and sports	42	60	50	-	-	-
Economics and management	16	8	17	17	100	63
Educational program, share of students, %						
	Russian students			Chinese students		
	SPSU	UFU	Mean	HIT	ZU	Mean
Bachelor’s degree	76	34	50	92	100	96
Specialist's degree	8	8	8	-	-	-
Master’s degree	8	58	38	8	-	4
Postgraduate education	8	-	4	-	-	-

Note. All the Russian and Chinese learners are full-time students.

In terms of planning their future career, Russian students exhibited a greater preparedness to work as executives within the sports industry than students from Chinese universities (Table 4). The variance in opinions was even greater when it came to choosing to work in an international sports organization. Chinese students were found not to be planning to work for one as a manager in nearly 70 % of cases. Virtually even numbers of the respondents (58-59 %) said they were prepared to engage in activity in sports management and within the sports industry.

Table 4. Motivation and Expectations of Russian and Chinese Students Who are on the University Basketball Team

Question: Do you see yourself as working in the future for a sports establishment within the federal, regional, or municipal authorities?						
Possible answer	Russian students			Chinese students		
	SPSU	UFU	Mean	HIT	ZU	Mean
Yes	50	42	48	16	13	15
No	16	8	8	59	47	52
I don't for now	34	50	44	25	40	33
H _j ⁱ	H ₁ ^{0.05} , $\chi^2 emp = 6.75; \chi^2 0.05 = 5.99$			H ₁ ^{0.05} , $\chi^2 emp = 6.25; \chi^2 0.05 = 5.99$		
Question: Do you see yourself as working in the future for an international sports organization?						
Yes	58	58	58	25	20	22
No	8	8	8	67	67	67
I don't for now	33	33	33	8	13	11
H _j ⁱ	H ₁ ^{0.05} , $\chi^2 emp = 9.00; \chi^2 0.05 = 5.99$			H ₁ ^{0.01} , $\chi^2 emp = 12.25; \chi^2 0.01 = 9.21$		
Question: Do you see yourself as working and enjoying career growth in sports and the sports industry?						
No	-	-	-	16	27	22
Yes	33	75	58	42	73	59

It is possible	46	16	34	-	-	-
Undecided	16	8	8	42	19	19
H _j ⁱ	H ₁ ^{0.05} , $\chi^2 emp = 7.75; \chi^2 0.05 = 5.99$			H ₁ ^{0.01} , $\chi^2 emp = 9.25; \chi^2 0.01 = 9.21$		
Question: Are you interested in continuing your education via a particular educational program (e.g., International Sports Management)?						
Yes	33	25	29	50	60	56
No	25	16	20	50	27	37
Undecided	42	59	51	-	13	7
H _j ⁱ	H ₀ , $\chi^2 emp = 2.25; \chi^2 0.05 = 9.21$			H ₁ ^{0.01} , $\chi^2 emp = 19.75; \chi^2 0.01 = 9.21$		

From a perspective of the export of educational services, of the greatest interest are the preferences of Chinese students pursuing a Bachelor’s degree. For instance, nearly 50 % of Chinese students are interested in continuing their studies via International Sports Management, a Russian Master's-level graduate academic program. It was found that colleges in Harbin do not offer this particular program at the moment. This fact is a precondition for viewing this academic program as a potential export as part of the SCOU (Table 4). There are plans to soon put in place a joint Master's-level graduate academic program of this kind (at the RUDN (Russia) and the HIT (China)).

The fact that there is optimism regarding the export of educational services is evidenced by Table 5. Around 60 % of Chinese students are planning to carry on their studies, after having completed their Bachelor’s degree, at a Eurasian college. With Zhejiang University, this figure is 80 %.

Table 5. Student Answers to the Survey Question ‘Are You Planning to Carry on Your Studies at a Eurasian University?’

Answer	Russian students			Chinese students		
	SPSU	UFU	Mean	HIT	ZU	Mean
Yes. I’d like to improve my language command	8	25	17	-	20	12
Yes. I’d like to pursue a Master's degree overseas after I have completed my Bachelor’s degree	8	16	12	-	30	18
Yes. The current trend of education internationalization is perfectly facilitative of getting an education overseas	-	-	-	50	30	37
Yes. It would be exciting to carry on my studies at a foreign university which has a highly-ranked basketball team	25	8	17	-	-	-
No	58	50	54	50	20	33

The results from the authors’ assessment of the null hypothesis based on Pearson's chi-squared test (Table 2 and Table 4) are quite satisfactory and confirm the advisability of taking the approach adopted by the authors. Out of 12 assessments of the null hypothesis only two confirmed the absence of a statistically significant difference between the samples (H₀). For the overwhelmingly most part (83 %), the difference between the distributions is statistically significant, with it being greater than 0.01 (H₁) in 50 % of cases. Activity related to the conduct of questionnaire-based surveys of Russian and Chinese colleges will continue and the size of the samples N will increase, which will make it possible to generate more sustainable statistical assessments.

The authors are hopeful that their assessments of the significance level P confirm the advisability of proceeding along this chosen path for research into the “portrait” of the potential consumer of Russian exported educational services. They hope that research conducted based on colleges within the SCO University will be continued and that its geographic scope will be expanded.

4. Discussion

The internationalization of education and development of the market for educational services are among the key components in the global educational process today. While having a number of strengths and benefits, education internationalization also comes with drawbacks and side effects which may affect the development of the market for educational services. Based on the views expressed by a number of Russian and foreign researchers (Kholina, et. al., 2016; Finn, 2017; Joint Statement; Krechetnikov, Pestereva, 2017; Li, 2018; Sun, 2017; Wu, Zha, 2018 and etc.), these shortcomings, in summary, include the following:

- taking a commercial approach is reflected in the expansion of the practices of establishing offshore campuses, admitting students directly to paid academic programs, and implementing franchising programs, which may lead to poorer quality of education;
- certain countries lacking a legislation that would clearly define the rights, powers, and obligations of foreign students and instructors, as well as many of the concessions and restrictions existing in this area and in the area of employment for foreign student and graduates;
- internationalization may be fraught with stiffening competition in the global educational market, as developed nations have firmly in place a neoliberal model of the academic market for labor, where competitive relationships are a priority;
- the focus being shifted from academic results to secondary indicators like the number of students leaving overseas, the number of foreign students paying for their education, or the number of courses taught in a foreign language, etc.;
- a low level of tolerance on the part of certain students and instructors toward representatives of other nations, peoples, and cultures; what oftentimes gets ignored is the fact that internationalization is not so much about interaction between countries but interaction between cultures;
- an excessive focus on the utilitarian and economic aspects of education – as opposed to its social value;
- insufficient understanding of the importance of taking meticulous account of the local context and cultural characteristics when getting involved with global cross-border processes that are part of education internationalization.

A key objective for the development of internationalization is to boost the quality of education and research activity. It could be possible to boost the efficiency of Russian exported educational services via the following measures (based on the example of Chinese students attending the SCOU):

- developing a cutting-edge advertising strategy for attracting Chinese students (not only via state-funded programs);
- galvanizing activity in the “secondary” market for additional exported educational services for students who are attending a Russian university already;
- developing a strategy for attracting Chinese students attending not only a SCOU college in China;
- developing a strategy for attracting Chinese students attending a university in China run by a different nation (e.g., an American, British, French, German, Canadian, or Italian university).

5. Conclusion

As evidenced by research conducted by Russian and foreign scholars, the Russian market for the export of educational services has high educational and research potential and could be quite competitive in the Eurasian educational space. Some of the key priorities at the current stage of the development of the Russian market for the export of educational services include: conducting in-depth research into the matter and putting together a “portrait” of the potential “buyer of Russian educational programs”, segmenting the consumer market, developing innovative knowledge

transfer technology, and developing strategies and mechanisms for boosting the market's competitiveness at the national and regional levels. The authors suggest it may be possible to develop a concept on and a model for boosting the competitiveness of the Russian market for the export of educational services using many of the key findings and recommendations generated through this particular research study. A pilot project of this kind could be implemented and tested in the setting of the Shanghai Cooperation Organisation Network University.

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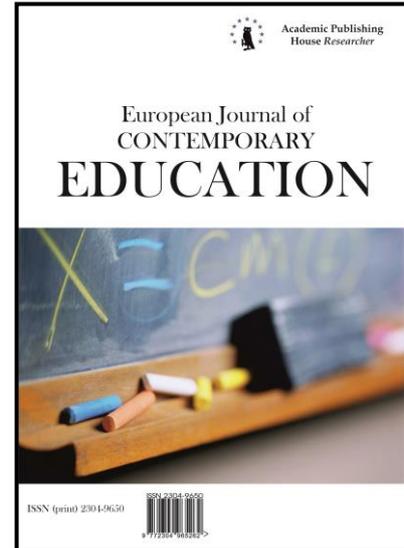
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Assessment of Student Creativity in Teaching Physics in a Foreign Language

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Abstract

Multilingual skills tend to be an integral part of modern society because a specialist able to speak, read and write in multi-languages is able to meet competition. Given that all the latest discoveries and achievements in the field of natural science have been published in English, in accordance with the theme of our study, Physics teaching in English becomes one of the topical issues. However, experience has proven that a few students realize the importance of language integrated learning (LIL) that was confirmed by statistical data from questionnaire made among students of specialties 5B060400 and 5B011000-Physics, the Faculty of Natural Sciences, the Akhmet Yassawi International Kazakh-Turkish University. Realizing the value of gained knowledge is directly related to the motivation and result of learning process. It is assumed that the solution to this problem lies in the competitive organization of language integrated learning in teaching namely in appropriate choice of teaching methods. This is valuable in the context of modern practice-oriented understanding of learning. These technologies include the ICT and case study method which help to change the students' meaning of how the foreign language important from the point of view of their proficiency that was confirmed by statistical data. Some methodological aspects of the use of ICT and case-study in language integrated teaching as well as mechanisms of interdisciplinary coordination and cooperation between English teachers and Physics teachers that both contributed to the ICT and case-study integration in language integrated teaching as well as it is valuable for further research in this area. The staff of the Chair of Physics at the Akhmet Yassawi International Kazakh-Turkish University creates close ties worldwide and conducts extensive work in this direction. The theoretical and experimental studies that were carried out convincingly prove the need introduce into the educational process an innovative

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methods in the educational process as a case study and ICT for the formation of creativity of University students.

Keywords: Physics teaching, content language integrated learning, educational forms and techniques, case-study method, digital technologies, creativity of students.

1. Introduction

The revision of specialists' training system by the world's leading pedagogical universities resulted in new comprehensive specialties (Lorenzo et al., 2010), as well as system of supplementary education in the field of professional communication (Herppich et al., 2017), that was expected from the humanitarization of physical and natural science education and also reflects the need of society for specialists who are ready to work in the foreign language medium (Rezida et al., 2014).

The second language-integrated education of future Physics teachers and teaching of foreign Physics students in English in the world's universities are different methodological directions for any Physics teachers: both phenomena consider Physics teaching in a second language; however, one problem is the same: development Physics manuals in English as a second language (Roberto et al., 2017).

At the moment, the greatest attention of those who studies language integrated learning (LIL) is paid to the stage of pre-university training of foreign students in the world: the features of teaching approaches in other content subjects are considered (Singh et al., 2017). However, professionally oriented LIL and language-integrated competence of students in the universities (Ruiz de Zarob, 2008) were not also overlooked. Despite the lack of information concerning application of the language integrated method in Physics teaching there is the phenomenon like Physics teaching in a second language which is obviously considered as a single methodological issue.

While studying foreign literature, it should be noted that CLIL can be used as the latest technology for the development of subject-language competence. At a time when the importance of the topic of our study is of particular importance for the country, there is a noticeable lack of research in this area. The lack of research in the field of development of subject-language competence in the teaching of natural subjects, in particular, physics, unformed systematization of teaching didactics, lack of advanced technologies, textbooks and effective methods create difficulties for the development of this direction. The only way to overcome these difficulties is to combine IT-based management of education with Physics teaching in English.

The studies of Prather et al., 2011 and Klein, 2014 can be considered when talking about students' teaching in Physics through the digital technologies.

Despite this, second language integrated teaching of future educators and school Physics teachers through the digital technologies has been formed not as a unite system, but is still considered as an individual proposal.

Nevertheless, above studies are about the use of information and communication technologies in teaching of high students, but unfortunately, a fundamental scientific solution to the problem of implementing the development of subject-language competence of students in the conditions of IT-based management of education has not been found yet. There is a contradiction between the need to use digital technologies for the development of subject-language competence of students, the need for new technologies, methodological and computer software for its implementation and the lack of research in educational system based on the development of subject-language competence of students through the use of digital technologies.

The search for solution to this contradiction is mainly featured our research, that is, the development of subject-language competence in the process of Physics teaching in the way of IT-based management of education.

When a foreign language is used to teach certain subjects in this case there is one direction with the use of an intermediary language in which the language of teaching is a foreign language not only for student but also for a teacher. In our country and abroad, English is most often used as the intermediary language.

The second language integrated teaching is widely used in national and international high schools and according to studies conducted (Emadi, 2013) this is because of attraction of such English-based training programs from commercial point of view as well as personnel promotion, growth of the university competitiveness at an educational market, bring PhD expertise abroad etc.

According to the research carried out by the European Academic Cooperation Association, the European universities are encouraged to develop English-based training programs because of attracting both foreign and local students (providing the national labor market with highly qualified personnel with international experience) (Yemelyanova, 2014).

The second language integrated teaching of local and foreign students is seen to be insensitive by researchers but the interest in this matter has recently increased significantly. At the same time, according to S. Al-Shukri, M. Vakhitov and N. Filippova, second language integrated learning at national universities increases the level of requirements for foreign students because there is no language barrier between a student and a teacher; it develops internal competition and strengthens learning motivation as well as attracts teachers with fluent English (Al-Shukri, 2014). In such circumstances, learning of future teachers in the specialty Physics and English is seen as training of world-class specialists (Roehl, 2013).

Let's take a closer look at the approaches used both in training foreign students in a second language in our country and in training our students to make them able to work in a second language medium. It should be noted that an important feature of the CLIL is a simultaneous learning of the subject and language of instruction, i.e. the implementation of educational activities in conditions of imperfect knowledge of the language of instruction. The quality of training of foreign students in our country is directly dependent on the theoretical study of this issue, which is not reduced to the methodology of learning a foreign language, or to the methodology of teaching certain disciplines in pure form. In our opinion, the methodology of Physics teaching in second language should be considered as a complex of tasks and should integrate the methodology of Physics teaching with certain aspects of the methodology of English teaching (Usembayeva, 2015).

The problem of training Bachelors of Education in Natural Science in universities is seen to be relevant with a focus, on the one hand, to improve the scientific and methodological training of future Physics teachers, on the other hand, aimed at the widespread use of digital technologies in teaching, management of the educational process.

It is necessary to start fundamental research in order to make future Physics teachers ready for the use of digital technologies. An integral model of Physics teacher with additional specialization in computer science, based on an accurate forecast of trends in the development of the education system in general and computer science in particular, is a global problem, and its relevance is obvious.

We took into account another important fact that in the current socio-economic conditions of the development of society one of the urgent tasks of training is the development of personal qualities of future teachers, the development of their creative thinking, creative potential and value orientations (Leonard, Swap, 2010). Thus, D. Leonard and W. Swap characterize creativity as "a process of developing and expressing novel ideas that are likely to be useful", "a goaloriented process", on the one hand, and as a process which "involves convergent as well as divergent thinking", on the other. In their opinion, the convergent thinking is characteristic of the initial stage of the creative process.

Another definition of creativity is worth to be mentioned: "Creativity is a multidimensional ability that is influenced by various factors of specific social environments such as culture or language" (Gelade, 2002). The idea of connection of creativity with cross-cultural differences is of interest for researchers all over the world. Thus, Lee H, Kim K. investigated relationships between bilingualism and adaptive creative style, innovative creative style, and creative strengths among Korean American students. The results demonstrated that the degree of bilingualism was positively associated with creativity, creative style and creative strengths (Lee, Kim, 2014).

There exist points of view referring to the development of creativity in every learner. (Johnson, 2015) The explanation is that "creativity is no longer a "nice extra" in education". In his work D. Johnson presents his theory of multiple creative abilities. He dwells on strategies for assessing creativity, considers that everyone should become personally more creative every day.

A number of articles and books reveal creativity in teaching disciplines, and, namely physics, including high school physics (MacDowell, Michael, 2014; Sternberg et al., 2015; Jones, Richards, 2015; Carlile, Jordan, 2013).

It must be emphasized that the physics as an academic discipline has great potential in the formation of creativity. Firstly, this is due to the variety of physical disciplines (general, mechanical, molecular physics, electromagnetism, optics, quantum physics, etc.), different

methods and techniques which are used in studying them and provide wide opportunities to both teachers and students. Secondly, there are various forms of organization of educational activities in the study of physical disciplines that help to develop creativity.

We believe that the use of new methods as a case study in Physics teaching, in particular, in language-integrated Physics teaching is promising for solving these problems. It is needed to join interactive educational methods as case study with digital technologies while language-integrated Physics teaching. Their use in today educational system is stipulated by several factors. First, thanks to social and economic achievements, many universities have computers. The number and quality of ready-made software products in Physics help to realize various learning technologies. Secondly, computer modeling allows to obtain dynamic visual illustration not only actually observed physical processes and phenomena but those are unobservable in a real experiment and also allows for more flexibility in computational physical experiments and solving different experimental tasks in English. The computer along with update support equipment is used to realize various studied processes at a high level.

In his efforts the U.S. researcher Becker examines features of digital technologies in Physics learning. Mr. Becker proposes to change the way of use of digital technologies in Physics learning to meet actual requirements. Only then it will be possible to improve the quality of students' knowledge in Physics (Becker, 2001).

C. Angell, A. Guttersrud, E. Henriksen and A. Isnes in their efforts pay attention on the approaches in Physics teaching via digital technology. Their main concept is that Physics is very interesting although complicated science and teacher with students should improve the methodology of Physics teaching in accordance with modern requirements, to introduce information technology in the process of timely learning (Angell et al., 2004).

As well as some foreign scientists such as P. Klein, S. Greber, G. Kuehn and A. Mueller proposed to increase the interest of students by animated analysis of physical phenomena, using i-pad or a computer as a means of experiment. A. Rudolf, S. Leimin, E. Prazer based on the specifics of digital technologies in Physics teaching showed the importance of case study method in explaining of physical phenomena (Prather et al., 2011).

The thesis *Use of information and communication technologies in the development of creative potential of future Physics teachers at the university* written by A. D. Amiraliev considers development of creative potential of future Physics teachers using ICT and case study at the universities (Amiraliev, 2003).

In the case-study the key element is undoubtedly the case which also has a number of characteristic features that are important for this study. Based on the analysis of scientific papers which explain the meaning of "case" (Fischer, Casey, 2008), its characteristic features in the context of foreign language learning were identified and generalized: the case, consisting of authentic texts, has a communicative, dynamic, practical nature, since it involves the definition, discussion and joint search for solutions to urgent problems related to professional activities, and also has an interdisciplinary nature, since it is an information complex, which includes a range of related conditions from economic to socio-political ones. It is important to note that to solve the case it is necessary to take into account the full range of related conditions, to take into account relationship between presented areas of knowledge to obtain a complete picture and make the most correct decision. However, it should be emphasized that the case-study method is a tool to integrate related subject in second language medium and makes it possible to organize the process of the CLIL taking into account specifics of future professional activity by focusing on the formation of key skills of future specialist and also enables the student to see the diversity of interdisciplinary connections, because it is complex.

However, the use of ICT and cases is insufficiently covered in the development of creativeness of Physics teachers in the CLIL process.

The relevance and urgent need for practice in improving educational process to make future teacher ready for creative professional activity led to the choice of the line of our study.

2. Materials and methods

The following methods were used while study implementing:

- analysis of methodological, philosophical, psychological, pedagogical and methodical literature
- by means of various questionnaire, tests and reviews to elicit to what extent English is in-demand in schools of Turkestan region and find out the level of English proficiency
- review of advanced language acquisition technologies; consultations with scholars abroad
- analysis of case-study method in Physics teaching in English as second language
- review of IT education, elements of robotics and electronic digital resources
- selection of 3D and 4D computer programs needed to create digital resources
- creation of methods to build subject-language competence of future educators and school Physics teachers, and
- implement field activities, develop tests, using mathematical and statistical methods.

Experimental work was carried out at the International Kazakh-Turkish University and South Kazakhstan state University. The nearly 73 students were engaged in an experiment presented below in chronological order. 36 students at target (TG) and 37 students at experimental group (EG).

As part of the experiment, it was necessary not only to ensure the implementation of laboratory work in English and/or reports on the results of laboratory work in English by creating a foreign-language didactic environment and the development of foreign-language subject communication in the experimental group by the introduction of special teaching methods, but also to compare the results of training with a target group.

During the study, the diagnosis of the main qualities was carried out creativity: the ability to analyze and synthesize; fluency, flexibility and originality of thinking; the ability to develop a detailed hypothesis; the ability to detect and pose problems. Research methods: summary of estimated test the Buzın-Wunderlich; tests of creativity Torrance, E. P., adapted in the context of physics; the questionnaire creativity of Johnson (adapting E.E. Tunick). Distribution of students by levels of development of qualities of creativity was carried out by formulas 1 and 2.

$$\text{Low score limit: } m - \frac{2}{3} \sigma \tag{1}$$

$$\text{High score limit: } m + \frac{2}{3} \sigma \tag{2}$$

where: m – arithmetic mean, σ – standard deviation.

The reliability of the results obtained at the beginning and at the end of the experiment for each quality of creativity, as well as for the integral indicator is provided by the *Pearson's* chi-square test and *Student's t-test*.

To compare the distribution of students by levels of creativity in the control and experimental groups, the following hypotheses were formulated: H_0 – there are no significant differences in the levels of creativity; H_1 – there are significant differences (the results are shown in [Tables 5](#) and [6](#)).

The Akhmet Yassawi International Kazakh-Turkish University has created computer models of various physical processes and phenomena on the basis of *Optics in English* training course and has developed a method of their application. They have also elaborated an elective training course on the application of computer models and demonstration of various physical processes and phenomena *Application of computer models and demonstration in Optics*. The teachers' team has set up a curriculum on Optics course. It covers 135 hours per one semester totally including 90 hours of class work, that is divided into 15 hours of lectures, 15 hours of practice, and 15 hours of laboratory works as well as 45 hours take students' individual work. At the end of the semester student should take an exam. The teachers' staff has also outlined syllabus for Physics training course on credit transfer educational system, introduced it in the educational plan and placed on the website of the University (www.ayu.edu.kz).

This training course can be used by students studying Physics, Information technologies, Mathematics, Information systems, Automation and control. The authors note that this manual can be used by the teachers at the institutes, colleges, schools, gymnasiums and lyceums who teach in classes with in-depth study of Physics.

Students need to pass an exam at the end of the training course on Optics and they must to explain theoretical questions and solve a physical problem in English, and one of the criteria for successful completion of the exam is to show their speaking skills in English in the field of Physics.

Since English opens the way to the formation of creativity, we have evaluated the effectiveness of the methodology we have developed, through the evaluation of creativity.

3. Results

To successfully apply digital technology in language integrated Physics teaching it is required to clearly understand basic principles and techniques that contribute to the strengthening of future teachers' intellectual capabilities.

The structure and content of future teachers' professional training are undergoing significant changes today. Social order of training in modern professional school is focused on the development of thinking, creative inclinations of students, and their involvement in independent search activity, familiarization with the methods of scientific knowledge, formation of the ability to apply knowledge in new conditions. One of the ways to implement this direction is to organize students' productive and creative activity which, in turn, is a condition for the formation of their professionalism.

The problem of our research can be formulated as follows: what are the pedagogical possibilities of ICT and case-study method in the development of future teachers' creativity and appropriate educational conditions for their use in future teachers' training. Our research is aimed to find the solution of this problem. Below we offer didactic conditions for improving language integrated Physics teaching (Table 1).

Table 1. Didactic conditions for Physics teaching in English

Prerequisites for the development of teaching physics in english	
1	2
Prerequisites	Results
To give theoretical underpinning of content and language (English) competence development of future teachers and school physics teachers by means of new information technologies use	Results of specified tasks solutions differ in a clear idea of theoretical bases of new information technologies use in content and language competence development. To set up didactic system content and language competence development of future teachers and school physics teacher; As a research result of the specified task the system of advanced technologies of physics in English development will be created and introduced in educational process.
Definition of General Physics study course content by means of information technologies	According to the didactic system created during solution of this task electronic textbooks and manuals will be published and introduced in schools and higher education institutions. Also the maintenance of the organization and holding facultative occupations at school will be defined.
The organization of upgrade training course for regional schools physics teachers	Physics teachers at the schools of Turkestan city department of education will complete upgrade training course, based on the best foreign practices, and will examine the maintenance of facultative lessons.
Start of the portal (website) "Physics education in English" in public and republican level;	Creation of electronic educational resources (electronic textbooks and multimedia programs, demonstration and virtual computer models), release of the manuals based on the advanced foreign methods and definition of use methods in the course of physics education.
Ensuring introduction of electronic educational resources and manuals at the rate of the general physics in republican schools educational process. Carrying out skilled and experimental works, creation of tests, use of mathematical and statistical methods	

Thus, below we consider the method of using these didactic conditions in any form of training.

At the university a lecture keeps on using to introduce new educational material, there is a problem of using digital technologies to improve the efficiency of lectures. According to D. Matros, D. Polev, N. Melnikova, N. Sokolova and A. Skripkin, lectures-presentations are one of the main opportunities for digital tools to be used in an educational process and the main idea behind of this is in applying computer technologies for visual presentation of the most important information on slides (texts, formulas, drawings, tables, graphic materials, etc.) (Moldabekova, 2013).

We have created an e-textbook on Optics, which provides for the use of an interactive mode for tutoring, performing training tasks, creative exercises and checking the level of students' subject knowledge in English. In this tutorial we have developed computer models of optical phenomena in the form of animation, such as wave properties of light – interference, diffraction, polarization, and corpuscular properties of light – photoelectric effect, Compton Effect. Below are some of these models (Figure 1).

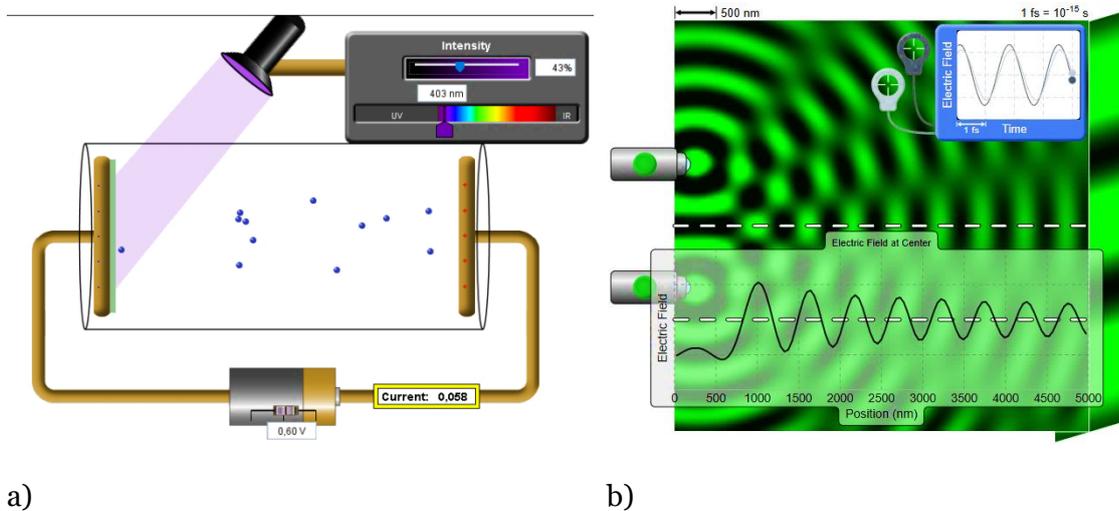


Fig. 1. Computational models in Optics. (a– photoeffect, b – interference)

During the workshops we try to apply creative tasks that make students think critically and use additional literature. To increase students' creativity and individual work we have developed a workbook in Optics with creative tasks. The workbook includes different cases, puzzles, experiment-based tasks and various tests. Herewith are some examples from our workbook:

a) CASE #1

Maksat and Raushan decided to make a resistor for Physics. Maksat took a copper wire and Raushan took an iron wire.

– That's not a good idea to use an iron wire, a conductor is better to make from a copper wire, it is more valuable, – Maksat said.

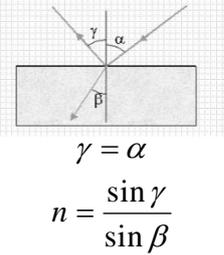
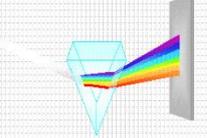
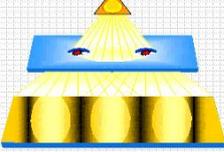
– I think the copper wire is hardly suitable because the resistance will be very low, – Raushan said.

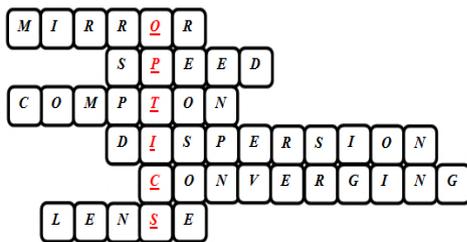
- Well, it depends on what wire is to take! – Maksat chuckled. – Mine's better.

Questions to the case

1. Who of friends is right?
2. What characteristics should have the wire to make a resistor?
3. How to calculate the resistance of a resistor made of simple wire?
4. How to check if you are right?

Table 2. Example on Optics for students

Property	Example	Wave s	Particl es	Notes
Reflection, Refraction	 $\gamma = \alpha$ $n = \frac{\sin \gamma}{\sin \beta}$	+	+	Both particles and waves obey the law of reflection Particles and waves both refract. $\left. \begin{array}{l} \text{waves} \\ \text{light} \end{array} \right\} n_{2,1} = \frac{g_1}{g_2}$ Particles
Dispersion		+	-	Waves naturally do this, particles do not
Interference		+	-	Waves naturally do this, particles do not



A certain light wave has a frequency of 4.29×10^{14} Hz. What is the wavelength of this wave in empty space? In water?

SOLUTION

1. _____ are made from highly reflective metal that is applied to a curved or flat piece of glass.
2. When light is refracted its wavelength and _____ change
3. In 1922, Arthur _____ directed X-rays of known wavelength at a graphite target.
4. _____ - Newton proposed that different colors of light were actually different sized particles.
5. Lenses that focus light are called _____ lenses
6. _____ can be used to make visual representations, called images.

Fig. 2. Crossword from a students' workbook in Optics

Every teacher from the Department of Physics is also able to use full interactive Open physics course which includes more than 80 virtual laboratory complexes, video recordings of experiments with voice explanations. They provide options for changes in a wide range of initial parameters and conditions of experiments, varying their time scale, as well as modeling situations that are not available in real experiments.

Below is a fragment from a virtual laboratory work "Identifying the radius of curvature of the lens using Newton's ring" (Figure 2).

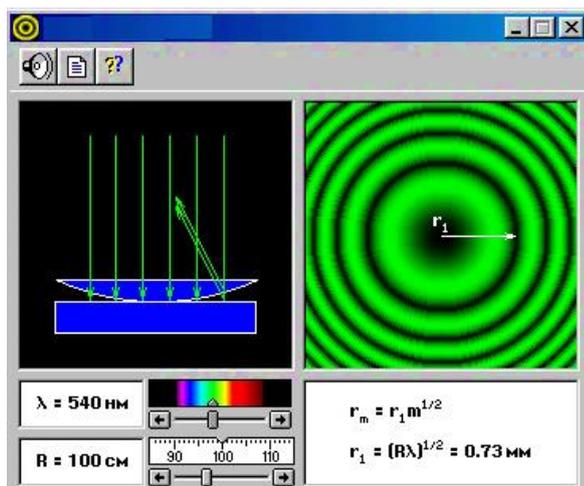


Fig. 3. A fragment from virtual laboratory work

Experimental verification of the effectiveness of educational and methodical complex in second language-integrated Physics learning is quite a difficult task, because usually such an experiment is to compare a new textbook with existing ones.

Since English opens the way to the formation of creativity, we have evaluated the effectiveness of the methodology we have developed, through the evaluation of creativity.

Monitor of the level of students' creativity involves the use of special techniques. There are a lot of scientific approaches to the problem of creativity research (J. Gilford, E. Torrance, D.L. Johnson and E. Tunick).

For our experiment, the most appropriate method is the method of creativity monitoring, proposed by E. P. Torrance, which is currently recognized as the most reliable and valid in comparison with other methods and is used for different age groups (Torrance, 2004).

The [Table 3](#) below lists some criteria of creativity:

Table 3. General formation structure of future Physics teachers' creativity

Components	Criteria and indicators	Levels
Fluency Thinking	<ul style="list-style-type: none"> - quickly perform creative tasks - able to solve tasks fast - able to quickly recognize the new - able to act promptly - able to create several thoughts corresponding to the tasks; resourceful thoughts 	Low Average High
Flexible Thinking	<ul style="list-style-type: none"> - tend to practice - be flexible to new problems - tend to solve the problem - be loyal to discussions - think beyond the borders of the task - be able to find more than one solutions - be able to give more than one right answers to new problem 	Low Average High
Original Thinking	<ul style="list-style-type: none"> - have some original thoughts while implementing the task - be able to do the task by themselves - able to be sensible - offer original solution - use some individual elements in solution of new problem 	Low Average High

Fluency, flexibility and originality of thinking were monitored by E. Torrance technique where verbal Physics-adopted subtests were used. The scores students had obtained passed through the quantitative and qualitative analysis. Table 4 shows changes in distribution of the level of creativity among students in target (TG) and experimental groups (EG) at the beginning and at the end.

Table 4. Comparison of the creativity level among future Physics teachers before and after experiment

Index of creativity	Level	Before experiment (the number of students)		After experiment (the number of students)	
		TG	EG	TG	EG
Fluency Thinking	High	6	7	5	12
	Average	18	14	21	20
	Low	13	15	11	4
Flexible Thinking	High	10	10	5	14
	Average	14	9	21	12
	Low	13	17	11	10
Original Thinking	High	6	3	4	11
	Average	-	-	11	13
	Low	31	33	22	12

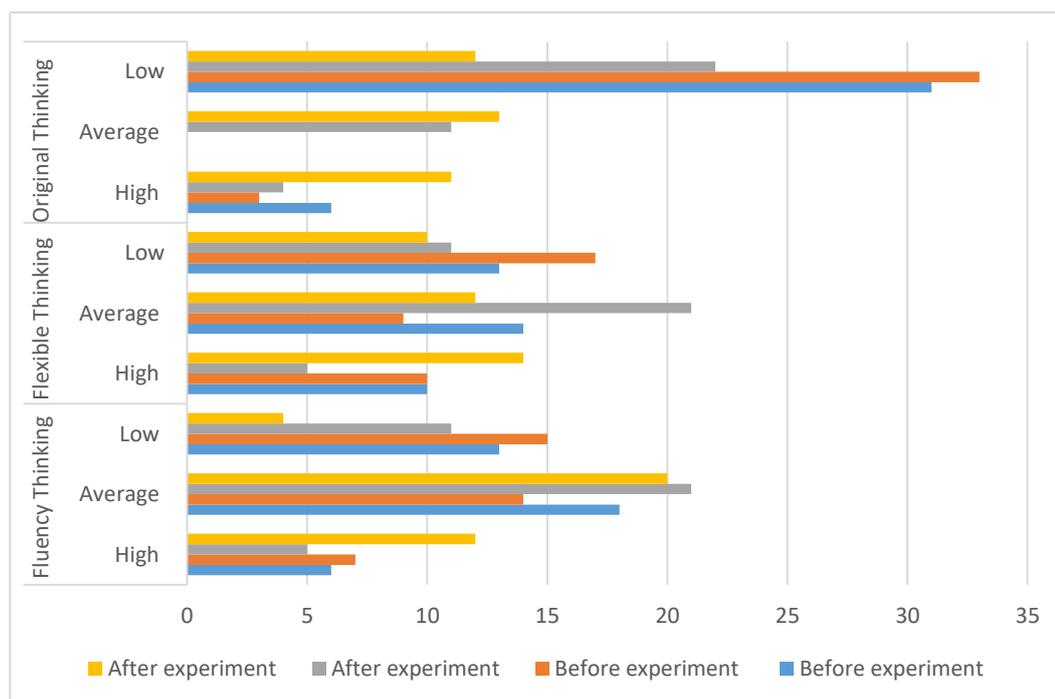


Fig. 4. Dynamics of students' creativity

Comparative indicators on creative properties of future Physics teachers before and after the experiment:

According to the data shown in Table 4, it can be noted that creativity is being developed uneven. In particular, 55 % of students in experimental groups have an average level of thinking fluency. In relation to the originality of thinking at the beginning of the experiment, students showed low and high levels of development, i.e. in the course of the experiment the students either did not exercised originality of thinking at all, or gave one answer, which could be considered as original. In general, experimental group has demonstrated higher level of creativity.

Thus, it can be seen that e-teaching aids and virtual laboratory complexes created in the process of our study improve the quality of knowledge and professional training, contribute to the formation of creative thinking of future Physicists by combining theory and practice.

4. Discussion

The reliability of results obtained at the beginning and at the end of forming stage for each criteria of creativity, as well as for the integral indicator is provided by Pearson criterion χ^2 and Student's t-test. To compare the distribution of students by levels of creativity in target and experimental groups the following hypotheses were formulated: H_0 – no significant differences in the levels of creativity; H_1 – there are significant differences.

Table 5 shows the values of Pearson test $\chi^2_{\text{экен}}$ on tested qualities on a quasi-professional level of physics teaching at the beginning and at the end of forming stage. According to the table of critical values for originality of thinking % $\chi^2 = 3,841$ ($g=2, v = 1$), in other cases $\chi^2 = 5,991$ ($g = 3, v = 2$).

Table 5. Values $\chi^2_{\text{экен}}$ at the beginning and at the end of forming stage

Creative qualities	Before experiment	After experiment
Fluency Thinking	0,706	6,160
Flexible Thinking	1,606	6,753
Original Thinking	1,049	6,362

At the beginning of the experiment it is seen that $\chi^2_{\text{exp}} < \chi^2_{\text{tg}}$ that means there are no differences between the development level of students' creativity from both experimental and target groups (hypothesis H_0). At the end of the experiment $\chi^2_{\text{exp}} > \chi^2_{\text{tg}}$, that means there are significant differences in the development level of students' creativity (hypothesis H_1).

Values of t-criteria t_{exp} and t_{tg} at the beginning and at the end of the experiment are shown in Table 6.

Table 6. values of t-criteria t_{exp} and t_{tg} at the beginning and at the end of the experiment

Creative qualities	t_{exp}		t_{tg}	
	Before experiment	After experiment	Before experiment	After experiment
Fluency Thinking	0,070	3,127	2,007	1,994
Flexible Thinking	1,184	2,020	1,995	1,995
Original Thinking	0,213	2,389	1,999	1,996

According to the data from the table it is seen at the beginning of the experiment $\chi^2_{\text{exp}} < \chi^2_{\text{tg}}$, and at the end of the experiment $\chi^2_{\text{exp}} > \chi^2_{\text{tg}}$. In that way, in regard to development of fluency, flexibility and originality of the thinking the hypothesis H_0 is reasonable at the beginning and H_1 is just at the end of the experiment.

5. Conclusion

The experiment shows positive dynamics in students' understanding to what extent each several skills in English are important and open up new horizons to them. This confirms that the interdisciplinary approach to second-language indicated Physics teaching is not unidirectional: it is of interest not only in terms of the synergy of foreign language teaching and special subjects. Students able to present the results of the study can participate in international conferences and work with authentic scientific and technical literature gives students a range of opportunities for

research activities at the international level, etc. Implementation of an interdisciplinary approach involves the development of strategic prospects both for the Faculty of Foreign Languages and the Faculty of Physics. The given interaction mechanisms can be successfully extrapolated to other areas of technical profile. The relevance of digital technologies and case study in the CLIL of Physics teaching was justified from theoretical and statistical point of view. The use of digital technologies and case-study helps to implement interdisciplinary and practical orientation of educational system today. The results received are valuable for further research in order to identify organizational features of second-language integrated learning of other technical subjects and build prospects for inter-faculty cooperation.

Research results make it possible to create and implement didactic system of second-language indicated teaching of natural subjects, namely Physics:

- transform educational system into a new model of economic growth through the technologies of accelerated second-language integrated learning of some subjects
- narrow the gaps between education in urban and rural schools by means of IT technologies; widen opportunities to improve human resources through fast English learning
- rise the quality of life by increasing of qualified English teachers
- develop high-tech product based on innovative technologies in educational process.

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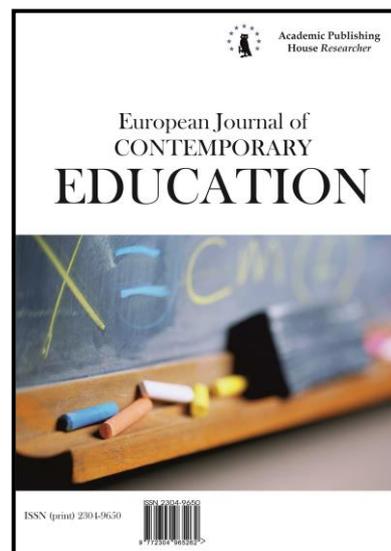
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Wearable Activity Trackers Usage among University Students

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Abstract

In spite of the fact that physical activity is inevitable in sustaining health, there are more people in the world who do not take it into account than who do. A growing number of young adults have been using wearable activity trackers, particularly step counts, to keep an eye on their health in the past few years. In an online survey university students were interviewed as a focus group. All members were current wearable activity trackers. Data was analyzed with SPSS 22 version. Beside descriptive statistics we applied Pearson's Chi square test (χ^2) and independent samples test, as well. We considered the results of statistical tests significant in case of $p < 0.05$. The wearable devices that participants used were wristbands (65.1%, $n=95$) and smartwatches (34.9 %, $n=51$). Their number one purpose was to measure step counts (93.2%, $n=136$) and sleep patterns (63.7 %, $n=93$) with the devices. The highest number of people answered to the question of what is the main purpose of using these devices that they monitored daily physical activity with it (56.2 % $n=82$). The majority of the conveners do regular sports and in general exercise on 3.84 days for 30 minutes (Mode=3.0, Median=4.0, SD=1.78). Only 3.4 % of the ($n=19$) are not engaged in any sort of physical exercise. A significant discrepancy could be observed in the number of days spent doing sports between wearable activity tracker users and non-users in favour of users (users: Mean=4.26 SD=1.83; non user: Mean=3.69 SD=1.74; $t=3.279$, $p < 0.01$). 70.6 % of smart watch wearers claimed that using the device took positive effects on their physical activity and only 29.4 % stated that their habits were not altered by the trackers. 42.1 % of those wearing wristband trackers increased their physical activity as a result of wearing the gadget, whereas 57.9 % of them were not affected in their physical activity ($\chi^2=10.839$, $df=2$, $p < 0.05$). The publication is supported by the EFOP-3.6.1-16-2016-00022 project. The project is co-financed by the European Union and the European Social Fund.

Keywords: wearable activity trackers, physical activity, university students, smartwatch, wristband.

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1. Introduction

Sedentary behaviour and the lack of moderate or vigorous physical activity can lead to the development of several non-contagious illnesses, such as coronary disease, type 2 diabetes, various mental disorders and certain types of cancer. In addition to this, a number of studies have proved that physical inactivity increase the risk of mortality, which is regarded the fourth most important risk factor nowadays (WHO, 2017; Haskell et al., 2007; Morris et al., 1953; Knowler et al., 2002; IARC, 2002; Chau et al., 2013, Bendíková, 2016a, b).

In spite of the fact that regular moderate intensity activities (adults: 150 minutes/week) are proved to act beneficially and protectively against chronic illnesses, the great majority of the adult population does not suit the guidelines of physical activity (Owen et al., Biswas et al., 2015; 2010; Warburton et al., 2007; Lee et al., 2003; Colley et al., 2011; Hallal et al., 2012). At the same time, several epidemiological examinations have shown that a higher percentage of time spent with sedentary behaviour – not applying to all kinds of sedentary behaviour – may have a negative effect on a lot of health results, independent from whether the individual carries out (moderate or vigorous physical activity) (Katzmarzyk, 2010; Katzmarzyk et al., 2009; Dunstan et al., 2010; Bendíková, Dobay, 2017).

These are the reasons why promoting the physically active way of life and altering the majority's present attitudes has a huge importance these days (Apor, 2012). Sadly, a high rate of the young population is typical of the sedentary behaviour, first and foremost the target group of university students, who spend most of their time sitting while studying whenever they are at lectures, use the computer, watch TV or travel.

Measuring physical activity is only possible with reliable and valid methods. Among these we can choose from self-report questionnaires, indirect calimetry, direct observation, heart rate monitors, or sensors measuring various movements. Quite a few gauges measuring physical activity are available, but oftentimes procuring them clashes with financial or technical obstacles. As a result of these obstacles, IPAQ – International Physical Activity Questionnaire based on self-report has become widely agreed. With the help of this method the observation of the measures and quality of physical activity has become fully implementable and easily accessible (Ács et al., 2018).

The subjective judgement of physical activity based on self-report as opposed to objective measurements tends to be unreliable as people often wrongly under- or overestimate the extent of their activity. The study of O'Neill et al. (2013) emphasized the accountability of the objective measures, where it was established that both gyroscopes and pedometers count the number of steps in a day properly. Gyroscopes show a more precise picture of the intensity of physical activity, while the results of IPAQ questionnaires might not show the reality as far as physical activity is concerned. For instance, it can happen that activities that are part of our everyday life, such as walking from the carpark to our workplace or to the shops, playtime with our children, are not seen as part of our daily physical activity, although they are organic part of it. In self-report questionnaires people usually concentrate on the actual sports activities, like jogging or workout at the gym. Objective measurements allow the record of all activity, even that is left out of the self-report method as explained above (Falck et al., 2015; McCormack et al., 2004).

Thanks to the extraordinary and dynamic development of innovative information technology, so-called wearable technological devices have appeared recently. The most wide-spread and well-known forms of wearable devices mean smartwatches and fitness trackers from the category of everyday tools. These tools usually apply an accelerator sensor, by the help of which they are able to determine physical activity and by means of smart phones or computer applications present it to the user (O'Brien et al., 2015). Activity monitoring devices most often have a built-in step count in them, but they can also measure other components of physical activity such as the intensity of the activity (for example a certain degree of intensity/day), estimated energy consumption (burnt calories), covered distances and also the number of floors climbed up and down stairs. A number of devices are able to take one's pulse or point out one's exact location by a GPS, but it is also possible to measure the quality of sleep (the period of sleep, wakefulness, quiet and active sleep periods) in devices of physical activity (El-Amrawy, Nounou, 2015). Early studies focused especially on the accuracy of these meters in respect of physical activity factors. Based on their findings it can be concluded that – while under- and overestimations occur in various examination and technological environments – the devices measure the number of steps most accurately and are less reliable in

terms of other components such as pulse or burnt calories (An et al., 2017; Chen et al., 2016; Evenson et al., 2015; Fokkema et al., 2017; Huang et al., 2016).

In spite of the fact that studies doubt whether using wearable technology, particularly activity trackers improve health conditions (Finkelstein et al. 2016; Jakicic et al., 2016), the grounds for tools monitoring physical activity have been justified in several fields. Different overview studies and meta-analyses have confirmed that sedentary behaviour with adults can be influenced by using activity trackers (Stephenson et al., 2017; Prince et al., 2014; Martin et al., 2017). Another research has proved that the use of pedometers correlates closely to the increase of physical activity and the decrease of body mass index (BMI) as well as blood pressure (Pal et al, 2009). Physical activity monitors can encourage their users to do more action by providing individuals with data about their performance, the possibility to focus on a number of aims and to get feedbacks, instructions and rewards (Bravata et al., 2007; Mercer et al., 2016; Lyons et al., 2014). The continuous and real-time feedbacks allow experts to work out widely manifestable low-cost intervention programs in order to roll back sedentary behavior (Macridis et al., 2018).

In general these investigations concentrate on short periods of time (usually a week) and they also do not touch upon the usability of mobile applications and the properties and attitudes connected to wearing activity meters and their functions. Finding out the experiences of users can provide workers of health care, researchers or suppliers with useful information.

Taking this deficiency into account the present study intends to survey the findings of people using wearable activity trackers about the device and its use. Almost half of tracker owners are under the age of 35: 42 % are 18 to 34 years old, 19 % are 35 to 44 years old, 16 % are 45 to 54 years old, 16 % are 55 to 64 years old, and 7 % are 65 and older (Khalaf, 2014) therefore they are the target group of the examination.

2. Methodology

Overview. This present study has gathered data and surveyed experiences on wearable activity trackers among university students. For detailed understanding of the issue, a questionnaire survey and a focus group discussion was performed. Both examinations were completely anonymous. The principles of the Declaration of Helsinki and the new GDPR served as a basis for the experiment that all participants understood and thus gave their consent to.

Participants. Only people aged between 18 and 34 who wear some sort of technological device at present were examined in the questionnaire survey. Participants were selected from among the population of the university in general education courses. We searched an answer among non-wearers for what the cause of their decision was, namely not wearing the device and whether they were planning to gain one in the future. After interviewing 400 people we ceased to gather data by questionnaires. For in-depth interviews potential participants were approached and verbally recruited by authors. Until a desired number of test subjects were found, experts used snowball sampling and gathered the additional participants. In the focus-group interview the target group became young people aged between 18 and 34 currently using wearable activity trackers.

Measurement.

a) Questionnaire. Beyond observing demographical data, the questionnaire was to explore the use, motivation for and effect on physical activity of wearable activity trackers as well as the technical parameters of using the device. During the survey CAWI (Computer-Assisted Web Interviewing) method was applied. The recruitment was carried out partly at university courses and partly on e-learning interface, where we placed the link directing to the questionnaire.

b) Interview. The focus group was specifically aimed to gather information that is to say to gain recognition in order to complement questionnaire surveys. In the paper we employed semi-structured focus group interviews so as to gain more comprehensible details on observations and insights to wearable devices in connection with the following topics: advantages and disadvantages of the wearing and functionality of the devices and also their effect on physical activity.

The group interview was carried out with the participation of ten young people on the basis of focus group interview format where they were required to answer questions in a conversational setting. It took an hour and throughout the interview questions were presented in a semi-structured questionnaire format used in a flexible fashion according to the flow of the process. The whole event was audio-recorded and later transcribed into a text file accordingly. Recruiting

the focus group took place partly with the help of the organizers from their own study groups and partly in online form through the e-learning interface of the University of Debrecen.

Analysis. Data was analysed with SPSS 22 version. Beside descriptive statistics (SD, Mode, Median), we applied Pearson's Chi square test (χ^2) and Student's t-test as well. We considered the results of statistical tests significant in case of $p < 0.05$, $p < 0.01$.

3. Results and Discussion

Demographical properties. A total of 589 people filled in the questionnaire, 28 out of who were excluded afterwards because of faulty completion, another 6 people were over 34 years of age, so eventually as many as 555 people were taken into account in our sample. At present 146 people use such a device and the number of non-users is 409. Properties of the participants are presented in [Table 1](#).

Table 1. Demographic characteristics of participants

Factors/n	User	Non user
Gender	n=146	n=409
Male	63 (43.2 %)	188 (46.0 %)
Female	83 (56.8 %)	221 (54.0 %)
Age (average,18-34 years)	20.55	21.96
Education		
High school diploma	139 (95.2 %)	371 (90.7 %)
BSc degree	6 (4.1 %)	37 (9.0 %)
MSc degree	1 (0.7 %)	1 (0.3 %)
Settlement type		
Village	21 (14.4 %)	71 (17.4 %)
City with right of county	59 (40.4 %)	197 (48.2 %)
City	64 (43.8 %)	139 (34.0 %)
Capital	2 (1.4 %)	2 (0.5 %)

The average age of participants was 21.59 years (SD=2.64), 45.2 % (n=251) of them were female and 54.8 % (n=304) were male. A great majority of the attendants live in a town or a city and their highest degree of education is secondary. The latter one is certainly the conclusion of the studied sample.

The kind of technology used. The most commonly used wearable devices were wristbands (65.1 %, n=95) and smartwatches (34.9 %, n=51). Each of the participants used one certain type and apart from the two above mentioned gadgets they did not use any others. In the market of wearable devices these two stood out in terms of sales volumes in 2017.

How long they have been used. Smartwatch users entered the market before fitness tracker users appeared. 51 % of them started wearing these watches over a year ago, 43 % of them in the past year and 26 % in the last 6 months. 25 % of fitness tracker wearers have been using the device for more than a year, 41 % for up to a year and 34 % of them for a maximum of 6 months. This can be explained by the fact that higher price category smart watches appeared in the market earlier, while lower price, relatively reliable performance second- and third generation fitness trackers only popped up in the past two years. On the other hand, the change in customer trends also give reasons for the discrepancy.

Ways of acquisition. Regarding the ways of acquisition, most typically people give smart watches to others as presents: 71 % of watch wearers got the device as a present and only 29 % of

them bought it for themselves. As opposed to that, it is the other way around in the case of fitness trackers: nearly 50 % bought the item for themselves.

Table 2. Wearable technology usage among participants

Factors/n	Smartwatch	Wristband
Gender	n=51	n=95
Male	23 (45.1 %)	40 (42.1 %)
Female	28 (54.9 %)	55 (57.9 %)
Age (average,18-34 years)	20.63	20.52
How did you get the device?		
Purchase	36 (70.6 %)	48 (50.5 %)
Gift	15 (29.4 %)	47 (49.5 %)
How long have you been using the device?		
< 6 month	3 (5.9 %)	32 (33.7 %)
6-12 month	22 (43.1 %)	39 (41.1 %)
>12 month	26 (51.0 %)	24 (25.2 %)

Exercising, physical activity. As far as doing exercise is concerned, it can be stated that a significant majority of the participants do regular sports (65.6 %, n=364); only 34.4 % (n=191) claimed not doing any physical activity at all. Most of the people doing regular sports do recreational level sports (78 % n=284), while the percentage of competitive level sportlers is 22 % (n=80). Among users and non-users of the device there was a remarkable difference as for doing sports ($\chi^2=7.224$, $df=1$, $p < 0.01$).

150 minutes of moderate-intensity aerobic activity every week is recommended by the Physical Activity Guidelines for Americans to improve health. Therefore we asked them how many days they have a week, when they pursue a minimum of 30 minutes of moderate-intensity exercise. The answerers do it on 3.84 days on average (Mode=3.0, Median=4.0, SD=1.78). Only 3.4 % (n=19) of the interviewees do not get engaged in any exercise at all.

A notable difference could be found between wearable tracker users and non-users in the number of days they spend doing exercise ($t=3.279$, $p < 0.01$). Non users spend an average of 3.69 days a week (SD=1.83) doing exercise while wearable tracker users spend 4.26 days a week (SD=1.74).

Participants were asked whether the use of the device had any effects on their previous physical activity. A surprising percentage of 47.9 % believed that it did not change their physical activity and a little over half of the participants (52.1 %) said that it did to various extents. In respect of the wearers of the two devices, a large difference could be spotted in the change of physical activity. 70.6 % of smart watch wearers claimed that wearing the tracker had a positive effect on their physical activity and only 29.4 % said that it did not influence their physical activity. In case of the fitness trackers 42.1 % were positive about the effects and 57.9 % remained neutral about them ($\chi^2=10.839$, $df=2$, $p < 0.05$)

Table 3. Physical activity among participants

Factors/n	User	Non user
Regular sport	n=146	n=409
Yes, recreational level	84 (57.6 %)	200 (48.9 %)
Yes, competitive level	25 (17.1 %)	55 (13.4 %)
No	37 (25.3 %)	154 (37.7 %)
Perceived physical activity (minimum 30 minutes moderate physical activity) / week	Average: 3.84 day; Mode: 3.0; Median:4.0	
	4.26 days/week	3.69 days/week

What is the reason for wearing it? We found it crucial to investigate what was the participants' main purpose for using a wearable activity tracker? More than half of the interviewees (56.2 %, n=82) use the device in order to get a more precise image of their daily physical activity. Almost every fourth person (24 %, n=35) admitted that they wear such appliances because they like to follow information technology trends and enjoy trying new gadgets.

Table 4. Main purpose for using wearable activity trackers

Purposes	Users (n=146)
Monitor my daily physical activity	82 (56.2 %)
I would like to live healthier	11 (7.5 %)
I like the gadgets / I like to keep up with IT trends	35 (24.0 %)
I would like to harden more	5 (3.4 %)
I would like to look better	8 (5.5 %)
Other	5 (3.4 %)

How often is it used? More than half of the people (50.7 %, n=74) wear the device constantly, and 37.7 % (n=55) take it off from time to time, but wear it mostly. Only 11.6 % (n=16) wore the trackers with a varying intensity or rarely.

What users measure and observe? In this section, we present respondents' experience of using a wearable activity tracker, especially what kind of features they use them for. The most commonly used function is a pedometer (86.3 %, n=126), 63.7 % use the sleep watch function and more than half of the respondents (56.2 %, n=82) take their pulse with the help of the device. Only 5.5 % track their weight change with it.

Table 5. Monitored features

Features	Users (n=146)
Step counts	136 (93.2%)
Sleep pattern	93 (63.7%)
Heart rate	82 (56.2%)
Weight	8 (5.5%)
Blood pressure	5 (3.4%)
Burned calories	47 (32.2%)
Distance	66 (45.2%)

We also asked participants how often they examined their daily activity data. 76 % (n=111) of the people said they checked their data minimum once a day. 45.9 % (n=67) of them did so several times, 13.7 % (n=20) watched their data less than 2 or 3 times a week and 10.3 % (n=11) checked theirs even less frequently.

We asked users about whether they set any goals in any features. 77.4 % (n=113) of them set daily goals, which were usually the amount of steps (total n= 113; 86.7 %, n=98) and sleep (14.2 %, n=26).

Detecting problems. Apart from positive experiences, participants reported disadvantages, as well. Most of them did not encounter any problems while wearing the device (41.8 %, n=61). The most frequently occurring problem was low battery power (28.8 %), inaccurately measured data (20.5 %), synchronization problems with smartphone/tablet (15.1 %) and technical issues (14.4 %).

Non-users. We were curious to find out the reasons for not owning a wearable activity tracker device. Most people (50.4 %) named the price of the devices as a main factor. Every fifth respondent reported that the everyday use of the device would disturb them. 17.8 % were not interested in the item and 16.1 % had not used one because they found it imprecise. Only 26.7 % were planning to buy some sort of a wearable activity tracker in the near future, while most of them (73.3 %) still did not think that they would need such a device.

The results of the deep interview. Based on the interviews we distinguished 3 major themes: usage (advantages/limits), monitored features and impact on physical activity. 10 people took part in the deep interview, 5 men and 5 women and their average age was 21.8. Several advantages and disadvantages were mentioned by users in connection with the wearing of the devices. Quite a few users pointed out that wearing the device did not disturb them, moreover it was much more practical than measuring data by a telephone. More than one person stated that the outlook of these devices are trendy, have nice designs and suit most outfits.

„I can wear the fitness tracker day and night, I do not need to hold another device such as my phone that would count my steps, in my hands.” [P1]

„The device is small, its size does not disturb me, and it is not conspicuous. Its color suits every outfit, it is not bright, but simple, black.” [P1]

„It is easy to wear, has a youthful design, is trendy and never blocks me in doing anything.” [P5]

„Its layout is youthful, modern. It can be worn even with a suit, but it also matches sportswear.” [P6]

The fact that certain devices are non-waterproof and cannot be used in case of certain sports (swimming) and while washing was named as a univocal disadvantage among users. Others mentioned that wristband trackers disturbed users in doing sports and could even cause a skin reaction such as a rash. Some respondents claimed that the device did not match all of their outfits.

„It is not waterproof and I need to take it off when having a shower and I find it uncomfortable. I have to watch out that the device does not contact with water when I wash my hands.” [P1]

„When I was doing exercise or even sleeping the meter fell out of the rubber part of the tracker.” [P2]

„When I did workout at the gym I had to take off the device, because it obstructed me, but other than that, I did not experience any setbacks while wearing it.” [P3]

„It disturbs and annoys me sometimes on my wrist.” [P4]

„It does not match all of my outfits.” [P7]

One of the respondents emphasized that wearing a rubber band can lead to health problems on the long run.

„Rubber covers may cause skin cancer, and it is uncomfortable daily that my skin sweats under the device more than otherwise.” [P1]

Most respondents were interested in step counts, but data on sleep won great recognition, too, as people had not come across this function before.

„I followed the pedometer especially.” [P8]

„I was really curious about my sleep results, the quality of my sleep every night.” [P1]

„Apart from the step data that I closely follow, I am keen to check the data on my sleep not because I want to improve it, just because I find it interesting.” [P2]

„I would first highlight sleep analysis as I have not met this application before and find it very useful.” [P5]

There were users whom sleep watch function remained a dead square for, because wearing the device was not comfortable for them.

„I did not use the sleep watch function, because I did not like to have it on while sleeping.” [P10]

Most users spoke positively about the accuracy of data, but some participants expressed frustration that the tracker registered the moves of the hands, therefore showed inaccurate data.”

„I checked the pedometer mostly, at the same time it did not measure my step precisely, because it counted my arm movement as well.” P8]

Another user mentioned the problem of pulse measurement during load.

„The device is not suitable for collecting data during load: it can either not take pulse during running or shows an unrealistically low value. In other normal circumstances it is perfectly reliable.” [P6]

Users observed the data daily, but some of them did it far more regularly.

„I follow my daily physical activity on it 7 or 8 times a day.” [P6]

Wearable activity trackers provide insight into participants' physical activity, and all of them found this feedback very useful.

„I have knowledge about how many steps I take and what my sleep is like.” [P4]

„I can track down my physical activity, if my organism receives the sleep and physical activity amount that it needs for proper functioning.” [P8]

Users estimated the effects of the wearable activity trackers on their lives differently. Some of them stressed that the use of wearable activity trackers increased physical activity. When they started wearing them, data supplied by step counts acted as a trigger to spend more time with physical activity, however this enthusiasm faded with time.

„In the first few days it was very exciting to see how many steps I take a day, how much I sleep. When the first month went by, my enthusiasm was far less intensive. I worked on fulfilling my goal that I set up for every day, though.” [P1]

„I was absolutely motivated by the numbers the gadget showed me, therefore I took it as a race and unconsciously I started doing more and more exercise. After I realized it, it became conscious. It affected the daily distance/step counts.” [P2]

„I feel motivated if I can see my results. In the beginning it expressly encouraged me to do exercise and to run a healthy way of life, but after 5 months it subsided. Still, my physical activity is much more intensive than when it was before wearing the tracker. I live reaching my daily goals and having a good quality of sleep as a positive experience.” [P7]

A user had a guilty conscience when they could not reach their target for the day.

„It gave me some pricks of conscience to see that I was not really active on the weekends.” [P1]

In some cases users did not change their habits of physical activity as a result of wearing the device.

„I reckon my activity has not changed to a great extent neither positively nor negatively since wearing the tracker. I would say that following the control of my activity has been an interesting new thing for me.” [P3]

„Wearing the tracker did not cause me to do more exercise, since I had been doing regular sports beforehand, too.” [P9]

There have been relatively few surveys that examine the use of wearable devices by college students. The study investigated attitudes towards wearable technology among university students. Our research employed both quantitative and qualitative data analysis methodology in order to make a more in-depth analysis of user experience.

A common statement of the studies related to this theme was that wearable activity trackers were used to self-monitor physical activity and if users set goals, they enhance physical activity levels (Ridgers et al., 2018). Similar findings were observed in this study: most respondents wear the device in order to follow their physical activity and three quarters of them set some sort of aims for the day with the gadget.

In general we can conclude that most of the interviewees do regular sports, primarily on a recreational level. Among tracker users the number of those who do sports is remarkably higher than among non-users. This difference in favor of users was also noticeable when they were asked about how many days they have on a regular week when they do exercise of moderate intensity for at least 30 minutes.

When examining the effects of the device on physical activity we found that almost half of our respondents did not change their physical activity from starting wearing the tracker on. And among users, mostly smart watches had an effect on physical activity. We suppose its explanation could be that device users were most typically those who did regular sports. This supposition was supported by deep interviews. The primary purpose of using the device was to track down physical activity.

Also, it can be concluded that every fourth participant wears such a device because they are keen on following information technological trends or are interested in gadgets.

The use of wearable technology has been spreading more and more widely among customers recently with the most well-known and wide-spread form of smart watches and activity trackers in the category of everyday devices. Similar findings were observed in this study, namely that among university students the most commonly used gadgets were wristbands and smart watches.

As a general rule, the constant wearing of the device is influenced by aesthetic and comfort aspects in the age group of our respondents (Ridgers et al., 2016).

Congruent to the findings of Ridgers et al. (2018), there was contrasting data in relation to comfort and wearability: some university students pointed out that they found it comfortable and fashionable to wear (6 mentions) while others claimed that wearing the device restricted their movements in a way (4 mentions). Interestingly every fifth respondent reported that they did not use a tracker because they thought wearing them would be uncomfortable.

We found that fitness tracking devices are primarily used for tracking step counts (93.2 %). Apart from this function the amount of sleep was also checked by respondents and several people highlighted the novelty of this application.

The most commonly mentioned disadvantages of the device were the short lifespan of the battery, the difficulty in synchronization and the inaccurately measured data. These findings are consistent with a previous work, in which (Maher et al., 2017) found that the battery lifespan was the participants' main complaint regarding activity trackers (Schaben, Furness, 2018).

Both types of device motivate users to do more physical activity, thus having a positive effect on health.

The study is limited to a relatively small area, which must be taken into consideration when interpreting the results. One shortcoming of our study is a relatively small sample size of the population. We surveyed only 146 participants, so the generalization of our findings is not as extensive as we wanted it to be. Although the use of wearable activity trackers was more common in the younger age group sample, our findings should be explained with caution and data collected through a self-report survey might not be considered representative either because of the low attendance. Our results should also be interpreted with caution in case of the younger age group sample. With older generations we could have received different answers as far as usage and purpose of wearable activity trackers are concerned. We presume that university students' physical activity levels are probably higher than that to other age groups, therefore our results should not be generalized to all ages of people.

4. Conclusion

Wearable devices carry new possibilities for individuals to improve their health and physical fitness and mean new challenges to researchers and clinicians about this emerging domain. Wearable devices have positive effects on physical activity among university students. To sum it up, this study found that in the given age category wearable devices were used to self-monitor daily physical activity and sleep patterns.

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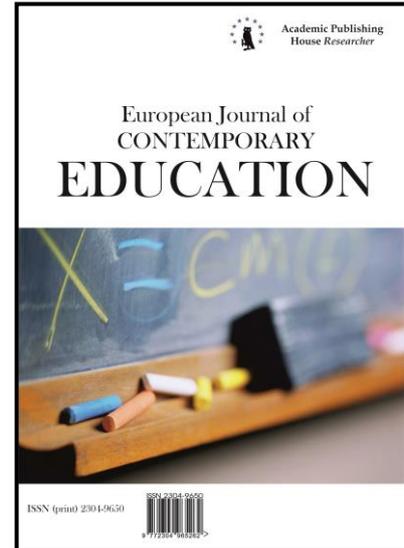
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Quest in a Digital School: the Potential and Peculiarities of Mobile Technology Implementation

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Abstract

The problem of the research is due to the need to realize the didactic and interdisciplinary potential of mobile applications which are able to support the quest technology. Teachers have to understand peculiarities of organizing such a game form of activity in a digital school.

The purpose of the study is to theoretically prove and experimentally test the effectiveness of using mobile game applications in the “quest” genre in order to form necessary competencies of future specialists in a digital school environment.

The research methodology is the analysis and synthesis of psychological and pedagogical work, methods of mathematical statistics, and methods of psychodiagnostics. The pedagogical experiment of the study is the assessment of the formation of basic competences which provide the base in the field of computer science, cybernetics and artificial intelligence required by the state and society.

Results of the study. The study proves the didactic potential of mobile applications which are able to support the quest technology in order to achieve high-priority objectives in the project “Digital School”. The authors describe ideas of the methodical approach, which reflect the necessary changes in the support of students' cognitive activity through mobile game applications in the quest genre. The study shows levels of differentiation of education depending on the individual and age characteristics of students and the choice of digital means. The authors prove that the “quest” technology, focused work to solve education tasks, motivates future professional activities, and also with the help of modern digital means, contributes to the development of such necessary cross-professional competencies of future specialists as project activities, systems thinking, interaction and interindustry communication.

In conclusion, the authors confirm that the inclusion of mobile game applications in the “quest” genre in education activities will help to form key competencies and skills that meet the priorities of the digital school and are most in demand by society.

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Keywords: quest, competencies, digital educational space, teaching methods, mobile applications, challenges of the future.

1. Introduction

1.1. The urgency of the problem

New challenges and requirements to the education system determine the need to develop students' skills of information interaction and experimental activity in the digital world, training in data analysis, programming elements, creating digital projects for the future profession, in technology, digital medicine ([Strategiya razvitiya..., 2013](#)). The implementation of the project "Digital School" will make a number of significant changes in the Russian education system: it will help to update the content of education; teachers will have resources to improve the quality of educational programs; parents will be able to control the learning process of their child. The teacher will be a tutor who helps to develop an individual learning way, who will guide students according to their chosen priorities ([Soboleva et al., 2018](#)).

Thus, the important condition for the training of future professionals is the introduction of advanced forms of education based on digital technologies into the education system. Since one of priorities of the project "Digital School" is "student-centered education", a special information educational environment with this support, according to scientists like (SIE) is currently developed at school. According to M.A. Kholodnaya, E.G. Gelfman ([Kholodnaya, Gelfman, 2016](#)), this environment will change the nature and content of educational activities, reduce the proportion of reproductive activities and enhance research, experiment and creativity ([Kicherova, Efimova, 2016](#)). Despite the difficulties of organizing pedagogical support, practical work on the information object, working in a virtual software environment has considerable potential for developing thinking, communication, developing skills to apply the skills, design and construct ([Papert, 1993](#)).

In this regard, there are works on using the technology of additional reality ([Navarro-Ibarra et al., 2017](#)), gamification ([Tcyplakova, 2016](#)) etc. in the educational process. As an effective learning technology, many researchers single out the game activity in the form of a quest according to requirements of the digital school ([Osyak et al., 2015](#)).

1.2. The purpose and objectives of the study

The purpose of the study is dictated by the need to change support of schoolchildren's cognitive activity due to new priorities of a digital school and possibilities of mobile game applications in the quest genre to form the relevant necessary competencies of specialists of the future.

Objectives of the study are:

- to explore the potential of mobile applications which are able to support the quest technology in order to form necessary competencies of specialists of the future;
- to formulate basic methodological ideas of the approach, which reflect necessary changes in the support of students' cognitive activity with the help of mobile game applications in the quest genre;
- to present levels of differentiation of education depending on the individual characteristics, schoolchildren's age, and the choice of digital means;
- to prove experimentally the effectiveness of the proposed changes aimed to improve the quality of education, taking into account the requirements of a digital school.

2. Relevance

2.1. Review of Russian scientific and pedagogical literature

Due to the state support of the development of digital technologies, programming, mobile applications and game platforms, there is a need to develop new forms and means of education. Numerous studies are trying to clarify such basic concepts as "digital technology", "digital literacy", "mobile application", "mobile device", "educational game", and "gamification of learning". The most significant are works of E.O. Tsiplakova ([Tcyplakova, 2016](#)), E.V. Soboleva, E.G. Galimova, Z.A. Maydangaliev, K.K. Batchayeva ([Soboleva et al., 2018](#)), where the phenomenon of gamification of learning, the didactic potential of game platforms for educational purposes are described.

There is a practical, educational and public need to train specialists with competences in the field of programming and the application of modern digital technologies in order to solve a wide range of professional tasks (Vishnevskaya, Zudina, 2017).

Some studies prove the need to solve problems in the development of innovative didactic technologies, the importance of active use of digital technologies with the possibility of gamification of training (Bonsignore, 2016). In other words, the pedagogical resources of the digital educational environment should make maximum use of the didactic potential of software tools to support the non-linear nature of information presentation, variability and the personality-centered type of cognitive process (Kholodnaya, Gelfman, 2016).

One of such forms of organization both in educational and career-oriented activities is the “quest” technology. A.V. Khutorsky (Khutorskoy, 2017), S.A. Osyak, S.S. Sultanbekova (Osyak et al., 2015), M.N. Kicherova, G.Z. Efimova (Kicherova, Efimova, 2016), M.N. Popova, I.P. Popov (Popova, Popov, 2018) and other researchers study in detail the essence of the quest technology, its didactic capabilities and features of inclusion in the education process for the Russian school.

A. Ponomarev, I. Dezhina underline the need to change the content, organizational forms, methods and means of education in the conditions of the development of a digital school (Dezhina, Ponomarev, 2016). They suggest a model for determining the scientific and technological priorities of Russia, consider possible tools and their use. The authors examine in detail a wide range of service functions and various digital technologies which expand the interaction of participants in the digital educational environment.

Ya.M. Roshchina, S.Yu. Roshchin, V.N. Rudakov (Roshchina et al., 2018), A. Lagunov, N. Podorojnyak (Lagunov, Podorojnyak, 2017), D.A. Alexandrov, V.A. Ivanyushin, D.L. Simanovsky (Aleksandrov et al., 2017), T.A. Shulgina, N.A. Ketova, K.A. Kholodova, D.A. Severinov (Shulgina et al., 2018) and others deal with the development of online courses, descriptions of their features and software support.

At the same time, some new scientific research (Mokretsov, Zaslavskiy, 2018) reflect capabilities of mobile devices and applications in order to improve the educational process.

V.S. Zasedatel, V.A. Serbin have achieved significant results in theory and practice of using mobile technologies, including Russia (Zasedatel', Serbin, 2014). The authors investigate the specifics of pedagogical support for the use of mobile devices in education; identify their importance and didactic functions. Moreover, they describe in detail main advantages and disadvantages of mobile technologies, possibilities to put them into practice (Usol'tsev, Antipova, 2019). Authors also analyze existing mobile solutions, their interface, and technological support feature (Mokretsov, Zaslavskiy, 2018).

The gamification phenomenon is actively used in modern educational environments, allows to expand the range of possibilities of interactive tools and mobile applications for organizing information interaction, and to create conditions for improving the quality of education, aiming to the needs of the student's personality. D.O. Koroleva (Koroleva, 2016), E.O. Tcyplakova (Tcyplakova, 2016), D.A. Aleksandrov, V.A. Ivanushin (Aleksandrov et al., 2017) formulate and substantiate these possibilities in the studies.

However, at the moment, most of the existing mobile tools and applications are included in the cognitive process only at some separate stage of activity on solving a certain system of tasks for educational and career-guidance purposes (Shulgina et al., 2018), or for the development of mental processes: thinking, memory, attention and imagination (Kholodnaya, Gelfman, 2016). According to R.M. Mokretsov, M.M. Zaslavskiy, it does not meet the specifics of the implementation of the quest technology in the education process, priority areas of variation, personality-oriented education. These reasons significantly reduce the didactic potential of mobile applications to support the technology of the educational quest in the conditions of the formation of a digital educational environment (Mokretsov, Zaslavskiy, 2018).

2.2. Review of foreign literature

Some foreign researchers such as B. Dodge (Dodge, 2019), T. March (March, 1998), F. Chen, J. Birova (Chen et al., 2017), V.Hill V., K. B. Knutzen (Hill, Knutzen, 2017), P.-S. Seow, S.-P. Wong (Seow, Wong, 2016) deal with defining the phenomenon of the quest as a technology that has an interactive game character. For example, O. Saritas describes specific computing functions of a

smart device in education. The author notes that smart devices form a new ecosystem, a new paradigm for the intellectual environment (Saritas, 2013).

Many foreign researchers study widely possibilities of using not only traditional digital resources (online courses, electronic textbooks, websites, simulators), but also mobile applications of the game interactive format in order to improve the quality of education. In particular, D. Petko, R. Schmid, L. Müller, M. Hielscher (Petko et al., 2019) experimentally prove that mobile technologies open up new ways to stimulate thinking. J. Záhorec, A. Hašková, M. Munk (Záhorec, 2019) show that the potential of digital tools is not limited to student's motivation, but it also contains resources: for working with multimedia content, for necessary clues in intellectual activities, for the exchange of experience of all participants in the digital educational space.

V. Hill, K. B. Knutzen (Hill, Knutzen, 2017) underline the importance of using mobile applications to form "digital literacy" – a special set of knowledge, skills and abilities. The authors consider obtaining a special system of knowledge and skills, formation of digital literacy through remote interaction in the virtual simulator of the medieval world "The Quest" (project Camelot).

We note the works of M.V. Gruzdev (Gruzdev et al., 2018), M. Janelli (Janelli, 2018) in the field of digital research, confirming the need to coordinate the theory of eLearning, the practice of online learning and priorities of the educational environment.

E.M. Bonsignore (Bonsignore, 2016), Navarro-Ibarra et al., 2017 points out that working with digital environments and intelligent systems provides additional resources for motivating, encouraging students in the design and implementation of applications using specific programming languages. Moreover, foreign authors introduce a term "computational thinking"; its formation is most effective in solving a series of problem tasks (Nissen et al., 2018).

P.-S. Seow, S.-P. Wong (Seow, Wong, 2016), M. Chang (Chang et al., 2019) reflect the capabilities of mobile devices and applications to improve learning.

Summarizing the results of the analysis, we come to the conclusion that authors and developers of interactive mobile applications, able to support the educational quest technology with the potential to form the competencies and most demanded by modern society (Hill, Knutzen, 2017, Chang et al., 2019), do not discuss forms and content of resources with the participants of the digital educational environment (Bonsignore, 2016).

3. Materials and methods

3.1. Theoretical and empirical methods

Theoretical methods of the study are: analysis of psychological, educational, scientific and technical literature to consider the essence of "quest" technology as a form of modern digital educational environment. Analysis of specific developments of subject teachers helped to study functions of mobile applications and interactive gamification software in education.

When studying the practice of incorporating mobile applications and game technologies into training, the authors used praximetric methods in order to describe, characterize, and analyze the methods used, means, forms of organization and control. Moreover, the authors used methods of systematization and generalization of ideas and laws, and principles of didactics in teaching.

Empirical methods (observation, analysis of results of schoolchildren's research projects) is a special group aimed to obtain recent data on the formation of the required competencies and skills in designing mobile educational applications and the use of digital technologies.

For evaluating statistical differences in the levels of skills development demanded in a digital school Pearson's chi-squared test (χ^2) was used.

3.2. The base of the research

The pedagogical experiment evaluated the effectiveness of using mobile gaming applications in the "quest" genre, taking into account requirements of a digital school. 192 high school students in the city of Kirov and the Kirov region took part in the experiment. Thus, the control group had 92 schoolchildren, while the experimental one had 100. The experiment was conducted in specially equipped computer classes, using the same software. Tasks from L.L. Bosova's developments were used in order to assess the input conditions (Bosova et al. 2012). This choice was due to the fact that the tasks presented in the methodical and training materials are based on long-standing experience of teaching, are respected in the scientific community and meet the requirements of the federal educational standard.

3.3. Stages of the research

The research had three stages.

At the first stage, the authors carried out an ascertaining experiment: they investigated the state of urgent didactic problems on including mobile educational games and digital technologies in the educational process. For this purpose, the authors analyzed the scientific literature on the research problem, studied and made a comparative analysis of teaching experience in Russia and other countries in order to identify the necessary changes.

The second stage was devoted to the development of ideas of a methodical approach to using mobile game applications in the quest genre aimed to improve the quality of learning. In addition, the authors analyzed priorities of the project “Digital School” and selected the most demanded competencies ([Nadprofessional'nye navyki](#)).

The third stage of the research covered experiential teaching and the improvement of the basic ideas of the approach in relation to the identified requirements of a digital school and the formation of key cross-professional competencies. Teaching is accompanied by constant monitoring of the results of student research projects, which allows to consistently improve the proposed methodological ideas. Discussion of the research results took place in the form of publications in journals and reports at conferences of various levels.

4. Results

4.1. Clarifying the basic concepts

The authors propose their own approach to reveal the content of a mobile educational application. It is an online application that allows to organize the educational process using portable devices. It may include an electronic journal, a library of electronic educational resources, digital opportunities for collective interaction of all participants in the educational process and other services.

When characterizing the essence of the “quest” technology in terms of mobile design, we keep the standpoint that digital game platforms provide a convenient tool for interaction with a user through application differentiation. A programmed choice of content, depending on the individual, age characteristics, life experience and interests allows mobile applications to fully realize the didactic potential of digital school technologies.

In terms of general didactics, a quest is: solving a problem task with game elements; a technology, which involves finding solutions, solving the mystery; an interactive and gaming method of working with students, which motivates them to study activities; a form of organization of the educational and cognitive process, which contributes to the organization of situations of communication, interaction with participants ([Khutorskoy, 2017](#)).

The quest has the following structure: introduction (script, distribution of roles); preparation of tasks (games, contests, role-playing sketches); algorithm of conducting (bonuses, penalties); results (diplomas, prizes).

For the experiment, we consider that for the successful and effective use of digital platforms in the organization of an educational quest it is necessary to prepare:

- a didactic component: goals and objectives, content, number of participants, motivation, etc;
- software and hardware support: the choice of a digital platform, a technical tool (phone, tablet, laptop), a programming system or a ready-made software solution, interface languages;
- a psychological component (ergonomics, individual age characteristics of participants, emotions, needs and interests);
- methodological support: organizational stage, methodological recommendations for teachers, rules for participants, evaluation principles and prizes;
- game educational space: plot, game space with rules, characters, levels, etc.

However, the greatest difficulty for a teacher who wants to incorporate a mobile educational application into the didactic process is the content of the educational game space.

The components described above determine the changes made to the implementation of the quest technology and broaden teachers' ideas about including such a game form of activity for the educational space of a digital school.

4.2. Mobile game applications in the "quest" genre

The proposed methodological approach is described on the example of "Castle in the forest", an application in the "quest" genre.

The didactic component is implemented through a game of interactive activities to solve a series of educational and cognitive tasks. Tasks are differentiated. Each level has a specific substantive content, a certain specificity of training in a digital school.

Despite the obvious fact that it is difficult to form competencies from the entire system of soft skills, especially considering the preparation for the challenges of the future, it is possible to improve the quality of acquired knowledge. In the future, knowledge that contributes to effective action in non-standard situations will be in need (Hill, Knutzen, 2017). In fact, we are talking about competence, which implies a special type of organization of knowledge and allows to make decisions under conditions of uncertainty. In order to form such competence, it is necessary to determine the expected result after the inclusion of mobile game applications in the quest genre in students' learning and cognitive activity.

It should be noted that the same skill can be in the content of different competencies. We used the following skills as evaluation criteria: system thinking; algorithmization and programming; project management; work in conditions of uncertainty; principles of interaction and interdisciplinary communication (Vishnevskaya, Zudina, 2017).

Teachers choose the program component themselves. It could be Python, Scratch, Java, C++, etc. In our research we used Android Studio. The choice of such a digital resource is due to the following factors: it contributes to the development of tracked skills; has a free version; easy enough to understand when introducing into object-oriented programming; has a preview of the image of the developed project; is one of the most convenient and popular programs for creating Android applications.

In the present study, an emotionally motivating component has a special role in supporting the quest as a game technology for learning. When planning a quest it is necessary to take into account needs of the participants, their professional goals, and individual-style features of working with information. Emotions, a special class of mental processes and states associated with instincts, needs and motives show how to regulate behavior in the theory of gamification of education.

We will describe in detail methodological support for the game educational space "Castle in the Forest" depending on the level of the game.

The main intrigue of the game is that the player must choose the right items to take to the forest, answer the problematic question and understand what the King has encrypted in the message using his favorite domino game. Only after having finished all these tasks, a student will be able to pass through the forest and continue his way. At the beginning of the game the participant enters the forest with a castle. In the castle he enters the corridor and sees three mysterious doors with mysterious names, which briefly tell the traveler about the proposed tasks.

Now we will describe the algorithm of the quest game with rules and recommendations.

1. To get out of the forest, a wanderer needs to go into the castle and pass all the tests – tasks of the King and his assistants. Only then the traveler will receive a map with a way out of the forest.
2. Before entering the last door (the third one), you need to go through the previous two doors.

Rules of the game: the user clicks on the door, gets a task, the correct solution of which is the exit to the castle corridor, where the next door is available. The number of attempts to open the door is unlimited, there is no time deadline. If the wanderer opens all the doors, he leaves the castle and returns to his way, otherwise he remains to serve the King in the castle.

Let us summarize: three levels - three doors (two of them are closed), each door has its own task. To complete the next task, you must complete the previous one (open the door and solve the problem).

The first level (the first door). If you click on it, it opens and you see the task. After solving it, the user goes into the corridor of the castle.

The second level (second door). After returning to the castle's corridor, the second door opens in front of the wanderer (the lock disappears). The traveler enters it and sees the following problem. After solving it, the third door also becomes available.

The third level is similar.

At the end of the game you see a message that the King's unit will help you to get out, you can also take the opportunity to "Restart".

Let us describe the content of levels.

The first level: you should choose what to take to exit the forest. Items for selection are: a torch, fish, backpack, tomato, knife, and syringe. There should be a place for inventory, where selected things are displayed. Then the user confirms his choice, and if it is correct, he sees the message "You have passed the first test!" Then the traveller automatically moves to the corridor of the castle. Otherwise, the message is "You have made a mistake. Try again". Here, the correct answer is a torch and a knife.

Recommendation: the first level should warm-up in order to adapt the user to the game space and understand how to manipulate information objects. As a didactic hint, we note that it is possible to overcome the level by trial and error.

The second level. The wanderer has one match. What should he ignite first to get out of the dark forest? He must choose among a fireplace, torch, kerosene lamp. If the choice is correct, he sees the message "You have passed the first test!" And the traveller automatically moves to the corridor of the castle. Otherwise, the message is "You have made a mistake. Try again". The correct answer is a match.

Recommendation: the level should motivate the user to show ingenuity and work in conditions of uncertainty. The cognitive problem is to choose according to the requirements of the problem.

The third level. The king of the castle Bastian Forest likes to play dominoes. If the wanderer can solve his favorite task, the king's detachment will help him to get out of the forest. The player is offered five dominoes in a row. Next, you need to guess what they mean (first 1-1, second 6-4, third 4-5, fourth 5-2, fifth 2-1). The correct answer is "detachment".

If the answer is correct, the user sees the message "You have solved the riddle of the King, now our unit will help you get out of the forest." Then he sees a map and the message: "You have passed all the tests!"

The third task is the most difficult as you need to show non-standard thinking. At first, everything seems complicated, but then different interpretations of these dominoes appear. The problem is only in choosing the right decryption strategy. Here is the correct logic: the figure below means the number of the letter in the word number above.

Recommendation: to solve a series of tasks, you should remember that the content for each mobile application should be chosen by students on their own, taking into account the specifics of possible professional problems and life experience. This feature should be reflected in the variants of projects for independent research activities.

For example, there are such quest ideas aimed to expand the horizons that do not require special training of programmers. The plot of the game "I want to go on vacation" is simple. You are a student, you have the last three lessons today and then you can go home. You need to complete three tasks. There is a diary and three recorded titles of tasks: "Mathematics", "Geography" and "Vacation".

The first task: "How many months in a year have 28 days?" The correct answer is the number 12, since there are 28 days in all months.

The second task. There is a compass pointing east and the words "West", "North", "South" and "East". In this case, the solution will be, for example, "South", since the arrow points to this word.

The third task: "What comes after December 31?" Possible answers are "December", "January", "New Year" and "New Month". The answer will be "?" in the question task.

Having finished all the tasks, the student receives congratulations and virtually goes home on vacation.

Recommendation: the implementation of this quest in a mobile application is possible on the basis of the libraries of the described game "Castle in the Forest".

4.3. Experimental evaluation

4.3.1. The ascertaining stage of the experiment

At the first stage of the experiment, students had a control task to work with an information model in a software environment in accordance with the skills presented. Thus, it was possible to

collect experimental data on 192 students from various educational institutions (82 respondents in the 2017–2018 school year, 110 of the students in 2018–2019). Since, as a result of the preliminary control test, almost all the students, participants of the pedagogical experiment of three years, had the same initial level of readiness, we can consider them as a general sample of 192 people. Thus, we formed the experimental (100 people) and control (92 people) groups. The experimental group had 70 % of girls and 30 % of boys.

4.3.2. The forming stage of the experiment

Theoretical classes for students were conducted in the same way, but practical work in the computer class was different. Mobile game applications with educational content were included for students from the experimental group. The participants of the control group were involved in independent research activities organized in the traditional way in the form of practical computer work, performing tasks on specific topics and without active use of mobile games for educational purposes.

In order to evaluate the effectiveness of the proposed methodological approach, at the end of the educational process, students were given a test, which involved the implementation of an interdisciplinary project using digital technologies. We formulated a series of educational tasks, involving the use of systems thinking; algorithmization and programming skills; project management; work in conditions of uncertainty; interaction and interdisciplinary communication.

As it was previously noted, actually we evaluated the formation of competence, which implied a special type of organization of knowledge, which allowed to make decisions in conditions of uncertainty. For its evaluation, we formulated the following indicators: how many times students needed teacher's help during the project activity; correct interpretation of messages of the program environment (error messages); successful independent solution of problems (all levels of the quest); the ability to make the right conclusions on the results of passing levels.

To determine the level, we used the criteria "very low", "low", "medium", "high", "very high". For the first indicator, the student's complete independence in the course of research activity indicated a "very high" level. For "high" criterion, it was allowed to ask for help once or twice. If the teacher's help was required 3-5 times in the course of the project, it was the "average" level. The "low" criterion corresponded to 6-7 times of teacher's help. More intensive teacher's support meant "very low" criterion.

During educational and cognitive work on the proposed methodological approach, we paid special attention to the ability to interpret the messages of the program environment (error information). Understanding of all messages and knowledge of how to correct mistakes corresponded to a "very high" level. For the "high" criterion, the student basically understood situations and messages, but did not always know how to correct errors. If in the process of decision he understood some messages, it was the "average" level. The "low" level of the indicator corresponded to the case when the student tried to read, but did not understand the meaning of the messages. The criterion "very low" was determined if the student simply closed messages during the course of work without reading their text.

As for the third indicator, complete success in solving problems independently (all levels of the quest) met the "very high" criterion. For the "high" criterion, we denoted situations when the student completed 3-4 tasks. If he did only two tasks, then it was the "average" level. The "low" level was when a student successfully solved only one problem.

One of the stages of the proposed approach was the ability to draw correct conclusions on the results of passing levels. As for this indicator, fully right formulated conclusions indicated a "very high" level. For the "high" criterion, we denoted situations where the student basically made correct generalizations. If in the process of solving he made insignificant errors in the conclusions, the logic of the conclusions couldn't be traced, then it was the "average" level. The "low" level corresponded to the case when the student made conclusions with fundamental errors. The "very low" level was if the student did not draw any conclusions from the results of the study.

Table 1 shows an analysis of outcomes concerning formation of competence, which involves a special type of organization of knowledge, providing the ability to make decisions in conditions of uncertainty.

Table 1. The results of the experimental evaluation

Level of formation	Number of students			
	Experimental group (100 students)		Control group (92 students)	
	before	after	before	after
Very low	17 (17%)	4 (4%)	16 (17%)	12 (13%)
Low	50 (50%)	45 (45%)	43 (47%)	46 (50%)
Average	25 (25%)	33 (25%)	27(30%)	22 (24%)
High	5 (5%)	10 (10%)	3 (3%)	8 (9%)
Very high	3 (3%)	8 (8%)	3 (3%)	4 (4%)

An “excellent” mark corresponded to levels “high” and “very high”, a “good” one – for the “average”, “satisfactory” – for “low” level. In all other cases, the mark was "unsatisfactory".

The diagram (percentage ratio) in Fig. 1 shows the qualitative change by levels in accordance with the results of an independent research project.

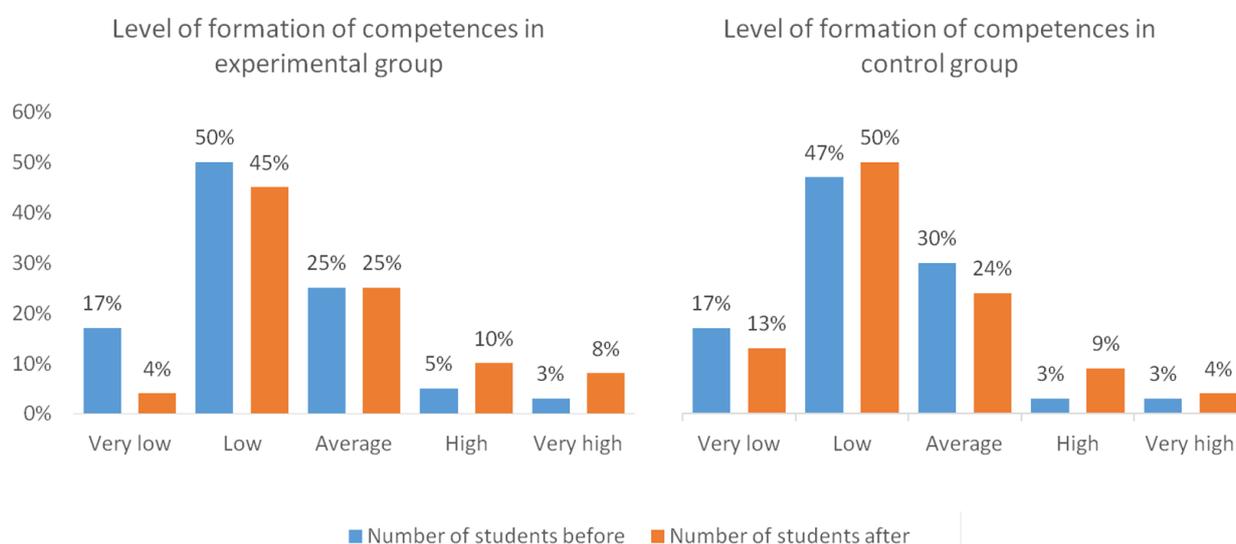


Fig. 1. Results of tests

Table 2 shows the results of the test before the experiment.

Table 2. Results if the test before the experiment

Groups	Marks				
	5	4	3	2	
Experimental group	8	25	50	17	100
Control group	6	27	43	16	92
	14	52	93	33	

Table 3 shows results of the implementation of an interdisciplinary project by means of digital technologies after the experiment.

Table 3. Results of the test after the experiment

Groups	Marks				
	5	4	3	2	
Experimental group	18	33	45	4	100
Control group	12	22	46	12	92
	30	55	91	16	

After a quantitative analysis of the results, we can conclude that 51 % of the students in the experimental group had a high level of skills and abilities (marks 4 and 5) at the end of the experiment, while initially this percentage was 33. It shows a qualitative improvement in the training indicators of the subjects of the experimental group. The level of skills and abilities in the control group also increased, but not so significantly: only 37 % of the students in the control group showed good results (compared to 35 % before the experiment) after the experiment, over 60 % of the subjects remained on average and low level.

4.3.3. The control stage of the experiment

Authors used Pearson's chi-squared test (χ^2) to evaluate statistical differences in the levels of skills development demanded in a digital school in the control and experimental groups before and after the inclusion of mobile game applications in the quest genre in students' research activities.

Let us accept the following hypotheses. Students of the experimental group have a statistically equal level of skills demanded in a digital school to the level of skills of the students of the control group. Hypothesis H1: students of the experimental group have a higher level of skills demanded in a digital school than the level of skills of students in the control group.

Let us calculate the values of the chi-squared statistics before ($\chi^2_{observ. 1}$) and after ($\chi^2_{observ. 2}$) the experiment:

$$\chi^2_{observ.1} = \frac{1}{100 * 92} * \left(\frac{(8 * 100 - 6 * 92)^2}{8 + 6} + \frac{(25 * 100 - 27 * 92)^2}{25 + 27} + \frac{(50 * 100 - 43 * 92)^2}{50 + 43} + \frac{(17 * 100 - 16 * 92)^2}{17 + 16} \right) = 1,92$$

$$\chi^2_{observ.2} = \frac{1}{100 * 92} * \left(\frac{(18 * 100 - 12 * 92)^2}{18 + 12} + \frac{(33 * 100 - 22 * 92)^2}{33 + 22} + \frac{(45 * 100 - 46 * 92)^2}{45 + 46} + \frac{(4 * 100 - 12 * 92)^2}{4 + 12} \right) = 8,43$$

$$\chi^2_{observ.} = 8,43.$$

At the significance level $\alpha = 0,05$ and the number $c = 4$, the number of degrees of freedom is equal:

$$n = c - 1 = 3$$

According to the tables of distribution χ^2 for $n = 3$ and $\alpha = 0.05$ the critical value of statistics is equal:

$$\chi^2_{critic.} = 7.82$$

Therefore, the following inequality is satisfied,

$$\chi^2_{critic.} < \chi^2_{observ.}$$

According to the decision rule, the null hypothesis must be rejected and an alternative hypothesis accepted.

Thus, the experimental assessment confirms the qualitative difference in the level of skills demanded in a digital school, and, accordingly, the development of competence, a special type of organization of knowledge, which allows to make decisions in conditions of uncertainty.

5. Discussion

In general, the pedagogical experiment allows to conclude that the inclusion of mobile applications able to support the quest technology in the educational space expands the interdisciplinary and didactic potential of this game form of activity in the context of digital school priorities.

The research has limitations due to not probabilistic sampling method. In city schools, if one of the classes was in the experimental group, then the second class from the parallel, where the

subject was taught by the same teacher, was in the control group. If a country school had only one class in a parallel, then a class from another school of the same district was in the control group.

Students of the experimental group significantly increased the level of skills in the field of digital technologies, and in the formation of most demanded competencies. The fact that the content for each mobile application was chosen by students on their own, taking into account the requirements of the digital economy is of particular importance for the solution of future professional tasks ([Strategiya razvitiya...](#), 2017). This feature was also reflected in variants of projects for independent research activities. Examples are the project "Sort Garbage", focused on the development of environmental thinking or a project on the use of English verb tenses.

The analysis of students' cognitive activity also allowed to confirm that mobile educational games, due to their interactivity and strengthening of feedback, enhancing information interaction, create additional opportunities to target education to the challenges of future professions. On the other hand, in the course of the experiment, we had to solve didactic and methodological problems: psychological barriers to digital technology, a low level of language training, time and labor costs of both students and teachers.

Thus, materials of the experimental study confirmed the compliance of education results with challenges of the project "Digital School".

6. Conclusion

The research results prove that new challenges and requirements of society, state, and business to the education system demand to form competences in the field of active use of ready-made electronic resources, but also of designing and developing own software solutions.

The quest technology, as a game form of activity, allows organically to use digital school tools along with traditional methods and learning tools. One of the options is mobile game applications with educational content.

Mobile applications able to support the quest technology have interdisciplinary and didactic potential in terms of developing the demanded competencies of specialists of the future: skills in non-standard, creative thinking; decision-making skills in conditions of "uncertainty"; ability to transfer experience from one game space to another; teamwork skills etc.

A significant result of the work is the description of basic ideas of the approach, expanding the ideas of teachers about the features of the organization of this game form of activity in the context of the priorities of a digital school. The changes are presented in the didactic, methodical component.

The didactic component suggests that the quest should be preceded by the elaboration of the game scenario, a reasonable choice of software and hardware support; correlation of the emotional-psychological component with the content of the game educational space. When choosing mobile applications and technologies, the teacher should know the conceptual apparatus and the range of mobile games with educational content, be proficient in the design, development and evaluation of creative forms of activity.

When designing a game space for the implementation of the quest based on digital technology, you should consider: variability of software solutions for the implementation of the plot; individual and age characteristics of the participants of the game, their interests, life experience; requirements of modern school and challenges of the future.

The effectiveness of the proposed approach was confirmed by a pedagogical experiment, during which the result of cognitive activity was assessed according to a set of criteria corresponding to the essence of the competences of the professions of the future and the priorities of the project "Digital School".

The obtained results can be used:

- to expand the methodological system of training teachers in the field of computer science, cybernetics and artificial intelligence as promising sectors of the future;
- to provide individualization of education through specially-organized areas of support for creative, inter-sectoral, and cognitive research activities of students;

A promising direction for improving the proposed methodological approach is to supplement it with aspects related to the design and creation of digital technology tools for a personality-oriented educational environment with gamification elements.

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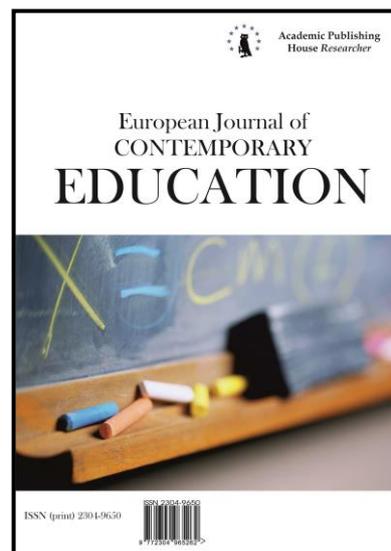
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The History of Education

The Development of the School Education System in Vologda Governorate (1725–1917). Part 3

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Abstract

This paper explores the process of the origination and development of the school education system in Vologda Governorate in the period 1725–1917. This part of the set is focused on the development of the region's public education system in the period 1860–1900.

The authors draw upon a set of works covering prerevolutionary pedagogy, as well as a pool of contemporary Russian scholarly literature.

In conducting the research reported in this paper, the authors employed both general methods of research, including concretization and summarization, and traditional methods of historical analysis. In addition, use was made of the historical-situational method, with a focus on exploring particular historical facts within the context of the given period in conjunction with various “neighboring” events and facts.

The authors conclude by noting that from 1860 to 1900 Vologda Governorate enjoyed a period of dynamic development in its public education sector, which can be illustrated by the following figures: (1) an increase in the number of educational facilities from 154 to 1,046; (2) an improved girls-to-boys ratio (1 to 4 in 1900, as opposed to 1 to 6 in 1860). The region witnessed a major change in its system of secondary education, with almost similar numbers of boys and girls achieved by the 1900s.

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The governorate entered the 20th century with a literate population of a little over 30% (exclusive of children under nine). Given the extensive experience gained in the course of its work on enhancing the system of public education, the governorate's leadership had come to realize that putting an effective system of education in place was possible only provided there was steady and sufficient funding available. And that is testimony that the 1860s experience *had*, actually, been taken into account.

Keywords: public education, gymnasium, specialized school, Vologda Governorate, Russian Empire, teaching staff.

1. Introduction

The first educational institutions in Vologda Governorate were established back in the 14th century. A prominent figure in this respect is Saint Stephen, the Apostle and Enlightener of Perm, who preached Christianity among local pagans (Popov, 1885: 40). In an effort to reinforce Christianity among the people, Saint Stephen went on to establish at the churches a series of specialized schools. He personally provided to children instruction in the Prayer Book and other church books (which had been translated into Zyryan).

However, after Saint Stephen's death writing in Zyryan would exist in the Perm region for only 100 years or so. It would eventually fade into oblivion, mainly due to pastors switching from Zyryan to the Slavic language. School education in the region would be resumed only under Peter the Great. This, third, part of the set is focused on the development of the system of public education in Vologda Governorate in the period from 1860 to 1900.

2. Materials and methods

The authors draw upon a set of works covering prerevolutionary pedagogy, as well as a pool of contemporary Russian scholarly literature.

In conducting the research reported in this paper, the authors employed both general methods of research, including concretization and summarization, and traditional methods of historical analysis. In addition, use was made of the historical-situational method, with a focus on exploring particular historical facts within the context of the given period in conjunction with various "neighboring" events and facts.

3. Discussion

Public education on the territory of Vologda province caused and continues to arouse the interest of specialists in the field of history of pedagogy. Initially, this topic was studied in the context of the history of Orthodoxy, and in particular the activities of St. Stephen of Perm in the XIV century. Researchers like E.A. Popov (Popov, 1885) and N. Otto (Otto, 1866), wrote or mentioned this topic, which was also mentioned in the work "For the History of the Vologda School Directorate" (Dlya istorii, 1860).

During the reign of Peter the Great, Russia began the process of creating educational institutions, namely, "numeric" schools and theological seminaries, which evolved to big and small schools, and later – to gymnasiums and district schools. The topic of public education in Vologda province in pre-revolutionary Russia was paid attention to by such researchers as: N. Bunakov (Bunakov, 1864) and A. Ivanov (Ivanov, 1879). It was also mentioned in the "Historical Review of the Activities of the Ministry of National Education, 1902–1902" (Istoricheski obzor, 1902).

In the modern period, the topic of history of Vologda educational institutions was addressed by such researchers as: N.S. Vorotnikova (Vorotnikova, 2015; Vorotnikova, 2015a; Vorotnikova, 2016), L.N. Kolos (Kolos, 2015), A.A. Cherkasov et al. (Cherkasov, Smigel, 2016; Cherkasov et al., 2019; Cherkasov et al., 2019a). At the same time, the issues of regional education of other central and southern provinces of the Russian Empire are actively studied (Peretyatko, Zulfugarzade, 2017; Peretyatko, Zulfugarzade, 2017a; Kornilova et al., 2016; Natolochnaya et al., 2018; Magsumov et al., 2018; Shevchenko et al., 2016; Shevchenko et al., 2018).

4. Results

The abolition of serfdom had a positive effect on the development of the public education system in the Russian Empire at large and in Vologda Governorate as well. In 1860, the total number of educational institutions in Vologda Governorate was 154. The number of teachers was

300 (278 males and 22 females). The number of students was 6,734 (5,758 boys and 976 girls) (Table 1) (Pamyatnaya knizhka, 1861: 66).

Table 1. Educational Institutions and Total Students in Vologda Governorate as at 1860 (Pamyatnaya knizhka, 1861: 66-67)

Administrative entity	Number of facilities	Number of students	
		Males	Females
1) Ministry of Public Education:			
Governorate Gymnasium	1	136	-
Noble boarding school at the gymnasium	1	51	-
First-rate specialized schools for females in Vologda	1	-	97
District specialized schools (for males and females)	12	505	177
Parochial specialized schools (for males and females)	14	451	245
Free daily school of priest Vasily Retrovsky in Vologda	1	5	22
<i>Total</i>	<i>30</i>	<i>897</i>	<i>382</i>
2) Specialized schools under the Department of State Property			
	56	2,447	348
3) Specialized schools under the Appanage Department:			
Tradesmen's schools	1	21	-
Rural specialized schools	9	274	-
Parochial specialized schools	44	157	202
Private schools	4	26	15
<i>Total</i>	<i>58</i>	<i>478</i>	<i>217</i>
4) Department of Religious Affairs:			
Seminary in Vologda	1	492	-
District specialized schools	6	1,108	-
Church-parochial specialized school in Ust-Sysolsk	1	36	-
<i>Total</i>	<i>8</i>	<i>1,636</i>	<i>-</i>
5) Alexander orphan home	1	-	70
6) Free daily school of priest Aleksandr Rukin in Gryazovetsky District	1	49	-
Grand total	154	5,758	976

As at 1860, the total number of students was 1/142 of the governorate's population. There was one schoolboy per 78 males and one schoolgirl per 510 females (Pamyatnaya knizhka, 1861: 71).

In 1862, Vologda Governorate had now 664 educational institutions. The number of teachers was 1,335, with 26 of these being females. The total number of students was 16,310, with 2,407 of these being females. The ratio of students at educational institutions to the total population was 1:60 and constituted 1/10 of the total number of youth of school age (Pamyatnaya knizhka, 1864: 129). Within the two-year period, the number of educational institutions rose four times (1860 – 154; 1862 – 664), while the number of teachers rose 2.5 times (by 1,035), and the number of students rose four times (by 9,576).

One may, possibly, find this progress somewhat questionable. The thing is that in 1853 the total number of students (boys and girls) was 5,974 – accordingly, in the six-year period the number of student had risen by 760 people, i.e. just 13%. Most of the subsequent increase in students was associated with the widespread opening of schools by the Department of Religious Affairs (Table 2).

Table 2. Educational Institutions and Total Students in Vologda Governorate as at 1862 (Pamyatnaya knizhka, 1864: 132)

Administrative entity	Number of facilities	Number of students	
		Males	Females
1) Ministry of Public Education:			
Parochial specialized schools	14	474	26
Private schools	2	6	71
<i>Total</i>	<i>16</i>	<i>480</i>	<i>97</i>
2) Specialized schools under the Department of State Property			
	64	2,917	414
3) Specialized schools under the Appanage Department:			
Rural schools	9	317	-
Parochial specialized schools	98	402	408
Private schools	5	36	15
<i>Total</i>	<i>112</i>	<i>755</i>	<i>423</i>
4) Department of Religious Affairs:			
Parochial specialized schools	1	43	-
Primary schools based at churches	448	7,384	1,125
<i>Total</i>	<i>449</i>	<i>7,427</i>	<i>1,125</i>
5) Alexander orphan home	1	79	1
Grand total	642	11,658	2,060

On March 21, 1863, the Vologda authorities carried out a one-day population census. The census results helped gain insight into literacy and education levels among the region’s residents. It was found there were 131 individuals with a higher education (all males), i.e. one per 78 residents; 747 male and 227 female graduates from a secondary educational institution, i.e. one male with a secondary education per 13 and one female with a secondary education per 39 residents; 744 males and 54 females with a primary education, i.e. one male per 13 and one female per 165 residents. There were 3,327 literate males and 2,520 literate females (‘literate’ meaning ‘can read, write, and count’). Finally, there were 4,245 illiterate males and 6,030 illiterate females. (Bunakov, 1864: 127). This information is displayed in Table 3.

Table 3. Literacy-Related Findings from a One-Day Census Conducted in Vologda on March 21, 1863

Literate residents who are graduates from an educational institution				Literate residents who can write and count	Total number of literate residents	Total number of illiterate residents	Literate to illiterate residents, %								
Those with a higher education	Those with a secondary education		Total												
131	-	747	227	744	54	1,622	281	3,327	2,520	4,949	2,801	4,245	6,030	53.8	31.8

Of particular interest in Table 3 is the number of those who either learnt to write and count on their own or did not finish an educational institution. This is well reflective of the logic so typical

of peasants and philistines – “the child has learnt to write and count, and thus needs not attend high school”. An alternative would be to hire a professional tutor living in a large trade village. Such tutors could accommodate up to 10 boys at a time at their own place. It was also possible to have a tutor live in the client’s house. The usual charge was 1-1.5 rubles for teaching the child to just read and 3 rubles for teaching them to both read and write. The tutor would normally live for a week with each of the families whose children they tutored. A program of study like this would typically take three years to complete ([Pamyatnaya knizhka, 1864: 133](#)).

The number of literate residents was even lower in other cities of the governorate, except for Yarensk. In Ustyug, the number of illiterate males was less than 1/2, and that of females was greater than 3/4. In Ust-Sysolsk, the number of illiterate males was around 2/3, and that of females was around 5/6. The lowest number of illiterate males was recorded in Yarensk, where the group constituted a little over 1/3 of the male population ([Bunakov, 1864: 129](#)). By degree of distribution of literacy, the cities of Vologda Governorate were positioned in the following order ([Table 4](#)).

Table 4. Distribution of Literacy across the Cities of Vologda Governorate based on the 1863 Census ([Pamyatnaya knizhka, 1864: 142](#))

	One illiterate resident per all residents (both sexes)	
1	Yarensk	1:1.91
2	Vologda	1:1.87
3	Velsk	1:1.77
4	Solvychegodsk	1:1.67
5	Kadnikov	1:1.67
6	Ustyug	1:1.63
7	Gryazovets	1:1.61
8	Nikolsk	1:1.56
9	Totma	1:1.49
10	Ust-Sysolsk	1:1.29

As evidenced from [Table 4](#), in Yarensk literate residents constituted nearly half of the population, whilst in Ust-Sysolsk the figure was only 25 %.

As regards the rural population, it may be particularly worth taking a look at statistics on Gryazovetsky District. In this district, out of 38,301 males 7,924 were literate, and out of 46,929 females only 1,817 could write and count. Thus, there was one literate male per 5 males and one literate female per 26 females. The number of literate residents in rural areas was a lot greater in places where there were more dissenters, as those who spread dissent placed quite a high value on literacy. Note that similar processes were taking place in the Catholic countries of Western Europe as well, where Catholics had failed to notice right away the widespread opening of schools by Protestants ([Mamadaliyev et al., 2019](#)).

As at 1870, the total number of educational institutions in the region was 677. There were 1,040 teachers, with 45 of these being females. The number of students was 12,491, with 1,440 of these being females ([Pamyatnaya knizhka, 1870: 23](#)).

[Table 5](#) illustrates the distribution of educational institutions across the administrative entities.

Table 5. Educational Institutions and Total Students in Vologda Governorate as at 1870 (Pamyatnaya knizhka, 1870: 24-25)

Administrative entity	Number of facilities	Number of students	
		Males	Females
1) Ministry of Public Education:			
Governorate Gymnasium	1	251	-
Valuation surveyor courses at the gymnasium	1	23	-
Mariinsky Gymnasium for Females	1	-	142
Pedagogical courses at the Vologda District Specialized School	1	39	-
District specialized schools	8	584	-
Second-rate specialized schools for females	5	-	240
<i>Total</i>	<i>17</i>	<i>897</i>	<i>382</i>
2) Department of Religious Affairs:			
Seminaries	1	382	-
District specialized schools	6	978	-
Primary schools at churches	551	5,817	695
<i>Total</i>	<i>558</i>	<i>7,177</i>	<i>695</i>
3) Zemstvo institutions:			
Urban parochial specialized schools and rural public schools	97	2,975	271
4) Private schools:			
In Vologda	2	-	49
In the village of Turundaevo	1	-	22
In Nikolsk	1	-	11
In Solvychevodsk District	1	-	12
<i>Total</i>	<i>5</i>	<i>-</i>	<i>94</i>
Grand total	677	11,049	1,442

In 1870, the ratio of students to the total number of residents was 1:78, or 1/13 of all youth (Pamyatnaya knizhka, 1870: 25).

It is also worth saying a few words about the region's libraries. As at 1870, in Vologda Governorate public libraries were in operation in the following cities:

1. Vologda. The library was run by a private person. It held 2,867 titles;
2. Kadnikov. Based at a district specialized school, the library held 496 titles;
3. Ustyug. Based at a district specialized school, the library held 657 titles;
4. Ust-Sysolsk. The library held 1,203 titles. It also carried several antique manuscripts.

The governorate's libraries held a combined total of 5,223 titles. The total number of subscribers was 240, with 133 of these being subscribers of the library in Vologda (Table 6).

Table 6. Distribution of Vologda Library Subscribers across the Estates (Pamyatnaya knizhka, 1870: 25)

	Estate	Number of subscribers
1	Nobles and government officials	58
2	Merchants and petit bourgeois	31
3	Clergy	3
4	Students	39
5	Teachers	2
	Total	133

By 1879, the number of educational institutions in the governorate continued to rise, reaching 322, five of which were secondary. These secondary educational institutions included the

following: the classic gymnasium for males, the ecclesiastical seminary, the real specialized school, the gymnasium for females, and the teacher's seminary. There were five progymnasia for females, three urban three-grade specialized schools (formed out of district specialized schools), two two-grade specialized schools, and a combined total of 302 primary urban and rural specialized schools for both sexes *and* church-parochial specialized schools (Pamyatnaya knizhka, 1880: 86).

As at 1879, there was one educational institution per 3,470 residents. In one year, from 1878 to 1879, the number of students rose by 736 and constituted 14,896 students (an increase of 5.2%). The ratio of students to the total number of residents was 1:75, with the figure being 1:54 with males and 1:341 with females (Pamyatnaya knizhka, 1880: 87).

When it comes to public specialized schools, one cannot but notice the sharp fluctuations around the region's church-parochial schools – in certain years these schools would close down on a massive scale, but they would reopen on as massive a scale afterwards. This phenomenon can be explained by nothing other than the lack of funding required to keep them running. Indeed, most school attendants would have to work for insufficient pay, while in some cases rural priests would have to work for free altogether – they would often be distracted from managing the school's day-to-day operations by their immediate duties around the parish, which impaired the stable operation of the educational facility.

Table 7. Distribution of Students across the Region's Church-Parochial Schools as at 1879 (Pamyatnaya knizhka, 1880: 87)

Districts	Number of schools	Number of students		Total students
		Males	Females	
Vologodsky	9	2,068	181	2,249
Gryazovetsky	9			
Kadnikovsky	4			
Velsky	20			
Totemsky	11			
Ustyugsky	7			
Nikolsky	18			
Solvychevodsky	9			
Yarensky	5			
Ust-Sysolsky	4			
Total	96			

Starting in 1870, the number of church-parochial schools decreased more than five times, while the number of students decreased just four times. The situation was more stable with urban parochial and rural specialized schools (organized via the state or zemstvo budget) (Table 8).

Table 8. Distribution of Students across the Region's Urban and Rural Specialized Schools as at 1879 (Pamyatnaya knizhka, 1880: 88)

Districts	Number of schools	Number of students		Total students
		Males	Females	
Vologodsky	36	7,966	1,569	9,535
Gryazovetsky	12			
Kadnikovsky	27			
Velsky	18			
Totemsky	18			
Ustyugsky	21			
Nikolsky	19			
Solvychevodsky	23			
Yarensky	11			
Ust-Sysolsky	15			
Total	200			

Each urban and rural specialized school had two instructors – a teacher of religion and a regular teacher.

A few words on the region’s teaching workforce. The total number of teachers in the governorate was 611, with 75 of these being females. A major portion of the region’s teachers had attended a secondary educational institution and a teacher’s seminary (Pamyatnaya knizhka, 1880: 88).

As at January 1, 1893, the total number of educational institutions in Vologda Governorate was 817. There were 32,264 students (26,705 boys and 5,559 girls). The number of secondary educational institutions increased to seven, with five of these located in the governorate’s center and two in district cities – one in Totma and the other in Ustyug (Pamyatnaya knizhka, 1893: 138).

There were five ecclesiastical specialized schools and six progymnasia for females. In the sector of public specialized schools, there were a total of 29 two-grade and three-grade urban, three-grade district, and primary urban and rural specialized schools under the Ministry of Public Education and 211 urban and rural specialized schools subordinate to the Specialized-School Councils.

Table 9. Educational Institutions and Total Students in Vologda Governorate as at 1893 (Pamyatnaya knizhka, 1893: 137-140)

Administrative entity	Number of facilities	Number of students	
		Males	Females
1) Secondary educational institutions:			
Ecclesiastical seminary	1	541	-
Classic gymnasium for males	1	248	-
Mariinsky Gymnasium for Females	1	-	263
Alexander real specialized school	1	190	-
Diocesan specialized school for females	1	-	214
Totma Teacher’s Seminary	1	160	-
Veliky Ustyug Diocesan Specialized School for Females	1	-	101
<i>Total</i>	<i>7</i>	<i>1,139</i>	<i>578</i>
2) Ecclesiastical specialized schools, progymnasia			
Ecclesiastical specialized schools	5	803	-
Progymnasia for females	6	-	637
<i>Total</i>	<i>11</i>	<i>803</i>	<i>637</i>
3) Public specialized schools:			
Two-grade and three-grade urban, three-grade district, and primary urban and rural specialized schools under the Ministry of Public Education	29	2,299	432
Urban and rural specialized schools subordinate to the Specialized-School Councils	211	9,898	2,199
<i>Total</i>	<i>240</i>	<i>12,197</i>	<i>2,631</i>
4) Church-parochial schools and literacy schools	559	12,566	1,713
Grand total	817	26,705	5,559

Based on data from the Diocesan Specialized-School Council, by January 1, 1893 Vologda Governorate had 81,563 boys and 83,716 girls of school age (Pamyatnaya knizhka, 1893: 140). Thus, the number of school-age children not in education in the governorate was 147,915.

In 1897, the Russian Empire carried out a population census, which, along with the nation’s demographic situation, covered the population’s literacy levels as well. The census revealed that in Vologda Governorate there were 328 literate males and only 67 literate females per 1,000. For both sexes, there were 191 literate residents per 1,000. Exclusive of children under nine, the number of

literate residents in the region rose to 30%. With that said, the number of literate males, exclusive of nine-year-olds, was 48 % (Uspenskii, 1914: 4).

As at 1899, the number of educational facilities in Vologda Governorate surpassed 1,000, reaching 1,046. There were a total of 47,445 students – 38,035 boys and 9,410 girls (Pamyatnaya knizhka, 1899: 9).

Table 10. Educational Institutions and Total Students in Vologda Governorate as at 1899 (Pamyatnaya knizhka, 1899: 9-10)

Administrative entity	Number of facilities	Number of students	
		Males	Females
1) Secondary educational institutions:			
Ecclesiastical seminary	1	493	-
Classic gymnasium for males	1	358	-
Mariinsky Gymnasium for Females	1	-	412
Alexander real specialized school	1	239	-
Diocesan specialized school for females	1	-	256
Totma Teacher's Seminary	1	103	-
Veliky Ustyug Diocesan Specialized School for Females	1	-	182
<i>Total</i>	7	1,193	850
2) Ecclesiastical specialized schools, progymnasia			
Ecclesiastical specialized schools	5	771	-
Progymnasia for females	6	-	887
<i>Total</i>	11	771	887
3) Public specialized schools:			
Urban and rural specialized schools under the Ministry of Public Education	35	3,119	773
Specialized schools subordinate to the Specialized-School Councils	237	12,972	2,938
<i>Total</i>	272	16,091	3,711
4) Church-parochial schools and literacy schools	756	19,980	3,962
Grand total	1,046	38,035	9,410

As evidenced by Table 10, in the last six years the number of secondary educational institutions, ecclesiastical specialized schools, and progymnasia for females did not change in the governorate. However, the number of primary schools increased by more than 200. Another noteworthy fact is the substantial increase in the number of female students. To be specific, in 1893 there were five boys per one girl, whilst in 1899 the ratio was now one girl to four boys.

Apart from traditional educational institutions, on the cusp of the centuries issues of public education were also handled in Vologda Governorate by the following two Orthodox fraternities: the Vologda Orthodox Fraternity of the All-Merciful Savior and the Veliky Ustyug Stephen-Prokopiev Orthodox Fraternity (Pamyatnaya knizhka, 1899: 10-11).

5. Conclusion

From 1860 to 1900, Vologda Governorate enjoyed a period of dynamic development in its public education sector, which can be illustrated by the following figures: (1) an increase in the number of educational facilities from 154 to 1,046; (2) an improved girls-to-boys ratio (1 to 4 in 1900, as opposed to 1 to 6 in 1860). The region witnessed a major change in its system of secondary education, with almost similar numbers of boys and girls achieved by the 1900s.

The governorate entered the 20th century with a literate population of a little over 30 % (exclusive of children under nine). Given the extensive experience gained in the course of its work on enhancing the system of public education, the governorate's leadership had come to realize that

putting an effective system of education in place was possible only provided there was steady and sufficient funding available. And that is testimony that the 1860s experience *had*, actually, been taken into account.

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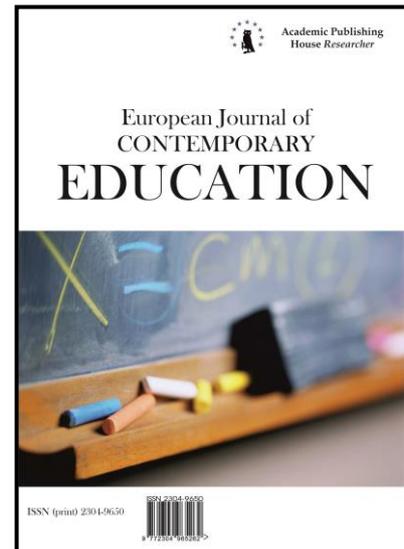
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Issues of Education and National Culture in the Work of North Caucasian Deputies of the State Duma of the Russian Empire (1907–1912)

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Abstract

The objective of the study is to analyze the activities of the North Caucasian deputies of the third-convocation State Duma of the Russian Empire in addressing issues of education and national culture. The people's deputies were focusing on the most relevant and vital questions of the Russian reality: democratization of political life, the problem of national and religious relations, education and enlightenment, as well as many others. The role of North Caucasian deputies in the consideration of draft laws on the development of national education and the empowerment of indigenous languages of the region is defined. The analysis of the transcripts shows that the people's deputies constantly paid attention to the violation of the civil rights of the local population and discrimination on religious and national grounds (in particular, the prohibition of local judicial proceedings in the native language). In the State Duma of the third convocation, the North Caucasian deputies were able to amend the law "On the Transformation of the Local Courts", according to which judges were obliged to speak local languages (the law was approved by the Emperor on June 15, 1912). They also supported bills on the development of teaching in local languages, on the establishment of national and religious equality, on the development of culture and school management.

After analyzing the materials and sources, the author comes to the conclusion about the high activity of the deputies in the elaboration of religious bills, as well as in solving the problems of national culture and education. However, the establishment of the June 3rd model of formation of the Duma led to ignoring the need for representation of the outskirts of the Empire in the all-Russian Parliament, which, in turn, brought about the stagnation and subsequent collapse of the entire political system.

Keywords: State Duma, Russian Empire, national question, national culture, education, North Caucasian deputies.

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1. Introduction

Russia had historically been formed as a complex state in the national, religious, civilizational, cultural and social/political aspects. Peoples, cultures, and religions had to share administrative and territorial boundaries confining large areas. The main efforts of the national government were focused on maintaining the unity and integrity of the country.

In the late Imperial period, St. Petersburg faced the task of uniting the society on the basis of the empire ideology, which led to the development of the idea of forming cultural and linguistic unity with the explicit dominant positions of the Russian language and culture as the basis for the formation of a common Imperial supranational identity (Kanukova et al., 2019: 2425-2433; Kobakhidze, 2016: 5)

Since the existence of national and regional peculiarities in all life aspects was a major obstacle to the implementation of this task, the government was forced to modernize basing on russification, which in those conditions meant not creating advantages and privileges for Russians, but first of all, systematization and unification of management, and integration of all ethnic groups to form a unified nation of Russia.

The objective need to adapt the outdated state system to the new conditions was shaped by the modernization of the Imperial political and economic system. The reforms of the autocratic political system of the Russian Empire, which were carried out in 1905-1906 by the pragmatically thinking part of the Russian ruling elite, opened up new opportunities for the constitutional development of the country and the formation of civil society. The Manifesto of October 17, 1905 proclaimed the creation of the State Duma in Russia, the first all-imperial election representative institution. It also transformed the State Council and established a joint Council of Ministers. The Manifesto, along with guarantees of civil rights and freedoms, gave an impetus to the creation of regional public and political organizations, the formation and reinforcement of national consciousness and the national political elite of the peoples of Russia. The North Caucasus was no exception to the rule. Under the slogan of constitutional dialogue with the authorities, the local political elite sought to develop their own behavior strategy. The establishment of the State Duma allowed the peoples of the North Caucasus to hope for the possibility of an open national-level discussion of issues relating to acute socio-economic, legal, religious and ethnic/cultural problems, which was becoming more relevant by the day, bringing the intensity of political tension in the region to a critical mark.

Analysis of the political and legal aspects of the State Duma and its impact on the economic, religious and cultural life of the peoples of the Caucasus and Russia as a whole is very relevant, as it allows to recreate a more complete picture of the transformations that were taking place in the region.

2. Materials and methods

2.1. The most important source were the published materials of the State Duma: verbatim records of the meetings, reports of deputies' speeches, collections of documents on the meetings and committees of the Duma.

2.2. The main research methods will be the principles of historicism and objectivity, which are based on the knowledge of things and phenomena in their formation and development. This approach seems promising, as it implies the possibility of avoiding unilateralism and bias in the evaluation of historical events. For the research of the verbatim transcripts of the state Duma meetings, the method of content analysis was used.

3. Discussion

In general, there are no special works devoted to the study of this problem. However, in historical literature, some aspects of this problem have been considered in the context of the study of other issues.

From the array of published works (more than 1,000 publications) on the process of understanding the relevant problems of Russian reality, it is necessary to mention the works of following prominent figures: V. N. Kokovtsov (Kokovcov, 2004), P. N. Miliukov (Miljukov, 1990), as well as witnesses and participants of many political events of the early 20th century, which has recreated the atmosphere that prevailed in the society of the time: A. A. Kizeveter (Kizeveter, 1907), D. N. Shipov (Shipov, 2007), A. Tyrkov-Williams (Tyirkova-Vilyams, 2007) and others.

Against the background of the mass politization of society that arose in connection with the first Russian revolution, the discussion in the State Duma of various aspects of the national, religious issue led to the publication of reflections on the debate in the Tauride Palace by S. Budilovich (Budilovich, 1907), G.A. Evreinov (Evreinov, 1908) and others.

Events related to national relations problems, understanding the needs of different ethnic groups, the choice of the most appropriate methods and forms of resolving the national issue explain the interest of specialists. A number of monographs, such as the ones by V. S. Dyakina (Djakin, 1998), I.E. Dunyushkin (Dunjushkin, 2003), A.A. Chemakin (Chemakin, 2018), etc., are aimed at overcoming the gap in this issue.

The need to rethink the political process in the Russian Empire in the early 20th century, the place and role of the State Duma brought about a number of new publications by V. Shelokhaev (Shelohaev, 1983), A.V. Gogolevsky (Gogolevskij, 2002), V.A. Demin (Demin, 1996), S.V. Darchieva (Darchieva et al., 2017), A.A. Kerimov (Kerimov, 2018). Early 20th century, which was incredibly rich in outstanding events, was a time of radical changes not only in the lives of the peoples of the Russian Empire, but also on a global scale. Therefore, this period in the political history of Russia draws the attention of foreign historians, such as A. Kappeler (Kappeler, 2000), M. Matthews (Matthews, 1994), E. Thaden (Thaden, 1990) and others.

4. Results

On April 27, 1906 the State Duma began its activity in the Russian Empire. The historical purpose and the main task of the Duma were to help the country out of the deepest economic, political and interethnic crisis. An objective assessment of the events that actually took place in the country was expressed by the historian and deputy of the Constitutional Democratic fraction, Alexander Kiesewetter: "It is still possible to rule over Russia using just the military force without the Duma; but it is impossible to govern Russia, i.e. regulate the life processes of a great country in a legitimate way, without the Duma" (Kizevetter, 1907: 194).

However, the Duma was established by those who were not really interested in its efficient functioning. The first two Dumas could hardly have any influence on the government policy, for the Council of Ministers only reported to the Emperor; besides, the Duma's legislative competence was blocked by the conservative upper chamber (State Council), the Emperor's right of veto. Besides, it could be overruled by emergency legislation. Yet these Dumas were an important forum for political debate. The land issue was brought to the fore of all the Duma debates, while specific national issues only became the subject of discussion sporadically. Such matters were the subject of Duma debate as equal rights for ethnic minorities, schooling in their native languages, freedom of religion, the responsibility of officials for the pogroms and many more.

The events that took place in Russia in relation to the dissolution of the second Duma and the change of the electoral law, are referred to as Coup of June 1907 by historians. The Emperor had every right to narrow and expand the rights and institutions he himself had granted to the country. However, the new law on elections, which got promulgated on the following day, clearly violated the constitutional provision that prohibiting to use Article 87 for "modifying the regulations on elections to the Council or the Duma" (Pajps, 2005: 249). To circumvent this restriction, amendments to the electoral law were made through the issuance of an Imperial Proclamation, as required for matters of vital national importance.

The law On Elections of June 3, 1907 reduced the number of members of the Duma by 82 deputies (from 524 to 442), one of its goals being a radical limit to the representation of national regions. The Manifesto on the dissolution of the State Duma and the change in the order of elections of June 3 read: "The State Duma, which has been established in order to strengthen Russia, should also be Russian in spirit. Other ethnic groups, which are part of our power, should have representatives of their needs in the State Duma, but not by so many people as to give them the opportunity to be the arbiters of purely Russian issues. In the same peripheral regions of the country, where the population has not achieved a sufficient level of civil development, elections to the State Duma should be temporarily suspended" (Kalinychev, 1957: 273).

As a result, according to the electoral law on June 3, 1907, the representation of Polish provinces in the III and IV Dumas decreased by 23 mandates (from 37 to 14), the Caucasus lost 19 of 29 seats (with only 10 left), the representation of Siberia and the Far East decreased by 7 seats (from 21 to 14), and of the 23 deputy seats for Central Asia and Kazakhstan, only 1 remained for the

Ural Cossacks ([Demin, 1996: 14](#)). The following North Caucasian deputies took part in the work of the third State Duma: Mr Pokrovsky from Terek Region, Kuban Region and the Black Sea Province (member of the RSDLP); Mr Tikhonov was elected to represent the Terek Cossacks (Octobrist resigned for health reasons in 1908, replaced by Mr. Lisichkin), Mr Bardige (Constitutional Democrat, Head of the Cossack group in the Duma). The representative of the Dagestan region and the Zakatala district in the Duma was Mr. Gaidarov (Social Democrat, who later joined the Muslim fraction). ([Boiovich, 1913](#)).

Thus, among the 4 Duma deputies from the Caucasus, two belonged to the left wing, one was a Constitutional Democrat, and the remaining one was an Octobrist. In general, Octobrists and those who shared their beliefs had a majority in the Duma: 154 of the 442 mandates. The right wing and the Nationalists obtained 147 seats, the Constitutional Democrats, 52 seats, and more than 40 non-partisan deputies adjoined them. The Social Democrats were represented by only 19 deputies. Such a composition of the Duma split it into two blocs - the right/Octobrist wing and the Octobrist/Cadet one, depending on the position the Octobrists, being the leading fraction. Over the five years of its work, the Third Duma considered and approved more than 2,000 bills, most of which were current laws.

A significant decrease in representation from the peripheral regions of Russia in the Duma of the third convocation under the electoral law on June 3, 1907 practically deprived the North Caucasian deputies of the opportunity to influence the course of the Duma debate. In order to be heard, the deputies who represented non-Russian ethnic groups and regions in the State Duma adopted new tactics. They used the discussion of issues and bills launched by the government and major fractions as a platform to express their positions, strived to make as many amendments, proposals and requests as possible. For example, the members of the Muslim fraction, Khas-Mamedov, Gaidarov, Enikeev and the Social Democratic Party deputies: Saghatelyan, Pokrovsky II, Chkheidze criticized the government's national policy when discussing the estimates of the Ministry of Public Education ([Gosudarstvennaja дума..., 1909: 2448-2452, 2574-2588](#)). It was the state of education that remained one of the acutest problems that directly affected the interests and rights of all the ethnic groups.

When discussing the estimated budget of the Ministry of Public Education for 1908, Mr Chkheidze, in particular, pointed out the following data. In the North Caucasus, one primary school should fit in 3,000 Russians, 4,800 Georgians, 5,400 Armenians, 17,300 Azerbaijani and 11,400 highlanders. The urgent tasks of expanding the sphere of education of the peoples of the Caucasus were justified by Deputy Khas-Mamedov. According to him, in the Baku Province with 774,000 Muslims there were only 37 primary schools with the capacity for 1,690 children in total, and in the Elisavetpol Province with 526 thousand Muslims, there only were 47 schools with 2,200 students. In the 20 years of existence of the Erivan Seminary, only 40 Muslims graduated from it. No primary school for Muslims had been established by the government ([Gosudarstvennaja дума..., 1909: 2515-2530](#)).

When the Third Duma was discussing the bill on primary schools proposed by the October majority, Deputy Khas-Mamedov, a member of the Muslim fraction, opposed the suggestion to study ethnic languages in schools only if possible. It should be noted that the decision on granting the right of cultural self-determination was quite a sensitive issue for the Union of October 17. In their understanding, native languages could not be compulsory because of the diverse national composition of students and the possible reluctance of students and their parents to learn them. Deputy Khas-Mammadov referred to this argument as unconvincing. With the compact settlement of national groups, it is possible to open separate schools for them, and parents should not be against their children's learning their native languages ([Kavkazskie deputaty..., 1912: 70-78](#)).

The North Caucasian deputies considered the introduction of education in each group's ethnic languages to be the most important aspect of the government's national policy. Deputy from the Dagestan region, Mr Gaidar, noted that the Committee's bill was aimed at transforming primary schools into Russification policy agents. He clarified that the official state language could never be preferred over the "natural"/"mother" one, as it was done in the project. The Deputy suggested that the primary language of instruction should be the mother tongue, while the Russian language should be introduced into the school curriculum as a separate subject only after the students had reached a certain level of literacy in their native languages.

The bill was criticized for an understandable reason: the language being the basis for the development of any national culture, the formation of the nation, the way of communication within the country. In addition, the task of forming a liberal worldview assumed close attention to the school teaching organization, with the language being the main tool of educational influence.

Speaking from the Duma rostrum, Deputies Saghatelian and Pokrovsky II emphasized the regressive nature of the project, and its chauvinistic orientation. And Deputy Chkheidze pointed out that the call-outs of the majority of deputies on "indigenous dominance" were aimed at the fragmentation of Russia and incitement of ethnic groups against each other. He stated the objective patterns of natural voluntary assimilation of the peoples of the Empire of the Russian language and their rapprochement with the Russian people.

Speaking of the need for the development of national culture, Deputies Pokrovsky II and Gaidarov consistently promoted in the Duma the idea that "at school, the native language and the Russian language are not the same thing." They considered the empowerment of indigenous languages in the region and the development of national education to be the major priorities. The desire to neutralize the national identity of the peoples of the North Caucasus and create a single national-cultural type based on the model of the prevailing Russian nation led to the reduction of the existing ethnic schooling in the province and the actual prohibition of teaching in the locals' native languages. Russian was the language of instruction in 1,928 primary schools out of a total of 2,086, according to the report of the Trustee of the Caucasian school district of 1903, and only in 158 schools Russian was allowed to be taught using the ethnic languages (Miropiev, 1905: 225-226).

Such a school policy caused a sharp negative reaction among the population of the North Caucasus and greatly aggravated the confrontation between the peripheral regions and the center, which can be clearly illustrated by the Duma discussions on the problems of public education of the "non-Slavic" population of Russia.

During the discussion in the Duma, the Octobrists added that "in areas with non-Russian population that has their own writing systems, schools in the local languages are premitted to be established" (Gosudarstvennaja дума..., 1910: 1236-1237).

That was followed by a list of ethnic groups that fell under the article. The Muslim fraction amended it to replace the word "Tatar" with "Muslim", justifying this by the fact that all Muslim peoples of Russia spoke different dialects of the same Turkic language and have a single Arabic script. The amendment of the Muslim fraction was not approved in the Duma, but the addition of the Octobrists was adopted.

The draft laws "On the introduction of universal primary education in the Russian Empire" and "On primary schools" with significant amendments and additions were adopted by the Third Duma, but failed the approval of the State Council. Thus, the Russian Empire adopted no law on universal primary education. Of all the major draft laws on public education, the only one that actually got approved by the State was the one "On Higher Primary Schools" (Musul'manskie deputaty..., 1998: 98).

Another problem raised by the deputies from the North Caucasus was the violation of the civil rights of the Muslim population, discrimination on religious and national grounds. The discrimination was obvious when it was forbidden to conduct local judicial proceedings in the local ethnic groups' languages. All the deputies advocated protecting the religious identity of the Muslims of the North Caucasus and preserving their daily life and ethnic characteristics. Deputy Gaidarov, in particular, during the discussion in the Duma of the draft law of the Ministry of justice on the local court emphasized: Prince Baryatinsky's words that "it is necessary to consider governing the mountaineers as their conquest", is still valid for the authorities even 50 years later. Nevertheless, in order not to incite nationalism, all ethnic groups need to have equal rights, including in the language of legal proceedings (Caucasian deputies, 1912: 64). In the Third State Duma, the deputies managed to amend the law on the election of the Chairman of the magistrates' court and the need for judges to speak local languages (the law was approved by the Emperor on June 15, 1912).

The development of interethnic relations and interaction of the local population with the authorities in the Caucasus was no less complicated and contradictory. They also came to the attention of Russian parliamentarians.

North Caucasus representatives gave numerous examples of the difficult socio-economic situation of the local peoples, their political and cultural disenfranchisement, and ongoing ethnic conflicts. Such a situation in the Caucasus had been brought about by many factors, and, as rightly noted by the deputies from among the Social Democrats and the Constitutional Democrats, it required a wide range of specific measures to settle it. This included rational land management on the ground, including *zemstva*, full satisfaction of cultural, national and religious requests, the abolition of exceptional provisions and emergency measures in the management of the Caucasus. "The Caucasian population can neither be swept off the face of the earth, as Deputy Markov advises us, nor managed according to the old system," Peter Milyukov, leader of the Constitutional Democrats, emphasized (*Kavkazskij zapros...*, 1909: 79).

The Duma Committee proposed a system of socio-economic and cultural measures to meet the basic needs of the peoples who inhabited the region, staff replacement in the administration, as well as separating the Terek and the Kuban regions to form an independent administrative-territorial unit. It was obvious to the parliamentarians that the ethnic, religious, cultural and economic aspects of the situation in the Caucasus should be carefully taken into account, and that a careful and well-thought-out system of gradual measures needed to be developed to approve the "honest and conscientious cooperation" of the population with the authorities (*Zorin et al., 1999: 128-145*).

However, it should be noted that, due to the scale and cultural and linguistic heterogeneity of the Russian Empire, the priorities of the national government in the Caucasus were associated with the acquisition of loyalty, expressed "in orientation to the imperial center as a priority source of cultural images and influences" rather than with the achievement of complete assimilation and the assertion of a common identity for the entire population (*Miller, 2006: 67*). The Empire itself adapted to the "peripheral" realities rather than adapting them to a single management standard. The pragmatic ideologists of government policy understood that the multi-faceted, centuries-old ethnic and cultural world of the Caucasus was just not capable of becoming 100 % Russian. It could be turned into an integral part of the Russian Empire, but it would always require a special approach and special care.

The analysis of the facts proves that the Russian national policy on the eve of World War One remained very inconsistent and ambiguous. The monarchy often sought the answers to the questions of the new era, however, in older recipes. Nevertheless, it proved itself unable to pursue any coherent policy without undermining the basis of its own existence.

5. Conclusion

Despite the short historical period of activity of the State Duma, it had an impact on the development of political culture and public education in the country. Millions of people gained the right to vote, which allowed them to feel their involvement in public affairs. The development of the legislative process, when the preparation and adoption of laws ceased to be limited to professional bureaucrats, with more and more people getting gradually involved in the discussion of draft laws, was an inevitable consequence of political changes in Russian society.

The North Caucasian deputies of the State Duma were primarily focused on vital issues of Russian reality: development of education, democratization of political life, the problem of ethnic and religious relations and many others. The elected representatives advocated for the development of national education and the empowerment of indigenous languages in the region. They constantly drew attention to the violations of civil rights and discrimination on religious and national grounds (in particular, the prohibition of teaching in schools in the local languages). The North Caucasian deputies of the third-convocation State Duma supported bills on the development of teaching in local languages, on the establishment of national and religious equality, on the development of culture and school management. The use of this experience can undoubtedly contribute to the solution of the tasks that the Russian government is facing in the field of education and language construction at the present stage.

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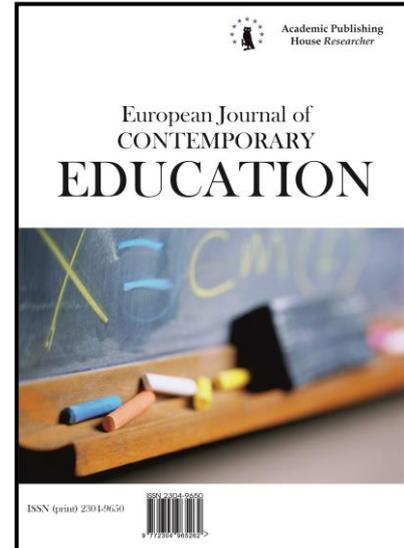
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The German System of Public Education in the Period between the 15th and early 20th centuries. Part 2

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Abstract

The second paper in the set explores the evolution of the Prussian elementary school system on the cusp of the 18th and 19th centuries. The authors examine the activity of squire Friedrich Eberhard von Rochow with regard to the establishment of rural schools on his lands.

The work's materials are grounded in a body of related research and special literature. The study's methodological basis rests on the principles of historicism, research objectivity, and systemicity, which are traditional in historiography. The authors have made use of the problem-chronological method to explore certain facts in the evolution of the German (Prussian) system of public education in the context of the then-existing historical situation. The use of this particular method has helped gain insight into the process of centralization of the German system of public education in the late 18th century.

The authors conclude by noting that, essentially, by the end of the 18th century the pedagogical community and central government in Prussia had both reached a common understanding of key needs in the elementary education system. It is in this period that a set of bills were passed regulating the nation's primary education system. Even dozens of years later, many of these pedagogy-related regulations would still retain their relevance, with modifications made to them only based on natural changes in the state of affairs in society.

Keywords: elementary schools, German Empire, Prussia, Friedrich Eberhard von Rochow, King Friedrich Wilhelm III.

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1. Introduction

As commonly known, compulsory elementary education was introduced in Prussia back in 1717 (Clark, 2006: 163). However, the system had long remained just on paper, with the schools getting insufficient attention from the government, which did little to fund the construction and upkeep thereof. It was really only up to the town councils, squires, or rural communities to get this cause going. Under the influence of the spirit of 18th-century educational philosophy and philanthropy, Germany would witness a number of more or less successful private efforts aimed at extending education to wider popular masses. Among the period's most prominent private figures, of particular mention is Brandenburg squire Friedrich Eberhard von Rochow, a canon of Halberstadt, who established several rural schools on his estates (Reckahn, Götting, and Krahne) and created an entire system of public education geared to the needs of rural residents. Educational facilities established by von Rochow would eventually go on to be regarded as a paragon of rural schools even in the late 19th century.

2. Materials and methods

The work's materials are grounded in a body of related research and special literature. The study's methodological basis rests on the principles of historicism, research objectivity, and systemicity, which are traditional in historiography. The authors have made use of the problem-chronological method to explore certain facts in the evolution of the German (Prussian) system of public education in the context of the then-existing historical situation. The use of this particular method has helped gain insight into the process of centralization of the German system of public education in the late 18th century.

3. Discussion

The historiography related to the subject under examination can be divided chronologically – into the pre-revolutionary historiography (1860–1917) and the contemporary historiography (1918–2019).

In terms of the pre-revolutionary historiography, researchers have devoted a significant amount of attention to issues of public education in Germany in particular and in Europe as a whole. The subject has been explored by scholars Yu.S. Rekhnevskii (Rekhnevskii, 1860), P.N. Voeikov (Voeikov, 1873), A.V. Belyavskii (Belyavskii, 1887), F. Paulsen (Paulsen, 1908), N.V. Speranskii (Speranskii, 1898), and others.

Researchers have demonstrated a high level of interest in the subject of philosophical currents in pedagogy as well. This area has been investigated by scholars H. Weimer (Weimer, 1913), M.I. Demkov (Demkov, 1912), E.P. Krevin (Krevin, 1915), E. Künoldt (Künoldt, 1897), G. Krenenberg (Krenenberg, 1896), F. Jakobi (Jakobi, 1916), F. Fischer (Fischer, 1912), and others.

In terms of the contemporary historiography, issues of the history of German pedagogy, in particular, and that of European pedagogy, at large, have been researched by scholars A.I. Piskunov (Piskunov, 1960), A.M. Mamadaliev (Mamadaliev et al., 2019), L.G. Abramova (Abramova, 2004), V.G. Bezrogov (Bezrogov, 2018), S.M. Marchukova (Marchukova, 2011), I.A. Sergienko (Sergienko, 2017), G. Rajović (Rajović et al., 2018; Rajović et al., 2018a), L.V. Obraztsova (Obraztsova, 1999), and others.

4. Results

Friedrich Eberhard von Rochow (1734–1805) was neither a pedagogue nor a scientist. As was common among Prussian nobility in those days, he chose a military career. After getting a superficial education at the Brandenburg Military Academy, he enlisted in the Prussian Guard. He took part in the Seven Years' War. Eventually, he had to leave military service after getting wounded in 1757. Von Rochow took up residence at his patrimonial estate of Reckahn. He devoted himself exclusively to agriculture, with a focus on care for the well-being of his peasants. Between 1771 and 1772, the region experienced a poor harvest, which resulted in increased prices, and later caused an epidemic among the residents and livestock. In an attempt to alleviate his peasants' suffering, von Rochow hired a physician to provide free medical care for the peasants. However, most of the peasants would not see and would not follow the instructions given to them by the doctor – mainly, due to various entrenched preconceptions and superstitions, negligence, uncouthness, or just apathy. Instead, the sick would turn to quacks, shepherders, and all kinds of charlatans,

whose services were quite costly, but, quite predictably, entire families would eventually perish this way. This is when von Rochow would actually step in and resolve to improve the level of public literacy – at least within the boundaries of his own estate (Rekhnevskii, 1860: 144).

As early as 1772, von Rochow produced his first essay, ‘An Attempt at a Schoolbook for Country Children, or for Use in Village Schools’. In discussing a set of means to be employed to improve the level of moral and mental education among the rural population, von Rochow fairly reasoned that, similar to a competent physician providing medical assistance to a mother nursing a newborn, a person who desires to improve public education must begin by improving the caliber of public teachers. To this end, he proposed the following measures:

1) the post of public school teacher should not be conferred on would-have-been craftsmen or lackeys; on the contrary, the position of rural teacher must be filled by candidates of theology, and from these one must elect rural preachers. If such candidates are not available and until teacher seminaries are in place, the position of teacher must be filled by diligent educated young people, who must first be taught the art of teaching by pastors;

2) rural teachers must be entitled to a salary of no less than 100 thalers per year, apart from housing, heating, and a garden, so as to have sufficient means of subsistence in order to be able to devote themselves to school wholly. With that said, each and every learner must receive education free of charge;

3) each rural school must have two grades; lectures must be no longer than six hours per day (four hours in the morning and two hours in the afternoon);

4) a rural school must be housed in a sturdy, warm, and light-filled building, and must have all the necessary facilities required in a school (Rekhnevskii, 1860: 146-147).

The second and third conditions implied considerable costs, so von Rochow would call on the authorities to provide the actual funding needed to establish the rural schools. Soon after his book was published, he received a complimentary letter from Karl von Zedlitz, Prussia’s then-Minister of Education, saying that King Friedrich II appreciated von Rochow’s aspirations and intended to establish in the Kurmark several schools based on his projects, and that a certain percentage of the sum of 100,000 thalers would be allocated toward teacher salaries (Rekhnevskii, 1860: 147). Initially, von Zedlitz wanted to hire school teachers from Saxony, which at the time was doing better in education than the Brandenburg region, but von Rochow managed to dissuade him from doing so by suggesting that Saxonians did not know the Lower Saxonian dialect, which was used by Brandenburg peasants.

Having secured support at this high a level, von Rochow set to carrying his project into effect. The care of the very first school (built at his main estate, Reckahn) was entrusted by von Rochow to his secretary Heinrich Julius Bruns, a music teacher. However, the school was immediately faced with a shortage of books needed to teach children. The Nuremberg ABC-book, used in public schools at the time, was too dry, boring, and poor in content, whilst the Bible, on the contrary, was too lofty and, thus, not readily accessible for rural schoolchildren. In an attempt to fill this gap, von Rochow would write and then publish the first part of his primer ‘The Friend of Children’.

Von Rochow and Bruns were perfectly aware that a key condition for success in learning is the teacher’s ability to make proper use of a textbook, i.e. the ability to first properly deliver the material to the student and then put questions to them based on that. To gain this ability, one would first have to undergo a few-months-long training in the use of the book, with trainees taking turns acting the parts of the teacher and the student. With the right groundwork in place, the two went on to open up in early 1773 a school of their own (Ignatovich, 1869: 26), for which they also created a constitution. The document was entitled ‘An Instruction Manual for Rural Teachers, or General and Special Directives to be Followed by Every Rural Teacher’ (Rekhnevskii, 1860: 148).

The school in Reckahn was comprised of the following premises: a stone building consisting of a teacher’s apartment and a large classroom with windows overlooking a garden. It was a unisex school divided into two grades: the first one was for little children, who were learning to read exclusively, and the second one was for their older counterparts. Classes for first-graders were held daily from 1:00 p.m. to 3:00 p.m., and those for second-graders ran from 7:00 a.m. to 11:00 a.m. Children entered first grade at the age of six. When a child visited the school for the first time, the teacher was expected to receive them in a friendly manner and try to win their confidence. Normally, the teacher would have a chat with them, would ask them their name and age and ask

them about the rank and place of residence of their parents, and would then assign them a seat in the classroom in which they would have to sit in every class.

Instruction in the rules of the faith, based on the Reckahn system, was combined with instruction in reading, as the first books used for instruction dealt with catechism, Bible study, and Biblical history. In addition, students in each grade had to attend two hours of God's Law class weekly.

The school maintained strict discipline: before the final strike of the clock, all students had to be in their seats; each lesson commenced with a prayer, uttered by the teacher, and the singing of a few verses from the Psalms. During class, no student was allowed to leave the classroom. The roster of students who missed class would be forwarded to the squire, who would then have a talk with their parents about it. Bodily punishment was employed rarely, mainly in the event of theft or utter disobedience to the teacher. The Reckahn schools did not offer any achievement awards for students (Rekhnevskii, 1860: 155). This must have been due to European asceticism at the time. In terms of student punishment for violating school discipline, Von Rochow proposed the following, progressive, system of punishment: admonishing, reproving, reprimanding, and only then punishing one (Ignatovich, 1869: 26).

It did not take long before the educational efforts undertaken on von Rochow's estates started to bear fruit. The peasants quickly realized the benefits of learning, and would readily send their children to school, both in summer and in winter. Based on an eyewitness account, as early as 1792 "von Rochow's estates stand apart from all others in the morality of peasants, their level of education, and the level of agreement and harmony amongst them. Young people in both sexes are distinguished by modesty. Over a six-year period, there has been just one illegitimate birth. The squire and the pastor are enjoying the love and complete loyalty of the peasants. Soldiers hailing from Reckahn have, likewise, always been distinguished by their obedience, discipline, and sophistication" (Rekhnevskii, 1860: 155-156).

The Reckahn estate, inclusive of its rural schools, would soon enjoy wide fame. Thousands of travelers from Germany and other countries would visit Reckahn in order to see the school. The number of curious visitors would eventually become so large that this would start to interfere with the actual learning process (Ignatovich, 1869: 27). In conjunction with this, von Rochow would later issue a detailed description of his school.

Without question, it is in part under the influence of the time's overall pro-education sentiment in Germany, but more so under the influence of pedagogical ideas by von Rochow, that Friedrich II would resolve, during the last years of his life, to issue the following two statutes, which would prove crucial for the nation's elementary school system: (1) on establishing Prussia's Central Directorate for Educational Institutions and (2) on enacting into law the General Prussian Code. Both acts, drawn up by Minister of Education Karl von Zedlitz when Friedrich II was still alive, would be promulgated, based on the grounds established by the King, later on under his successor, Friedrich Wilhelm III. These statutes were underpinned by the key idea that all schools, both higher and lower, are public institutions (Ignatovich, 1869: 29).

During the Middle Ages and a period of time after the Reformation, educational facilities across Europe were regarded as belonging to the Church, as it is at churches that they were actually established. This led to the well-known rivalry between Catholics and Protestants in the area of public education (Mamadaliyev et al., 2019: 445-453). At the same time, German universities, most of which were established by imperial ruling princes, were right from the outset of their existence subject to government influence both administratively and economically.

It was enjoined via statutory initiatives that: (1) all schools, higher and lower, and universities in Prussia be treated as public institutions; 2) it be possible to open any school only with permission from the government; 3) all public educational institutions operate under the oversight of the government, which was empowered to make visits to them and inspect them at any time; 4) no person be denied enrolment in a public school based on religious affiliation (Ignatovich, 1869: 30).

Concurrently, the authorities established two seminaries for the training of future "higher school" teachers, one in Halle (as part of the university's theological seminary, established back in 1757) and one in Berlin. Enrolling in the seminary in Berlin required having a university education (Jeismann, 1996: 104-106).

Seminaries for the training of rural school teachers emerged later (Hamann, 1993: 87-88). Likewise, there were very few of them and at first they, too, were not independent entities but formed part of other educational institutions in cities like Königsberg, Züllichau, Stettin, etc. The first independent seminary emerged in 1778 in the city of Halberstadt.

Another area that was enshrined in law was regulation of the operation of rural elementary schools, which included the following eight items:

1. Local administration and oversight. The operation of community schools was to be overseen by the local civil authorities, with participation from the local clergy. A church-warden was to keep watch over external order in the schools and make a note of any imperfections, of which, along with any suggestions on how to improve a certain area, they were to notify a local civil officer and the clergy;

2. Appointment of teachers. This was up to the local authorities. Note that no one could be appointed to the position of school teacher without having provided a legal certificate of their having passed a relevant exam and been proven fit to perform the duties of a teacher;

3. Teacher oversight. Teachers in community schools were answerable to the local civil authorities, which, with participation from a clerical school inspector, supervised the proper execution of duties by them and were empowered to impose fines on them in the event of violation of the obligations assumed by them;

4. Pay for teachers. Where community schools did not possess special funds, the provision of funds to pay the teachers was to be the obligation of male-heads of the family, regardless of whether or not they had children and no matter which faith they practiced. Note that in the case of special schools established for a particular religious denomination, the residents, accordingly, were to be divided in this context by religious denomination. The size of contribution, both monetary and in-kind, was to be commensurate with each family male-head's financial capacity. The communities were to bear all costs associated with the travel of newly appointed teachers, along with members of their own family, and the moving of their personal belongings, including their clothing, linen, home furniture, silverware, and books;

5. The upkeep of the school building. The upkeep of the school house and the teacher's apartment was the obligation of family male-heads as well. Note that a member of a different community whose child was attending the same school was to pay only half of the tax. For activities like construction and repairs of school buildings, the city councils and rural squires were to provide free of charge any necessary construction materials from city- and squire-owned forests if those were available; if these materials were not available, construction materials had to be purchased for the school. No one was exempt from paying the school-upkeep tax based on religious affiliation;

6. Parent obligations. Every family male-head who could not or did not want to have their child taught at home was to send them to school at the age of five. A child was allowed to stay at home beyond this age only with permission from the local civil authorities and the clerical school inspector. Children who, due to their household chores, were unable to attend school on a regular basis were to attend it on Sundays, during a break from those chores, or at any other convenient time. A student was to go to school until the spiritual adviser declared that they finally possessed the amount of knowledge appropriate for a sensible person of their social class;

7. Student oversight. Under the auspices of the local civil authorities, a school watcher was to keep watch both over the accurate execution of duties by teachers *and* over the behavior and attendance of school-age children in school. If need be, the officer was empowered to employ enforcement measures in respect of negligent parents and impose penalties on them. The local preacher (a teacher of religion) was to help the educational facility achieve its objectives not only through their supervisory activity but their own teaching work as well;

8. School discipline. The enforcement of school discipline must never involve the use of punishments that could result in any kind of harm to a child's health. If the teacher was convinced that a soft punishment did not work against continuous violations of discipline by a student, they were to notify of this the local civil authorities and the clerical school inspector, which, with participation from the parents, would then study the case more closely and take appropriate measures to reform the child's behavior (Ignatovich, 1869: 31-32).

Thus, in the late 18th century, Germany witnessed the establishment of control over all of the kingdom's educational institutions. The religious cleavage between Protestants and Catholics in the area of public education was overcome thanks to the position assumed by the relevant central

authority. Directly answerable to the King, it consisted of several secular members, under the chairmanship of the Minister of State. All agenda issues were to be decided by majority voting. This central educational agency oversaw the operation of all Prussian universities, gymnasia, knight academies, urban and rural schools, orphanages, children's homes, and boarding schools, totally regardless of religious affiliation. Its ambit covered the following areas: (1) ensuring the proper structuring of the operation of all types of educational institution; ensuring the provision of proper education *in* and implementation of improvements *to* them in keeping with modern trends and in alignment with the school's special characteristics; ensuring that all facilities use decent textbooks and top teaching methods; gathering the most accurate and detailed information on the state of affairs in the school; (2) conducting school audits; (3) keeping watch over the admission into educational facilities that fell under the agency's remit of persons who had yet to provide proof of having passed relevant exams; (4) working to establish in convenient areas across the country seminaries for the training of teachers, especially elementary school instructors (Ignatovich, 1869: 33).

The significance of these two statutes lies in that all of the above resolutions would continue to remain relevant even nearly 100 years later. The slight changes to them would either deal with their outward form or have to do with their further development and enhancement. Yet, it may be worth noting that the above resolutions were focused solely on the outward organization of public schools, as well as their administrative and economic relationships, whilst things like actual learning, its needs, objectives, spirit, and areas of focus were left totally ignored. We find all of this in two other government statutes: (1) Minister Johann von Wöllner's Regulations for Public School Teachers, Urban and Rural, on Ways to Provide Proper Education to Disciples Entrusted to Their Care (December 16, 1794) and (2) King Friedrich Wilhelm III's Edict for All Regiments and Battalions on the True Needs of Education in Garrison Schools (August 31, 1799) (Ignatovich, 1869: 33-34).

Friedrich Wilhelm III's edict reflected his true vision of elementary education and of its objectives. This vision would be acknowledged by the pedagogical community even 100 years later. Here is a quote from the edict: "Truly educated, and therefore useful to themselves and to society, is a person who has a clear idea of all their relations and obligations within the circle which fate has placed them in and knows how to meet those obligations. This objective is what education in all public schools is to be confined to. Teaching a commoner sciences they will not be able to make use of in their field of activity may be regarded as a waste of time. The reasoning is that a commoner will very soon forget what they were taught in school, while whatever stays in their memory may turn into obscure concepts in their heads, resulting in all kinds of fallacies and desires that cannot be satisfied given their status – this may lead to disgruntlement with their lot and general unhappiness.

The primary objective for the elementary school system is to teach commoners what they will need to be useful to others and be content with their status. If met, this requirement will no longer be seen as negligible as it seems at first glance. The true purpose of school is to better familiarize a person with their human, Christian, civil, and family obligations and help them get proficient in various crafts, so that they can later choose for themselves an area that best matches their abilities and propensities; above all, it must teach them to read, write, and count well" (Ignatovich, 1869: 36).

Thus, two of Friedrich II's nearest successors, who, likewise, were committed to educating all of the strata of society and were tolerant toward religion, would deem it necessary to undertake measures against dangerous (liberal) thinking, which started to emerge in elementary schools, as well as against the expansion of the volume of elementary education in top public schools. There, however, were very few schools like these in the late 18th century. It will not be an overstatement to put the estimated number of schools which provided proper pedagogical education in Germany at the time at one-sixth, with the rest five-sixth, especially schools in rural areas, employing young people taught by the local clergy or disabled soldiers, tailors, night watches, and shepherds, still. For the sake of fairness, it should be noted that these candidates would first have to have an appointment with the school inspector and at the latter's directive take an exam with the local pastor. However, there were very few worthy candidates, as the position of rural teacher still remained lowly attractive. Even in the late 18th century the government still continued to encourage rural teachers to engage in sericulture. Almost everyone grew mulberry trees and kept silkworms

(Ignatovich, 1869: 38). This would lead to teachers getting badly distracted from performing their direct duties, while their profit from this was rather negligible.

However, that was not the only (and not the root) cause of the poor state of affairs with regard to rural schools in Prussia. The crux of the problem lay in the low social status of rural commoners, with the various forms of dependent labor, including *corvée*, by all means discouraging rural residents from properly cultivating their spiritual and mental powers (Kareev, 1894: 210). As accurately noted by von Rochow, rural commoners “had become barbaric like an animal, ill-tempered, and totally disgruntled with themselves, the whole world, the authorities, and God” (Ignatovich, 1869: 38).

By the start of the 19th century, the pedagogical community had succeeded in making the Prussian King aware of the issue. As a consequence, on October 9, 1807 the government issued an edict designed to abolish all forms of hereditary subjection to seigneurial will and jurisdiction, including by birth, marriage, subject position held, or contract. The document provided each and every rural resident with the full freedom to use their property as they desire and choose their profession. However, before this historic event finally came to pass the German school system continued to remain in rather poor shape. In 1798, King Friedrich Wilhelm III, when appointing Ludwig von Massow Minister of the Royal House, demanded that he present a set of proposals regarding the improvement of Germany’s system of elementary schools. The King was resolute in his belief that it was high time to give earnest thought to providing proper education for the children of urban and those of rural residents alike. According to the King, “education and upbringing help provide guidance to one right from an early age; both of these processes are commonly entrusted to our schools, whose influence on the well-being of our nation is, therefore, of immense significance. This has long been acknowledged by everybody. Yet, government support has thus far been provided almost exclusively to research schools alone. Whilst, as regards elementary schools, which are designed to provide proper education to large numbers of residents, i.e. all subjects and their children, nothing has been done for them yet, excepting a few unsuccessful initiatives undertaken to this end. First and foremost, we need to take care of preparing good teachers for these schools. There is a need to explore the actual state of affairs with regard to local teachers and design appropriate measures for overhauling and enhancing their professional competence, in keeping with the local characteristics. The government’s support must supplement what the local population is unable to provide the elementary schools with” (Ignatovich, 1869: 39-40).

5. Conclusion

Essentially, by the end of the 18th century the pedagogical community and central government in Prussia had both reached a common understanding of key needs in the elementary education system. It is in this period that a set of bills were passed regulating the nation’s primary education system. Even dozens of years later, many of these pedagogy-related regulations would still retain their relevance, with modifications made to them only based on natural changes in the state of affairs in society.

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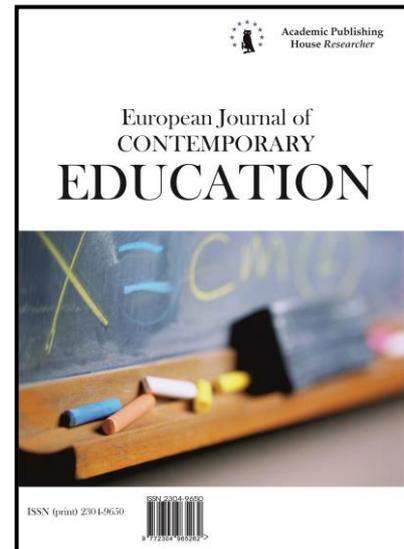
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The History of the Public Education System in Vilna Governorate (the Second Half of the 19th and Early 20th Centuries). Part 1

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Abstract

This paper examines the public education system in Vilna Governorate in the period between the second half of the 19th century and the early 20th century. This part of the paper analyzes the system's development in the period 1803–1880.

In putting this work together, the authors drew upon a pool of statistical data published in Memorandum Books for Vilna Governorate in the period from the 1860s to the 1910s, as well as an array of statistical data on the Vilna Educational District published in the scholarly journal *Zhurnal Ministerstva Narodnogo Prosveshcheniya*. The authors also made use of several regulatory documents.

The authors conclude by noting that the system of public education in Vilna Governorate had developed markedly distinct characteristics of its own. One of these characteristics was based on the motley ethnical and confessional composition of the area's population. As a consequence, in the period 1803–1880 the region witnessed two Polish uprisings, which would ultimately have an effect on its system of public education. At the same time, the development of the system of public education in Vilna Governorate had a set of features common to other regions within the Russian Empire as well. More specifically, there was a sharp rise in the number of educational institutions subsequent to the 1861 reform, and afterwards there was a drop in that number in the second half of the 1870s.

Keywords: Vilna Governorate, public education system, primary schools, secondary education.

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1. Introduction

Vilna Governorate was an administrative-territorial unit in the Russian Empire, with its capital being the city of Vilna (present-day Vilnius). Currently, most of the area is part of Belarus, with the rest of it, including the capital, forming part of Lithuania. This paper examines the development of the system of public education in Vilna Governorate in the period 1803–1880.

2. Materials and methods

In putting this work together, the authors drew upon a pool of statistical data published in Memorandum Books for Vilna Governorate in the period from the 1860s to the 1910s, as well as an array of statistical data on the Vilna Educational District published in the scholarly journal *Zhurnal Ministerstva Narodnogo Prosveshcheniya* ([Nizshie uchilishcha, 1878](#); [Nizshie uchilishcha, 1879](#); [Srednie uchebnye zavedeniya, 1896](#); [Sbornik svedenii, 1873](#)). The authors also made use of several regulatory documents (e.g., the Edict on the Establishment of the Educational Districts ([Imennoi ukaz, 27](#))).

In conducting the research reported in this paper, the authors employed both general methods of research, including concretization and summarization, and traditional methods of historical analysis. In addition, use was made of the historical-situational method, with a focus on exploring particular historical facts within the context of the given period in conjunction with various “neighboring” events and facts.

3. Discussion

There is a relatively small amount of historiography on the system of public education in Vilna Governorate. Prior to the 1860s, the system is not mentioned even in the memorandum books. However, starting in the 1890s, along with descriptions of the education system in specific years ([O-v, 1895](#); [O-v, 1896](#); [O-v, 1898](#); [Il'in, 1905](#); [Il'in, 1905a](#)), there even emerge some real research studies on the subject. Most researchers regard as the first ever work of this kind in the pre-revolutionary period I.P. Kornilov's “The Russian Cause in Northwestern Krai” ([Kornilov, 1901](#)).

During the Soviet time, the subject was explored in the context of the history of the national republics. For instance, the subject of public education in Belarus was investigated by I.M. Il'yushin and S.A. Umreiko ([Il'yushin, Umreiko, 1961](#)). During the post-Soviet period, the subject was now investigated by scholars from two republics – Lithuania and Belarus ([Aleksandravičius, Kulakauskas, 1996](#); [Sergeenkova i dr., 2008](#); [Ershova, 2006](#)), as well as from the Russian Federation ([Korotkov, 1993](#)).

Of major significance in terms of analysis of historiography are works on the development of the public education system in other governorates, like Vologda Governorate ([Cherkasov et al., 2019](#); [Cherkasov et al., 2019a](#)), Vyatka Governorate ([Magsumov et al., 2018](#)), and Don Oblast ([Peretyatko, Zulfugarzade, 2017](#); [Peretyatko, Zulfugarzade, 2017a](#)), as well as the Caucasus ([Natolochnaya et al., 2018](#); [Magsumov et al., 2018](#); [Shevchenko et al., 2016](#)). This helps examine the issue through the prism of comparison with various regions in the country.

4. Results

The Vilna Educational District was among the first six educational districts in the Russian Empire created via Emperor Alexander I's edict of January 24, 1803 ([Imennoi ukaz, 27](#)). At the time of its establishment, the district comprised educational institutions in eight governorates: Vilna, Vitebsk, Volhynian, Grodno, Mogilev, Minsk, Kiev, and Podolia. The Major Vilna School was made the district's educational and administrative center. It would later be transformed into Imperial Vilna University via an edict of April 4, 1803.

It is worth remembering that when the Vilna educational district was created the region's system of public education featured specialized schools in the charge of the Department of Religious Affairs and major and minor public specialized schools*. As at 1803, the region's major and minor public specialized schools had 767 students, and specialized schools in the charge of the Department of Religious Affairs had 5,820 students ([Il'yushin, Umreiko, 1961](#)).

* Major and minor schools were part of the European system ([Rajović et al., 2018](#); [Rajović et al., 2018a](#); [Mamadaliyev et al., 2018](#)).

One of the first projects by the Russian Administration was the unification of schools within Vilna Governorate. Under the University Statute of 1804, within the Vilna Educational District the authorities established a set of four-grade district specialized schools, as well as one-grade and two-grade parochial specialized schools in the charge of the Department of Religious Affairs. A new reform, launched in 1828, would change the system of public education in the region. From there on out the primary education system would feature parochial and educational specialized schools, while the secondary one would include gymnasia.

In the period 1830-1831, the region witnessed a Polish uprising. The unrest involved a group of students and instructors at Vilna University, which resulted in the facility closing down in 1832 and the Vilna Educational District getting disbanded. The educational facilities were placed into the charge of the Belarus Educational District. This state of affairs lasted up until 1850, when the Belarus Educational District was disbanded as well, with the Vilna Educational District restored in its place. Over that period, the Russian Administration carried out a tremendous amount of work on training new personnel, both for the specialized schools and for Vilna University.

By 1848, the Vilna Educational District had 27 two-grade public specialized schools with 1,792 students (1,240 boys and 552 girls). There were 109 primary public one-grade specialized schools, with a combined 3,053 boys and 1,935 girls enrolled in them (Nizshie uchilishcha, 1879: 64).

By 1855, the Vilna, Grodno, Minsk, Mogilev, and Vitebsk governorates had a combined 19 five-grade and eight 8 three-grade district specialized schools, 89 parochial specialized schools in the charge of the Ministry of Public Education, 89 schools in the charge of the Department of State Property, seven specialized schools in the charge of churches representing foreign faiths, and three female schools. There also were schools in the charge of the Holy Synod.

Back to Vilna Governorate. As at 1861, the system of public education in the city of Vilna had quite an extensive network of schools (Table 1 and Table 2).

Table 1. Educational Institutions in the Capital of Vilna Governorate

	Educational institution	Number of facilities	Total number of students	
			Males	Females
	A. Institutions in the charge of the Vilna Directorate for Specialized Schools:			
1	Gymnasium with parallel classes	1	559	-
2	Reception (preparatory) class		46	-
3	Real department		80	-
4	Valuation surveyor classes		36	-
5	Progymnasium	1	260	-
	Parochial specialized schools:			
6	Ostrobramskoe	1	31	-
7	Zarechnoe	1	17	-
8	Zamkovoe	1	24	-
9	Two-grade school	1	25	-
10	Evangelical Lutheran school for both sexes	1	9	10
11	Specialized school at a foster home for both sexes	1	13	22
	B. Institutions in the charge of the Directorate of the Vilna Institute for Nobles:			
12	Institute for Nobles	1	162	-
13	Public magnet boarding school for females	1	-	51
14	Private boarding schools for females	7	-	234
15	Parochial schools for females	2	-	35
	C. Institutions in the charge of the Directorate of the Vilna Rabbinical Specialized School:			
16	Rabbinical specialized school	1	348	-
17	Former public real specialized school	1	55	-

18	First-rate public Jewish specialized school	1	70	-
19	Talmud-Torah school*	1	69	
	Yeshivas, run by:			
20	Iochelson	1	25	-
21	Margolis	1	52	-
22	Female boarding school run by Zilverovich	1	-	20
	Female schools, run by:			
23	Perel	1	-	96
24	Hermeise	1	-	60
25	Schreiber	1	-	95
26	Sabbatical festal trades school	1	-	100
27	D. Specialized school for non-resident females under the Supreme Patronage of Her Majesty the Empress Maria Aleksandrovna	1	-	89
	E. Department of Military Affairs			
28	Alexander Cadet Corps	1	383	-
	F. Institutions in the charge of the Department of Religious Affairs for those raised in the Orthodox faith:			
29	Seminary	1	182	-
30	District religious specialized school	1	125	-
31	Specialized school for the daughters of the Orthodox clergy	1	-	30
	For those raised in the Roman Catholic faith			
32	Seminary	1	118	-
33	Sunday school	1	70	-
	Total	40	3,601, including 767 females	

Note. Data from (Sbornik, 1868: 151-153).

As evidenced from Table 1, the governorate's capital, Vilna, had around 40 educational institutions with a large number of students, 3,601, i.e. an average of 90 individuals per educational institution.

To provide a general insight into the situation, let us examine it through the prism of the system of public education in the governorate exclusive of the city of Vilna (Table 2).

Table 2. System of Public Education in Vilna Governorate, Exclusive of Its Capital, Vilna, as at 1861

	Educational institutions	Number of facilities	Total number of students	
			Males	Females
	In the Vilna District			
	A. Institutions in the charge of the Vilna Directorate for Specialized Schools:			
1	Parochial rural specialized school in the estate of Pavlovo	1	27	-
2	Cheders [†] in the cities of Lida and Ashmyany and the borough of Merkinė in the Trakai District	20	73	
	In Lida and the Lida District			

* Talmud-Torah schools were Jewish religious educational institutions for boys.

† The cheder was a Jewish primary school for boys.

3	Lida three-grade district specialized school for nobles	1	41	-
4	Reception (preparatory) class		23	-
5	Shchuchyn parochial two-grade specialized school	1	32	-
6	Lida public Jewish first-rate specialized school	1	28	-
	In the city of Ashmyany and the Ashmyany District			
7	Ashmyany parochial specialized school	1	34	
8	Private female one-grade boarding school in the city of Ashmyany	1	-	12
9	Ashmyany public Jewish first-rate specialized school	1	35	-
10	Jewish private female school in Ashmyany	1	-	10
	In the city of Trakai and the Trakai District			
11	Trakai parochial specialized school	1	23	-
12	Public Jewish first-rate specialized school in the borough of Merkinė	1	23	-
	Institutions in the charge of the Švenčionys Directorate for Specialized Schools:			
	In the city of Švenčionys			
13	Gymnasium	1	130	-
14	Reception (preparatory) class		10	-
15	Public Jewish first-rate specialized school	1	32	-
	In the city of Dzisna			
16	Two-grade parochial specialized school	1	49	-
17	Public Jewish specialized school	1	27	-
	In the borough of Maladziečna in the Vileyka District			
18	Progymnasium	1	93	-
19	Reception (preparatory) class		13	
20	One-grade parochial specialized school	1	6	-
21	Public Jewish first-rate specialized school	1	12	-
	In the borough of Budslau			
22	Parochial specialized schools	1	31	-
	In the cities of Švenčionys, Vileyka, and Dzisna			
23	Cheders	33	79	
24	Talmud-Torah school	3	35	-
25	Specialized schools in state peasants' villages in the charge of the Department of State Property	28	1,249	-
	Total	105	2,127	

Note. Data from (Sbornik, 1868: 155-156).

Exclusive of the capital, Vilna Governorate had 105 educational institutions with a combined 2,127 students enrolled in them, i.e. there were 20.2 individuals per educational institution in the area. When combined with the capital, the figure would rise to 39.5. It is worth taking into account that over 30 % of the area's educational institutions were accounted for by Jewish institutions of primary learning – cheders, which each had an average of 2.8 individuals enrolled in them, i.e., in essence, these facilities provided education on an individual basis.

If we add up the numbers in Tables 1 and 2, the total number of students in Vilna Governorate in 1861 was 5,728. Given that the governorate's population at the time was around 902,000, there was one student per 174 residents. Understandably, the shares were not equal for the various estates. For instance, for nobles the figure was one to 20 (for males one to 16, and for females one to 71), and for the clergy it was one to 17 (for males one to 10, and for females one to

63). The figure was the highest with freemen and merchants – one to 12 (for males one to 22, and for females one to 9). The figure was the lowest with peasants – one to 433 (Sbornik, 1868: 158).

Following the Polish uprising of 1863-1864, which involved a group of instructors and students, the region witnessed a massive slash in the number of instructors who were Polish and Catholic. The authorities closed down the Vilna Institute for Nobles, which provided the instruction in the Polish language. The measures undertaken helped curtail the reactionary, nationalistic environment in the system of public education in Vilna Governorate. The abolition of serfdom, as well as the zemstvo self-government reform, provided a powerful impetus for the development of regions in the Russian Empire. Vilna Governorate was no exception, with its system of public education enjoying dynamic development.

Based on 1872 data, the governorate had the following educational institutions in place:

- those in the charge of the Department of Religious Affairs: two seminaries* (143 students), a district religious specialized school (110 students), and a specialized school for the female children of the clergy (94 students);

- those in the charge of the Department of Military Affairs: a cadet infantry specialized school (232 students);

- those in charge of the Department of Civil Affairs: two gymnasias (for males – 593 students, for females – 284 students), a Mariinsky higher female specialized school (274 students), a teacher's seminary (73 students), a primary specialized school at the seminary (70 students), six district two-grade specialized schools, 26 parochial schools, 331 public schools (9,807 students), five Christian private female boarding schools and schools for both sexes, a Rabbinical specialized school (transformed in 1873 into the Jewish Teacher's Institute) (414 students), 6 public Jewish first-rate specialized schools, and 12 other Jewish specialized schools. There were a total of 384 institutions, with 42 of these being in Vilna, with a total of 15,279 students enrolled in them (with 4,328 of these being in the city of Vilna) (Pamyatnaya knizhka, 1874: XVIII). The total number of students relative to the number of residents in the governorate was one to 68, or 1.45 % (Pamyatnaya knizhka, 1874: XVIII).

In 1873, the number of educational institutions increased by one to reach 385, thanks to the establishment of a progymnasium in Vilna. At the same time, the total number of students reached 15,850. The total number of students relative to the governorate's population was one to 66, or 1.48 % of the population (Pamyatnaya knizhka, 1875: XIX-XX).

By 1875, the number of educational institutions reached 397, with 44 of these being in Vilna. The total number of students reached 17,093. The total number of students relative to the total number of residents was one to 64 (Pamyatnaya knizhka, 1876: XVIII).

In 1876, the number of educational institutions dropped to total 361, with 45 of these being in Vilna. With that said, the number of students almost did not change, totaling 17,001 people (Pamyatnaya knizhka, 1877: XX).

In 1877, the number of educational institutions in the governorate continued to drop, totaling 340, with 45 of these being in the capital. With that said, there was quite a significant drop in the number of students – to 16,007 people (Pamyatnaya knizhka, 1878: XVII-XVIII). Based on data from the scholarly journal Zhurnal Ministerstva Narodnogo Prosveshcheniya, by January 1, 1878, the number of students dropped even more, totaling 14,328 people, with 13,237 of these being boys and 1,091 being girls (Nizshie uchilishcha, 1878: 53).

By 1878, the number of educational institutions continued to drop, totaling 336, with 44 of these being in the capital. The total number of students was a bit up, reaching 14,537 (Pamyatnaya knizhka, 1879: XVIII).

In 1880, the number of educational institutions dropped to 330, with 44 of these being in Vilna. The total number of students, compared with 1878, remained virtually the same, totaling 14,565 people (Pamyatnaya knizhka, 1879: XIX).

The annual figures in Table 3 can provide a better idea of the positive and negative dynamics of the development of the public education system in the region.

* One of the seminaries was Lithuanian, and the other was Roman Catholic (Pamyatnaya knizhka, 1875: XIX).

Table 3. Development of the System of Public Education in Vilna Governorate in the period 1861–1880

Years	Number of educational institutions	Number of students	Average number of students in one educational institution
1861	145	5,728	39.5
1872	384	15,279	39.7
1873	385	15,850	41.1
1875	397	17,093	43.0
1876	361	17,001	47.1
1877	340	16,007	47.1
1878	336	14,537	43.2
1880	330	14,565	44.1

Table 3 illustrates Russia’s nationwide consistent pattern with regard to a rise in the number of educational institutions. It is worth noting that in the first decade following the 1860s reforms, the governorates witnessed a major increase in the number of schools. Schools were established on a wide scale with financial support from the zemstvo self-governments, with peasants often exempted from paying for school. They were also established in a private manner, thanks to the efforts of the local clergy, without any funding provided for the purpose whatsoever (Cherkasov et al., 2019a: 422). The 1860s euphoria was followed by a period in the 1870s when running a wide network of educational institutions became financially costly to the self-governments, with a portion of the schools coming under the charge of the Ministry of Public Education and the rest having to close down altogether. The largest number of schools in Vilna Governorate opened up in 1875, which was followed by a slump. Regarding the average number of students in a single educational institution, as evidenced by Table 3, there was growth virtually throughout, with the only exception being the year 1878, when there occurred a sharp drop in the number of students in Vilna Governorate.

5. Conclusion

The system of public education in Vilna Governorate had developed markedly distinct characteristics of its own. One of these characteristics was based on the motley ethnical and confessional composition of the area’s population. As a consequence, in the period 1803–1880 the region witnessed two Polish uprisings, which would ultimately have an effect on its system of public education. At the same time, the development of the system of public education in Vilna Governorate had a set of features common to other regions within the Russian Empire as well. More specifically, there was a sharp rise in the number of educational institutions subsequent to the 1861 reform, and afterwards there was a drop in that number in the second half of the 1870s.

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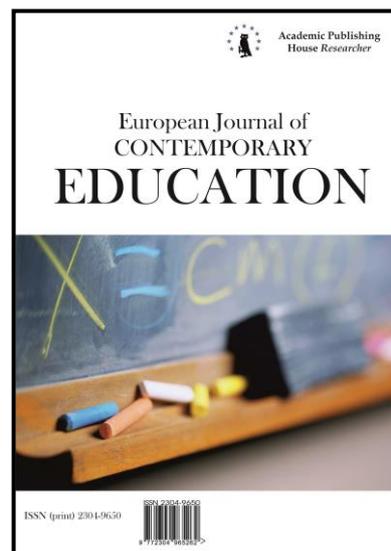
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«66 % of Literacy among the Male Population of School Age Brings it Closer to Common Education» vs «in the Largest Villages, it was Difficult to Meet a Literate Person»: the Main Statistical indicators of Primary Education among Don Cossacks in the XIX century. Part 2

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Abstract

The question about the degree of development of primary education in the Don in the XIX century remains controversial among historians. Archival documents and testimonies of contemporaries allow us to cover this question in completely different ways (both quotes in the title are taken from them). The article attempts to summarize statistical information about the development of primary education in the Don Cossack environment from 1799 to 1899. A number of myths prevalent in historiography (for example, about the significant role of zemstvos in the creation of new educational institutions in villages or about the crisis of Don education in 1880–1890) are debunked.

Keywords: history of education on the Don, primary education of the Don Cossacks in the XIX century, district schools, parish schools, parochial schools, literacy schools.

1. Introduction

“The Don Cossack Host is second to last in terms of school enrollments, and is the last one in terms of the number of schools as compared to other irregular military formations” (Nash krai, 1963: 467); “In the largest villages, even in those closest to towns and cities, it was difficult to meet a literate person” (Nash krai, 1963: 465); “The school is in the most wretched state in all respects” (Nash krai, 1963: 466). All these are excerpts from the documents featured in the milestone anthology “Our Land” (Nash krai), prepared by leading Soviet historians of Don Cossacks in 1963 (the list of authors included a number of respected researchers such as A.P. Pronshtein and I.P. Khlystov). Naturally, all the excerpts are original, but they, just like compilers’ comments do,

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reflect only one facet of reality. The authors had to pick up archival materials echoing ideological statements defined in the preface to the section “Enlightenment on the Don”: “Primary and secondary education was in a plight until October 1917” (Nash krai, 1963: 459); “The reform of public education was increasingly curtailed by the government. The reactionary steps particularly intensified in the 80s-90s” (Nash krai, 1963: 459).

On the other hand, a polar opposite trend is now taking shape to idealize the pre-revolutionary Don education. For example, a Taganrog historian, L.A. Donskova, in one of her papers, says that the stance of Soviet historians on education was not only “a tribute to the narrow, class-biased and politicized approach of the Soviet era”, but also “suffered from one-sidedness and was unable to consider multiple and contradictory aspects of the government’s educational policies” (Donskova, 2008: 133). Yet she further provides a similar one-sided and idealized picture of “the authorities and society combining their efforts in the field of education”, based on “ideas of the common good and religious virtues” (Donskova, 2008: 138). Interestingly, the modern author repeatedly refers to information from the “Our Land” anthology of documents, but interprets them in a completely different way inconsistent with Soviet researchers. For example, while the anthology compilers saw the launch of new educational institutions in 1860-1870 as a least-evil measure by the government that did provide financing for the most of the facilities (Nash krai, 1963: 458), L.A. Donskova regards this increase in primary and secondary schools as an illustration of “consolidated efforts by the Don Oblast administration, zemstvos, the public” (Donskova, 2008: 133-135).

At the same time, neither Soviet historians nor today’s researchers made any attempts to systematize even the essential statistical information on education on the Don in the 19th century. In fact, the only person who tried to act on the matter was the secretary of the Don Statistical Committee, S.F. Nomikosov, who pointed out in 1884 that the number of students in the Don region doubled in 1830-1860, grew by 6 times in 1860-1870, and only by 1.7 times in 1870-1880 (Nomikosov, 1884: 575). It is already clear from this information that a popular Soviet statement claiming that “the introduction of zemstvo institutions on the Don in the 70s also contributed to the growing number of primary schools” (Nash krai, 1963: 458), is a historiographical myth, and in the zemstvo period on the Don, the pace of opening new school actually slowed down dramatically as compared to the previous decade. For this reason, we decided to elaborate on the idea of S.F. Nomikosov, and trace how the number of schools and their students grew on the Don in the 19th century, and then, using the information gathered as a basis, to develop an understanding of the factors that actually hampered and accelerated the expansion of education.

This article is a continuation. Part I see (Peretyatko, Zulfugarzade, 2019).

2. Materials and methods

Nevertheless, certain circumstances impeded the use of this research method. First of all, the borders of the Don Host Oblast underwent major changes in 1888 as new regions – Rostov-on-Don, Azov and Taganrog – were now included in it. Moreover, the region’s territorial division was also revised, and this did not allow us to use statistics on individual districts. A solution for this problem was offered by the materials of the commission headed by Lieutenant-General N.A. Maslakovets, which investigated the causes of impoverishment of Don Cossacks in 1899. In the process, the commission collected detailed data on primary education in the Cossack community (Protokoly, 1899: 251-262). On the other hand, before 1880, when parochial and literacy schools first began to open in the Don Host Oblast, local statistical figures separately indicated the number of students and students in Cossack villages (stanitsas) and peasant schools. So, this enabled us to compare the statistical indicators we are interested in for 1880 and 1890, but exclusively for the Cossack population of the region. Considering this, we decided to limit the scope of our research in the paper, and only deliver the systematized material on primary education in the Cossack community.

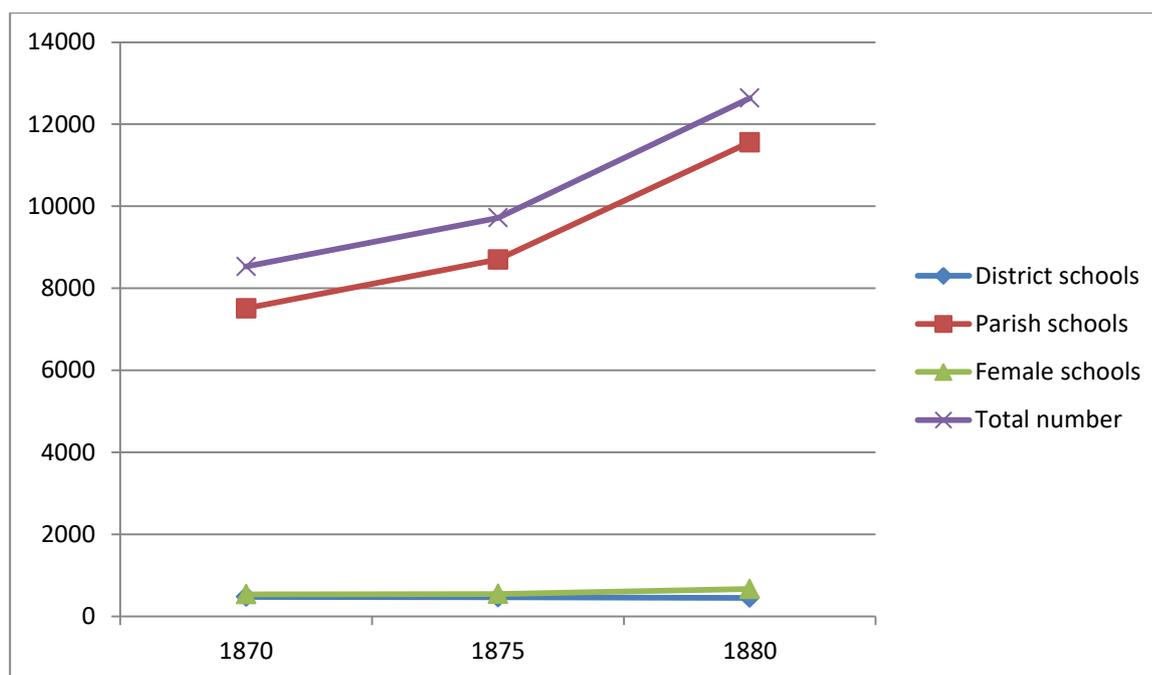
Although technically, even with this restriction, the data we used was not quite comparable. We know how many children attended stanitsa schools for the most of the 19th century. However, we have precise information that the schools taught not only Cossacks but children from other estates as well although their number was insignificant (for example, in early 1860, 7 serf peasants, a few dozens of clergy and merchant children took a training course there) (Krasnov, 1863: 401-403). On the other hand, a part of Cossacks could study in rural schools. Reviewing the year of

1890, we, on the contrary, knew how many Cossacks studied in primary and secondary schools, but we have no data what proportion of them received education outside stanitsas. In any case, the number of students in primary schools specified in official statistics was approximate. In 1896, a contemporary gave the following description of the situation in Don rural schools: “In September, the school accepted 12, in October – 15 and in November – 24 students, more students were also brought in December and in January, but 20 students stopped going to school from mid-March, and another 15 in April” (Po voprosu..., 1896: 4). It is obvious that in this context the number of students reflected in the documents depended to the great extent on the counting method. Moreover, throughout the 19th century, Don officials and scholars complained at the outrageous inaccuracy of absolutely any official numerical data. Here is what K.A. Kartushin, an employee at stanitsa boards of the Ust-Medveditsky district, wrote about this: “Data is not collected based on any rational program but often fabricated to only show modifications in the data already available at hand and of the same value and origin” (Protokoly, 1899: 156). For this reason, the inaccuracy and crudeness of information we provide here would be inevitable even if the borders of the Don Host Oblast remained the same, and we had homogeneous material regarding the number of students in stanitsa primary and secondary schools or on the number of Cossacks who received primary education over one hundred years. And yet this does not downgrade the statistics we systematized. In 1902, the head of the Main Directorate of the Cossack Hosts, P.O. Shcherbov-Nefedovich, when found himself in a similar situation, wrote to the Minister of War in the preamble to the document prepared by him: “Some of the statistical tables enclosed in this report should only be considered approximately correct” (RGVIA. F. 330. Op. 61. D. 1861. L. 30b). The same refers to the diagrams that we created as they contain only rough figures but reflect general trends in the progression of Don education, and although with inaccuracies in Don statistics, specific numerical values can vary greatly in them from the actual ones, in most cases variances in these values by 10–20% will not affect the general trends and patterns we have identified.

Speaking of the materials that constituted the basis of our paper, in this case, we preferred to use, if possible, testimonies and accounts of people related to Don education, rather archival sources. The fact is that most of these people (for example, S.F. Nomikosov, S.S. Robush, Kh.I. Popov) often tried to explain the data quoted by providing important information and valuable insights. Since the information is often unknown even in the scholarly community, and some of the texts on Don education, published in the late 19th century, are not analyzed or relied on by researches, we will extensively leverage from the historical descriptive method. The methods of historical comparison and historical systematization will be instrumental in drawing general conclusions and summaries on the trends in the development of the Don education.

3. Discussion and results

And indeed, in the 1870s, the Don education was stuck in the next phase of the stagnation, and, moreover the spread of education not only slowed down after the above boom, but was restrained by external factors. We have seen that the growing number of students in the 1860s was ensured with the help of parish schools that were financially supported by stanitsas. However, in 1870, the Host authorities decided to transfer a number of expenses, which were earlier covered by the Host treasury, to stanitsa budgets, and the measure was implemented several times in the next two decades (Protokoly, 1899: 104). Interestingly, in 1899, the disastrous line of action for the Don education was highlighted by Minister of War of the Russian Empire A.N. Kuropatkin himself. Here is how he described the situation: “Literacy is declining in the Don <Host>. They are asking to allocate subsidies from the Host budget. Stanitsas’ money is spent on accoutrements for Cossacks” (RGVIA. F. 330. Op. 61. D. 2109. L. 95). S.F. Nomikosov noted that by the early 1880s, primary and secondary schools in the Don Host Oblast were “packed with students and students to bursting”, and “the number of those who wanted to receive primary education rose from year to year” (Nomikosov, 1884: 579). Below are given diagrams for these years based on S.F. Nomikosov’s data (once again, they are somewhat at odds with the information provided by S.S. Robush and “The memorial book of the Don Host Oblast”, which we used before, but since we are interested in dynamics, we tried, if possible, to pick up data for one diagram from one source).



Source: [Nomikosov, 1884: 576-577](#).

Fig. 1. Dynamics of the number of students in Cossack schools in the Don Host Oblast. 1870-1880

The [Figure 1](#) clearly shows that the expansion of school education in the first half of 1870 slackened not only as compared with the boisterous five-year period from 1860 to 1865, when the number of students in schools went up by more than 5,000, but also as compared with the five-year period from 1865 to 1870, when the similar growth was about 1,500. In 1870-1875, the increase only slightly exceeded 1,000. However, the second half of 1870 signaled some improvements in the situation, even despite the Russian-Turkish war of 1877-1878. The absolute growth recorded at the time (almost 3,000 people) was second only to the period from 1860 to 1865. We should yet note that just in 1880, according to S.F. Nomikosov, in addition to one-class parish schools that functioned exclusively in Cossack stanitsas, 15 two-class parish schools began to operate, of which 3 were located in peasant settlements. Although we have no precise data on the number of students in the schools, the figure can be estimated at several hundred people (in total, 15 two-year schools taught 1,613 children, and, accordingly, if we take the average figures, 3 such facilities should have around 332 students ([Nomikosov, 1884: 574-577](#)). However, even with this correction, it is obvious that in 1875-1880, the region managed to exceed the growth of school enrolment rates characteristic of the previous decade.

This, probably, should be attributed to the activities of the zemstvo bodies on the Don, which were introduced only in 1876. At the time, a familiar contradiction (we know well from previous periods) became distinctive – instead of facilitating the natural development of education in the Cossack environment (and it had appropriate prerequisites for this, as we showed above), the zemstvo authorities tried to accelerate the process by dramatically increasing allocations for educational institutions, and the funds for their operation were again collected from Cossacks. Here is a citation of N.A. Maslakovets on the state of affairs: “The Khopersky district assembly, despite very disadvantaged economic circumstances of the local population, expands the budget to a hundred thousand rubles for no imperative reason; moreover, despite the relatively efficient financial arrangements made for the public education in the district, it allocates 30,000 rubles for the same project” ([Maslakovets, 1880: 41](#)). As he noted, in the end this measure simply led to the refusal of the Khopersky district Cossacks to pay zemstvo duties ([Maslakovets, 1880: 41](#)). With his staunch conservative views, N.A. Maslakovets cannot be considered an absolutely reliable source in this regard; however, we uncovered complaints in the State Archive of the Rostov Region, executed by stanitsa assemblies that “zemstvos will inevitably bring well-off citizens into extreme poverty, and consequently, Cossacks would be much better able to maintain their life and material standing

without zemstvos" (GARO. F. 301. Op. 10. D. 85. L. 29-29ob.). Ultimately, the zemstvos' attempt to speed up the development of the Don education, contrary to the logic of events, ended in failure: despite the fact that the existing schools were "packed with students and students to bursting", Cossacks did not want to pay additional charges, imposed by zemstvos, to start new schools. So, the administrative bodies were closed down in 1882 (Volvenko, 2003: 51).

If we look back at the last diagram we analyzed, we can see that in terms of the education structure, the 1870 situation continued the trends of the previous decade. The number of students in district and female schools achieved stability for a while. The overall increase in the number of Cossack children receiving primary education was still driven by parish schools. However, as a reminder, by 1871 the total number of schools had reached 154 in the Don region. Meanwhile, there were only 121 stanitsa in the Don Host Oblast even in 1899 (Maslakovets, 1899: 42). So, by 1871, the majority of stanitsas were covered by a network of parish schools. This inevitably hampered the growth of the school infrastructure, and the number of the educational facilities increased only from 154 to 170 (excluding 3 schools in peasant settlements) from 1871 to 1882 (Nomikosov, 1884: 574-577). We can see that the pace was even slower than in 1866–1871 when the number of schools went up from 123 to 154 in half the time. It was evident that by the late 1870, the Don education should be redefined and leap to the next level of quality, similar to the one which it was organized in early 1860, while zemstvos could only offer quantity by increasing the funding for education needs. Moreover, as we showed above, the general financing of stanitsa schools worsened significantly from 1870, because the possibilities of stanitsa capitals were lessened in this regard.

Despite the background, the leap was still implemented, but its core was formed by literacy schools and parochial schools subordinate to the clerical administration. Based on the data from S.F. Nomikosov, first such facilities were opened on the Don in 1880, but even in 1882 there were only 18 such schools, both in Cossack and peasant districts, with 1,112 students (given the fact that the statistician wrote about "peasant literacy schools", the contingent was mainly represented by peasants) (Nomikosov, 1884: 575-577). The secret of the subsequent growth of the number of such educational institutions and students in them can be revealed in the materials of N.A. Maslakovets' commission. Kh.I. Popov, a renown expert in the Don local history of the late 19th and early 20th centuries, reported to this commission that parochial schools, unlike the schools, managed by the Department of Public Education, enjoyed no fixed funding, but were "left solely to the discretion of the department responsible for them and local communities and charitable institutions" (Protokoly, 1899: 259). According to his estimates, an average parochial school (including two-class schools) received 212 rubles per year, with around half the sum donated by local donors, and another quarter provided from the churches' own income (the remaining quarter was paid by the Holy Synod) (Protokoly, 1899: 260). For comparison, in one-class parish schools, personnel alone were paid 460 rubles each year (Protokoly, 1899: 252). Therefore, when in the 1880s, the Don region saw parochial schools establishing on a massive scale, the process was not checked by the financial capabilities of stanitsas and the Host. Cossacks only paid donations they could afford, and the primary funding was provided by the Russian Orthodox Church.

According to the protocols of N.A. Maslakovets' commission, parochial schools, being far from ideal, were able to partially meet need for education in the Cossack community. Another commission member, I.G. Folimonov even proposed that the entire responsibility for primary education on the Don should be handed over to the clergy in order to mitigate the discord between parochial schools and schools of the Ministry of Public Education (Protokoly, 1899: 262). However, as time passed, parochial schools faced increasing hardships in performing their functions at a minimum satisfactory level because they had to operate in the conditions of desperate shortage of funds. By the end of 1890, they survived only thanks to the initiatives led by the local diocese and civic courage of the clergy. Kh.I. Popov wrote that priests managed parochial schools and taught there the Law of God totally free of charge and, despite this, most of them "conduct their mission with zeal" (Protokoly, 1899: 260). Teachers in parochial schools were paid much smaller salaries than their colleagues in the schools run by the Ministry of Public Education, and deacons and psalm readers who graduated from the seminary were required to teach without any payment at all (we should note that Kh.I. Popov already did not speak of any "zeal" in this category of teachers) (Protokoly, 1899: 260). On the other hand, part of the funding allocated for the operation of the district and military inspections for parochial schools was actually transferred to schools in khutors (on the Don, new settlements, which had detached themselves from stanitsas) and stanitsas, in the

form of annual allowances (4,600 rubles per year) and, in addition, as one-time payments in case a new school was opened (from 8,000 to 12,000 rubles) (Protokoly, 1899: 260). Moreover, the diocesan authorities required that churches annually donate 44,000 rubles to support schools on top of the statutory 26,000 rubles paid from their incomes. As a result, this only allowed the schools to make ends meet in the teaching costs, but many parishes did not have even enough money to maintain church buildings (Protokoly, 1899: 260). With all their sympathy for parochial schools, Cossacks, because of quick impoverishment, found it increasingly difficult to pay the much needed voluntary donations to the schools, and the diocesan authorities ran out of resources to help these educational institutions (Protokoly, 1899: 260).

It is clear that in this context collecting accurate and reliable statistics on parochial schools was a matter of the low priority to their administrations. This might explain why the Don statistical editions of the 1880s (first of all, in “The memorial book of the Don Host Oblast”) informed only of the total number of students in the region without specifying their place of study and estate. In all probability, even the archives preserve no exhaustive information on the state of education in Cossack and peasant communities in the Don Host Oblast in the years – while the Ministry of Public Education differentiated stanitsa and rural schools, the church authorities did not. Therefore, we will review the period from 1880 to 1890, and up to 1895, inclusively, without creating diagrams similar to those provided above, relying on fragmentary statistics.

In the 1880s, parochial schools expanded even more intensively on the Don than parish and rural schools in the 1860s. While in 1882, as we showed above, there were 18 such schools with 1,112 students, by 1890, the number reached 350 (126 parochial schools and 224 literacy schools) with 10,248 students (Po voprosu..., 1896: 3)! This time, the rate of opening new schools continued longer than ever before as there had been already 553 parochial schools by 1894 that were attended by 17,616 people (On the subject ..., 1896: 4). By 1895, the church authorities succeeded in launching schools not only in each stanitsa, but also in each parish except for the two newly established church territorial units (in 1894 and in January 1895) (Otchet, 1896: 3). And again, schools were set up through grass roots initiatives as common people were interested in them. So, while in the 1850s, private teachers were hired in major stanitsas, in the 1890s, they were already invited to small khutors that had no even parochial schools (Protokoly, 1899: 261). However, such khutors lacked money to establish full-fledged educational facilities in line with the Ministry of Public Education standards: inhabitants could only afford to pay a teacher a monthly salary of 30-40 rubles (Protokoly, 1899: 261). As for the church authorities, they had no resources to open literacy schools in each khutor, and therefore, by late 1890, the existing educational facilities continued to be “excessively packed with students”, just as in the early 1880s (Protokoly, 1899: 261). Contemporaries noted with regret that the growing number of schools still failed to keep pace with the growing population, and the number of children who did not receive primary education only increased every year (from 145,556 in 1891 to 145,871 in 1895; however, we see below, the share of such children steadily declined) (Po voprosu..., 1896: 4).

Here, however, we should provide one more fact. From the 1870s to 1890s, the Don population was refilled largely through migrations from other Russian governorates. According to the calculations of a modern historian, M.V. Alyaev, between 1860-1870, the Cossack population grew by 1.56 % per year, and the non-resident population by 13.92 % per year (Alyaev, 2005: 38); for the period from the 1880s to the 1890s, he measured an annual growth at 1.77 % for Cossacks and at 7.44 % for peasants, both local and non-resident ones (Alyaev, 2005: 45). As a result, there was a gap between the rapidly rising number of schools and the growth of the population that was replenished only because of the inflow of migrants from outside. We will show below that the situation was noticeably better in Cossack stanitsas, and the improvement fell on the period from 1880 to 1890.

As for the relative figures, we have already written that the information, given by S.F. Nomikosov in 1870, indicated 11.2 % of boys and 2 % of girls who studied on the Don. Using simple calculations based on the primary statistics provided by him, we found out that in general the share of children who went to school was 6.7 % in the Don Host Oblast (Nomikosov, 1884: 578-579). By 1880, this proportion increased, but only slightly, to 9.3 % (Nomikosov, 1884: 578-579). Meanwhile, in 1890, according to the records of the Don diocesan authorities, the proportion of students reached 18.7 % of the total number of Don children, and by 1895 approached 23.2 % (Po voprosu..., 1896: 4). However, S.F. Nomikosov apparently overestimated the proportion of children

in the general population, taking the figure almost equal to 20 % in his calculations (Nomikosov, 1884: 578), while other authors considered it not higher than 9 % (Protokoly, 1899: 261). Perhaps, this is way a leap in the share of students in 1880 was not that impressive.

In any case, the results achieved disgruntled Don educators and officials in education. We quoted A.N. Kuropatkin as saying that “literacy was declining in the Don Host” in the 1890s. Although the Minister of War obviously exaggerated and dramatized the situation, his account was grounded not only on the fact that in absolute numbers the share of non-educated children increased on the Don. He cited statistics on other Cossack Hosts, which suggested that by 1897, 64 % of school-age boys attended school in the Urals Host, 75 % in the Orenburg Host, and the Kuban Host could announce that it had achieved universal education (RGVIA. F. 330. Op. 61. D. 2109. L. 95). In the circles of the Don clergy, it was rumored in the 1890s that the neighboring Kharkov and Voronezh governorates were ready to introduce compulsory education (Po voprosu..., 1896: 1). It is clear that in this background, the 23.2 % of the schoolchildren reported by the diocesan authorities could not be considered as a good performance indicator.

For this reason, when in 1899, N.A. Maslakovets' commission was created to identify the root causes of the impoverishment in the Don Cossack community, its members underlined the need to achieve “general male literacy” at least in the group of the Cossack population (Protokoly, 1899: 251). Data on education levels in stanitsas was collected by the commission specifically to understand how serious steps should be taken to achieve the goal. A comparison of the data with the information for 1882, provided by S.F. Nomikosov, suggests that in 1880-1890, the reach of primary education enhanced dramatically in the Cossack community. Over the period, the array of primary schools administered by the Ministry of Public Education more than doubled in stanitsas – from 170 to 368 (Protokoly, 1899: 251). Even the number of parish schools (that were already numerous enough) increased substantially (from 165 to 259). However, we would first emphasize the opening of many relatively rare educational institutions such as female schools (61 vs 14), and private schools (240 vs 14) (Nomikosov, 1884: 574-575; Protokoly, 1899: 250). The number of Cossacks who studied in schools of the Ministry of Public Education grew from 12,638 to 24,235 (Protokoly, 1899: 251). But even a more significant contribution was made by parochial schools, improving quantitative indicators on the Cossack primary education. According to Kh.I. Popov, the number of such schools in Cossack stanitsas reached 555 (171 parochial schools, 307 literacy schools and 77 female schools), and the facilities taught 18,576 people (Protokoly, 1899: 259)! As we can see, with selfless devotion shown by the Don priests and efforts of the diocesan authorities, the parochial primary education on the Don almost closed the gap with the secular education, and even surpassed it in the number of schools in less than two decades after it appeared. Hence, from 1882 to 1899, the total number of primary and secondary schools improved from 170 to 923 in stanitsas, and the number of students from 12,638 to 42,811. It is easy to see that in the long term, abolishing Don zemstvos not in the least slowed down the spread of primary education in the Don region, but on contrary the parochial version of the education, thanks to its cheapness and accessibility in small khutors, proved to be much more efficient than the zemstvo project.

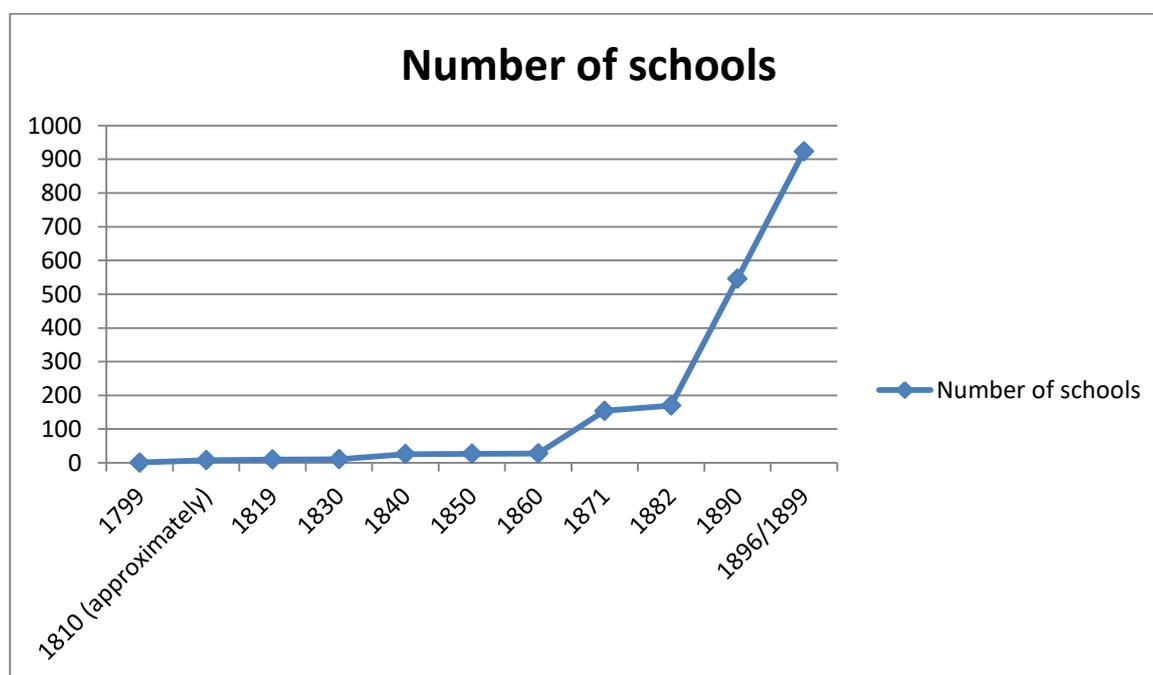
As a result, when N.A. Maslakovets' commission presented its findings on quantitative indicators on the Don Cossack primary education, the figures were unexpectedly most favorable. The commission evaluated that 67 % of boys and 22.2 % of girls of the Cossack estate studied in primary schools (Protokoly, 1899: 259). However, since the exact number of Cossack children was unknown to the commission, the figures were an approximate estimate. If they used S.F. Nomikosov's counting method, the data would have been much worse, namely it reflected that the primary education was received by 31 % of boys and 10.75 % of girls (as a reminder, members of N.A. Maslakovets' commission took the percentage of children was 9 % in the total the population, while S.F. Nomikosov – almost 20 %). This is another example illustrating that it is a great challenge to uncover any reliable absolute figures when studying the Don education.

In any case, members of N.A. Maslakovets' commission firmly believed that the level, at which most Cossack boys received primary education, had been successfully passed by 1899. One of the commission members, A.S. Yezhov, commented the conclusions: “66 % of male literacy among the school-age population brings it closely to general education so that we can consider that the population's need for it has matured, and only the lack of the adequate number of schools prevents the entire male population of school age from learning” (Protokoly, 1899: 251). However, the commission members argued that to promote further progression of the primary education,

Cossacks needed government support more than ever before. Schools were to be created in relatively sparsely populated areas of the Don Host Oblast, since densely populated areas already enjoyed the facilities; meanwhile, the poverty of the Cossack population worsened to such grinding levels that it was unable to endure new expenses on education (Protokoly, 1899: 252). Consequently, the last remaining internal resources of the population, Cossacks' willingness to study and the enthusiasm of the church authorities, having played their positive role in the Don education in 1880-1890, were now depleted, and the Don education was to face another period of stagnation unless it received any help from the state. And in his final report, N.A. Maslakovets formulated one of the points as follows: "The Commission stated the opinion that it is essential to employ all sorts of levers and practices to satisfy the needs, which are taking shape in the minds of the Cossack population, in the universal primary education for all of them" (Maslakovets, 1899: 101).

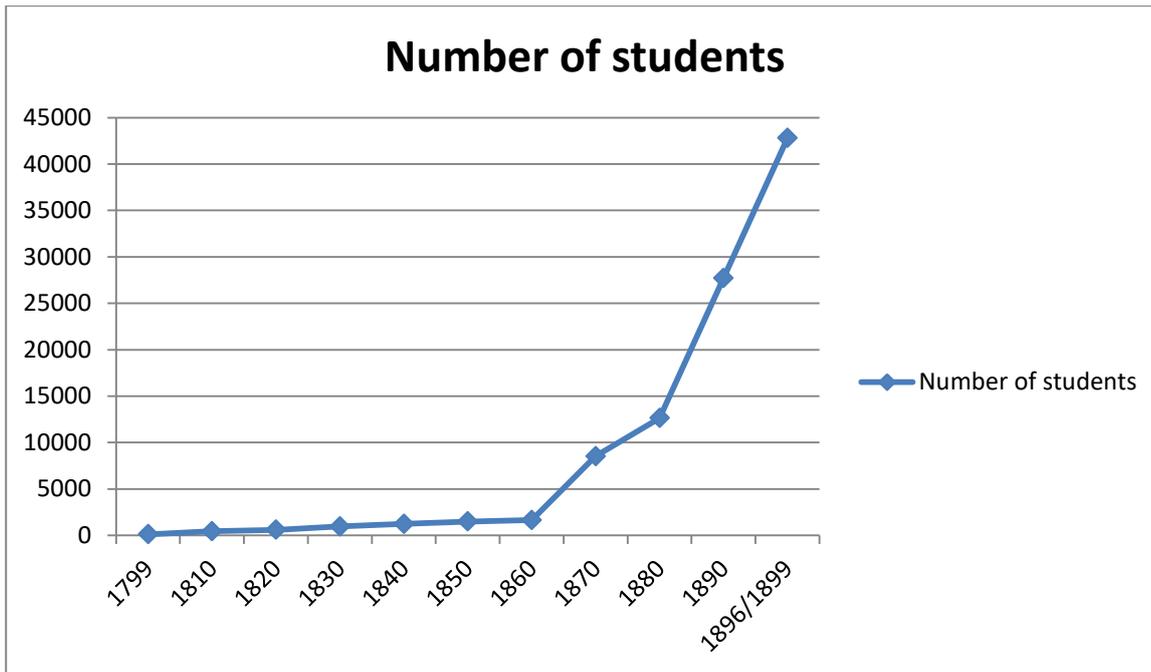
4. Conclusion

Summing up the points detailed in our paper, we would like to present two diagrams to readers to summarize the above statistical material.



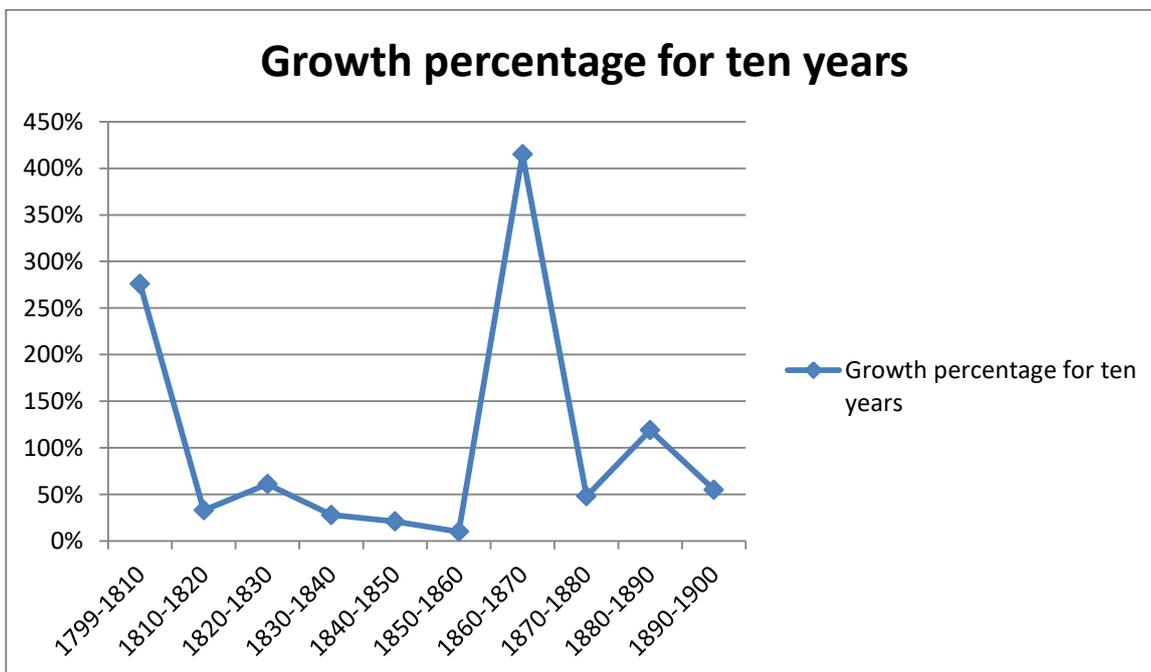
Note. For 1890, we took the arithmetic average between 1882 and 1896/1899, because there is no data available for the period, and we proceeded from this starting point only to maintain the scale in the diagram.

Fig. 2. Dynamics of the number of Cossack schools in the Don Host Oblast. 1799-1900



Note. For 1890, we took the arithmetic average between 1880 and 1896/1899, because there is no data available for the period, and we proceeded from this starting point only to maintain the scale in the diagram.

Fig. 3. Dynamics of the number of students in Cossack and parochial schools in the Don Host Oblast. 1799-1900



Note. The data for 1880–1900 are very approximate, as they are calculated on the basis of the arithmetic average for 1890.

Fig. 4. Dynamics of the number of students in Cossack and parochial schools in the Don Host Oblast. 1799-1900 (relative indicators, growth percentage over a decade)

The diagrams show that in absolute figures, the primary education developed in the Don Cossack community continuously throughout the 19th century. However, the development can be

precisely divided into two periods. In 1799–1860, both the number of schools and students in Cossack stanitsas grew at a very slow pace; schools existed only in district centers and major stanitsas, and as a result the documents in this and in the beginning of the next period gave rise to claims, popular in the Soviet historiography, that “In the largest villages, even in those closest to towns and cities, it was difficult to meet a literate person”. However, in 1860, the situation turned for the better. The period from 1860 to 1899 was characterized with a rapid growth in the number of both educational institutions and Cossack children who attended them. An indicative statement expressed in the Soviet historiography saying that, as it were, in the counter-reform period, in 1880–1890, “the reform of public education is increasingly curtailed by the government” turned out to be a historiographic myth as it was in these decades when more schools were opened than ever before, and the number of schoolchildren grew most rapidly in absolute terms. The situation in the Don education rather confirms the concept of a Rostov historian, R.G. Tikidzh'yan, proposing to consider the years from 1861 to 1905 as a single period of the Don Cossack modernization (Tikidzh'yan, 2016: 102-103).

If we look at the relative growth rate, we will see that each of the periods in the Don education development in the 19th century consisted of several stages, with periods of stagnation followed by the rapid growth in primary schools and students. Below we will try to provide a description of each of the stages.

1) 1799–1805. This time brings about the launch of first schools outside Cherkassk, and the event was facilitated by the activities to spread literacy rolled out by enthusiastic priests and policies of the Don atamans in the 18th century. Although the number of Cossacks wishing to study in the early 19th century seemed not to be too big, there were already enough of them to ensure the normal functioning of schools, at least in large administrative centers. Considering this, it is clear why *uezd* and “*uezd-style*” schools become the main type of primary school at the time. The number of schools and pupils increase by several times, but the increase is insignificant in absolute figures – we speak about the opening of individual schools and several hundred students in them.

2) 1805–1815. New schools continue to be started, but the number of students goes down (a unique situation for the period under review). Logically, the situation was pre-determined by the Napoleonic wars when a significant part of the male population was conscripted.

3) 1815–1835. The first period of relative stagnation in the Don education. Almost no educational institutions open, and the number of students grows by 100–200 people over the five-year period, and this is slower even in absolute terms as compared with the 1799–1805 period. Moreover, the growth rate slows down every five years, and we can speak of a visible crisis in primary schooling. Apparently, the crisis gradually developed as *uezd* schools depleted its capabilities. It was inconvenient for most Cossacks to take their children to study in remote administrative centers, parochial schools were scarce, and the number of students was insignificant there. Although the authorities did not object to the opening of such schools, there were practically no community initiatives to this end; sometimes the new schools had to close as Cossacks were unwilling to support them.

4) 1835–1839. This period marked a sharp increase in the number of parish schools initiated from the top, and they became the main educational institutions of primary education for the Don Host. Although the number of students indicated only a slight growth, the period created prerequisites for its further improvement.

5) 1839–1861. For the first time in the history of the Don education, stagnation resulted from the wrong policy of the imperial government. Cossacks demonstrated a stronger desire to study, but very few schools were opened, first because of the policy on Don Cossacks, pursued by Nicholas I, and later because of the bureaucratic complexity that made it very difficult to establish new schools. At the same time, Don Atamans M.G. Vlasov and M. G. Khomutov seemed to sympathize with the idea of enlightenment, and created the foundation to further accelerate the development of primary education. In particular, as early as in 1859, they raise the issue of teacher training for future schools, and in 1860, M.G. Vlasov petitioned to grant “permission to establish male and female schools in all stanitsas and populous settlements”.

6) 1861–1866. The time of the most rapid expansion of the Don Cossack primary education, estimated in relative numbers. In the previous five years, the number of students increased by 100–200 people, but now it grew by more than 5,000! Perhaps this is the only period when we can

speak of synergies between all stakeholders when “the authorities and society combined their efforts in the field of education” – stanitsa assemblies repeatedly requested the Host ataman to open new parish schools, and the Host authorities encouraged the process as much as possible by simplifying bureaucratic procedures and arranging training courses for teachers.

7) 1866–1884. However, this improvement did not last long. In the second half of 1860, Cossacks show weaker interest in developing education – it is obvious that schools already functioned in large stanitsas, and the process of starting new ones slowed down noticeably. On the other hand, since 1870, the Host authorities begin to gradually build up financial pressure on stanitsa budgets, handing them over more and more former host expenditures. Eventually, when by the second half of 1870, existing schools were overcrowded, stanitsas simply did not have enough money to open new ones. From this point on, the prevalence of those who wanted to study over the number of places available in schools becomes the norm for the Don. The introduction of zemstvos, contrary to the Soviet historiography, contributes almost nothing in the progress of education, but aggravates the financial plight: zemstvos make efforts to raise charges levied from Cossacks for school maintenance, and this leads to the closure of the zemstvo bodies.

8) 1884–1899. A partial solution for the situation was the opening of parochial schools that were mainly operated at the expense of voluntary donations and church authorities. With the affordability of such schools for the population, it became possible to establish them even in individual khutors, and the number of students in absolute figures grew more quickly than ever. Still, even the contemporaries, who sympathized with parochial schools, refused to recognize their operation as normal – in fact, the schools owed their existence only to the enthusiasm of the local diocese and priests who made great sacrifices for the sake of education. By the end of the century, the densely populated areas in the Don Host Oblast were fully covered by a network of schools, but the diocese and the population had no more resources, and creating new schools became impossible in less populated areas unless the government offered help.

The facts we gave above allow us to suggest that most concepts, prevailing in the Don historiography (about the major role of zemstvos in developing primary education on the Don, about a decline in education in 1880–1890, about the continuous fruitful cooperation between the authorities and society in education, etc.), disagree with the statistics that survived to the date. Moreover, the idea of small number of schools and students in the Don Host Oblast also should be corrected. If we take only the Cossack population, the proportion of students among the Cossacks of school age, calculated by N.A. Maslakovets’ commission in 1899 (66 %), almost corresponds with the figures on other Cossack Hosts given in the same year by A.N. Kuropatkin (64 % for the Ural Host and 75 % for the Orenburg Host). Even if members of N.A. Maslakovets’ commission gave a somewhat idealized representation of the situation, it is obvious that problems with attending schools mainly concerned the non-Cossack population of the Don Host Oblast, which rapidly increased, and providing an adequate number of educational institutions for the category was difficult for objective reasons. On the other hand, some important facts (for example, the role of the church in developing education or the impact of prosperity levels of Cossacks and the state of stanitsa budgets on the development) have remained unexplored so far. To turn around the situation, historians should shift from ideologically biased concepts and refer not only to individual documents and accounts of contemporaries, but to their total range that should be reviewed using a systematic approach, without picking up individual statements that confirm the a priori chosen concept.

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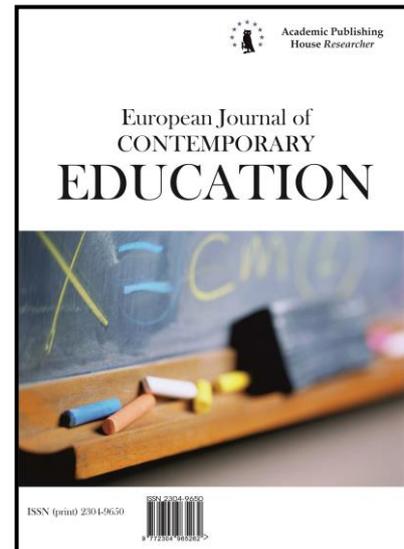
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Implementing a Value-Oriented Approach to Training Law Students

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Abstract

This paper explores the potential for implementing a value-oriented approach in legal education. The authors share their findings from a pedagogical study conducted at Sumy State University, which was designed to test a set of learning methodologies aimed at cultivating in law students a set of skills of critical, value-oriented thinking and legal reasoning, with a focus on the ability to weigh values and balance interests. In addition, there was an objective to assess the effect of these methodologies on the development of a set of personal value-based guideposts for students that are crucial to the successful effectuation of the actual mission of the legal profession. Among the most efficient methods for achieving the above objectives were case study analysis and business simulation games (mock legal debates), as well as value-based analysis of regulatory and administrative documents. The authors draw the conclusion that the use of a value-oriented approach in modeling particular legal cases can be effective for fostering a lawyer's ethical culture, help facilitate boosts in the significance of key values in legal practice, and help develop proper ethical mindsets, while also helping one acquire relevant knowledge, with a focus on cultivating appropriate professional competencies.

Keywords: value-oriented approach, value-based education, legal education, European Union values, tolerance, justice, value-based legal reasoning, competence.

1. Introduction

For the most part, Ukraine's current system of vocational training for lawyers does not meet the needs of legal practice and the labor market – nor is it aligned with the government-declared objectives of ensuring the rule of law, respect for human rights, and respect for a person's life,

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health, honor, dignity, privacy, and security, as the highest social values, as well as the objectives of the strategy for integration into the European legal space.

As evidenced by an OSCE report on the state of legal education and science in Ukraine, since it became an independent nation its system of legal education has never been truly reformed in keeping with changes in political, legal, and socio-economic priorities – either formally or substantively (Stan yurydychnoi osvity, 2011: 25). Existing approaches to the vocational training of lawyers have more than once been the object of criticism on the part of leading legal experts and practicing lawyers. Some of the key issues include substantively imperfect curricula, the educational process being oriented toward the acquisition of knowledge of existing legislation rather than the actual competencies crucial to adapting to the changing professional environment, an excessive focus on theory as opposed to practice, the absence of an effective internal system of assessing the quality of education at universities, and errors in decision-making regarding the formation of the teaching staff team (Bostan, 2016; Horodyskyi, 2017; Melnyk, 2013).

It should be noted that a few steps in the direction of improving the situation have already been taken. More specifically, in 2018 the government signed into law the Higher Education Standard on Specialty 081 (Law) for the first (Bachelor's-degree) level of higher education. On the one hand, this standard provides universities with significant freedom in designing curricula, while, on the other hand, it clearly defines the list of competencies for a graduate (Standart, 2018). To help assess bachelor's students' preparation levels, there are now in place Master's entrance exams designed based on external independent testing technology, which include tests in a foreign language, law, and general academic legal competencies. The Ministry of Education and Science of Ukraine, jointly with the Ministry of Justice of Ukraine, has prepared the Draft Concept on the Reform of Legal Education (Proekt Kontseptsii, 2019), which currently is the subject of keen discussion among members of the academic and professional communities.

Among the key objectives for reform of legal education are optimizing the content of educational programs, boosting their practical orientation, systemically engaging practitioner lawyers in teaching law, implementing cutting-edge learning technology, raising the requirements for evaluating the outcomes of learning, and ensuring the academic integrity of students and instructors. At the same time, in the context of the changes being sought, there is currently a lack of attention devoted to the value-based aspects of legal education. Legal education and law-enforcement practice in Ukraine are still bearing the imprint of Soviet legal thinking, which tended to prioritize the law over values such as the rule of law, freedom, justice, and respect for human dignity.

Over the past two and a half decades, the Ukrainian government has passed a significant number of laws that are based on European standards in the area of human rights, fight against corruption, good governance, democracy, and justice. However, this has had an insufficient regulating effect on practice. The ineffective implementation of best European practices has been caused by a plethora of political, social, cultural, and other factors. Among other things, this situation has been caused by a mismatch between the challenges facing Ukraine today and the nation's stereotyped attitude toward the law and human rights, with the country's government policy and legal mechanisms for implementing it being grounded in inadequate values. Equating law as a social regulator with regulatory prescriptions issued by the government, ignoring human rights and liberties while seeking to achieve the objectives set by the state's law-enforcement machine, and perceiving representatives of the legal profession (with many not minding being regarded as such) as mere cogs in the penal machine, rather than as specialists who can help people defend their own interests – these are just some of the deformations of legal consciousness and legal culture inherited by Ukraine from decades of the hegemony of Communist ideology.

These negative phenomena could be overcome only by altering existing value-based orientations in society as a whole – most importantly, the values underpinning legal education and law-enforcement practice.

The above-mentioned Draft Concept on the Reform of Legal Education (Proekt Kontseptsii, 2019), just like a number of other policy documents that preceded it, points to the need to cultivate in future legal experts an understanding of the fundamental role of lawyers in reinforcing the rule of law through the protection of human rights. What needs to be established is what methods to use to achieve this understanding and how it will be translated into law-making and law-enforcement activity, which may require thorough and careful consideration. Moreover, it is quite

obvious that a competent specialist who knows how to use the legal instrumentarium and is perfectly aware of the powerful effect of law on the life and well-being of various individuals may utilize law not for the purpose of serving people and the ideals of justice but for nefarious purposes or to accommodate the misguided interests of the government.

Similar challenges have faced not just Ukraine but other nations in the post-Soviet space as well. In particular, researcher J. Bieliauskaitė has spoken of similar issues in the Lithuanian system of legal education. The scholar has noted that the aspects of value-oriented education are still reflected in law curricula in Lithuania insufficiently today, with most programs dominated by an instrumental approach to law and legal education. This shortcoming in the nation's system of legal education is one of the factors behind negative public opinion about the professional activity of lawyers and public distrust of legal institutions in Lithuania (Bieliauskaitė, 2013). The need to mainstream the axiological foundations of legal education has been stressed by a number of Russian scholars as well (Artem'eva, 2018; Sablin, 2012). Traditionally, leading Western systems of legal education have devoted a significant amount of attention to cultivating not only the professional abilities of a legal expert but an orientation toward values in alignment with societal needs. With that said, the quest for more effective models and methodologies for achieving these objectives carries on today (Gerst, Hess, 2009; Whitecross, 2016).

Given the above, the authors tested a set of learning methodologies aimed at cultivating in law students the skills of value-oriented thinking and legal reasoning, based on weighing values and balancing interests in working on the factual circumstances of legal cases and determining which norms and principles may be applied to those circumstances. In addition, there was an objective to assess the effect of these methodologies on the development of a set of personal value-based guideposts for students that are crucial to the successful effectuation of the actual mission of the legal profession.

2. Materials and methods

The study's theoretical basis is grounded in works related to the use of a value-oriented approach in higher-education pedagogy (Belikov, 2010; Chaitanya, 2017. Demchenko, 2011; Ibragimova, Istrofilova, 2014), as well as special works devoted to issues in legal education and its axiological foundations (Artem'eva, 2018; Bieliauskaitė, 2013; Bostan, 2016; Gerst, Hess, 2009; Horodyskyi, 2017; Melnyk, 2013; Whitecross, 2016). The paper's authors have based their judgment on the use of a value-oriented approach as a way to organize a certain activity, perform it, and employ the outcomes obtained from it from a perspective of particular values (Belikov, 2010; Ibragimova, Istrofilova, 2014: 117).

The study's overall direction was informed by the UN Basic Principles on the Role of Lawyers (Basic Principles, 1990), Recommendations by the Council of Europe (Recommendation, 2000; Recommendation, 2003), Ukrainian statutes on higher education, as well as requirements set under the Higher Education Standard on Specialty 081 (Law) (Standart, 2018). These documents, along with the Council of Europe's Convention for the Protection of Human Rights and Fundamental Freedoms (Convention, 1950), the European Court of Human Rights' case law applying it, and fundamental EU agreements (Treaty of Lisbon, 2007), helped define an array of key values that play a determining role in law-enforcement activity and must serve as guideposts in making legally significant decisions. These values include respect for human rights, justice, the rule of law, freedom, equality and non-discrimination, dignity, tolerance, pluralism, democracy, solidarity, and good governance.

To achieve the objectives set, the authors employed the pedagogical experiment method. To implement this method, and factoring in the discipline's substantive characteristics, the authors made use of an academic discipline entitled 'European Union Values', which is a part of the curriculum offered at the first (Bachelor's-degree) level of higher education to students majoring in Law at Sumy State University.

The European Union Values course was offered to third-year students as an elective. Out of 106 third-year students, 54 elected to take the course. As part of the lectures, each value was examined in terms of substance, regulatory enshrinement, and case law related to conflict-of-values situations. With that said, there also was an objective to not just get to the students all the necessary information but try to demonstrate through specific examples that what the legal solution will be to a case depends directly not only on existing legal norms and evidence but on

value judgments made by the judge based on those facts as well. Practical classes were mainly aimed at analyzing the value-related content of regulatory texts and solving cases, which were either based on real situations or modeled by reference to the objectives set. These classes had the format of individual work and work in small groups, with the mock legal debate method also employed.

To assess the effectiveness of the approaches used, the authors employed the methods of survey and modeling of specific situations (case study), followed by comparative analysis of the learning outcomes of students who had taken the course and those who had not. The project-based and forecast methods were employed in developing a set of recommendations on enhancing the system of teaching value-oriented application of the law by reference to existing issues and trends in the development of legal education.

3. Results

Prior to taking the European Union Values course, all of the college's third-year students (i.e., both those who had elected to take the course and those who had opted for a different course) were invited to take part in a survey aimed at determining their value orientations. The survey featured a questionnaire designed for first-to-sixth-year students factoring in their social and personal levels of legal consciousness. The questionnaire contained 20 pairs of statements, which were to be compared by significance. Each statement dealt with a certain value category (a total of 10 categories – i.e., four statements in each category). The survey helped determine the students' attitude toward values such as the rule of law, legality, peace and solidarity among nations, non-discrimination, pluralism, equality, dignity, freedom, solidarity, justice, and tolerance.

The respondents were offered statements like the following: 'Each person can stick to traditions associated with by their religious affiliation', 'The military conflict in my country is over', 'My future is all up to me. So, I can choose to live anywhere and any way I please', 'I am free to communicate with members of any ethnicity', or 'War is an historical holdover. There are no wars in this world'. The students were asked to express their attitude toward the hypothetical statements listed on a special scale (from 'this is of no value to me whatsoever' to 'this is of the highest value to me').

Each statement came with a certain number of points, depending on the answer ('this is of no value to me whatsoever' – 0 points, 'this is of some value to me' – 3 points, and 'this is of the highest value to me' – 5 points). The sum of points on the four statements in each category measured the significance of a particular value to the respondent, with the arithmetic mean of points in each category measuring the significance of a particular value to the group. The maximum number of points a value could generate was 20, which meant it was of the highest significance. The minimum was 0 points. In [Table 1](#), below, the points for each category have been rounded off to whole numbers.

Table 1. Significance of the Values to Third-Year Law Students (as at the start of the fifth term of study)

	Value	Average significance of the value to students	
		Group of students who elected to study the European Union Values discipline	Group of students who elected to study other disciplines
1	Rule of law	12	11
2	Legality	19	20
3	Peace and solidarity among nations	18	18
4	Non-discrimination and equality	7	6

5	Pluralism	8	8
6	Dignity	7	6
7	Freedom	9	9
8	Solidarity	5	5
9	Justice	10	11
10	Tolerance	7	7

At the end of the fifth term, students underwent another survey designed to help determine the respondents' value orientations. The survey's methodology did not differ from that of the one conducted at the start of the fifth term. The statements were replaced with equivalent ones, designed to help determine the significance of particular values to the respondents. In [Table 2](#), below, the points for each category have been rounded off to whole numbers.

Table 2. Significance of the Values to Third-Year Law Students (as at the end of the fifth term of study)

	Value	Average significance of the value to students	
		Group of students who elected to study the European Union Values discipline	Group of students who elected to study other disciplines
1	Rule of law	19	12
2	Legality	10	18
3	Peace and solidarity among nations	17	18
4	Non-discrimination and equality	12	7
5	Pluralism	13	9
6	Dignity	12	7
7	Freedom	14	10
8	Solidarity	9	5
9	Justice	13	11
10	Tolerance	11	6

The survey results will be discussed below. Note that the data in [Table 2](#) vary significantly with the group that during the term studied the theory and practice of value-oriented application of the law. These data indicate a significant change in student attitude toward certain values.

Among the ways to cultivate value orientations, the most efficient was the method of mock hearings and debates. Within the frame of the European Union Values discipline, the authors organized a simplified mock hearing, with the students having to present a stance as determined by draw. Note that, while the students had been familiarized with the case background earlier, they

would not know which side they were going to represent. Consequently, the students had had to prepare the arguments for the defense of each of the parties upfront.

Below are a couple of stories that were used to simulate the adjudicatory process.

Background Story 1. Several human rights organizations intend to carry out an equality march in a city, an activity aimed at calling on the public to cultivate tolerance and non-discrimination toward members of the various minorities (religious, ethnic, sexual, disability, etc.). The slogans selected for the event are 'All are Equal in Their Rights' and 'Human Rights are for All People, Bar None'.

Taking into account the provisions of Ukraine's Constitution, the march organizers submit to the Executive Committee of the City Council a notification that a mass event will take place on Sunday between 11 a.m. and 12 p.m. in the city's central street, with between 100 and 150 participants expected.

At a meeting of the City Council the next day, it is proposed that the equality march be disallowed. Some of the deputies warn that most of the city's residents have traditional views of the institution of the family and may react negatively to this kind of activity. On top of that, at the time the march is taking place its participants will most certainly run into members of the congregation leaving the Orthodox cathedral after attending a Sunday service, which means that clashes and unrest are possible. Plus, someone reminds the rest of the deputies of a Feast of the Intercession fair that will be held throughout the week, including on the day the march is held, in the city center. So, the City Council orders the Executive Committee to disallow the equality march.

That same day, the Executive Committee files a request with the District Administrative Court for disallowing the equality march. In the petition, the Committee cites the decision by the City Council and asserts that the march may pose a possible threat to public order, while it may be possible to use the public space for some other objectives. The parties to the case are the Executive Committee of the City Council (Party 1) and the organizing committee for the equality march (Party 2).

Background Story 2. The village of Ivanovka has 2,500 residents, with 72 % of these being Ukrainians, 12 % – ethnic Russians, 9 % – Belarusians, 4 % – Bulgarians, and 3 % – Romani. The last group (a total of 75 individuals) live in a compact fashion in a so-called social house – a communal house maintained via the local budget, which is intended to provide accommodation for the disadvantaged. After relocating to Ivanovka from the military conflict zone in 2014, the Romani moved into the social house based on an open-ended tenancy agreement, whereby they would have to only pay utilities and keep the house and the courtyard around it in an appropriate condition.

On September 22, 2018, a fight broke out at a local nightclub, during which the Romani full brothers R. and M. committed the murder of a 17-year-old ethnic Russian in public view. The two brothers fled the scene and hid at the social house. They would then mysteriously disappear the following morning. That day, after word of the tragic incident got out, nearly half of the village's residents took part in a chance gathering. The protesters were soon joined by the Chairman of the Village Council, who promised to resolve the issue as soon as possible.

At a meeting of the Village Council, the deputies spoke of the crime rate having gone up ever since the Romani moved into the village, the asocial mode of life of members of the community, their long-overdue utility bills, and the unsanitary state of the courtyard around the social house. The majority of deputies voted for evicting the Romani from the social house.

To put this decision into effect, the following day a group of deputies, accompanied by a district policeman, walked up to the social house and told the Romani that they would have to vacate the social house within three days' time. A group of Romani tried to appeal against the decision and turned to an attorney for help. The parties to the case are the Romani community, represented by an attorney (Party 1), and the Village Council (Party 2).

In organizing the debates, the authors employed a set of classic rules which combined the features both of legal debate (the use of a case background story and utilization of legislation and case law in making one's case) and of the Karl Popper Debate format (a limited number of participants, speakers given the floor in strict order, and time limits for speakers). The performance of debate participants was evaluated across the following four criteria: (1) substance (degree to which one's presentation is well-reasoned and logical and knowledge of the case's factual circumstances (background) and legal regulation in the area – up to 50 points out of 100), (2) discussion skills (quality of one's questions asked and answers given – up to 30 points out

of 100), (3) use of rhetorical techniques and verbal and non-verbal techniques for persuasion (up to 10 points out of 100), and (4) compliance with rules and ability to have a proper discussion (up to 10 points out of 100). The activity engaged a third-party judging panel, which consisted of representatives of three areas of legal activity – an attorney, a human rights advocate, and an administrative court judge.

Subsequent to the mock hearing (debate), the students could share their impressions in a review by filling out a special Google form. The survey comprised a set of statements on the effect of taking part in the debate on the participants. The total number of respondents was 49. Each participant could choose from four possible answers ('Completely agree', 'Rather agree', 'Rather disagree', and 'Totally disagree'). The survey results are provided in [Table 3](#) below.

Table 3. Results from the Survey of Participants in a Mock Legal Debate

	Statement	Number of participants who responded by saying the following			
		Completely agree	Rather agree	Rather disagree	Totally disagree
1	Thanks to my participation in the debate, it will be easier for me to argue my stance from now on	18	18	8	5
2	Thanks to my participation in the debate, I am a more tolerant person now	18	17	10	4
3	My participation in the debate has helped enhance my skills in critical thinking	10	26	7	6
4	My participation in the debate has helped enhance my public speaking and oral presentation skills	16	19	10	5
5	Thanks to my participation in the debate, it is now easier for me to classify discrimination	26	16	5	2
6	Thanks to my participation in the debate, I now know better how to protect the rights of groups suffering from discrimination	20	15	7	7
7	My participation in the debate has changed my attitude toward groups suffering from discrimination	21	16	7	5

Students taking the course were also given assignments related to analyzing statutory enactments, court judgments, other types of document, and video-materials (mainly, content from news websites) for the purpose of detecting in them a conflict of values (e.g., freedom of speech and protection of privacy, pluralism and protection of public order, tolerance toward national or religious traditions, and providing for the interests of children and women) and determining which value must be protected in that specific situation by the law and which one must be restricted.

Subsequent to the end of the course, to assess the level of student competence in the area of value-based application of the law, the students were offered a set of cases from case law. The choice of cases for test evaluation was grounded in the criterion of the absence of a clear-cut solution and the possibility of different interpretations of the situation depending on the value-related mindsets of the subject who was solving the case.

Here is an example of a case background story that meets these conditions which was employed in the experiment. In 2005, the court found two individuals, N and M, guilty of robbery and willful murder and sentenced them to life in prison with confiscation of property. The court dismissed the defendants' complaints of harsh treatment at the hands of law-enforcement officers. The decision was left unchanged by the Supreme Court of Ukraine and entered into force. Subsequently, N filed a complaint with the European Court of Human Rights, claiming that the criminal proceedings against him were unfair, while the court verdict was founded on testimony obtained under duress. In examining the complaint, the European Court found some evidence of the facts being true. Responsibility for torturing the defendants for the purpose of falsifying evidence in the case and treating them in an inhuman and degrading manner was placed on the government of Ukraine. In 2016, the Supreme Court of Ukraine lifted the sentence and remanded the case to the trial court. Throughout this period, N and M remained in confinement. The punishment was changed to house arrest only in 2017 by the trial court. Prior to imprisonment, N and M had lived in the city of Sumy, i.e. the same city where their attorneys worked. With the case being under consideration at the appellate court in Odessa Oblast (i.e., where the crime was committed) for over two years, to take part in the proceedings the defendants and their attorneys would each time have to travel a distance of over 800 km. The defense team filed a petition asking to conduct the court proceedings by way of video conferencing. Ukraine's current Criminal Procedural Code (in effect since 2012) permits this. However, since the case was initially tried based on the 1960 Code, the new trial, accordingly, would have to be conducted based on the latter's regulations, which do not include any provisions permitting the use of video conferencing in court proceedings.

The students were asked to make a decision on the essence of the petition filed and argue it, i.e. make a choice between strict compliance with the letter of the law and justice, the rule of law and protecting the defendant's rights and interests. With that said, the students had been warned that there would be no clear-cut solution to the case and that their performance would be graded based not on their stance but on the quality of their reasoning. As a side note, in real life the above petition was sustained, with the court meeting the defense team halfway by departing from the tough provisions of procedural law. Despite being debatable, the decision was not challenged by the prosecution.

Out of 52 students who had studied the theory and practice of value-oriented application of the law as part of the European Union Values discipline, 10 individuals were guided by the legality principle in trying to consistently prove the need for rigorous compliance with the requirements of the Criminal Procedural Code in its version followed during the initial trial. Among the participants, 42 students decided on the need to sustain the petition, basing their judgment, mainly, on the provisions of the Constitution and laws of Ukraine, as well as international agreements that recognize a human being and their rights as the highest social value and capture the rule-of-law principle. In addition, 18 students out of 42 stressed the need to take into account, in considering the petition, the responsibility of the nation's law-enforcement system for the years spent by the defendants in confinement based on an unsubstantiated and illegal sentence.

The case was offered to a group of 36 students in the same year who had elected not to take the course. As a result, the views were divided as follows: 28 students opted for dismissing the petition, and 8 – for sustaining it. With that said, this group employed the same legal reasoning techniques as the other one.

4. Discussion

A key objective in the use of a value-based approach in legal education is to prepare students for resolving real legal issues, cultivate in them a proactive and principled frame of mind, and foster in them the ethical mindsets that are crucial to shaping the right attitude toward the role and place of the legal profession in society. Value-based education does not imply imposing on them or indoctrinating them with particular values. Yet, it can help transform, through the learning

process, their perception of people and phenomena around them and foster in them compassion and respect for all those who are different from us (Chaitanya, 2017: 6). The study's findings indicate that the methodologies employed by the authors are effective enough to help achieve a similar desired result in real life.

Considering that European Union Values is an elective, the authors' initial survey covered all full-time third-year law students at Sumy State University. The fact of having chosen this particular discipline implied that one already possessed certain value-based mindsets or that one had a special interest in studying value-oriented application of the law, which in the course's syllabus was listed as its key objective, along with acquiring knowledge on the EU and European law. However, this hypothesis was not confirmed. As indicated by the data from the initial survey, both those who had elected to take the course and those who had not exhibited a nearly similar attitude toward relevant values, listing among the most crucial legality, peace and solidarity among nations, the rule of law, and justice. Both groups provided a similar assessment of the value of freedom, pluralism, and tolerance, with solidarity, equality, non-discrimination, and dignity listed among the least significant (Figure 1).

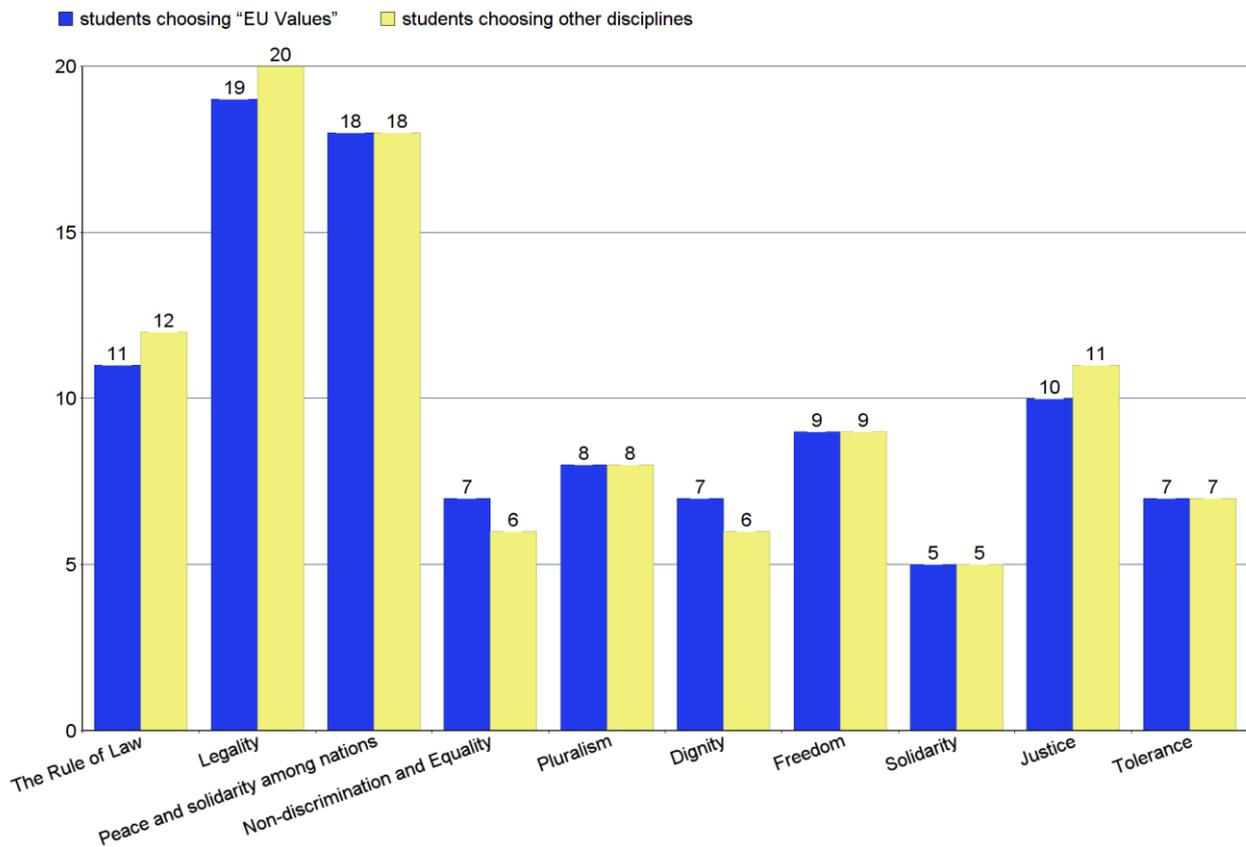


Fig. 1. Significance of the values to third-year students as at the start of the fifth term of study

Over a period of four months (the length of one term), around half of the students surveyed at the beginning of the term worked with materials related to values and their regulatory enshrinement in laws operating across the European Union, the Council of Europe, and Ukraine as part of the European Union Values discipline, which would lead to a certain change in their value-based mindsets and orientations (Figure 2).

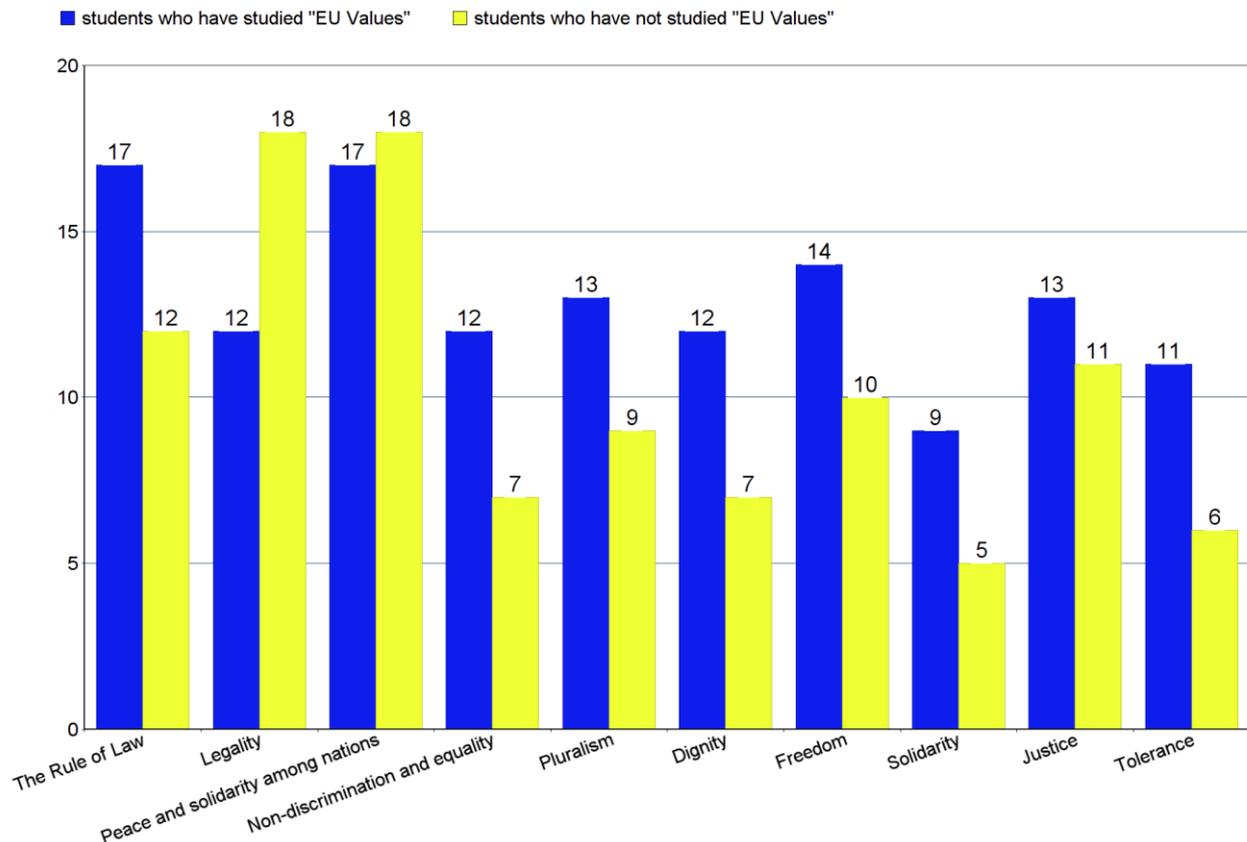


Fig. 2. Significance of the values to third-year students as at the end of the fifth term of study

The most tangible were changes in student attitude toward values such as the rule of law and legality. At the beginning of the fifth term of study, both groups of respondents clearly leaned toward legality, whilst at the end of the term those who had taken the European Union Values course now deemed the rule of law to be more significant. What remained invariably high is the significance of peace and solidarity among nations.

In addition, the students who took part in the experiment started to attach greater significance to values such as pluralism, freedom, non-discrimination, dignity, and tolerance. It is these values, along with justice, that the primary focus of the above-described learning methodologies was on. Crises of these values most often lead to conflicts in society, resulting not only in a lack of mutual understanding among various groups of people but violence and gross violations of human rights. The role of lawyers in the cause of preventing situations of this kind from happening and minimizing their negative effects is of critical significance, regardless of whether they represent public or private interests. Consequently, for members of the legal profession appropriate value mindsets and the ability to perceive people around them and relationships between them are no less significant than they are for medical workers. Just like a medical worker, a lawyer gets to make decisions which the fate of various people directly depends on and determine the acceptability or non-acceptability of the use of particular methods of influence, restrictions, and penalties. Does it not stand to reason that a legal expert who has perfect knowledge of legislation but is not a tolerant person will hardly take a fair decision in relation to a member of a group that they are intolerant of or bear enmity toward, altogether? In this regard, the transformation of values observed in the experimental group may be regarded as quite a positive result.

Another area that may require additional interpretation is certain results from the survey of participants in a mock hearing (debate). Of the greatest interest in the context of this study is what is related not to skills and competencies but a set of value orientations cultivated via the activity. As mentioned above, one of the key conditions for arranging the debate activity was that the

participants would have been familiarized with the case background in advance but would not know which party they would represent (this was to be determined by draw before the start of the debate). Thus, preparation for the debate required working on each background story and organizing one’s arguments for the defense of each of the parties to the case.

This particular approach helped raise the students’ level of empathy toward members of discriminated minorities. Among other things, the students would have to put themselves in the shoes of those who protected a vulnerable or discriminated group (in different case background stories, these were the organizers of an equal-rights march, a Romani community, individuals serving time in a correctional facility, transgenders, disabled individuals, and members of religious minorities). With that said, it was also necessary to take account of the rights and interests of the majority, the need to protect public order, property, interests related to environmental protection, etc.

The debate participants later admitted to having experienced a certain amount of change in their worldview, which resulted from their work with the case background stories. For instance, 35 respondents out of 49 (71 %) agreed totally or in part with the statement that they had become more tolerant as a result of taking part in the mock hearing (Figure 3).

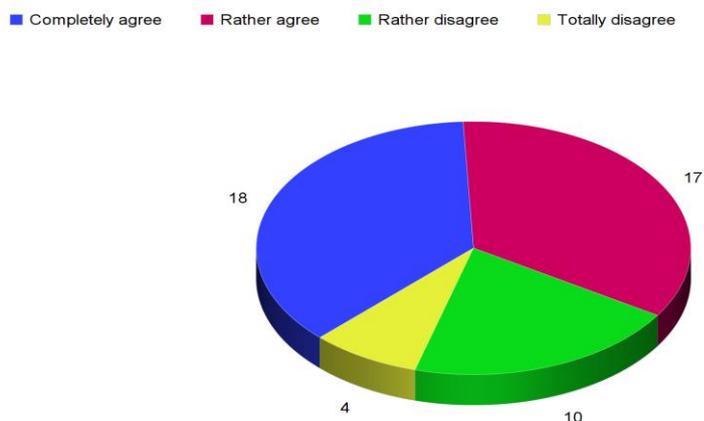


Fig. 3. Results from the survey of participants in a mock legal debate (responses with respect to the statement “Thanks to my participation in the debate, I am a more tolerant person now”)

It is, in a sense, the inclination to empathize with their potential “client” that reduced the threshold of sensitivity to cases of discrimination, with 42 respondents out of 49 (85 %) starting to view it as more obvious and unacceptable (Figure 4).

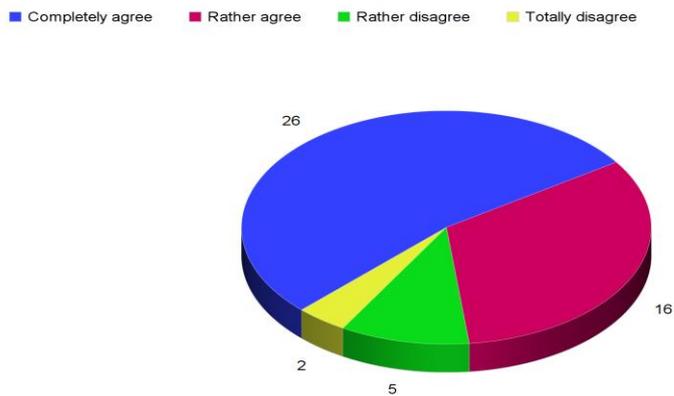


Fig. 4. Results from the survey of participants in a mock legal debate (responses with respect to the statement ‘Thanks to my participation in the debate, it is now easier for me to classify discrimination’).

Consequently, getting to know better about the real (note that, while having been modified to a certain degree for academic purposes, the case background stories were, for the most part, founded on real case law) and potential issues facing the discriminated helped change, to a certain degree, the debate participants’ attitude toward them. The overwhelming majority of respondents (37 debate participants, or 75 %) admitted to the debates having helped to change, to one degree or another, their attitude toward discriminated minorities (Figure 5).

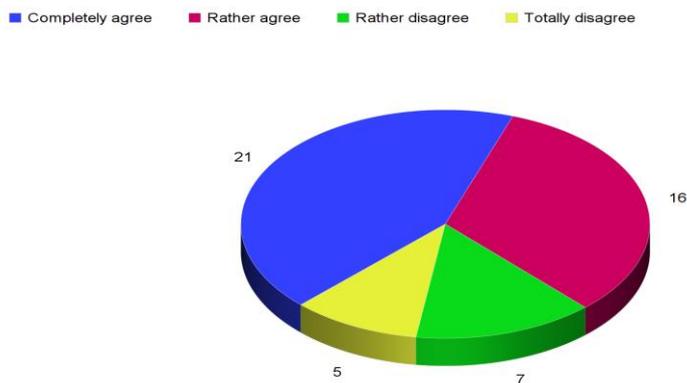


Fig. 5. Results from the survey of participants in a mock legal debate (responses with respect to the statement ‘My participation in the debate has changed my attitude toward groups suffering from discrimination’)

Finally, quite of interest are the results of solving test cases at the end of the term which implied the need to make decisions under circumstances where the literal interpretation of legal norms would lead to injustice, inhuman treatment of the subjects, or unjustified restriction of their rights and liberties. Unfortunately, situations like these can hardly be avoided today, as there are flaws in law, there are new areas and types of social relations emerging, and law-making activity is out of synch with the needs of society. In some cases, this is also due to the low level of the legislative technique and to the lobbying of the interests of certain persons or groups in the law-

making process. It appears to be much easier for the judiciary to just plainly follow the requirements of the law rather than look for appropriate legal ways to achieve justice and stand up for the ideas of humanism. However, in case of failure to do so, constitutional norms that recognize a human being and their rights, liberties, honor, and dignity as the highest value will just remain on paper, like something that can never be put to real use.

The test case was intended to help assess the degree to which the students, who already possessed a broad base of knowledge in the key areas of jurisprudence, perceived relevant values and were prepared to follow them in practice. The results indicate that over 75 % of the students, who had thorough knowledge of the axiological foundations of European law and some experience in the value-based application of the law, approached decision making from a perspective of the value of people and their rights and dignity. They were able, with varying quality of reasoning, to utilize constitutional principles that possess supremacy in the legal system for the protection of an individual. Such students constituted less than 25 % of the group of students who had not taken the experimental discipline (Diagram 6).

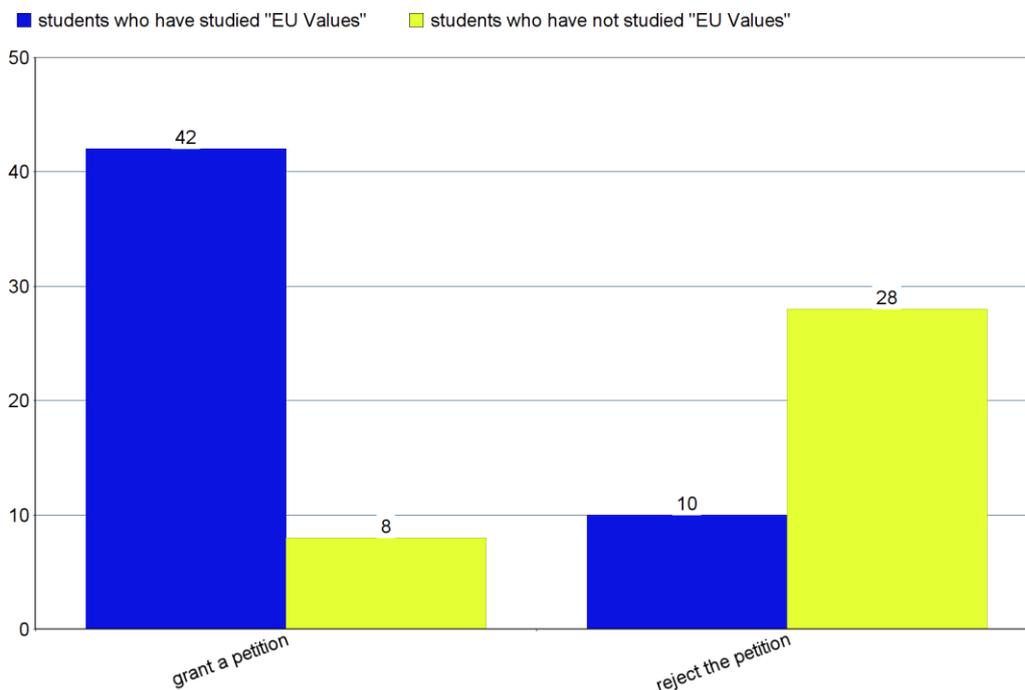


Fig. 6. Results from work with a value-based case by students who had studied the European Union Values discipline and those who had not

5. Conclusion

Within the frame of the European Union Values discipline, the focus in instruction in law was shifted from specific legal norms and their practical application to the axiological basis of legislation and the effect of the use of value-based guideposts on the outcome of law-enforcement activity. In a way, this made it possible to transform, within one term, the students' value-based mindsets, boost the significance to them of categories such as tolerance, pluralism, non-discrimination, justice, and dignity. In addition, taking this kind of approach helped develop in them the skills of interpreting legal norms on a value-based basis.

Legal deontology, a lawyer's professional ethics, and other similar disciplines that are part of various bachelor's degree curricula, likewise, are aimed at developing the ethical component of a lawyer's professional culture. However, virtually always they are taught in the first year, and quite often in the very first term. In this stage, most students have quite a vague idea of the essence of issues that face the judiciary, and more so of ways to resolve them. As a consequence, quite often

knowledge that is offered to them is perceived as abstract and strictly theoretical, with the desired effect not achieved.

The participants in the authors' experiment were students with a sufficient basis in the area of material and procedural law and a clear idea of the key objectives of jurisprudence, who were ready for the assignments they would be given. The students were engaged in the process of interpreting norms of law and resolving legal cases based on the use of a value-oriented approach. As evidenced by the study's findings, they not only acquired a set of specific skills but gained a deeper insight into the ethical aspect of their future occupation. The methodologies used as part of this study could be employed in instruction in virtually all special legal disciplines. In the authors' view, it is taking this kind of approach that can help develop proper ethical mindsets, while also helping one acquire relevant knowledge, with a focus on cultivating appropriate professional competencies

6. Acknowledgements

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