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The Problems of Contemporary Education

The Ethics of Digital Technology Usage among Secondary Stage Students

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Abstract

This study aimed to identify the degree of practice among secondary stage students in Kuwait regarding the ethics of digital technology use from their perspectives. Also, it investigates the degree of practice's relationship with the variables of gender, specialization, and grade. The researchers used the descriptive survey method to answer the study questions. The study sample was 771 male and female students of the secondary stage of Al-Ahmadi Educational Zone in Kuwait for the academic year of 2018/2019, where they were selected by random stratified method from different schools. The study instrument (survey) was developed, and its validity and reliability were verified. The results showed that the degree of the practice of secondary stage students in Kuwait of the ethics of using digital technology was high. In addition, results revealed that there is a statistical difference attributed to the variables of gender, specialization, and grade. Several recommendations were discussed.

Keywords: digital ethics, technology usage, secondary stage students, Kuwait, students' perspectives.

1. Introduction

The knowledge revolution and the speed of change in information and communication technology have given schools, local and global communities the opportunity to teach students the life skills they need to enable them to live effectively (Al-Qarni, 2018). Mayer, Reed, and MacGilchrist (2012) demonstrated that the smart school, in the current era, seeks to achieve a clear vision related to values and beliefs. It focuses on empowering the learner as the center of the educational process. In addition, it seeks to inculcate the values that make learners self-observant of their behaviors. That is, the modern era is characterized by an increase in the area of personal

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freedom and a decrease in the effectiveness of follow-up and observation. Consequently, developing the internal restraint of the learner is the most important educational task (Bakkar, 2011). Since digital technology has permeated our society and our daily lives greatly, it has become imperative for its users to deal with it wisely, effectively, and ethically (Lever-Duffy, McDonald, 2018). Despite the positives of this technology, there are wide areas of misuse at the same time, and it is necessary to work responsibly with modern technology, by encouraging the ethical behavior of children and students (Al-Mutawa, 2011).

The user of technology should adhere to this goal if human societies want to build a productive and good citizen because ethical values are important and have a great role in the process of school education; ethics are inextricably linked to the whole education process, starting from the principal to the learners (Bakkar, 2012). Bitter and Pierson (2013) demonstrate that practicing ethics is not limited to the commitment of teachers and administrators only; rather, attention should be paid to good ethical preparation for students. Further, since the education of students is an ethical basis for the formation of future generations, the moral intelligence lies at the heart of the learning and teaching processes. It is concerned with the student's development in all aspects. Furthermore, students, who live in the era of digital technology, should be educated and trained to practice the ethics that they should demonstrate while using digital technology (Bitter, Pierson, 2013).

1.2. Issues Related to the Application of Digital Technology in Education

Ethics are a necessity for both the individuals and the community. Each community needs a value and ethical system that guarantees its goals and ideals. In addition, the individuals, too, needs a system that guides their behaviors and actions in their interactions with people, attitudes, and things (Assaf, Al-Agha, 2015). Therefore, the current conditions of the community and the implications of digital technology have produced a problem in ethics. The application of digital technology to education in general, and in the classroom, in particular, raises many issues. Among these issues, is the issue of the compatibility of digital technology with the objectives and strategic goals, monitoring student's behavior on the Internet, ensuring that every student has the opportunity to use technology, preventing software piracy and the protection of privacy and security, monitoring property rights, and promoting freedom of expression with respect for the rights of others (Lever-Duffy, McDonald, 2018).

Ribble (2012) points out that digital technology ethics are characterized by their strong relationship with the educational system, as it was noticed recently that many issues have crowded out the school tasks. The most important of these issues is the issue of monitoring the learner's behavior on the Internet. Further, preventing software piracy, preventing cyberbullying, protecting student's security and privacy, and preventing practices related to misuse of digital technology, such as using mobile phones inside the school, blackmail through social media, cyberbullying, downloading programs without respecting property rights, and using the school's computer for a non-educational purpose. To confront these issues and solve them, there must be digital awareness of both the teacher and the student (Ribble, 2012).

Lever-Duffy and McDonald (2018) assert that the issues related to technology application are diverse. They are categorized as follows: 1) legal issues: these are concerns that arise when the application of technology has the ability to influence legal requirements, such as proprietary rights, software piracy, and student privacy protection, 2) social issues: these are issues that the teacher should be aware of when incorporating technology into the classroom, such as equal access, cyberbullying, and student's security while using technology, and 3) ethical issues: these are issues that include concerns that address personal values and community standards, especially with regard to the use of digital technology, such as honesty, freedom of expression, and respect for the privacy of each student.

1.3. The Concept of Digital Technology Ethics

The researchers of this study define the concept of digital technology ethics as the set of rules, principles, and laws that the user is subject in order to evaluate their behavior and actions so that they do not offend themselves and others. In addition, they consider digital ethics as a part of the digital efficiency that each user needs. It is necessary to develop ethical capabilities by training users of digital technology on the ethical aspect that enables the user to think critically and be able to meditate and analyze and then make sound decisions before using digital technology.

Al-Ghafri (2013) explains that the ethics of digital technology include a set of rules and laws that the individual is to abide by and on which base their decisions and actions when using this

technology. Al-Ghafri divided these ethics into several sections: 1) between the individual who uses digital technology and themselves, 2) between the user for digital technology and others, and 3) between the user and the material components of digital technology.

In light of achieving the objectives of this study, the researchers re-divided the ethics of using digital technology into three fields. The first field is student ethics towards themselves while using digital devices. This field includes: 1) the students' ethical practices towards themselves while using digital technology, whether in terms of holding them responsible for everything they publish online, or their respect for themselves and for the values and principles, 2) avoiding browsing suspicious and harmful websites, 3) the extent of their commitment to entering websites that fit their age, 4) the extent of their verification of the authenticity of news before publishing them, and 5) the way they use technological applications, whether positively or negatively. The second field is student ethics toward others when using digital technology. This field includes: 1) the student's ethical practices towards others when using digital technology in terms of clearly and openly identifying themselves, 2) the extent of their respect for customs and traditions, 3) whether they assume the identity of others without their permission, 4) whether they download commercial programs after paying for them, 5) the extent of their refusal to send pictures or videos that offend people, and 6) the extent of their commitment to mentioning sources when they copy information from the Internet for research. The third field is student reactions resulting from the ethical practices of digital technology from others. This field includes: 1) the student's reactions resulting from the ethical practices of digital technology from others in terms of not responding to the abuse and threat from others, 2) the extent of the student's caution against responding to messages from strangers, 3) the extent of their disregard for electronic messages that include harassment, 4) whether they block people who repeat bad behavior, and 5) notifying their guardian of being subjected to cyberbullying and other practices.

1.4. Ethical Challenges When Using Digital Technology in Education

Olcott et al. (2015) have shown that there are many important and prominent ethical challenges that relate to student practices when using digital technology from a global perspective. These challenges include: 1) digital ID, which is information about a person who is available online; it includes: personal data, photos, files, news, comments, and providing a personal description at the digital level, 2) the Internet security, which is the lack of knowledge on the part of the student who uses the Internet, which makes them vulnerable to the risks that range from data loss to digital identity theft, 3) cyberbullying, which is the attack that a student is subjected to from others, ignoring his privacy, and taking advantage of their fear of what is harmful to them in the psychological and personal aspect, 4) intellectual property, which is related to copyright of digital content in terms of storage, copying, and publishing, 5) dissemination of information, and knowledge exchange on the Internet, so as not to guarantee its quality or truthfulness.

Given the novelty of the so-called ethics of using digital technology in educational literature in general, it was the focus of the care and attention of the European Union (EU). EU developed a strategic plan to enable digital technology, and protect the fundamental values of EU. This strategic plan called for 1) respecting the human dignity, freedom, democracy, citizenship, participation, privacy, independence, justice, and solidarity, and 2) emphasizing on the importance of being responsible and monitoring the individual's conscience to protect data and privacy while realizing the consequences that result when sharing digital content without awareness (Olcott et al., 2015).

Accordingly, the development of a strategic plan to enable digital technology and protect values has become necessary to advance the level of education in the Arab world. There are many teachings and values that students in the Arab world follow and which urge them to monitor their behavior while using digital technology and enhance self-censorship through which students can respect themselves first, and then others, and do no harm themselves or others. The Prophet Mohammad, peace and blessings be upon him, says: None of you believes until he wishes upon his brother what he wishes for himself (Al-Bukhari, 2002). Gunter & Gunter (2015) presented the meaning of this saying under the name the "Golden Law", which states: Treat others the way you want them to treat you.

Following the previous knowledge, Kuwait has paid attention to digital technology issues, as it has enacted its laws and made legislation to deal with electronic security issues, by issuing legislation No. (63) that combating information technology crimes because traditional penal texts do not help to counter the new cybercrimes that are committed on the advanced technological

means. Further, it protects the freedoms, honor, and reputation of people. In addition, it wards off aggression on public and private funds and properties, in an effort by Kuwait in the context of supporting international approaches to combat these crimes, and in compliance with the provisions of The Arab Convention on Combating Information Technology Crime ([Kuwait Ministry of Interior, 2015](#)).

1.5. School Students' Awareness of the Ethics of Using Digital Technology

Ribble (2013) asserts that awareness of the concept of digital citizenship is the educational solution through which teachers and students can learn the standards of the global digital community. Learning those standards will enable them to learn 1) the appropriate behaviors for their community because digital citizenship is not only an educational solution but rather it is a lifestyle that everyone needs in this era, 2) the rules of digital behavior and electronic responsibility for actions, rights, and responsibilities, and 3) understanding the potential impacts on oneself and on others because the goal of digital citizenship is for every technology user is to become a user and at the same time to be responsible ([Ribble, 2013](#)).

Al-Ghafri (2013) demonstrates that the principles and ethics that make the use of digital technology a classy use and a useful tool in exchanging of information and knowledge are not related to the means of technology as means in themselves. They are rather related to the users who reason their actions. They are not related to the systems that codify the use of digital technology, but they are related to the ethics in the human psyche, which will govern how to behave when there is no imposed system. That is, these ethics may be between the individuals who use the technology and themselves, or between them and others, as well as the ethics between the users and the physical components of the digital technology ([Al-Ghafri, 2013](#)). Lever-Duffy and McDonald (2018) point out that those who use digital technology brilliantly, spontaneously, and frequently are students. Therefore, the need arose to investigate the ethics of using this technology and the laws that protect students. In addition, it has become necessary for the teachers who teach the new generation to examine all technological laws designed to promote ethics for the use of digital technology, to protect the privacy and property of thought, and to reduce cybercrime.

This study focused on students of secondary stage, who live adulthood and adolescence, and need to build an internal deterrent that prevents them from committing bad deeds and vices, and that helps them to sustain a healthy life with a proper personality ([Mahfouz, 1984](#)). In light of the foregoing, the current study sheds light on the concept of ethics for the use of digital technology through its endeavor to reveal the degree to which secondary stage students in Kuwait practice the ethics of using digital technology from their own perspectives.

Previous Studies

Many researchers have conducted research studies that are concerned with exploring the ethics of using digital technology. For example, Al-Fatli (2017) conducted a study aimed at finding the extent to which secondary stage students practice moral values from the viewpoint of their teachers. To achieve this goal, the researcher adopted the descriptive survey method and used the questionnaire as a study instrument which was applied to a sample of 138 male and female teachers. The results showed that the extent to which students practice moral values in their schools is mediocre. Further, they showed that there is no statistically significant difference attributed to the gender and specialization variables. However, Al-Maghzawi (2016) tried to identify the availability of electronic communication controls from an Islamic perspective among secondary stage students in the Kingdom of Saudi Arabia. The researchers adopted the descriptive survey method and used the questionnaire as a study instrument to achieve the research goal. The study instrument was applied to a random sample of 3000 male and female students. The study results revealed that the moral controls are all at an advanced level.

Riggio (2014) conducted a study aimed at exploring the impact of digital media on fifth-graders' communication, and the extent of its contribution to training them on cooperation, ethics, and ethical thinking. The researcher used a qualitative research that has a variety of practices where she used an electronic blog as a tool to develop e-citizenship skills. The research sample included 22 fifth graders, who were contacted via the blog. They were trained in managing digital dialogue. The results indicated that digital media by its participatory nature enabled students to communicate and collaborate knowledge among themselves as well as consulting each other. In addition, the study found that blogs are a digital tool that greatly contributes to supporting

learning with thinking and ethical behavior in the classroom. Jamea, Al-Saeed and Mubariz (2016) conducted a study aimed at attracting the attention of specialists in the field of technology to the concept of contemporary technology ethics. The study sample included middle school students in Egypt. The study results indicated that contemporary technology is considered as a profession, and it has its ethics that must be adhered to. The use of technology of all kinds must be subject to laws, regulations, and ethics. Further, the existence of the so-called models of ethical designs for the fair use relationship between humans and modern technological innovations; the former is concerned with developing the moral side, while the latter is concerned with developing the technological knowledge side.

In the field of higher education, Arouri and Hamaidi (2017) conducted a study aimed at verifying the extent of Tafilah Technical University students' application of ethics and netiquette in dealing with the Internet. In order to achieve the goal of this research study, the researchers used the descriptive research method, and distributed a questionnaire to 245 male and female students. The results of the study revealed that university students have a consensus about the general rules of ethics and netiquette for using the Internet. Moreover, the results revealed that students' views of the implemented behavior practices were not affected by gender, specialization, or level of study at the university. Furthermore, the study revealed limited practices, especially the ones related to practices of dealing with critical thinking skills. Also in the same field, Hall (2012) conducted a study aimed at obtaining a general sense of the digital lifestyle, and discovering some digital behaviors practiced by first-year students at the university in New England. This study addressed some technological issues such as security, publishing, privacy, and programming. The questionnaire was used as a research instrument and distributed to 69 students. The study found that 78 % did not pay attention to security certificates, (83 %) read claims and warnings before clicking, 85 % used an Internet connection which they were not authorized to use, and (60 %) of the students were not exposed to discussions about ethical digital behavior in high school.

Alawi (2015) conducted a study aimed to learn about the ethical problems faced by the Arab countries as a result of the forced entry into the information society without a good preparation. In order to achieve this goal, the researcher adopted the questionnaire as a main instrument for gathering data. The study sample included 257 faculties from the University of Menturi. The study results revealed that 1) the establishment of a culture of information in Arab communities is one of the most important elements for eliminating the digital gap by 58.75 %, 2) the moral and legal responsibility are complementary to establishing a fair information society, 3) the proportion of those agreeing that respect for privacy on the Internet does not conflict with the freedom of information flow into the digital network according to university professors 65.76 %, and most of them are females. This indicates that the value of privacy for Arab women, according to the results of the study, is high even if they have freedom. In addition, the study results revealed that the culture of information occupies the first rank by 46.7 %. This indicates the low level of Arab countries in the information culture and in the skill of dealing with modern technology and localizing it according to the requirements of the Arab society and its original ethics. Assuming a return to moral values ranked second with a percentage of 36.97 %.

Based on the review of previous studies, the researchers concluded that this current study is the first study that investigates the degree of high school students' practice of the ethics of using digital technology in Kuwait from their perspectives.

Problem and Questions of the Study

Statistics confirm the spread of digital technology applications and the increase in the number of its users in the Arab world in general, and in Kuwait in particular. Abbasi (2018) indicated that 64 % of social media (Facebook, Twitter, Instagram, and LinkedIn) users in Arab countries are under the age of 30. The annual report of Communications and Information Technology Statistics issued by the Central Administration of Statistics in Kuwait (2019) confirms that the number of individual Internet subscribers has increased in the period from 2009 to 2017. Their number in 2009 was 93,581 subscribers, and their number in 2017 reached 98,051 subscribers. Other statistics mentioned in the same report, showed the increasing number of computer labs in public secondary stage in the period from 2008 to 2016, where the number of computer labs in 2008 was 285 labs and the number in 2016 reached 327 labs.

Several research studies, such as Hall (2012), showed that students practice some wrong digital behavior related to technological issues such as security, publishing, privacy, and

programming. It found that 78 % of the sample does not pay attention to security certificates, and 85 % used an Internet connection that they were not authorized to use. Al-Mutawa's study (2011) revealed that moral crimes are widespread on the Internet due to the users' lack of ethics in dealing with modern technologies.

In light of the foregoing, all educational institutions must adopt the necessary strategies to guide learners towards the optimal use of digital technology. They should develop training programs that promote positive behavior for the use of digital technology with a view to preparing good digital students who are able to protect themselves and their community from the negative effects of digital technology.

The researchers noticed the absence of the concept of ethics for the use of digital technology at the secondary stage level in Kuwait. They did not find topics or lessons that talk about digital technology ethics in the computer books for the secondary stage level, nor did they find plans or training programs that promote positive behavior for the use of technology. Rather, they found that most of the topics are dealing with the knowledge and technology side without ethics' side (Ministry of Education..., 2018). Hence, the need has emerged to know the extent to which secondary stage students practice the ethics of using digital technology. In order to achieve this, the study sought to answer the following two questions:

1. What is the degree to which high school students Kuwait practice the ethics of using digital technology from their perspectives?

2. Are there statistically significant differences at ($\alpha = 0.05$) between the averages of secondary stage students' estimates related to their practice of ethics of using digital technology due to the variables of gender, specialization, and grade level?

The Study Purpose and Importance

This study aimed to reveal the degree of secondary stage students' practices of the use of digital technology ethics from their perspectives, and its relationship to the following variables: Gender, specialization, and grade level.

This study focuses on the importance of the secondary stage in the formation of the ethical system among students, where the secondary stage is one of the most important stages that educators need to focus on, and the detection of methods that enhance moral values during the study therein. This study is considered as one of the studies that deal with issues of the age and the growing role education researchers have in establishing the ethics of digital technology in the Arab world, specifically in Kuwait. Moreover, the study provides a theoretical framework about the extent to which high school students in Kuwait practice ethics of using digital technology. This study is considered as one of the recent studies that examine the degree of secondary stage students, in Al-Ahmadi Education District, practice ethics in the use of digital technology. It is expected that this study may open the way for researchers to conduct more research and studies related to the extent of the practice of workers and associates in the educational sector regarding the ethics of using digital technology. It is hoped that the results of this study will benefit planners and developers of curricula, school supervisors, principals and teachers due to its importance in revealing the degree of high school students' practices in the ethics of using digital technology. This study may contribute to improving and emphasizing the need for students to use the ethics of using digital technology to be followed and practiced when using digital technology.

Study Terms and Procedural Definitions

The current study includes a number of terms that need to be conceptually and procedurally defined as follows:

Ethics: A set of abstract rules and principles to which a person is subjected to his actions, and through which his behavior is evaluated (Assaf, Al-Agha, 2015).

Digital Technology: The technology that combines multimedia of image, sound, and text with high definition and quality, all of which operate under the control of the computer at once. The computer converts letters, numbers and symbols into a binary number system (ones and zeros), and this enables the computer to store information visually and verbally, i.e. in picture and word, and then dealt with on this basis (Al-Baltan, 2013).

Digital Technology Ethics: It can be defined procedurally in this study as: A set of rules, principles, and laws to which the user is subjected during the use of digital technology. They refer to it to evaluate their behavior and actions. The degree of practice is measured by the degree that the respondent gets on the study instrument prepared by the researchers for this purpose.

Secondary Stage Students: Procedurally, they can be defined as students of the final stage of school education, and this stage is preceded by two stages of basic education (primary, intermediate), followed by the stage of higher education. The secondary stage is specialized in the age group between the ages of 16 and 18 years, and it is divided into two levels (eleventh and twelfth grade). Its tracks starting from the eleventh grade are divided into two majors: Scientific and literary.

2. Method and Procedures

2.1. Study Methodology

The descriptive survey method was used, for its relevance to the current study. According to Qahwan (2012) the descriptive survey approach: 1) benefits in obtaining data collection on the existing conditions, 2) contributes to identifying accurate descriptions of the phenomenon to be studied, and 3) contributes to revealing the prevailing developments, conditions and trends of the problem.

2.2. Study Community and Sample

The study community consisted of 12069 male and female students of the eleventh and twelfth grades of the secondary stage in Al-Ahmadi Educational District schools in Kuwait for the academic year 2018/2019, based on statistics issued by Al-Ahmadi Educational District. For the purposes of the current study, a sample consisting of 771 male and female students from the secondary stage students in Kuwait was chosen by the random stratified.

2.3. Study Instrument

To achieve the objectives of the study, a questionnaire was built by referring to theoretical literature that dealt with the ethics of using digital technology. This questionnaire examined the ethical practices of using digital technology, and it was divided into three domains. The first domain consists of 16 items to measure the student's ethical practices towards themselves while using digital devices. The second field consists of 19 items to measure the student's ethical practices towards others when using Digital technology. As for the third field, it consists of 13 items to measure student reactions resulting from the ethical practices of digital technology from others. The questionnaire in its final form contained 48 items, so that each participant of the study answers them with one of the alternatives on Likert scale (5-point scale), according to the following distribution: Always = 5, often = 4, sometimes = 3, rarely = 2, never = 1. The cut points for the mean values of the study sample responses are: low degree = (1-2.33), moderate degree = (2.34-3.67), and high degree = (3.68-5).

2.4. Validity and Reliability of the Study Instrument

The validity of the questionnaire was verified by presenting it to a group of university professors with specializations in the fields of education technology, curricula and teaching, and educational administration. Seventeen arbitrators reviewed the questionnaire in order to ensure the extent of each item related to the ethics of the use of digital technology, and the degree of the items' suitability for study purposes, and to ensure the integrity of linguistic formulation. The amendments were made in accordance with the observations with 85 % consensus of the arbitrators.

The reliability of the internal consistency of the questionnaire was calculated using the (Cronbach Alpha-Reliability Coefficients) equation after applying the questionnaire to an exploratory sample outside the study sample, which consisted of 30 students. The result indicated that Cronbach's alpha coefficient was (0.906), which is acceptable for the purposes of the current study.

Study Variables

The study has the following variables: 1) independent variables that include gender (male and female), specialization (literary and scientific), and grade (eleventh and twelfth), and 2) the dependent variable is the degree of secondary stage students' practice in the ethics of using digital technology.

Statistical Treatments

The researchers used The Statistical Package for Social Sciences (SPSS) to analyze the collected data. They calculated means and standard deviations to answer the first question, and to find the differences of statistical significance for the variables of gender, specialization, and grade. In addition, they used MANOVA test to answer the second question.

3. Results and discussion

First Question

Means and standard deviations were calculated to answer the first question: “What is the degree to which high school students in Kuwait practice the ethics of using digital technology from their perspectives?”. The results are shown in [Table 1](#).

Table 1. Means and Standard Deviations of The Sample Estimates on The Scale of Practicing Ethics of Using Digital Technology in The Light of The Domains of The Study Instrument

| Instrument Domains | Mean | Standard Deviation | Rank | Degree of Practice |
|--|------|--------------------|------|--------------------|
| Student ethical practices towards others while using the digital devices field | 4.39 | 0.472 | 1 | high |
| Student ethical practices towards themselves while using the digital devices | 4.19 | 0.527 | 2 | high |
| Student reactions resulting from the ethical practices of digital technology from others | 4.19 | 0.572 | 2 | high |
| Total practice | 4.27 | 0.430 | | high |

[Table 1](#) shows that the overall degree of high school students' practice of using digital technology ethics was high ($M = 4.27$). Further, it shows that the domain of "student ethical practices towards others while using the digital devices" came first in ranking ($M = 4.39$). However, both of the domain of "student moral practices towards himself while using digital devices" ($M = 4.19$), and the domain of "student reactions resulting from ethical practices from others" ($M = 4.19$) came in the second ranking. Furthermore, it indicates that all means of the three domains got a high practice score. This may be attributed to the adherence of the people of Al-Ahmadi Governorate in Kuwait to Islamic customs, traditions, and values. It may also be attributed to the presence of voluntary youth groups that educate students about the safe use of this technology, such as the volunteer team (be smart+safe) that provided courses in most schools in Kuwait. In addition, the high degree of practicing ethics of digital technology use may be an indication of what the Ministry of Interior has done in Kuwait in the recent years of enacting laws and setting deterrent penalties for those who misuse digital technology and its applications, by issuing Law No. (63) regarding combating information technology crimes ([Ministry of the Interior, 2015](#)).

Those results of this study are in agreement with the study of Al-Maghzawi (2016), whose results indicated that the ethical controls for electronic communication are all at an advanced level. Moreover, the current study supports the perception of Jamea, Al-Saeed, and Mubariz (2016) proposed to consider contemporary technology as a profession with its ethics that must be adhered to. The use of digital technology must be subject to laws, regulations, and ethics; and the results of the current study confirm this. The current study is consistent with Arouri and Hamaidi's study (2017) that students have a consensus about the general rules of ethics and netiquette for using the Internet. However, the current study disagrees with the Hall (2012) whose results indicate students' lack of interest in security certificates; the use of an Internet connection without permission to use it; and the assessment of the ethics of students' use of digital technology was low.

Second Question

To answer this question: “Are there statistically significant differences at ($\alpha = 0.05$) between the averages of secondary stage students' estimates related to their practice of ethics of using digital technology due to the variables of gender, specialization, and grade level?”, means and standard deviations were calculated, and [Table 2](#) shows that.

Table 2. Means And Standard Deviations of Sample Estimates on The Scale of The Ethics of Using Digital Technology, Due to Variables of Gender, Specialization and Grade

| Variables | Variable levels | Fields | | | | | |
|----------------|-----------------|--------------------------|-------|-------------------------|-------|-------------------|-------|
| | | Practice towards oneself | | Practice towards others | | Student reactions | |
| | | Mean | S.D. | Mean | S.D. | Mean | S.D. |
| Gender | Male | 4.06 | 0.603 | 4.29 | 0.545 | 4.07 | 0.635 |
| | Female | 4.30 | 0.425 | 4.47 | 0.386 | 4.30 | 0.494 |
| Specialization | Literary | 4.17 | 0.539 | 4.29 | 0.553 | 4.11 | 0.590 |
| | Scientific | 4.21 | 0.517 | 4.46 | 0.388 | 4.25 | 0.553 |
| Grade | Eleventh | 4.28 | 0.542 | 4.43 | 0.466 | 4.25 | 0.582 |
| | Twelfth | 4.11 | 0.499 | 4.34 | 0.474 | 4.14 | 0.559 |
| Total | | 4.19 | 0.527 | 4.39 | 0.472 | 4.19 | 0.572 |

Table 2 reveals that there are apparent differences between means according to the variables of gender, specialization, and grade. To determine the levels of statistical significance for these differences, a MANOVA test was used, as shown in Table 3.

Table 3. MANOVA Test Results for The Differences Between the Estimates of The Sample Individuals Based on A Scale of The Ethics of Using Digital Technology, Due to The Variables of Gender, Specialization, and Grade

| Variable | Dependent variable | Type III Sum of Squares | df | Mean Square | F | Sig. |
|-----------------|--------------------------|-------------------------|-----|-------------|-------|-------|
| Gender | Practice towards oneself | 11.269 | 1 | 11.269 | 44.0* | 0.000 |
| | Practice towards others | 8.749 | 1 | 8.749 | 43.2* | 0.000 |
| | Student's reactions | 12.170 | 1 | 12.170 | 39.9* | 0.000 |
| Specialization | Practice towards oneself | 1.586 | 1 | 1.586 | 6.2* | 0.013 |
| | Practice towards others | 9.045 | 1 | 9.045 | 44.7* | 0.000 |
| | Student's reactions | 7.230 | 1 | 7.230 | 23.7* | 0.000 |
| Grade | Practice towards oneself | 4.467 | 1 | 4.467 | 17.4* | 0.000 |
| | Practice towards others | 1.544 | 1 | 1.544 | 7.6* | 0.006 |
| | Student's reactions | 1.747 | 1 | 1.747 | 5.7* | 0.017 |
| Error | Practice towards oneself | 196.435 | 767 | 0.256 | | |
| | Practice towards others | 155.296 | 767 | 0.202 | | |
| | Student's reactions | 233.848 | 767 | 0.305 | | |
| Corrected Total | Practice towards oneself | 213.577 | 770 | | | |
| | Practice towards others | 171.710 | 770 | | | |

| Variable | Dependent variable | Type III Sum of Squares | df | Mean Square | F | Sig. |
|----------|---------------------|-------------------------|-----|-------------|---|------|
| | Student's reactions | 252.154 | 770 | | | |

*Statistically significant at the significance level ($\alpha = 0.05$)

It is clear from [Table 3](#) that there are statistically significant differences in the student's ethical practices during the use of digital devices, whether “towards oneself”, “towards others”, or as “reactions during the use of digital devices” due to the variables of gender, specialization, and grade variations. According to gender variable, the field of “practice towards oneself” has $F = 44.0$ the field of “practice towards others” has $F = 43.2$, and the field of “student reactions” has $F = 39.9$. These values are statistically significant in favor of females as shown in [Table 2](#). These results may be attributed to the fact that females in Kuwaiti community are surrounded by a conservative environment that focuses on protecting the females with more controls than the males. Females in Kuwait are more concerned for their reputation and the reputation of their families, which makes them not dare to practice unethical behaviors while using digital technology. Accordingly, the degree of their practice in the ethics of using digital technology varied from males' practices. The results of the current study are consistent with the Alawi's study (2015) in the presence of statistically significant differences attributable to the gender variable to the advantage of females. However, the results differ with the studies of Arouri and Hamaidi (2017) and Al-Fatly (2017) in the lack of statistically significant differences attributable to the gender variable.

Further, according to the findings related to specialization variable, [Table 3](#) showed that the domain of “practice toward oneself” has $F = 6.2$, the domain of “practice towards others” has $F = 44.7$, and the domain of “student reactions” has $F = 23.7$. These values are statistically significant to the advantage of the scientific branch as shown in [Table 2](#). Those results may be attributed to the fact that students of the scientific branch, by virtue of their more difficult specialization, do not have time to waste on the practice of immoral behaviors while using digital technology. The current study differs from Arouri and Hamaidi (2017) and Al-Fatly (2017), as these studies have found that there are no statistically significant differences attributable to the specialization variable.

Furthermore, according to the findings related to grade variable [table \(3\)](#) showed that the field of “practice toward oneself” has $F = 17.4$, the field of “practice towards others” has $F = 7.6$, and the field of “student reactions” has $F = 5.7$. These values are statistically significant to the advantage of eleventh grade as shown in [Table 2](#). Those results may be attributed to the fact that whenever the student progresses in the age group, the restrictions surrounding him/her, whether by parents or teachers, decrease and this may contribute to the practice of behaviors prohibited to him/her previously. The current study differs from the study of Arouri and Hamidi (2017), which concluded that there were no statistically significant differences attributable to the academic track.

Study Limitations

The current study is subject to the following limits:

Objective Limits: The current study is limited to identifying the degree of secondary stage students' ethics in using digital technology.

Human Limits: The study is limited to students of the eleventh and twelfth grade of secondary stage in the Al-Ahmadi Educational District in Kuwait.

Spatial Limits: This study is limited to secondary schools in Al-Ahmadi Educational District in Kuwait.

Time Limits: This study was conducted in the first and second semesters of the academic year (2018–2019).

The results of this study are also determined by the extent to which the study tool has the psychometric properties and the objectivity of the response of the study sample individuals to study instrument.

4. Conclusion

This study aimed at investigating the degree of practice of secondary stage students in Kuwait regarding the ethics of using digital technology from the students' perspectives. The findings revealed that the degree of the practice of high school students in Kuwait was high. In addition,

they revealed that there is a statistical difference attributed to the variables of gender, specialization, and grade. In light of this study results, researchers encourage issuing an official charter that serves as a guide to the ethics of using digital technology. Further, this study may urge other researchers to conduct more studies dealing with the concept of the ethics of using digital technology and its relationship to other variables and other educational stages. The results of this study would encourage the educational institutions in Kuwait to deploy the concept of the ethics of using digital technology at all educational levels. Further, to Kuwait may sustain the high degree of using digital technology ethics by holding sustainable educational and training workshops. Finally, research findings can notify those in charge of curricula development on the importance of adding the concept of ethics of using digital technology in educational curricula.

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An Examination of Students Online Learning Satisfaction, Interaction, Self-efficacy and Self-regulated Learning

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Abstract

Despite constantly growing, many educational institutions have not been prepared to shift from traditional to online learning environments until the pandemic. Current research aims to examine online students' satisfaction, interactions, internet self-efficacy and self-regulated learning among 210 high school students. The questionnaire has been used to collect the data from the participants. The findings suggested that the participants feel confident while using the Internet and are quite self-directed and do not lack interactions or satisfaction with online learning. Furthermore, the findings indicated that while grade level and GPA insignificantly influence students' satisfaction, time spent online and gender influence it significantly, with males reporting higher levels of satisfaction. While GPA and grade level significantly affect online interaction, gender and time spent online have no impact. Moreover, students who invest extra efforts into learning and obtain high grades feel significantly more satisfied with online learning than those with lower grades. The time spent online significantly affect internet self-efficacy and self-regulated learning, while the influence of grade level, GPA and gender is insignificant. This study findings may help instructors create an online classroom environment conducive to improving online students' satisfaction, interaction, internet self-efficacy and self-regulated learning and, as a result, improve the effects of online education.

Keywords: online learning satisfaction, learner interactions, self-efficacy, self-regulation.

1. Introduction

Without a doubt, constantly growing globalization has given rise to a rapid escalation in the benefit of 'information and communication technology (ICT)' in every sector, economics, politics, business, particularly in the educational sector, resulting in different ways of learning, teaching and

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training as well. The physical "brick and mortar" classroom is losing its domination as the place of learning (Nguyen, 2015). What is more, rapid developments in technology and the usefulness of online learning have made distance education easy (McBrien et al., 2009) and enhanced teachers' ideas on forming student-oriented and flexible learning environments (Bećirović et al., 2021; Kim, Hannafin, 2005). Being aware that in order to help learners gain knowledge and open-ended learning environment, only implementation of different instructional methods is far from being sufficient (Mašić, Bećirović, 2020), specifically in language learning (Jabeen, 2014), educators, scholars, and practitioners make a special effort to use the digital online learning tools as a bridge to encourage learning. Thus, the qualified programmers directed with incorporating proper technologies combined with those pedagogical approaches that boost ICT use in the process of teaching/learning are so far needed (Kim, Hannafin, 2005). As a result, many educational institutions have established diverse online learning programs not just to please the higher requirement of flexible learning conditions but rather as an instrument to convey knowledge and experience in order to attain the highest learners' outcome of learning, which will stimulate learners' creativity, innovation, comprehensiveness, and durability (Luankaew, 2016; Vilmolsiri, 2016). Since online learning is so popular, many researchers and teachers are interested in strengthening and improving learners' learning outcomes while fighting the decline in resources, strikingly in higher education (Pape, 2010). It is suggested that e-learning contributes to the fundamental and meaningful rich and actual learning environment, cooperative learning and social intercourse, the experience of enhancing motivation (Richards et al., 2014) and also empowers learners to have self-regulation (Chaiprasurt, Esichaikul, 2013; Shen et al., 2013). Not to mention the possibility of giving classes all over the world to anyone with an internet connection (De la Varre et al., 2009; Koller, Ng, 2014). Researchers suggest that e-learning learners have the objective of decreasing their ambiguity toward formal instruction by expanding comprehension of an attentively outlined path to achievement (Long, 2011; Young, Dziuban, 2000). Bearing in mind that learners would rather have an active than passive learning environment, and considering that they participate in a highly collaborative world regularly, they count on the same in their course (Bećirović, Akbarov, 2015; Dziuban et al., 2003). However, e-learning has been encountered by unease about quality from the created educational settings and society in general (Akdemir, Koszalka, 2008); consequently, learners' opinions become an alternate for learning engagement in the light of satisfaction (Swan, 2001; Bolliger, 2004). This might be due to contemporary learners' perception of information as a product that can be exchanged openly between a society of learners, and cooperation turns out to be essential to a diversity of educational results (Dziuban et al., 2013). Although the value of e-learning is remarkable, surprisingly, its fruitfulness has been doubted, and some studies have criticized its effectiveness (Istifci et al., 2016; Khan, 2016). Some of the main barriers to e-learning are lack of interaction, technical issues, and difficulties in comprehending instructional aims (Song et al., 2004).

While the concept of e-learning is more and more accepted and implemented in different universities and schools in the world (Dautbašić, Bećirović, 2022; Ghaffari, Abbas, 2011), education in Bosnia and Hercegovina (BiH) is far from being so. Only recently, due to the pandemic COVID-19 regarded as a public health emergency of universal concern in January 2020 (Mahase, 2020), all schools and higher education worldwide were imposed to e-learning. Rapid transitions to remote learning, particularly in state schools where online learning was not an urgent need for educational institutions in developing countries, learners and teachers found themselves in difficult situations.

Although numerous problems are linked to online learning, we cannot ignore its privileges in times of such emergency. As a result of its significance for education and attaining the best practice in the future, it is undeniably crucial to conduct a clear understanding of not only how efficiently online learning education is made available but also how convenient learners involve when getting into that program. As many studies (Kuo et al., 2013) argue that the interaction concept plays the most critical part in both classroom and online learning procedures, the current study aims to reveal whether high school students in Bosnia are satisfied with online learning, their interaction with teachers and other learners as well as learners' content-interaction and self-regulated learning, and learners' confidence while using the Internet.

2. Literature review

Although the first online learning started 15-20 years ago, in accordance with Matthews (1999) and Watson et al. (2017), distance education has been known to students for over 100 years.

Recent studies show that a large number of students willingly sign in online courses at the secondary as well as postsecondary levels, with the latest statistics displaying enrollments inclining to the top (Allen, Seaman, 2017; Graham, 2019; Mašić, Tarabar, 2021). However, the 2020 and the widespread COVID-19, have entirely transformed face-to-face learning to online learning, bringing high demands on mainstream teaching and learning. Considering the continuous development and growing communication tools (Kahrmanović, 2021), it is significant to seek out ways to improve learners' satisfaction in every instance.

Students' understandings of their course proficiency frequently become a substitute for learning engagement in the light of satisfaction (Bolliger, 2004). According to Moore (2011), learners' satisfaction can be observed in learners being successful and having good competence while learning online. This alludes to that satisfaction is a crucial indicator of effectiveness in diverse learning circumstances, particularly online courses. Not to mention that satisfied learners are more likely to be engaged, responsive and motivated, and conducive to a productive learning environment. More importantly, their achievement level is higher; however, teachers seem to have much more trouble fostering beneficial learning outcomes with dissatisfied students. Although it is not an easy task to measure learners satisfaction (Graham, 2019), it is of crucial importance as students spend a great time, money, and energy not only to obtain a proper education but also to make their online learning as being highly useful (Bollinger, Erichsen, 2013). Learners' satisfaction, as one of the crucial predictions of the success of a course as well as the effectiveness of distance learning (Allen, Seaman, 2003), is connected with numerous factors, including self-efficacy, technology, students' autonomy, interaction, and self-regulation as well (see Rodriguez Robles, 2006; Yukselturk, Yildirim, 2008). In particular, the focus of this study is on interaction, self-regulated learning, and Internet-self efficacy, all of which are assumed to be an indication of learners' satisfaction. Undoubtedly, interaction plays a crucial part in online and face-to-face learning programs (Kuo et al., 2013), as collaboration is essential to a diversity of educational developments (Dziuban et al., 2013).

Collaborative interaction is a crucial component in the internet learning environment. Students' interaction, as a factor that can predict satisfaction (Rodriguez Robles, 2006; Bray, Aoki, Dlugosh, 2008) is usually observed in three relations (Bray et al., 2008; Wanstreet, 2006): learner-learner, learner-content and learner instructor (Kuo, 2010), although extended options are known (Anderson, 2003). Online learning mainly focuses on learner-content interaction as integral (Kuo, 2010) because the content is exposed as multimedia (Yaman, Bećirović, 2016). Furthermore, what most affects online learning satisfaction as a predictor is learner-learner interaction, especially learner-instructor interaction (Rodriguez Robles, 2006). In addition, due to its integrating learner-learner and learner-instructor interaction, learner-content relation could be an even better predictor of student satisfaction (Chejlyk, 2006; Keeler, 2006). All three types of interaction affect and shape self-efficacy as they produce certain feelings that generate it.

As a psychological category, self-efficacy leans on Bandura's social-cognitive theory (1977) as pivotal for understanding self-efficacy. Self-efficacy is also defined as a self-appraisal of one's ability to master/accomplish a task or confidence in skill to perform a task (Pintrich et al., 1991). Based on one's belief, judgment, or conviction (Bandura 1977a, Bandura 1997b) and varied upon context and tasks, self-efficacy is not measurable through an omnibus test (Hodges, 2008). Instead, it subordinates to student-regulated learning (SRL). Bandura (1997b) and Schunk (1995) agree that self-efficacy beliefs influence effort, task choice, persistence, resilience, and achievement. Modern understanding of self-efficacy considers metacognition and motivational processes (Zimmerman, Campillo, 2003; Zimmerman, Moylan, 2009). Furthermore, influenced by the Information Processing Theory (Winne, 2001; Greene, Azevedo, 2007), Winne (2011) exposes cognitive and metacognitive aspects of SRL: 1) task definition (understanding of the task), 2) goal setting and planning (establishing goals and how to achieve them), 3) enacting study tactics and strategies (preprocessing set of actions), and 4) metacognitively adapting studying (making long term changes in motivation, strategies and beliefs) (Panadero, 2017: 10). The models emphasize self-efficacy as a crucial SRL process (Panadero, 2017: 13), and teachers should gain SRL expertise as learners (Moos, Ringdal, 2012). SRL considered as one of the most influential individual skills in current time (Eroglu, Ozbek, 2018), originates in Socrates' focus on independent learning, as well as continuous awareness of the best learning method with teachers as a leader for learners to develop independent learning and critical thinking skills (Bećirović et al., 2021). Furthermore, some

authors believe that self-regulatory skills can be pre-taught in the online environment (Dembo et al., 2006), whilst others suggest embedding those within the course (Chang, 2005; Cho, 2004).

While research in online learning favored computer self-efficacy and Internet self-efficacy (Hodges, 2008), Kuo (2010), conducted by Lim's idea (2001), included computer self-efficacy. He argues that using a computer successfully as a tool is a significant predictor of course satisfaction in online learning. Self-regulation is positively related to achievement in online learning (Shih, Gamon, 2001; Yukselturk, Bulut, 2005; Bell, 2006). Many authors agree that reaching high scores and grades is a reflection of students' achievement (Sinanović, Bećirović, 2016; Barnard et al., 2008; Edvardsson, Oskarsson, 2008; Wadsworth et al., 2007) and it is a common goal for both learners and instructors. Course satisfaction and achieving desired goals correlate, and they are communicated through feedback (Anderson, 2003) in learner-instructor interaction. Based on the presented theoretical ground, the study was guided by the following research questions:

1. Is there a statistically significant difference in students' satisfaction in online learning based on GPA, gender, average time spent online for courses each week, and grade level?
2. Is there a statistically significant difference in students' interaction in online learning based on GPA, gender, average time spent online for courses each week, and grade level?
3. Is there a statistically significant difference in internet self-efficacy and student-regulated learning based on GPA, gender, average time spent online for courses each week, and grade level?
4. Are internet self-efficacy, student-regulated learning, and satisfaction a predictor of students' achievement?

3. Methodology

3.1. Participants

The examination sample consisted of 210 selected participants from high schools in Bosnia and Herzegovina. Participants were selected from different grade levels, and a convenience sampling method was employed. Thus, there were 68 (32.4 %) first grade students, 47 (22.4 %) second grade students, 45 (21.4 %) third grade students, and 50 (23.8 %) fourth grade students. 107 (51 %) female and 103 (49 %) male students with ages ranging from 15 to 19 ($M = 16.77$ $SD = 1.10$), and the assumption of a minimum of 10 participants per group (McMilan, 2012: 269) was fulfilled.

Table 1. Descriptive analysis of the research sample

| | | N | % |
|--|-------------------|-------------------|------|
| Gender | Female | 107 | 51.0 |
| | Male | 103 | 49.0 |
| Grade levels | First | 68 | 32.4 |
| | Second | 47 | 22.4 |
| | Third | 45 | 21.4 |
| | Fourth | 50 | 23.8 |
| Average time spent online for course each week | Less than 5 hours | 61 | 29.0 |
| | 6-10 hours | 56 | 26.7 |
| | 11-15 hours | 42 | 20.0 |
| | 16-20 hours | 31 | 14.8 |
| | above 20 hours | 20 | 9.5 |
| | GPA | 2.5-3.5=3.0 (low) | 24 |
| 3.5-4.5=4.0 | | 114 | 54.4 |

| | | | |
|-------|--------------------|-----|-------|
| | (medium) | | |
| | 4.5-5.0=5.0 (high) | 72 | 36.0 |
| Total | | 210 | 100.0 |

3. 2. Instruments and Procedures

The instrument comprised five parts. The first part incorporated demographic questions such as gender, age, overall GPA, grade level, average time spent online for their course each week. The second part is comprised of learners' interaction scale developed and validated by Kuo et al. (2009). The aim of this instrument was to obtain more detailed information about students' satisfaction towards online learning with the five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument comprised 18 items divided into three subscales, namely learner-learner interaction (8 items, e.g., Overall, I had numerous interactions related to the course content with fellow students); learner-instructor interaction (6 items, e.g., I had numerous interactions with the instructor during the class); and learner-content interaction (4 items, e.g., Online course materials helped me to understand better the class content). The Cronbach's alpha reliability analysis of the instrument displayed an acceptable level of reliability $\alpha = .84$ for overall learner's interactions, as well as for its subscales, namely learner-learner interaction $\alpha = .76$; learner-instructor interactions $\alpha = .69$; learner-content interactions $\alpha = .58$.

The third part included the internet self-efficacy scale developed and validated by Eastin and LaRose (2000) with the purpose of measuring students' confidence while using internet-based technology. This instrument included eight items (e.g., I feel confident explaining why a task will not run on the Internet) with seven possible answers ranging from 1 (very unlikely) to 7 (very likely). The next was the self-regulated scale with twelve items (e.g., When I study for this class, I set goals for myself in order to direct my activities in each study period) developed by Pintrich et al. (1993). This scale was used to measure the degree to which the monitoring, regulating, and planning strategies students employed during online learning. According to Pintrich et al. (1993), planning (activities as goal setting and task analysis), monitoring (such as paying attention to other readers, self-testing, questioning, etc.), and regulating (for example, continuous adjustment to course requirements) are three usual features that form metacognitive self-regulatory activities. In order to answer questions related to this part, a 7-point Likert scale ranging from 1 (not at all true of me) to 7 (very true of me) was utilized. Finally, the last part was about students' overall satisfaction towards online learning (e.g., overall, I am satisfied with this class). This instrument developed by Kuo et al. (2009) comprised five items based on a 5-point Likert scale starting from 1 (strongly disagree) to 5 (strongly agree). Also, the instrument showed the consistency reliability for the following variables, internet self-efficacy $\alpha = .82$; self-regulated learning $\alpha = .85$, as well as learners' satisfaction $\alpha = .67$.

After obtaining the informed consent from the schools' administration and students themselves, the data online collections instruments were provided and adjusted in accordance with high schools by the investigators themselves. Participants were not left without a proper clarification on how to complete a Likert-type scale and were enlightened that the data gained from these instruments would be anonymous, voluntary, and confident.

3.2. Data Analysis

To examine the data, The Statistical Package for Social Science (SPSS) version 23.0 was utilized, and three different statistical methods were employed. To determine the degree of students' satisfaction as well as their interaction, self-efficacy, and self-regulated learning, the means (M) and the standard deviation (SD) were utilized. Further, a One-way ANOVA was performed to see the influence of GPA on learners' interactions, and factorial ANOVA was run to analyze the effect of gender, average time spent online for courses weekly, and grade level on learners' satisfaction. Finally, standard multiple regression was applied to investigate students' satisfaction, self-efficacy, and self-regulated learning impact on students' achievement in online learning.

4. Results

4.1. Initial analyses

The results displayed in Table 2 showed that the high school students generally felt confident in the online learning environment, with a mean ($M = 4.63$, $SD = 1.08$) being pretty high. More interestingly, the results suggested that students were quite self-regulated learners, with a self-regulation level being quite high ($M = 4.34$, $SD = 1.04$). When it comes to students' interaction the most used one seemed to be learner-instructor interaction ($M = 3.42$, $SD = .75$), however, only a slightly differences were observed as other two scales, learner-content ($M = 3.41$, $SD = .81$) and learner-learner ($M = 3.38$, $SD = .75$) interaction showed almost the same results. The lowest mean among these scales was observed on the side of learners' satisfaction towards online learning, with the mean being moderate ($M = 3.29$, $SD = .76$). The analysis showed that all variables above are normally distributed using skewness and kurtosis values (ranging from -2 to +2, as proposed by Hair et al., 2010).

Table 2. Descriptive results and correlation

| | N | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | α | Skewness | Kurtosis |
|-----------------------------------|-----|------|------|---|-------|-------|-------|-------|-------|----------|----------|----------|
| 1. Learner-learner interaction | 210 | 3.38 | .75 | 1 | .67** | .58** | .53** | .65** | .78** | .76 | .445 | -.132 |
| 2. Learner-instructor interaction | 210 | 3.42 | .75 | - | 1 | .65** | .62** | .62** | .60** | .69 | .379 | -.538 |
| 3. Learner-content interaction | 210 | 3.41 | .81 | - | - | 1 | .64** | .62** | .63** | .58 | .149 | -.408 |
| 4. Internet self-efficacy | 210 | 4.63 | 1.08 | - | - | - | 1 | .70** | .63** | .82 | .348 | -.245 |
| 5. Self-Regulated learning | 210 | 4.34 | 1.04 | - | - | - | - | 1 | .69** | .85 | .762 | .291 |
| 6. Learners' satisfaction | 210 | 3.29 | .76 | - | - | - | - | - | 1 | .67 | .600 | -.111 |

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

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

Additionally, correlation analyses demonstrated that all scales were positively and significantly correlated with each other ($p < .05$). In particular, it is found that learners' satisfaction is positively and significantly correlated with learner-learner interaction ($r = .78$ $p = .00 < .01$), learner-instructor interaction ($r = .60$ $p = .00 < .01$), learner-content interaction ($r = .63$ $p = .00 < .01$), internet self-efficacy ($r = .63$ $p = .00 < .01$), and self-regulated learning ($r = .69$ $p = .00 < .01$). Thus, the more learners interact, the more confident they feel, and the more self-regulated and self-efficient, the more likely they will be satisfied with online learning.

4.2. Learners' satisfaction based on gender, general GPA, grade level, and average time spent online

The four-way analysis of variance (factorial ANOVA) was performed to investigate learners' differences in satisfaction with online learning based on gender, general GPA, grade level, and average time spent online on courses each week. In particular, the factorial ANOVA analysis indicates significant interaction effect only between GPA and average time spent online $F(58, 128) = 6.998$, $p = .023$, partial $\eta^2 = .107$ while other interaction effects on learners' satisfaction with online learning have been insignificant. On the contrary, significant main effect was found for gender $F(58, 128) = 5.304$, $p = .023$, with low effect size partial $\eta^2 = .040$ and average time spent online $F(58, 128) = 3.241$, $p = .014$, having moderate effect size partial $\eta^2 = .092$, while main effects of grade level $F(58, 128) = 2.477$, $p = .064$, $\eta^2 = .055$, and GPA $F(58, 128) = 2.358$, $p = .099$, with effect size being low partial $\eta^2 = .036$, were statistically insignificant (Table 4).

Table 4. Learners' satisfaction based on gender, general GPA, grade level, and average time spent online

| Source | SS | df | F | p | partial η^2 |
|--|-------|----|-------|------|------------------|
| Gender | 2.427 | 1 | 5.304 | .023 | .040 |
| GPA | 2.158 | 2 | 2.358 | .099 | .036 |
| Grade level | 3.400 | 3 | 2.477 | .064 | .055 |
| Average time spent online | 5.930 | 4 | 3.241 | .014 | .092 |
| Gender x GPA | 1.187 | 2 | 1.297 | .277 | .020 |
| Gender x grade level | 2.173 | 3 | 1.583 | .197 | .036 |
| Gender x average time spent online | 1.415 | 4 | .773 | .545 | .024 |
| GPA x grade level | 2.430 | 6 | .885 | .508 | .040 |
| GPA x average time spent online | 6.998 | 6 | 2.550 | .023 | .107 |
| Grade level x average time spent online | 3.888 | 12 | .708 | .741 | .062 |
| Gender x GPA x grade level | 3.227 | 4 | 1.764 | .140 | .052 |
| Gender x GPA x average time spent online | .950 | 4 | .519 | .722 | .016 |
| Gender x GPA x grade level x average time spent online | 1.774 | 4 | .444 | .427 | .029 |

In order to determine which average time spent online groups were significantly different in satisfaction towards online learning, Bonferroni's post hoc test was conducted. Results revealed that learners who spent less than five hrs ($p = .004$) and 6 to 10 hrs ($p = .004$) as well were significantly more satisfied than those of 11 to 15 hrs spent online while other groups were not significantly different.

In regards to the level of satisfaction, the results showed that males were significantly more satisfied with online learning ($M = 3.33$, $SD = .80$) when compared to female counterparts ($M = 3.26$, $SD = .72$). Further, the results suggested that learners with high GPA scores were more satisfied ($M = 3.45$, $SD = .72$) than learners with medium ($M = 3.21$, $SD = .73$), and low GPA scores ($M = 3.21$, $SD = .94$), whose level of satisfaction was the same. When considering grade levels it is found that the highest score of satisfaction was obtained by the participants in the 4th grade ($M = 3.51$, $SD = .81$), next was the 2nd grade ($M = 3.44$, $SD = .67$), followed by the 1st graders ($M = 3.27$, $SD = .77$), while the lowest was among the 3rd graders ($M = 2.93$, $SD = .64$). Moreover, learners who spent less than 5hrs ($M = 3.46$, $SD = .79$), as well as 6-10 hrs ($M = 3.46$, $SD = .78$), were the most satisfied with online learning. Interestingly, learners who spent above 20hrs online ($M = 3.35$, $SD = .85$) were more satisfied than those with 16-20hrs online ($M = 3.08$, $SD = .66$). However, the lowest level was generally shown by participants who spent 11-15hrs online ($M = 2.96$, $SD = .55$).

4.3. Learners' interaction based on gender, general GPA, grade level, and average time spent online

A factorial MANOVA was also conducted to investigate the impact of gender, GPA, grade level, and average time spent online on learner-learner interaction, learner-instructor interaction, and learner-content interaction. Multivariate MANOVA showed significant interaction effect between Gender, GPA, Grade level and Average time spent online *Wilks' Lambda* $\lambda = 0.846$, $F(12, 374) = 1.846$, $p = .044$, $\eta^2 = .054$, GPA and Average time spent online *Wilks' Lambda* $\lambda = 0.799$, $F(18, 357) = 1.639$, $p = .049$, $\eta^2 = .072$, GPA, Grade level, and Average time spent online *Wilks' Lambda* $\lambda = 0.644$, $F(36, 373) = 1.666$, $p = .011$, $\eta^2 = .137$ on the combined variables of learners' interactions. As for the main effect on the combined variables of learners' interactions it was a significant for GPA *Wilks' Lambda* $\lambda = 0.862$, $F(6, 252) = 3.228$, $p = .005$, $\eta^2 = .071$ and grade level *Wilks' Lambda* $\lambda = 0.866$, $F(9, 307) = 2.078$, $p = .031$, $\eta^2 = .047$. Furthermore, results revealed significant interaction between gender and grade level on learner-instructor interaction F

(3, 128) = 4.141, $p = .008$, $\eta^2 = .088$, as well as, GPA and average time spent online $F(6, 128) = 2.884$, $p = .011$, $\eta^2 = .119$, and gender, GPA, and average time spent online $F(4, 128) = 4.357$, $p = .002$, $\eta^2 = .120$ on learner-content interaction. On the other hand, the results showed that GPA significantly affect learner-learner interaction $F(2, 128) = 10.003$, $p = .000$, $\eta^2 = .135$, and learner-instructor interaction $F(2, 128) = 3.361$, $p = .038$, $\eta^2 = .050$, and grade level also significantly affects learner-instructor interaction $F(3, 128) = 4.121$, $p = .008$, $\eta^2 = .088$. However, main effects of gender and average time spent online were statistically insignificant on all dependent variable. All interactions and main effects on lerners' interactions are presented in the [Table 5](#).

Bonferroni's post hoc test further reveals that learners-learners interaction is significantly more used by learners with a high GPA than learners with low GPA $p = .001$ or medium GPA $p < .001$. Also, in interaction with an instructor, learners with medium GPA significantly differ from those with high GPA $p = .016$, while learners with low GPA significantly less interact with content compared with learners with high GPA $p = .047$. Considering grade level, Bonferroni's post hoc test revealed a significant difference in all variables of learners' interaction between 3rd graders on one side and the 2nd and 4th graders on the other side $p < .05$.

Table 5. Learners' interaction based on gender, general GPA, grade level, and average time spent online

| Source | | SS | df | F | p | partial η^2 |
|---------------------------|--------------------------------|-------|-------|--------|------|------------------|
| Gender | Learner-learner interaction | .413 | 1.128 | 1.061 | .305 | .008 |
| | Learner-instructor interaction | .195 | 1.128 | .491 | .485 | .004 |
| | Learner-content interaction | .035 | 1.128 | .080 | .777 | .001 |
| GPA | Learner-learner interaction | 7.784 | 2.128 | 10.003 | .000 | .135 |
| | Learner-instructor interaction | 2.672 | 2.128 | 3.361 | .038 | .050 |
| | Learner-content interaction | 1.233 | 2.128 | 1.437 | .241 | .022 |
| Grade level | Learner-learner interaction | 1.470 | 3.128 | 1.260 | .291 | .029 |
| | Learner-instructor interaction | 4.915 | 3.128 | 4.121 | .008 | .088 |
| | Learner-content interaction | 2.022 | 3.128 | 1.571 | .200 | .036 |
| Avarage time spent online | Learner-learner interaction | 3.570 | 4.128 | 2.294 | .063 | .067 |
| | Learner-instructor interaction | 3.282 | 4.128 | 2.064 | .089 | .061 |
| | Learner-content interaction | .874 | 4.128 | .509 | .729 | .016 |
| Gender * GPA | Learner-learner interaction | .915 | 2.128 | 1.176 | .312 | .018 |
| | Learner-instructor interaction | .484 | 2.128 | .608 | .546 | .009 |
| | Learner-content interaction | .258 | 2.128 | .301 | .740 | .005 |
| Gender * Grade level | Learner-learner interaction | 2.317 | 3.128 | 1.985 | .119 | .044 |
| | Learner-instructor interaction | 4.939 | 3.128 | 4.141 | .008 | .088 |

| | | | | | | |
|--|--------------------------------|-------|--------|-------|------|------|
| Gender * Avarage time spent online | Learner-content interaction | 1.876 | 3.128 | 1.458 | .229 | .033 |
| | Learner-learner interaction | .962 | 4.128 | .618 | .651 | .019 |
| | Learner-instructor interaction | 1.761 | 4.128 | 1.107 | .356 | .033 |
| GPA * Grade level | Learner-content interaction | 3.386 | 4.128 | 1.973 | .102 | .058 |
| | Learner-learner interaction | 1.114 | 6.128 | .477 | .824 | .022 |
| | Learner-instructor interaction | 3.079 | 6.128 | 1.291 | .266 | .057 |
| GPA * Avarage time spent online | Learner-content interaction | 2.524 | 6.128 | .981 | .441 | .044 |
| | Learner-learner interaction | 4.704 | 6.128 | 2.015 | .068 | .086 |
| | Learner-instructor interaction | 4.743 | 6.128 | 1.988 | .072 | .085 |
| Grade level * Avarage time spent online | Learner-content interaction | 7.422 | 6.128 | 2.884 | .011 | .119 |
| | Learner-learner interaction | 4.129 | 12.128 | .884 | .565 | .077 |
| | Learner-instructor interaction | 6.974 | 12.128 | 1.462 | .147 | .121 |
| Gender * GPA * Grade level | Learner-content interaction | 8.254 | 12.128 | 1.603 | .098 | .131 |
| | Learner-learner interaction | 1.961 | 4.128 | 1.260 | .289 | .038 |
| | Learner-instructor interaction | 2.477 | 4.128 | 1.558 | .190 | .046 |
| Gender * GPA * Avarage time spent online | Learner-content interaction | 2.100 | 4.128 | 1.224 | .304 | .037 |
| | Learner-learner interaction | .548 | 4.128 | .352 | .842 | .011 |
| | Learner-instructor interaction | 1.958 | 4.128 | 1.231 | .301 | .037 |
| Gender * Grade level * Avarage time spent online | Learner-content interaction | 7.476 | 4.128 | 4.357 | .002 | .120 |
| | Learner-learner interaction | 3.858 | 12.128 | .826 | .623 | .072 |
| | Learner-instructor interaction | 4.114 | 12.128 | .862 | .587 | .075 |
| | Learner-content interaction | 4.495 | 12.128 | .873 | .576 | .076 |

Further, descriptive results showed that the female students experienced learner-learner interaction ($M = 3.42$ $SD = .73$) as the highest level of learners' interaction, whilst the male counterparts demonstrated that they interact the most with the content ($M = 3.46$ $SD = .85$). Considering GPA it is revealed that learners with the high grades interact the most with all types of interaction, as it follows learner – learner ($M = 3.74$ $SD = .74$), learner – Instructor ($M = 3.60$ $SD = .75$), and learner – content ($M = 3.56$ $SD = .84$) interactions. With reference to grade level it is found that older learners that is 4th graders interact the most in all types of interaction, however, the highest mean is noticed in learner-content interaction ($M = 3.62$ $SD = .66$), and learner-instructor interaction ($M = 3.62$ $SD = .85$), but the lowest is observed with learner-learner interaction ($M = 3.58$ $SD = .75$). Unpredictably, 3rd graders interact the least, favorably disposed to

interact with learners ($M = 3.16$ $SD = .67$), followed by instructors ($M = 3.13$ $SD = .72$), and then content ($M = 3.11$ $SD = .81$). The results are changeable when it comes to average time spent online for course each week, thus, learner-content interaction was the highest level of interactions recorded among the learners who spend above 20 hrs online ($M = 3.58$ $SD = 1.05$). The second highest level of interaction was learner-learner interaction exhibited by the learners spending less than 5hrs online ($M = 3.51$ $SD = .77$), whereas, the lowest level of online interaction was learner-instructor interaction with the highest mean shown by the students spending 6-10hrs online ($M = 3.50$ $SD = .80$).

4.4. Internet self-efficacy and self-regulated learning based on gender, general GPA, grade level, and average time spent online

MANOVA was further used to investigate the effects of gender, GPA, grade level, and average time spent online on internet self-efficacy and self-regulated learning. Multivariate analysis showed that all variables and their interactions except Average time spent online *Wilks' Lambda* $\lambda = .848$, $F(8, 254) = 2.731$, $p = .007$, $\eta^2 = .079$, and interaction between GPA and Average time spent online *Wilks' Lambda* $\lambda = .849$, $F(12, 254) = 1.806$, $p = .048$, $\eta^2 = .079$ had an insignificant influence on combined dependent variables of self-regulated learning and internet self-efficacy (Table 6).

Furthermore, univariate analysis showed significant interaction only between GPA and average time spent online on self-regulated learning $F(6, 128) = 2.553$, $p = .023$, $\eta^2 = .107$. However, other interactios had been insignificant on both Internet self-efficacy and self-regulated learning. Analysis of variance showed that average time spent online significantly influence internet self-efficacy $F(4, 128) = 4.095$, $p = .004$, $\eta^2 = .113$, and self-regulated learning $F(4, 128) = 4.060$, $p = .004$, $\eta^2 = .113$, while other independent variables showed insignificant influence on both Internet self-efficacy and self-regulated learning (Table 6).

Table 6. Internet self-efficacy and self-regulated learning based on gender, general GPA, grade level, and average time spent online

| Source | | SS | df | F | p | partial η^2 |
|--|-------------------------|--------|--------|-------|------|------------------|
| Gender | Internet self-efficacy | .010 | 1.128 | .010 | .919 | .000 |
| | Self-regulated learning | .858 | 1.128 | 1.002 | .319 | .008 |
| GPA | Internet self-efficacy | 3.954 | 2.128 | 2.003 | .139 | .030 |
| | Self-regulated learning | 5.059 | 2.128 | 2.954 | .056 | .044 |
| Grade level | Internet self-efficacy | .881 | 3.128 | .298 | .827 | .007 |
| | Self-regulated learning | 5.164 | 3.128 | 2.010 | .116 | .045 |
| Avarage time spent online | Internet self-efficacy | 16.167 | 4.128 | 4.095 | .004 | .113 |
| | Self-regulated learning | 13.903 | 4.128 | 4.060 | .004 | .113 |
| Gender * GPA | Internet self-efficacy | 1.563 | 2.128 | .792 | .455 | .012 |
| | Self-regulated learning | .080 | 2.128 | .047 | .954 | .001 |
| Gender * Grade level | Internet self-efficacy | 5.172 | 3.128 | 1.747 | .161 | .039 |
| | Self-regulated learning | 5.238 | 3.128 | 2.039 | .112 | .046 |
| Gender * Avarage time spent online | Internet self-efficacy | 4.726 | 4.128 | 1.197 | .315 | .036 |
| | Self-regulated learning | 2.172 | 4.128 | .634 | .639 | .019 |
| GPA * Grade level | Internet self-efficacy | 7.477 | 6.128 | 1.263 | .279 | .056 |
| | Self-regulated learning | 7.328 | 6.128 | 1.426 | .209 | .063 |
| GPA * Avarage time spent online | Internet self-efficacy | 10.720 | 6.128 | 1.810 | .102 | .078 |
| | Self-regulated learning | 13.115 | 6.128 | 2.553 | .023 | .107 |
| Grade level * Avarage time spent online | Internet self-efficacy | 16.759 | 12.128 | 1.415 | .167 | .117 |
| | Self-regulated learning | 9.315 | 12.128 | .907 | .542 | .078 |
| Gender * GPA * Grade level | Internet self-efficacy | .842 | 4.128 | .213 | .931 | .007 |
| | Self-regulated learning | 3.163 | 4.128 | .923 | .453 | .028 |
| Gender * GPA * Avarage time spent online | Internet self-efficacy | 6.399 | 4.128 | 1.621 | .173 | .048 |
| | Self-regulated learning | 3.823 | 4.128 | 1.116 | .352 | .034 |

| | | | | | | |
|--|-------------------------|-------|--------|------|------|------|
| Gender * Grade level * Avarage time spent online | Internet self-efficacy | 6.627 | 12.128 | .560 | .871 | .050 |
| | Self-regulated learning | 4.326 | 12.128 | .421 | .953 | .038 |

Additionally, analysis revealed that female learners despite having remarkably high confidence ($M = 4.60$ $SD = .11$), and being quite self-regulated ($M = 4.28$ $SD = .11$), male counterparts outperformed them for both internet self-efficacy with mean being pretty high ($M = 4.66$ $SD = .10$), and self-regulated learning ($M = 4.40$ $SD = .10$). As could be expected, learners with high GPA scores showed the most confidence while using the Internet, with the mean being high ($M = 4.80$ $SD = .72$), and also, they scored the highest mean for self-regulated learning ($M = 4.52$ $SD = .72$). With respect to grade level analysis further revealed that internet self-efficacy ($M = 4.76$ $SD = .50$), and self-regulated learning ($M = 4.57$ $SD = .50$) were the highest among 4th graders. However, the lowest mean was recorded among 3rd graders not only for internet self-efficacy ($M = 4.38$ $SD = .45$) but also fo self-regulated learning ($M = 3.93$ $SD = .45$). Considering the average time spent online for courses each week on the scale internet self-efficacy the highest mean was observed among learners spending 6-10 hrs online ($M = 4.96$ $SD = .56$), while the least confidence towards using internet was recorded among learners who spent 11-15hrs online ($M = 4.10$ $SD = .39$). Similar results were found for self-regulated learning, though the highest mean was reported among groups of 20hrs online ($M = 4.63$ $SD = .20$), while the lowest mean was among learners who spend 11-15hrs online ($M = 3.94$ $SD = .42$). Noteworthy, internet self-efficacy was higher compared to self-regulated learning in all independent variables.

4.5. Internet' self-efficacy, self-regulated learning, and learners' satisfaction achievement predictors

Standard multiple regression was performed to explore the accuracy of internet self-efficacy, self-regulated learning, and learners' satisfaction in predicting the students' achievement in online learning. The model summary indicate that the overall model of the three predictors (internet self-efficacy, self-regulated learning, and learners' satisfaction) was insignificant $R^2 = .019$, $R^2 adj. = .005$ $F(3,206) = 1.362$, $p = .256$. The regression coefficient further confirms that the higher levels of satisfaction scale towards online learning are linked with higher levels of learners' online learning achievement, even being insignificant. The beta weights in table 7 show that none of the three predictor variables significantly predict student achievement, as follows: internet self-efficacy ($\beta = .028$, $t(.282)$, $p = .778$; self-regulated learning ($\beta = .040$, $t(.372)$, $p = .711$; and learners' satisfaction ($\beta = .087$, $t(.869)$, $p = .386$, despite their positive contribution.

Table 7. Internet' self-efficacy, self-regulated learning, and learners' satisfaction as achievement predictors

| | B | β | t | p | Bivariate r | Partial r |
|-------------------------|------|---------|------|------|-------------|-----------|
| Internet self-efficacy | .017 | .028 | .282 | .778 | .019 | .020 |
| Self-regulated learning | .025 | .040 | .372 | .711 | .026 | .026 |
| Learners' satisfaction | .073 | .087 | .869 | .386 | .060 | .060 |

5. Discussion

Although being a popular topic (Li, Beverly, 2008; Palvia et al., 2018), instructors have not been prepared for online changes in teaching approaches (Hodges et al., 2018) until the pandemic outbreak. Concentrating on high school education, this research directs the remaining analysis gaps by pushing further into learners satisfaction, their interaction, self-regulated learning, as well as internet self-efficacy in online learning environments among high school students in Bosnia and Herzegovina. The findings suggested that high school students indeed feel confident while using the

Internet for educational purposes, which is not surprising as young learners are more connected than ever before, and by sharing and learning information immediately, the Internet has made the world appear like a 'small village' (Shali, 2018). Further, for high school students, self-regulation is vital in determining learning outcomes since the majority of them reported that they are quite self-regulated. This might be due to the fact that online instruction demands are more challenged for their learning effectiveness without educators' immediate interaction (Broadbent, Poon, 2015). Also, many studies (Barnard-Brak et al., 2010; Shea, Bidjerano, 2010) have shown that e-learning is highly learners-centered, where learners have to suppose more autonomy and responsibilities as well. Finding that learners like to interact is somehow expected as the nature of learning is social (Hamzić, Bećirović, 2021; Frey et al., 2019), and during the COVID-19, it is more likely that learners yearn for social relatedness owing to the physical lack of contact from classmates and teachers (Wong, 2020). Further, even being quite moderate, the least mean was found for students' satisfaction, which might be because educational institutions suddenly shifted from traditional classroom teaching to online teaching as a result of a pandemic outbreak. Hence, experiencing new challenges for both and finding ways to fulfill learning aims and outcomes and provide good teaching standards teachers and learners had to adopt and instantly shift to such a new learning environment. These results provide crucial clues that might enhance learners' satisfaction and build a better online learning experience by incorporating learners' self-efficacy. Learners' satisfaction might be controlled by course quality as a vital mediator that clearly affects learners' fulfillment (Alqurashi, 2019).

The correlations among all these variables were statistically significant. In particular, the results indicated that internet-self efficacy significantly correlates with students' online satisfaction, likewise many other studies (Chu, Chu, 2010; Shen et al., 2014; Womble, 2008). Thus, technical issues while using the Internet potentially will trigger learners' irritation and dissatisfaction (Choy et al., 2002). In line with earlier studies, the subject of correlation between three categories of interactions (i.e., learner-learner, learner-instructor, and learner-content interaction) and student satisfaction was also positive and significant (Rodriguez Robles, 2006; Sher, 2004). Also, numerous studies of online learning have argued that learner-learner and learner-instructor interactions were more connected to and predictive of learners' satisfaction in comparison with learner-content interaction (Bolliger, Martindale, 2004; Rodriguez Robles, 2006). However, the results are inconclusive, as some studies suggested that the intensity of content interaction is primary to learners' satisfaction in online learning than other types of interaction (Chejlyk, 2006; Keeler, 2006).

4.6. Learners' satisfaction based on gender, general GPA, grade level, and average time spent online

Even being reported that learners' satisfaction might be negatively inclined to take online courses than traditional ones (Aldhahi et al., 2021; Cole et al., 2014), recent studies found different factors benefiting learning satisfaction, such as course design (Allen et al., 2002), instructor support, and learners personal factors (Bolliger, 2004), the role of effort measured by time spent online (Johnson et al., 2002; Rich, 2006). Thus, the first research question deals with students' satisfaction based on GPA, gender, average time spent online for courses each week, and grade level of learners. The results revealed that GPA and average time spent online were significantly interacting in the influence on learners' satisfaction, while other interacting factors showed an insignificant interaction effect. Our findings put forth that extra effort can help learners to obtain higher grades, resulting in higher satisfaction. Thus, learners should know that academic success and satisfaction will be significantly more likely when effort and time are put forward from the very first day. As it is stated by Dell et al. (2010), in respect of learning, learners who devote themselves determinedly should be successful in both online learning environments and face-to-face learning. In spite of having limited studies on time and performance, it is frequently supposed that online learners will use any extra time to improve grades and knowledge (Bigelow, 2009). When particular variables were taken into account, it was found that average time spent online and gender significantly impact learners' satisfaction. Most studies on the adoption of online learning affirmed that gender was a significant determinant considering learners' satisfaction towards online learning (Goswami, Dutta, 2016). The greater satisfaction was more likely to be on the side of male learners, which is not surprising as male learners are intended to use computers more often, leading to a higher comfort level with computer use (Ashong, Commander, 2012). The same

results were obtained by Beqiri, Chase, and Bishka (2009), who found that male learners were away more fulfilled compared to female learners in the online learning context; however, some failed to see any significant difference based on gender (Cuadrado et al., 2010; Cole et al., 2014). Having said this, some investigators have suggested that females have outperformed their male counterparts in online performance (Turesky, Hebert, 2016; Wladis et al., 2015) and that their level of satisfaction is relatively higher (Maceli et al., 2011).

4.7. Learners' interaction based on gender, general GPA, grade level, and average time spent online

With regard to three levels of learners' interaction, namely learner-learner interaction, learners-instructor interaction, and learner-content interaction based on factors such as GPA, gender, average time spent online for courses each week, and grade level of learners, the study found that gender and grade level interaction significantly impact learner-instructor interaction. It appears that the influence of gender in learner-instructor interaction is different for lower graders versus higher graders learners. As a result of the emergency of the new situation, students with lower grades, particularly students who had just enrolled in first grade of high school, did not have much time to spend with their teachers leading to less interaction; either of not having enough information or shyness. However, some researchers have noted that the impact of gender is lowered for older learners (Vella et al., 2016). Further, the interactions between GPA and the average time spent online, and gender, GPA, and the average time spent online significantly influenced learner-content interaction. However, other variables showed insignificant influences. Damianov et al. (2009) also reported a positive and significant interaction between grades and time spent online, particularly for learners who get grades below B. Apparently, varying factors may regulate any disadvantages or advantages provided by identity labels, including gender, time spent online, GPA, and so on. To guarantee the success of all learners, the value of crucial significance is to continue studying how the elements are put together and establish a link between (Yukselturk, Bulut, 2007), since it is unlikely that a unique measure will result in better students performance. On the other side, it is revealed that GPA significantly influences learner-learner interaction and learner-instructor interaction. As evidenced in the current study, when learners feel close to their classmates and teachers, they gain more from online learning, confirmed by previous studies, which claimed that a happy student-teacher connection presumes students perceived knowledge attainment (Song et al., 2019). The awareness of learners' identity (Chang, Hus, 2016) and the exchange of ideas are undeniably more demanding among learners or between learners and teachers (Wut, Xu, 2021). Considering challenges to the learner-to-learner interactions in group tasks, learning from peers is rather difficult in the online learning environment. According to Wut and Xu (2021), in face-to-face classrooms, learners can immediately discuss with other peers aiming to obtain understandings, ideas, and suggestions, while not in online contexts. Keaton and Gilbert (2020) also argue that interaction among learners was the most challenging because they usually had little interaction with other learners due to time and distance limitations. Interestingly, the least interaction was done with content, though in many studies, learner-content interaction was considered to be the most critical (Bray et al., 2008; Keeler, 2006; Kuo et al., 2009) because of spending more time on requested reading or projects, and absorb the content they need to master throughout reflections, thinking or elaboration, which is confidentially intellectual interaction of an individual with the content (Laličić, Dubravac, 2021; Kuo et al., 2009). Thus, teachers should encourage learners to interact with the course matter directing at creating a new idea in the learning process, which can be done by selecting material for online courses, describing specific methods they can relate to their everyday lives (Jeffoate, 2010). Indeed, increased interaction can boost learner achievement, attitude, as well as motivation toward learning (Hillman et al., 1994).

Also, it is found that grade level significantly influences learner-instructor interaction, with the difference among 2nd and 4th grade on one side and 3rd grade on the other side. This might be because 3rd graders are usually less motivated in the Bosnian context (Ahmetović et al., 2020); thus, lower learners' motivation can lead to avoiding interaction. Also, the same learners may be lacking the ability to focus on their interactions or feeling that an online course is not as efficient as traditional ones considering that they do not sense as a part of the online community. Similar findings were found by Rouborn, BrckaLorenz, and Shoup (2018), who reported that older online

learners are generally more academically engaged and have more positive attitudes toward teaching, as well as course interactions online.

4.8. Internet self-efficacy and self-regulated learning based on gender, general GPA, grade level, and average time spent online

Corresponding to internet self-efficacy and student-regulated learning based on GPA, gender, average time spent online for courses each week, and the grade level of learners, the analysis showed that only interaction between GPA and average time spent online significantly influence internet self-efficacy, while significant influence was not found on the side of self-regulated learning. This means that learners with high GPAs are pretty confident in using the Internet and might have spent less time online than those with low GPAs. When single variables were considered, it is revealed that average time spent online significantly influences both internet self-efficacy and self-regulated learning. Although findings vary, it appeared to make sense that learners who spent 6-10hrs online had higher Internet self-efficacy compared to these 11-15hrs. Which means that learners who were more dominant in using the Internet for their assignments might have spent less time indeed online; otherwise, those who were not knowledgeable about the Internet might have no choice but to spend more time going through the course requirement. However, this does not need to be the case, as, for example, learners who spend above 20hrs on courses weekly claim that they are more confident than those with less than 5hrs online. The amount of time spent online weekly again significantly affected learners' self-regulation level. Thus, when contrasting the learners who spent 20hrs online with those who spent less than 5hrs per week, it is expected that they were more self-regulated. Apparently, learners who spent less than 5hrs online might have finished the requested assignment but without gaining a deep understanding of the subject, while a more self-regulated individual would give more time to ensure the preferable accomplishment of knowledge. Moreover, it appears vital for online students to acquire high Internet self-efficacy in order to finish required assignments for an online class produced through the Internet. Bearing in mind that online learning relies on Internet delivery and that the Internet is the main resource not only for connectedness but also for gaining more knowledge, it is not surprising that learners in current studies had remarkably high confidence in the Internet. Even having a lower mean compared to Internet self-efficacy, self-regulation learning is relatively high. Contrary to face-to-face instruction, online education is learner-centered, and much autonomous effort is needed for favorable outcomes (Artino, 2007).

4.9. Internet' self-efficacy, self-regulated learning, and learners' satisfaction as achievement predictors

Although preference is given to face-to-face instruction, supposing not only that online students are inclined to quit quite easily, but rather that online classrooms can lack response for both teachers and learners (Atchley et al., 2013). Learning more about learners' beliefs and attitudes will help to enhance e-learning courses and assist learners in being more competent in an educational program that is growing more prevalent every year. Numerous studies have reported that self-regulated learning (Bell, 2006; Yukselturk, Bulut, 2005), internet self-efficacy (Bandura, 1997; Kuo, 2010; Schunk, 1995), learners' interaction (Turley, Graham, 2019), and students satisfaction towards online learning significantly predict academic performance (Atchley et al., 2013). However, the same is not valid for the current study since insignificant but surely positive influences were found with all mentioned variables. This might be due to the fact that online learners did not have a choice but to have classes online, and indeed they were not ready for it. What is more, when the survey was collected, many high schools in Bosnia did not use any platform. Instead, they communicated via Viber groups with their peers, sending them either assignment to do or content to read without no or little control. Giving the right that online education is equal to the traditional one (Kim et al., 2015), supporting online learners' interaction, effort regulation, and confidence is crucial to helping them flourish academically and become more satisfied. Despite being disconnected, teachers must connect with their peers and be available to them since interaction and communication are essential pieces of the achievement puzzle (Rizvić, Bećirović, 2017; Iqbal, 2021).

The limitations and suggestions for further research can be drawn from the this study. Firstly, the study investigated learners in the time of imposed online learning by the coronavirus,

and the results might not have been realistic as learners had not had the chance to choose this type of learning. Furthermore, investigating learners who choose online learning over traditional one with longitudinal observation as well as qualitative and quantitative approaches might lead to more accurate results about the experience of online learning. Although teachers' attitudes towards online learning play a significant role in this learning environment, they were not investigated, and future research might include instructors as a part of the research sample.

6. Conclusion

Even though online learning was well developed in the western world by the moment of the COVID outbreak in Bosnia and Herzegovina, the system of high school education was not ready for the shift and did not have clear expectations on the overall process and its outcomes. This paper aimed to discover the characteristics of learners' satisfaction, their interaction, self-regulated learning, and internet self-efficacy in high schools in online learning environments. The participants testify that the students feel confident in such a learning environment and are mainly self-regulated. Communication, as the crucial condition, was troubled. The reasons for it might be found in the fact that educators' immediate interaction was not available and such a learning/teaching is highly student-centered. This paper provides crucial clues from the perspective of learners' satisfaction and self-efficacy, which is needed for the overall teaching enhancement. Communication between learners and educators mattered the most in terms of satisfaction, which puts aside the importance of the studied content.

It has been acknowledged that learners' satisfaction correlates with time spent online; more online time resulted in higher grades and, therefore, more satisfied learners. Males, in comparison to females, were significantly more satisfied with online learning. Female students experienced learner-learner interaction as the highest level of learners' interaction, while males interacted most with content. The impact of grade level was rather mild: learners of 4th grade were the most satisfied, followed by 2nd and 1st grades. Here should be emphasized that 1st graders faced difficulties in communication with educators due to insufficient time spent in face-to-face interaction needed for bonding. High achievers mostly interact with learners. Further, average time spent online significantly influences both internet self-efficacy and self-regulated learning. Self-efficacy, unlike satisfaction and confidence, was better in those who spent less time on the Internet than those who spent more. Additionally, even if we would expect the opposite, less time spent online resulted in higher grades. That probably has to do with quality rather than quantity of time spent online, which could be another aspect of self-regulation and self-efficacy.

In order to enhance e-learning in high schools, educators in Bosnia and Herzegovina should have been assigned to use educational platforms to ease communication and have courses better organized. On the other hand, being also unprepared for this type of learning, students responded quite well to it, coping well with unknown challenges. The difference in handling the situation between learners and educators may lay in the age gap – as generally known, younger generations respond to new technologies with more enthusiasm and curiosity.

The next step for educators, as found unready, should be working on gaining knowledge about learners' attitudes and beliefs. Those should be observed from the perspective of self-regulated learning, internet self-efficacy, learners' interaction and satisfaction with online learning. Online learning is progressive and more resistant to certain outer factors. It is a contemporary way of communication and, as a powerful tool in education, it deserves more attention from educators.

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Using Virtual Reality Techniques to Alleviate Cognitive Fatigue in Graduate Students Working while in College

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Abstract

Purpose: The purpose of this paper is to study the possibility of using virtual reality (VR) techniques to reduce cognitive fatigue (CF) in graduate students who work while in college.

Methods: A set of questionnaires standardised in Russia was used to assess CF and performance. The participants completed a VR program using a head-mounted VR headset. One stimulating and one relaxing scene, each lasting maximum 10 minutes, were played. The participants included 62 women and 24 men aged 22-53 years old who were graduate students studying psychology and pedagogy and working while in college. They participated in the study in the interval between the end of their working day and before the start of their evening classes.

Results: After first watching an exciting scene and then a relaxing scene, the participants in the experimental groups reported significant changes in their states relative to the control group. Acute CF, general fatigue, tiredness and monotony decreased. The women in particular reported a decrease in their level of psychological stress. Conversely, after watching a relaxing scene followed by a stimulating scene, men experienced a decrease in acute physical fatigue, tiredness and cravings. Women experienced a decrease in acute mental fatigue, acute physical fatigue, general fatigue and psychological stress.

Conclusions: A single immersive VR session experienced in the interval between the end of work and before the start of classes can decrease general fatigue and monotony in humans, as well as reduce acute mental fatigue or physical fatigue (depending on the sequence then a relaxing VR – scene).

Keywords: balancing study and work, cognitive fatigue, efficiency, functional state, virtual reality.

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1. Introduction

In the modern world, achieving success is often associated with having a busy schedule, which may include working while completing a college degree. Pursuing higher education is often a prerequisite for career growth, and master's degrees are highly sought after in Russia for this reason. People of different ages, including those who have reached retirement age, can take college classes to obtain a master's degree. Most graduate students work during the day and take college classes in the evening. This inevitably leads to fatigue, which, if left untreated, can lead to chronic fatigue syndrome. It is therefore urgent that we identify ways to reduce fatigue in graduate students working while in college. The exploration and use of the latest technological advancements, including virtual reality (VR), is especially relevant to this search.

Cognitive fatigue and performance

Mental or cognitive fatigue (CF) is characterized as a decrease in cognitive resources which develops over time due to constant cognitive demands. It is defined as a decrease in activity, alertness, orientation and executive attention. Chaudhuri and Behan (2000) proposed that such fatigue occurs due to a malfunctioning within the basal ganglia affecting the striatal–thalamic–frontal cortical system. CF is an unpleasant phenomenon, affecting both physical (McMorris, 2020) and mental (Holtzer et al., 2020) performance. Like tiredness, it occurs because of intense or prolonged work. It causes a decrease in performance of and non-specific changes in physiological functions and in several subjective sensations, the amalgamation of which is described as a feeling of fatigue (Santos et al., 2016).

Fatigue is a complex biological phenomenon which occurs depending on the time of day, workload, health and a lifestyle balance between free time and work (Caldwell et al., 2019). Prolonged activity in a state of fatigue leads to decreased immunity and accelerated biological aging of the body (Rybtsova et al., 2020; Berezina et al., 2020). Long-term life events associated with increased stress can also lead to the onset of chronic fatigue syndrome, a disease associated with a highly coordinated hypometabolic response to environmental stress, and short-term CF has been found to contribute to declines in performance (Schmaling, Patterson, 2019; Prins et al., 2006; Simon et al., 2020).

The level of work fatigue an individual experiences depends, to an extent, on his or her profession (Berezina, 2020). Physically demanding jobs, performed over long stretches of time, can contribute to severe fatigue and negatively affect human health (Holtermann et al., 2012). Increased fatigue also occurs in intellectually demanding jobs, jobs with extensive responsibilities and jobs which disturb the circadian rhythm, which results in accumulated sleep deprivation. It is known that fatigue causes workers to make more errors and renders them prone to accidents, some of which are lethal (Sadeghniat-Haghighi, Yazdi, 2015).

The increased mental load associated with studying can also lead to fatigue and thus negatively affects health and overall efficiency. All over the world, university students are increasingly taking on paid work while attending school full-time. One recent study conducted in the Republic of Ireland found that more than two-thirds of undergraduate nursing students hold part-time jobs, working an average of 15 hours per week; many of these individuals are non-traditional students, have children or joined the workforce later in life. The authors mentioned that non-traditional students are more likely to feel the positive effects of incorporating education into their workday, including increased self-confidence, improved skills and a deeper understanding of field-related problems (Clynes et al., 2020; Hasson et al., 2013).

However, despite the positive social aspects and better future life prospects, the combination of work and study can lead to exacerbate fatigue (Manouchehri et al., 2017). In Australia, an online survey was carried out to gauge the problems of students who work while in college: more than 66 % of the respondents reported that the demands of work interfered with their college performance. They complained of increased fatigue and the difficulties caused by having to balance work and study. A lack of confidence in discussing health and safety issues with employers and unfair pay were also stressors (Thamrin et al., 2019).

Restoring performance and alleviating fatigue.

A significant number of techniques have been developed to alleviate fatigue in people engaged in long, hard, stationary, or monotonous work. Traditionally, when organizing work hours to limit the risk of fatigue, a prescriptive approach involves setting maximum shift lengths to

prevent the excessive accumulation of fatigue and the associated increased risk. This approach also sets minimum break times to ensure adequate rest and recovery time during and/or between shifts. Researchers have developed special approaches based on risk management, using formulas and various procedures to calculate and regulate fatigue (Honn et al., 2019). Researchers have also proposed specific training programs to reduce workers' fatigue, including advice on self-control, breaks, workstation setup and exercise. There are workout options for doing gradual resistance exercises in the gym, while other physical exercises can be performed in the workplace using elastic bands (Santos et al., 2016).

An interesting direction in the correction of functional states is the use of the latest VR techniques. Currently, VR techniques are widely used to help people with a variety of conditions. For instance, they can help reduce cancer patients' pain levels through immersion in a colourful virtual world, offering a distraction (Ioannou et al., 2020). VR techniques are also used to correct depressive and phobic states (Riva, 2020). Evoking positive emotions and reducing negative emotions in patients is the goal of immersive VR sessions (Pallavicini, Pepe, 2020). Stimulating virtual games are used in which participants find themselves not only in a new reality but also able to interact with it by moving their head or their arms (Cieřlik et al., 2020).

The use of VR techniques can reduce fatigue caused by monotonous activities (Hirota et al., 2019), to restore performance and to improve and regulate emotional states. There are two approaches to using VR techniques to improve participants' emotional states. The first is 'relaxing VR', a technique based on classical relaxation methods such as progressive muscle relaxation, autogenous training, yoga and meditation. In this approach, participants are usually shown an environment which can help them feel safe (Villani et al., 2017). Relaxing virtual environments usually contain pleasant, peaceful landscapes such as islands, parks, gardens and other open spaces, which can reduce stress and anxiety (Annerstedt et al., 2013). The second approach, 'active VR', includes quests, competitions, races and puzzles. These programs are used to empower participants or help them regulate their emotions. For example, using a VR technique which simulated job interview situations showed that after five weeks of training, participants were able to better manage their emotions and felt less stressed (Riva, 2020). This approach is also used to treat stress-related disorders, including post-traumatic stress disorder, pathological grief and adjustment disorders. To achieve therapeutic outcomes, several emotionally charged virtual scenes are used in which participants are prompted to actively resist the world around them while undergoing both positive and negative simulated experiences (Baños et al., 2011).

The most effective VR technique is the combined approach, which incorporates different VR scenes. For example, Pizzoli proposed using personalised VR state correction techniques, which are developed using preliminary research on a subject's relevant life events to identify the distinctive perceptual features of personal memories and experiences (Pizzoli et al., 2019). These VR techniques combine both relaxing and stimulating VR programs. Maples-Keller and others used VR-based exposure therapy, which combines relaxing and stimulating VR scenes (Maples-Keller et al., 2017). Maples-Keller et al. (2017) noted that many such treatments include relaxation strategies during the introductory period (such as breathing relaxation or cognitive restructuring) and subsequent VR treatment strategies.

The purpose of this study is to evaluate the efficacy of using VR techniques to alleviate cognitive fatigue in graduate students who study and work. The scientific task test the impact of two different VR modes. The first mode was a stimulating VR programme, followed by a relaxing one. The second mode was a relaxing VR programme, followed by a stimulating one. We hypothesised that the first VR mode would reduce acute mental fatigue, while the second VR mode would reduce acute physical fatigue.

2. Materials and methods

The participants were 86 graduate students (aged 22-53 years old) who work during the day and take college classes in the evening. There were 62 women and 24 men.

The participants were randomly selected for either the experimental or the control groups. The first experimental group was formed, the second experimental group and the third group – the control.

The first experimental group included 36 participants (24 women and 12 men), who first watched the stimulating scene (3-5 minutes), followed by the relaxing one (3-5 minutes).

The second experimental group comprised 14 people (10 women and 4 men), who first watched a relaxing VR scene (3-5 minutes), followed by a stimulating one (3-5 minutes).

The third group was the control group; she included 36 participants (28 women and 8 men). The gender distribution in the sample corresponds to the distribution in the general population of teachers in Russia. The students were studying either psychology or pedagogy, and most worked in the field of education (schools, kindergartens, etc., or administrative work).

To diagnose the students' functional states, the following diagnostic methods (standardised in Russia) were used:

1. The differentiated assessment of states of reduced performance (DASRP) technique was developed by A.B. Leonova and S. B. Velichkovskaya. DASRP is a modified version of the BMS-II test developed by German psychologists H. E. Plath, G. Richter to assess the severity of work of workers of different types (Richter, 2000). The participants were offered several statements characterising feelings and sensations which they may experience during their work (for example, 'work gives me pleasure') and were asked to note the degree of each feeling and sensation as they experienced it. The DASRP technique includes 4 scales designed to assess declines in performance from different perspectives.

Scale #1: General fatigue. This is a condition caused by excessive stress, which manifests in a decrease in productivity.

Scale #2: Monotony. This is a functional state of reduced performance which arises in situations of monotonous work which involves repetitive, strenuous or onerous actions on a daily basis.

Scale #3: Satiety. This is a psychological state of reduced performance caused by monotonous, low-intellectual-content activity which does not interest or engage participants.

Scale #4: Psychological stress. This is a state of decreased performance due to an intense nervous overstrain, which can be caused by a wide variety of experiences.

Scores of up to 15 points were considered indicative of mild stress; scores ranging between 16–25 points were considered indicative of moderate stress (the fatigue and monotony scales); and scores within 17-24 points (the satiety and stress scales) indicated a high level of stress and/or fatigue.

2. Survey for acute mental fatigue. This technique is designed to assess the degree of mental fatigue which develops during one working day in people whose work is related to processing information. It contains 18 statements characterizing various manifestations of mental fatigue, including a decrease in general performance, specific impairments of sensations and perception, cognitive discomfort and changes in the emotional-volitional regulation of activity and social contacts. Scores of up to 9 points were considered indicative of negligible fatigue; scores from 10-15 points were considered indicative of mild fatigue; and scores from 16-28 points were considered indicative of moderate to severe mental fatigue.

3. Survey for acute physical fatigue. This technique is designed to determine the degree of acute physical fatigue which develops during one working day. The survey consists of 18 short statements which cover the direct symptoms of physical discomfort, mental instability and mental exhaustion, as well as emotional-motivational assessments. Scores of up to 10 points were considered indicative of negligible physical fatigue; scores from 11-17 points were considered indicative of mild fatigue; and scores from 18-25 points were considered indicative of moderate to severe fatigue.

4. The VR techniques were implemented using a stand-alone Oculus Quest 64 GB VR headset. Participants were shown two immersive VR videos intended to increase their personal interest in their evening classes. The first scene was a stimulating one, lasting 3-5 minutes. Participants were asked either to drive a vehicle along a changing route or to take part in a game which required them to hit moving targets, which in turn could hit them. The next video, which also lasted 3-5 minutes, was relaxing, pairing beautiful landscapes with calming music.

5. Statistics. A One-way Analysis of Variance (ANOVA) with sigma transformation was used to assess the reliability of the effect of VR on the participants' mental state. The effect of the VR was considered an independent variable. There were two groups: the first was the control group (the participants who were not exposed to VR) and the second was the experimental group of participants (those who were exposed to VR in the interval between the end of their work and the beginning of their classes).

The dependent variable was the difference in the participants' mental state (fatigue, monotony, satiety, psychological stress, acute mental fatigue, acute physical fatigue, chronic fatigue). Two evaluations for each participant from both the experimental and the control groups were obtained. The first evaluation was obtained before the start of a college class in the classroom. After that, the participants in the control group remained in the classroom to discuss the organisational issues of their studies, and 10 minutes later the class began. The participants in the experimental group went to a nearby auditorium and watched VR videos; afterwards they returned to the classroom and joined the class. The second evaluation was obtained in the classroom half an hour after the start of the college class with all of the participants (both the control and experimental groups).

3. Results

We evaluated the dynamics of the functional states of participants in the control and experimental groups before they started their college classes (first evaluation) and after the college class began (second evaluation). The results are presented in [Table 1](#).

Table 1. Dynamics of the students' functional state before and after beginning their college class

| | Acute Mental Fatigue | General Fatigue* | Monotony* | Satiety* | Stress* | Acute Physical Fatigue |
|--|----------------------|------------------|-----------|----------|---------|------------------------|
| First evaluation in control group | 17.1 | 19.2 | 18.6 | 19.6 | 19.5 | 10.4 |
| Second evaluation in control group | 19.2 | 20.8 | 20.5 | 20.1 | 20.1 | 12.4 |
| First evaluation in first experimental group | 16.1 | 19.0 | 19.5 | 19.8 | 20.1 | 10 |
| Second evaluation in first experimental group | 15.3 | 18.5 | 18.6 | 19.1 | 18.3 | 11.2 |
| First evaluation in second experimental group | 24.4 | 22.3 | 20.0 | 21.5 | 23.5 | 14.4 |
| Second evaluation in second experimental group | 21.3 | 20.2 | 21.4 | 23 | 22 | 12.5 |

* DASRP

The first evaluation of fatigue, acute physical and mental fatigue, monotony, satiety and psychological stress for the control and experimental groups produced moderate scores ([Table 1](#)). The second evaluation of the participants in the control group showed a mostly insignificant increase in these indicators, but these remained in the range of moderate values. In the experimental groups, however, most of the fatigue values in the second measurement tend to decrease (that is, the subjects' condition improves), these scores were also in the moderate range. Differences in absolute values between the first and second evaluations for all parameters were not statistically significant. We further analyzed the data by comparing the differences in the dynamics of the functional states of the students in the experimental groups and those of the control group. The results of this analysis are presented in [Tables 2](#) and [3](#).

[Tables 2](#) and [3](#) represent the results for the first experimental group, who watched the stimulating scene first followed by the relaxing one.

Table 2. The first and second evaluations of fatigue parameters in the female participants after watching stimulating then relaxing videos

| Parameter | Experimental Group [†] | Control Group [†] | F | P |
|-----------------------|---------------------------------|----------------------------|--------|--------|
| Acute mental fatigue | 1.45833 | -2.55172 | 6.5945 | .01320 |
| General fatigue* | 0.87500 | -2.06897 | 9.0345 | .00410 |
| Monotony* | 0.87500 | -1.68966 | 9.0486 | .00408 |
| Satiety* | 0.91667 | -1.00000 | 1.8446 | .18039 |
| Stress* | 2.458333 | -0.965517 | 10.654 | .00196 |
| Acute physical stress | -1.00000 | -2.21739 | 1.0046 | .32350 |

* DASRP

[†] Average difference between the first and second evaluations

The data presented in [Table 2](#) indicate that all of the fatigue parameters increased in the female graduate students in the control group. Negative values mean that the first evaluation values were lower than those reported during the second evaluation. The second evaluation revealed that the values for the fatigue parameters reported by the experimental group following VR training decreased, as represented by the positive values of the differences ([Table 2](#)). The values for acute mental fatigue, DASRP fatigue (decreased performance), feelings of monotony and psychological stress were statistically different between the experimental and control groups ($P < 0.05$). There were no differences in evaluations of satiety and acute physical fatigue between the experimental and control groups ($P > 0.05$; see [Table 2](#)).

Table 3. The first and second evaluations of fatigue parameters in male participants after watching stimulating then relaxing videos

| Parameter | Experimental Group [†] | Control Group [†] | F | P |
|------------------------|---------------------------------|----------------------------|--------|--------|
| Acute mental fatigue | 1.666667 | -0.500000 | 8.3342 | .00982 |
| General fatigue* | 2.833333 | 0.000000 | 7.1017 | .01578 |
| Monotony* | -0.00000 | -2.50000 | 3.8028 | .06692 |
| Satiety* | 0.500000 | 1.000000 | 50233 | .48756 |
| Stress* | -0.333333 | 0.500000 | 43902 | .51599 |
| Acute physical fatigue | -0.66667 | -1.00000 | 22857 | .64538 |

* DASRP

[†] Average difference between first and second evaluations

The dynamics of the fatigue parameters for the male graduate students were similar to those of the female students. They also experienced more fatigue during their college class, but in the male control group some of the fatigue parameters had improved by the time of the second evaluation. Psychological stress and satiety decreased, while fatigue levels, as determined by the DASRP method, did not change. Nevertheless, VR training significantly improved the fatigue parameters in the experimental group compared to those of the control group. The acute mental fatigue and DASRP fatigue were statistically different between the experimental and control groups ($P < 0.05$), although there were no differences between the control and experimental groups in the evaluations of feelings of monotony, psychological stress, satiety and acute physical fatigue ($P > 0.05$).

In the second experiment we used the same VR scenes, but participants watched a relaxing scene first, followed by a stimulating one. The results are presented in [Tables 4](#) and [5](#).

Table 4. The first and second evaluations of fatigue parameters in female participants after watching relaxing then stimulating videos

| Parameter | Experimental Group [†] | Control Group [†] | F | P |
|------------------------|---------------------------------|----------------------------|--------|--------|
| Acute mental fatigue | 3.70000 | -2.55172 | 10.468 | .00256 |
| General fatigue* | 2.40000 | -2.06897 | 10.208 | .00286 |
| Monotony* | -0.60000 | -1.68966 | .77300 | .38497 |
| Satiety* | -0.90000 | -1.00000 | .00722 | .93273 |
| Stress* | 1.900000 | -0.965517 | 13.957 | .00063 |
| Acute physical fatigue | 1.80000 | -2.21739 | 7.5558 | .00988 |

* DASRP

[†] Average difference between first and second evaluations

In the female students, the effect of the VR scenes when the relaxing one was shown first was less pronounced than when the scenes were reversed. The VR training significantly improved the fatigue parameters (acute mental fatigue, DASRP fatigue, decreased performance, and psychological stress) of female graduate students in the experimental group compared to those in the control group. The other fatigue parameters (feeling of monotony, satiety, acute physical fatigue) were the same in the women included in both the experimental and control groups.

Table 5. The first and second evaluations of fatigue parameters in male participants after watching relaxing then stimulating videos

| Parameter | Experimental Group [†] | Control Group [†] | F | P |
|------------------------|---------------------------------|----------------------------|--------|--------|
| Acute mental fatigue | 0.500000 | -0.500000 | .86022 | .37552 |
| General fatigue* | 1.000000 | 0.000000 | 1.6667 | .22575 |
| Monotony* | -5.00000 | -2.50000 | .59952 | .45668 |
| Satiety* | 1.00000 | -4.50000 | 16.463 | .00230 |
| Stress* | -0.500000 | 0.500000 | .32129 | .58333 |
| Acute physical fatigue | 1.00000 | -1.00000 | 6.0000 | .04983 |

* DASRP

[†] Average difference between first and second evaluations

In the male students, the effect of the VR scenes when the relaxing one was shown first was less pronounced than when the scenes were reversed. The values for satiety and acute physical fatigue were statistically different between the experimental and control groups ($P < 0.05$). The other fatigue parameters were the same in the control and experimental groups ($P > 0.05$) (Table 5).

4. Discussion

Improving the educational environment for all categories of students is an urgent task. Graduate students who study and work find themselves in a difficult situation because of prolonged CF, which can interfere with effective learning (Koteneva et al., 2020). We studied the effect of VR training on the functional state of graduate students who work while in college. The participants of the experimental groups were immersed in VR programs for 10 minutes before the start of their college class. They watched two VR scenes. The stimulating scene was used to encourage participants to physically participate in the VR experiments. The other VR scene was relaxing. The students in the control group stayed in the classroom and discussed organisational issues with the teacher while the experimental groups viewed the VR scenes. Once the VR programme was complete the participants in the experimental groups joined the class. The first evaluation of the fatigue parameters for both the experimental and control groups was performed before the start of the class; the second evaluation was performed in the classroom during the college class.

The values for most of the fatigue parameters increased in both women and men in the control group during the college class. We used method for assessing fatigue: a classic survey. Method showed that the participants in the control group experienced an increase in fatigue during the college class, which can be explained by the fact that most of the subjects came to class immediately after work, without no rest in between. Interestingly, the participants' mental fatigue increased while their physical fatigue did not change. This can be explained by the fact that most of the participants' employment consisted of stationary mental labour—most of them work in the field of education during the day, and in the evening, they go to their graduate classes, which also require mental activity. In other words, we assume that the reason for the decline in participants' performance is cognitive rather than physical fatigue.

The VR training was designed to contrast with the participants' daily routines. Most of them lead a 'sedentary lifestyle': during the day their work requires attention and perseverance, then they go to evening classes. The commute is about one hour long. We assumed that the fatigue they experience was not associated with increased physical activity but with monotony. Therefore, to restore them to their peak working capacity, these individuals need an adventure, which in this study was presented in the form of a VR programme. The first scene was either a variant of a spaceship race, where the pilot performed aerobatics, or a snowball game, where the participant had to hit moving figures with snowballs and dodge snowballs. The participants were permitted to choose which scenario they preferred. The stimulating video allowed the subject to 'shake things up', to participate in an energetic activity which required them to move their bodies and arms. The second scenario was a relaxing scene which was designed to calm the participants down if they were overly stimulated from the first video. Most of the participants of the experimental group returned to their classroom in high spirits.

The second experimental group was offered a classic sequence of VR scenes which many authors have used to reduce stress: in this case the first scene was relaxing while the second was stimulating (Maples-Keller et al., 2017). In this group, a decrease in fatigue was also observed, but the change was less pronounced than that of the first experimental group. However, in this group there was also a decrease in acute physical fatigue, which was not evident in the first experimental group. It is most likely that the beautiful landscapes and relaxing music gave the subjects an opportunity to simply relax, which is more effective in terms of reducing physical fatigue.

5. Conclusion

Our research has confirmed our hypothesis. Indeed, a single immersive VR session experienced in the interval between the end of work and before the start of classes can decrease general fatigue and monotony acute in humans, as well as reduce mental fatigue or physical fatigue (depending on the sequence then a relaxing VR - scene). If the subjects are offered first an exciting and then a relaxing VR scene, then their acute mental fatigue and monotony will decrease, and if they are offered first a relaxing and then an exciting VR scene, then physical fatigue will decrease.

Limitations

The VR techniques we used can reduce CF, but only in people who work while in college. Our participants' work is pedagogical or clerical in nature, and they are all working on degrees in humanitarian subjects. We have not tested the efficacy of our techniques on people who work in different fields and who study scientific and other subjects. In addition, our analysis of the participants' level of CF was conducted after a single VR session; we have not studied the efficacy of the prolonged use of VR techniques.

Advantages of our results

We propose to present to the subjects not only separately watched or relaxing VR scenes (the effect of which is already known), but to give their various combinations. In our study, it was shown that the combination of a watched a relaxing VR scene to a greater extent reduces acute mental fatigue, and the combination of a relaxing a watched VR scene reduces physical fatigue. You can explore the effects of three VR scenes, for example relaxing, then exciting, then relaxing again. Perhaps this combination can reduce both physical and mental fatigue.

It will be promising to use our results for people struggling with increased stress.

It will be promising to use our results for people struggling with increased stress, as well as people combining several activities. Our subjects combined work during the day and study in the evening. The VR scene combinations we've studied help them reduce fatigue between work and

study. However, there are other types of combinations of activities: work during the day and work in the evening, study in the afternoon and work in the evening, or work in the afternoon and family affairs in the evening. It would be helpful to develop VR programs to reduce fatigue between two different activities.

We studied the reduction of fatigue in people of mental labor who combine teaching work with teaching pedagogy or psychology. It will also be helpful to use combinations of VR videos which are effective for people who work in different fields (for example, manual labour). You can look for options for combining VR scene to help reduce physical fatigue in persons engaged in manual labor and combining it with study or some other activity.

We studied the effect of a single presentation of a VR scene. Such presentation can be useful in individual cases, on such and such important days for the subject: before the exam, or after a particularly difficult work. It is also promising to find modes of using VR scenes for prolonged use. If the effect persists with frequent use, then our proposed VR scene combinations can be offered for permanent use. It is important for people who are combining the two activities to be able to reduce fatigue every day.

Authors' note

This study was reviewed and approved by the Institutional Review Board of the Moscow State University of Psychology and Education and was conducted as an anonymous poll in accordance with the Federal Law of the Russian Federation No. 152-FZ (27/07/2006) and the Data Protection Act 2018, United Kingdom. The anonymity was that the subjects did not tell the experimenter their names and surnames, each subject was recorded under the number assigned to him in the experiment.

Declaration of conflicting interests

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author contributions

T.B. developed the methodology and lead the project, performed experimental work and statistical analysis, and wrote the manuscript. A.T. performed experimental work and wrote the manuscript. A.L. provided conceptual input and contributed to the discussion of the results. A.K. provided conceptual input and contributed to the discussion of the results.

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Promoting Augmented Reality Technology in Teaching English Language to Non-Linguistic Students in Higher Education

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Abstract

The aim of this paper is to examine the advantages of using IT in English language learning process in higher education. The study relevance stems from the fact that the latest information technology is steadily entering the higher education. The researchers' attention is focused on the implementation of the Augmented Reality technology and Quick Response codes in teaching English languages to non-linguistic students. The paper reviews recent researches related to the problem discussed. The authors of the article use several scientific methods such as analysis of scientific and methodological literature on the use of ICT in learning process, observation and experiment. The tools of information technologies mentioned above help to form students' professional foreign-language competence, to improve motivation and performance. The pedagogical experiment was conducted to show the effectiveness of these tools. 42 students of the faculty of the Information Systems and Technologies of The Povolzhsky State University of Telecommunications and Informatics took part in the conducted experiment. They were divided into three groups of 14 learners; one group is experimental, two others are control groups. The students of the control groups studied the English language according to the traditional methodology; the students of experimental group used the IC technologies at their classes. Motivation, the interest in learning process and the students' professional foreign-language competence were higher in experimental group. The results indicate the effectiveness of using ICT in teaching the English language for non-linguistic students. The experiment results would be served as useful material for teachers and university administrators. Teachers' training programs on ICT use and educational software for English language teaching can be developed according to the results of the study.

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Keywords: augmented reality, QR codes, professional foreign-language competence, motivation, higher education, information technologies, non-linguistic students.

1. Introduction

The use of advanced technologies in the field of education is a key factor in the development of intellectual society. The modern digital entertainment environment is a serious competition for traditional educational technologies (Alhubaishy, 2021). In order to involve students in the educational process, in particular, in this article we will consider English language education for students of technical universities. Specialists in the field of pedagogy, psychology and linguistics are in the search for new effective mechanisms for perceiving information. University teachers are expanding the possibilities of higher vocational training with elements and tools of innovative and information and communication technologies (Bonner, 2018). Continuous modernization and updating of educational content by means of modern technologies, training of highly qualified specialists is the primary task facing universities and teachers, in particular, aimed at solving applied problems and increasing the efficiency of education (Palaiageorgiou, 2017; Wu, 2013). Information and communication technologies make it possible to increase the efficiency of education and accelerate the learning process, make it practical and professionally oriented (Akçayır, 2017). Research in the implementation and application of AR technologies in the educational process shows the recognition of its advantages over traditional teaching, due to the fact that PowerPoint, video, is gaining momentum as an effective form of the pedagogical process. (Yang, 2017). The use of modern learning tools is an essential condition for enhancing the training effect (Karthiga, 2019).

The introduction of information technologies and their multimedia applications in foreign language education programs contributes to the more successful formation of foreign language competence (Varnikova, 2011).

One of the most progressive directions in training is augmented reality technology. It arouses the interest among foreign researchers and domestic authors: H. Kaufmann, R. Kaiser, K.N. Reskov, A.V. Grishkun, I.A. Otkupshchikova, A.A. Kuprienko, M. Papp, Yu.A. Kravchenko, A.A. Research on AR in education and it demonstrates a positive effect on students learning outcomes and motivation (Cecilia, 2021).

The main task of such a mechanism is to attract the interest of students in the subject of study, to create conditions for sustained internal motivation and to ensure an effective educational process (Kauffmann, 2006). Capabilities of Augmented Reality technology may make classes more engaging and information more apprehensible (Singaravelu, 2020).

The relevance of this scientific research is caused to the fact that the latest information technologies are sustainably included in the higher education system. The formation of students' foreign-language competence in the professional sphere should be optimized by integrating ICT tools into the learning process.

The aim of our study is to show the benefits of using augmented reality tools in the process of teaching English to students of technical specialties.

To achieve this goal, the following tasks must be realized:

- to study the theoretical foundations should be studied of augmented reality technology;
- to identify the advantages of this model in the process of teaching English in a technical university;
- to study and describe the ways of implementation augmented reality technology in order to form foreign-language competence of students in the professional sphere;
- to prepare recommendations on the use of augmented reality technology tools in English classes at the university.

The scientific novelty of this research is to confirm the effectiveness of the use of augmented reality technology when teaching English at a technical university, as well as to develop recommendations for the use of AR tools.

Beginning to apply augmented reality technologies, we are faced with a problem related to the lack of methodological recommendations and developments in the field of application of this technology.

Some researchers believe that the concept of "Augmented reality" (AR) was invented by a scientist from Boeing and described the concept of this technology. Another founder of the development of Augmented reality is Morton Heilig in 1957 (Sünger, 2019), the first developer of virtual reality technology, the creator of Sensorama, the world's first virtual simulator. The technology was dedicated to education. In preparing the patent documents, Morton Heilig gave a number of reasons for the need for his invention for educational purposes.

Subsequently, the following researchers studied this technology, its features and methods of application; R. Azuma, F. Kisino, T. Coldell, A.S. Konushin, P. Milgram, S.K. Ong, V.R. Roganov, M. Sairio, B.Cheng, M.L. Yuan and others.

Augmented reality is based on virtual reality, a digital simulated environment. When these two approaches are combined, a hybrid reality is formed. Augmented reality technology allows you to introduce, add parts of virtual information to the real human world. Augmented reality implies the interactive assimilation of the material, the formation of the necessary competencies in future specialists using cutting edge technologies (Karacan 2021, Cipresso, 2018). It is a mediator between the actual and artificially created worlds, helping to form one whole. This technology combines the original real-world data and additional data that are embedded in the subject's perception field. Visual, auditory, tactile, somatosensory and olfactory receptors are tools for enhancing the effects of this technology. For example, we have the task of modeling the language environment for English learners, we are in a certain room with installations of various parts of the city, we aim a smartphone camera or a tablet to the attraction, and we can see on the screen what a building or space looks like, and through the speaker we hear the speech of native speakers. Thus, students immerse themselves in augmented reality and an artificially created language environment (Makolkina, 2019).

Augmented reality technology is based on special software and special devices that operate this technology. Using such devices, graphic objects are superimposed on the translated real image. The Augmented reality environment has some features, for example; it combines real and virtual objects, the interaction takes place in real time, technology is implemented in three-dimensional space (Kauffmann, 2006; López-Belmonte, 2020; Panagiotidis, 2021). Devices using this technology run on special software. (Liao, 2020) The corresponding software should read a special label contained in the program code; this allows you to play an additional layer of information on the screen. Often, a simple one-color picture is used as a marker (Jakovlev, 2013).

2. Materials and methods

Theoretical analysis, generalization of scientific literature on the problems of using augmented reality technology in learning process and comparative analysis were used in the study.

Immersive technologies presented in the form of augmented reality are relevant and effective pedagogical tools, contribute to the formation and development of critical and spatial thinking in students at all levels of study, synchronizing the received information by integrating the acquired knowledge with real space and time. By visualizing objects students can manage and explore the subject in detail from different sides, scaling it, which in real conditions during classrooms without the use of technology is quite problematic (Vazquez-Cano, 2020).

Due to globalization, the task of higher education is to train a competitive specialist in a certain professional field. Such institutions should develop not only the necessary professional skills, but also students' foreign-language competence. Foreign language teachers need to introduce augmented reality technology into the educational process. This technology involves students in the process of English communication and forms foreign-language professional competence (Nabokova, 2019).

To achieve the goal set in this article, we conducted a pedagogical experiment. The experiment is aimed to update the use of augmented reality technologies when teaching English to students of technical specialties. The students of the faculty of Information Systems and Technologies at the Volga State University of Telecommunications and Informatics participated in our experiment. The empirical group consisted of 42 students. The main areas of work of this

specialty are: design of intelligent information systems; development of computer-based training information technology; real-time systems; design and modeling of computer networks, etc. The experimental group consisted of 14 students, the rest were participants in two control groups.

At the beginning of the experiment, the professional foreign-language competence rate, interest and involvement in the process of learning English were established, the motivation of students was determined. All the highlighted indicators in the experimental and control groups at the initial stage were approximately the same. See [Figure 1](#).

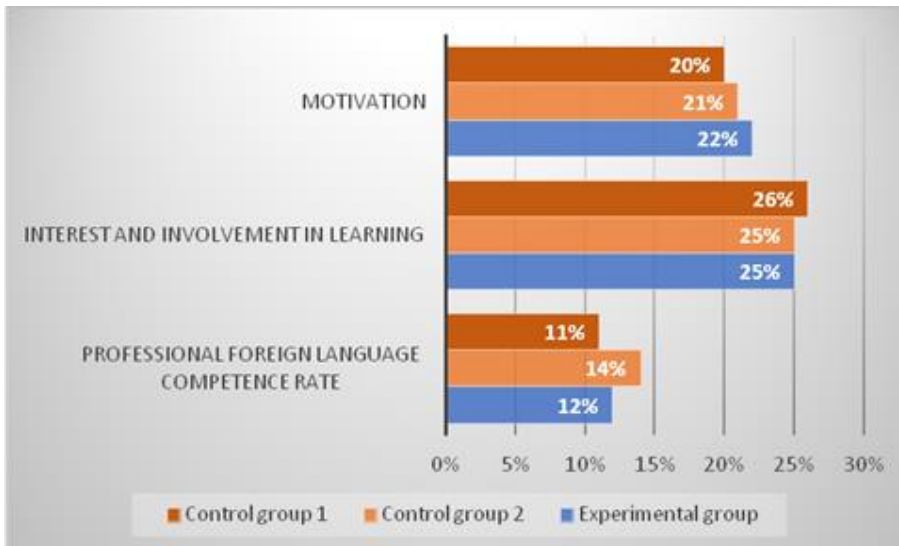


Fig. 1. The indicators at the beginning of the experiment

During the experiment, students of our control groups studied English on the basis of the traditional teaching methods for students of non-language universities. The students of the pilot group were offered augmented reality technology tools in accordance with the training profile, along with traditional teaching methods. Professionally-oriented English language education for students of specialties Information systems and technologies are taken into account with the specifics of professional vocabulary and terminology; features of vocabulary-grammatical and syntactic constructions; selection of language material, the selection and preparation of texts for analytical reading; creating a language environment.

In English classes, students of the control and the experimental groups learned the same material. They studied vocabulary on their specialty; read and retold professional texts; simulated business communication situations; worked on various projects in English. The volume of material and the time for study and preparation were the same in all groups. In addition to the above, the experimental team worked on a project to create a virtual presentation of the university in English using the Unity and Augmented reality application and used QR code technology to access authentic content in English.

Immersion in professional terminology took place through the work on the Augmented reality project, the students of the experimental group took a certain area to host the project, then using the packages for creating 3D computer graphics Cinema4D and Blender created the necessary objects and transferred them to Unity, then created a scene in Unity using these 3D objects. Including elements from the professional interests of future specialists in the process of teaching a foreign language, we achieve high motivation and deep involvement of students in the study of English, which in turn forms a foreign-language competence and competitive advantage. The Unity environment allows specialists from different fields to develop VR/AR applications, run projects using a catalog of various assemblies and tools.

In the process of working on their project, the students of the experimental group got acquainted with educational materials in English, which consist of step-by-step instructions, various topics, detailed additional lessons. Based on the results of their work, we concluded that

this type of work contributed to the expansion of vocabulary in the specialty and the formation of skills in foreign language competence.

In addition, in the experimental group, we used QR code technology in English language classes. In the process of teaching foreign languages using QR codes, we can encode and decode information for individual or group work with students. We consider QR codes as a pedagogical tool at modernizing the learning process and expanding competencies in the context of the use of computer and digital technologies.

The working hypothesis of our experiment is the use of QR codes in order to increase the level of knowledge among students in the field of Information Technologies. The basis was the textbook Professional English in Use ICT – Cambridge University Press, Unit 26 "Internet Security," which consists of parts: 1) Internet crime, 2) Malware: viruses, worms, trojans and spyware, 3) Preventive tips (Esteras, 2007). Together with the traditional pre-text, text and post-text work, with the help of QR codes, we supplemented the lesson with a professional-oriented video on the topic.

1. Internet crime – The Five Laws of Cybersecurity by Nick Espinosa. See [Figure 1](#).

2. Malware: viruses, worms, trojans and spyware – What's the Difference: Computer Virus vs Malware, vs Spyware by Thio Joe. See [Figure 2](#).

3. Preventative tips. How to Protect Your Computer From Viruses and Hackers by ThioJoe. See [Figure 3](#).



Scheme 1.

At the end of the class training sessions using AR tools, our experimental group and two control groups passed an oral survey in order to determine the level of formation of knowledge and skills on topics completed during this period. The survey showed that students who had the opportunity to use AR tools, better learned language material and expanded their vocabulary on the topic of Internet security, grammatically correctly and logically built statements without phonetic errors.

During our scientific experiment, we proved that the use of augmented reality tools such as Unity and QR codes contribute to the formation of vocational-oriented skills, competencies and an increase in the level of assimilation of language material. See [Figure 2](#).

The following evaluating criteria for the tasks were used in the study. Evaluating criteria for the translation and understanding a professionally oriented text:

- less than 3 points = unsatisfactory (2) – the essence of the translation is weakly related to the topic, the volume of translation is up to 65 %, there are noticeable violations of logic and deviations from the format, lexical, grammatical and spelling errors make it difficult to understand the text, less than 40 % are used active vocabulary;

- 3-5 points = satisfactory (3) – the translation as a whole corresponds to the original, but the ideas are poorly expressed, no more than 75 % of the text translated, grammatical, lexical and spelling mistakes do not greatly impede understanding, but speech is extremely primitive, less than 55% of the active vocabulary is used;

- 6-8 points = good (4) - the translation corresponds to the original, no more than 85 % of the text is translated, statements are generally logical, but there are some grammatical, lexical and spelling errors that do not impede understanding, speech is primitive, less than 65 % of the active vocabulary is used;

- 9-10 points = excellent (5) – the translation fully corresponds to the essence of the original text, translated at least 95 % source text, the task corresponds to the format completely, logically, grammatically and lexical means are diverse, more than 85 % of the active vocabulary is used.

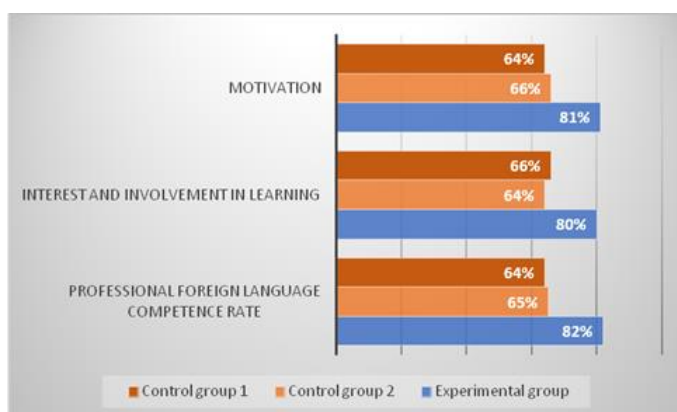


Fig. 2. The indicators at the end of the experiment

Evaluation criteria for the project:

- less than 3 points = unsatisfactory (2) – the student coped weakly with the communicative task, hardly understands questions, in more than 70 % of cases he cannot answer or answers inadequately, his speech is poor and incoherent, he cannot adequately formulate his thought, the vocabulary is limited, a large number of lexical, grammatical and phonetic errors, significantly complicating understanding, the slow pace of speech interferes with the coherence of statements. The written text of the presentation contains some errors that slightly hinder understanding. 30 % of active vocabulary is used;

- 3-5 points = satisfactory (3) – the student did not fully cope with the communicative task, understands examiner's questions, but in more than 30 % of cases cannot give an adequate answer, speech is not quite coherent, has difficulty formulating phrases, vocabulary the stock is limited, lexical, grammatical and phonetic errors are not much make it difficult to understand, the pace of speech is slow, which does not greatly interfere with connectedness statements. The written text of the project does not contain errors. In oral speech 45 % of the active vocabulary is used;

- 6-8 points = good (4) – the student coped with the communicative task, understands the examiner, but experiences slight difficulties in answering his remarks, the speech is quite coherent, it can be understood to formulate your thought, but allows grammatical, lexical and phonetic errors that do not impede understanding, the pace of speech is even. The written text of the project contains no errors. 60 % of the active vocabulary is used;

- 9-10 points = excellent (5) – the student coped with the communicative task, understands the examiner and adequately responds to all his questions, clearly and clearly expresses his thought, speech coherent, reasoned, the number of grammatical, lexical and phonetic errors are minimal and do not impede understanding, the rate of speech is fully consistent intended language level for this group. The written text of the project hasn't mistakes. At least 85 % of the active vocabulary is used.

3. Results

To indicate statistically significant difference in our experiment the χ^2 (chi-squared) Pearson test was used. We accepted two hypotheses: H_0 states that the results of learning process in the experimental group do not differ statistically from the results of the two control groups. H_1 states that the results of learning process in the experimental group are higher than that of the control groups.

The students' results before and after the experiment are presented in [Table 1](#) and [Table 2](#).

Table 1. The results of reading and understanding the text

| Rating | Experimental group (14 st.) | | Control Group №1 (14 st.) | |
|---------------|-----------------------------|------------|---------------------------|------------|
| | before exp. | after exp. | before exp. | after exp. |
| 5 (excellent) | 2 | 9 | 2 | 4 |

| | | | | |
|---------------------------|---|---|---|---|
| 4 (good) | 4 | 4 | 4 | 4 |
| 3 (satisfactory) | 6 | 1 | 6 | 5 |
| 2 (unsatisfactory) | 2 | - | 2 | 1 |

Using online resource <http://medstatistic.ru/calculators/calchit.html> the values of the criterion before and after the experiment were calculated. In experimental group the value of the criterion $\chi^2 = 10,025$; the critical value $\chi^2 = 7,815$ at the significance level $p = 0,05$. Statistical difference is significant at $p < 0,05$. Thus, we get statistically significant difference $p = 0,019$. The statistical difference in control group N^o1 is not significant, $p = 0,780$ ($0,780 > 0,05$)

Table 2. The results of project

| Rating | Experimental Group (14 st.) | | Control Group N ^o 2 (14 st.) | |
|---------------------------|-----------------------------|------------|---|------------|
| | before exp. | after exp. | before exp. | after exp. |
| 5 (excellent) | 2 | 11 | 2 | 2 |
| 4 (good) | 5 | 2 | 5 | 6 |
| 3 (satisfactory) | 5 | 1 | 5 | 5 |
| 2 (unsatisfactory) | 2 | - | 2 | 1 |

According to the results of project the value of the criterion in experimental group $\chi^2 = 12,183$; the critical value $\chi^2 = 11,345$ at the significance level $p = 0,01$. Statistical difference is significant at $p < 0,01$. Thus, we get statistically significant difference $p = 0,007$. The statistical difference in control group N^o2 is not significant, $p = 0,936$ ($0,936 > 0,01$).

The results obtained allow us to assert that H1 is correct, professional foreign language competence is higher in experimental group than that in control groups.

Completing our experiment, we compared the results of the training process in experimental and control groups and came to the conclusion that the use of augmented reality technologies in English language classes with students in the field of information technology at a technical university:

1. Contributes to the effective development of foreign-language competence;
2. Complements the possibilities of traditional educational and methodological complexes in the English language;
3. Increases motivation and forms a sustained interest among modern students in the development of professionally oriented English;
4. Promotes the development of neural networks and models the cognitive activity of students.

To realize the main goal set in our research, we studied the theoretical foundations of augmented reality technology and revealed the advantages of this model in the process of teaching English at a technical university. In addition, we studied and described ways to introduce augmented reality technology in order to form the foreign-language competence of technical

university students in the professional field. We considered how to use augmented reality technology tools in English classes at a technical university.

4. Discussion

Augmented reality, as one of the innovative learning technologies, is aimed at motivating students to gain new knowledge, develop skills for independent work and helps to unlock creative potential, therefor instilling interest in the study of the subject. The main task of AR applications in the context of training is to combine modern virtual educational resources with a real learning environment. Augmented reality technologies provide the teacher with limitless opportunities for spatial visualization, the development of training courses and testing of formed knowledge and skills in students. In modern realities, the acquisition of virtual reality glasses is not very costly, there are inexpensive models that have proved the effectiveness of use in an educational context. Based on the tasks and goals of the discipline being studied, the teacher chooses specialized software: advanced computer technologies such as 3D modeling, multimedia, tracking and registration in real time, projection video mapping, marks or markers, and other new tools (Xinqi, 2018).

Augmented reality implies the interactive assimilation of material, the formation of the necessary competencies among future specialists in the means of high-tech technologies. The undoubted advantage of using AR technologies is the use of smartphones and portable devices in various fields of education (Khan, 2019), which are characterized by simplicity and accessibility and include social interactivity (Reinders, 2017).

Augmented reality applications and tools provide University teachers with the opportunity to integrate 3D videos, texts, animated authentic materials into the learning process, which facilitates engagement and effective assimilation of material for students, forming a complete understanding of the opportunities, events and processes presented to students in classes; contribute to regeneration of learning processes for visual perception of received information (Jamrus, 2019). This technology in the educational context is based on the principle of visibility, aimed at a complete understanding and perception of the material, increasing the level of engagement and level of motivation among students. The core of augmented reality is interactive technology with the help of which the user overlays digital content on an object of the real world that is read from digital devices (Averjanova, 2019). The advantages of using AR technologies include practical-oriented training aimed at improving and developing the skills and skills of students in the professional field, the readiness of students to use the obtained theoretical knowledge in solving practical problems.

We have formulated the main characteristics of AR in learning process which reflect the authors' approach to the implementation of this technology:

1. Contextuality – the students can experience the real world and virtual elements simultaneously;
2. Interactivity gives the possibilities to interact with AR through the manipulation of both real objects and virtual properties, which offer novel possibilities for interaction;
3. Spatiality – virtual elements placed inside the 3D real world appear as if they were really there.

AR technologies are used in various areas of the educational process (laboratory work in chemistry and physics, architectural areas, medicine, language training, practical classes in painting, astronomy, etc.), including for students with limited opportunities, which implies the universality and quality of education using this technology. Often by means of a computer or mobile device screen, AR can enhance a student's environment, allowing them to visualize and interact with a concept that is otherwise inaccessible or difficult to comprehend. Students are able to build and retain knowledge by applying additional sensory skills (Ericksen, 2020). Many AR applications provide an opportunity to diversify the educational process in universities. Despite this, these technologies are rarely used in the formation of foreign-language competence.

This technology allows you to:

- offer students links to authentic materials (vocational-oriented texts, articles);
- organize classroom and out-of-audience independent work of students;
- listen to audio material and view authentic videos;
- organize project activities;

- offer access to links for downloading electronic textbooks, literature or additional information on a given topic;
- provide students with links for testing in order to control the formation of knowledge in students (ClassTools.NET, QRTreasureHuntGenerator) in a foreign language;
- post up-to-date information in the form of QR codes on stands in universities (schedule, schedule of teachers, competitions, and Olympiads, project protection, conferences).

QR coding requires a generator that is freely available on the network, which is easy to use and does not require special knowledge and skills in application: Qrmania.ru, Creambee.ru, Goqr.me, Keremerkan.net. These resources allow you not only to create a QR code, but also change the size, background, color of the source text. To decode the QR code, you need a phone camera and a code recognition program (some phones have this feature built into the camera): ScanLife, NeoReader, ReaderKaiwa, QR Droid. Decoded text can be stored in the memory of any electronic medium. There is an automatic generation of QR codes, presented in the form of a flash drive with information placed on it. This virtual information on the server is accessed by users with existing embedded code and information download statistics are automatically maintained.

After we have analyzed current learning tools in the context of augmented reality, we have introduced QR codes into the English learning process to realize the didactic capabilities of computer technology, as we have already mentioned above in our article. The experience of the university teachers of the Department of Foreign Languages of The Volga State University of Telecommunications and Informatics in the use of QR codes in teaching English in accordance with the specialization of students allows them to be used for surveys, testing or to supplement or "revitalize" the image, in case it is a country study material. We offer students QR codes placed in the text for transition to an additional information resource on a relevant topic, located in the electronic library of our university or on various Internet resources. When pointing at the QR code, students are offered video material that complements the language portfolio of students, develops the perception of foreign-language authentic material, and improves the phonetic perception of the material.

Based on the tasks and goals of the discipline studied, the University teacher chooses specialized software: tablets, smartphones, AR-glasses helmets. The application of Augmented reality in the context of higher vocational education is determined by the following pedagogical advantages:

- improving the efficiency and quality of education through the use of advanced immersive technologies (Augmented reality, Virtual reality, Artificial intelligence, mixed reality);
- increase student involvement and interest in the subject or discipline in comparison with traditional teaching methods and means;
- visualizes in detail the studied object and concretizes abstract concepts, which helps to remove difficulties in the educational students' process with the perception of the subject;
- stimulates students' self-education skills and instills self-development skills, develops self-work skills;
- develops the desire of students to apply modern technical innovations, forms not only users' skills, but also professional skills in working with information and computer technologies;
- implemented through accessible information technologies (telephone, smartphone), does not always imply significant material costs for the purchase of additional technical equipment.

Like any educational method using innovative technologies implementing augmented reality has negative aspects:

- leads to the breakdown of interpersonal relations (connections) between the participants of the training (teacher-student);
- there is a significant gap between the development of information and computer technologies and technologies that are used in the actual practice at universities, the lack of teaching literature and recommendations;
- lack of necessary training or retraining of faculty and formation of necessary digital skills to work with advanced educational technologies.

During the years of study at the university, modern graduates need to become not only the highly qualified specialists according to their specialization, but also acquire proficiency in the skills of working with digital technologies. The digitalization of modern society leads to the reform of the system and the transformation of the content of higher professional education, contributing to the interest and involvement of students in the studied discipline (Manikovskaya, 2019). Among

the necessary competencies of graduates of universities is the acquisition of digital skills by students and the acquisition of digital literacy skills.

With certain digital skills and technological devices, students can see and hear digital objects, it is possible that in the foreseeable future they will be able to touch them. Using multimedia information, University teachers can contextualize and adapt information for students. Augmented reality technology provides an opportunity to learn in practice, to be involved in interactive activities. The roles of students and teachers are transformed, which leads to a change in the traditional form of learning, greater involvement in the educational process, and rapid assimilation. VR favorably influences the creation of an active learning environment, develops cooperation and makes it possible to study outside the classrooms, which in turn allows you to develop an independent, creative approach to learning (Dementjeva, 2018).

Any technology used for educational purposes involves the creation of modern and effective methodological recommendations. The application of Augmented reality in the modern educational context can be represented by means of applying – codes. QR code (Quick Response – quick answer) is a matrix code presented in the form of encoded information (a black and white square with a volume of about 3 thousand bytes) (Law, So, 2010), which is recognized by pointing a smartphone camera at it. A special beam scans both information and converts it into a picture or text. In the toolbox of any University teacher working with multimedia tools there are sources and resources aimed at solving educational problems used by the teacher both in classroom hours and in out-of-hours activities. The large variability of QR codes facilitates their integration into the educational process. The use of QR codes in an educational context contributes to the effective assimilation of the material, since students have access to information resources, and thus they minimize the time spent looking for the necessary and relevant information (Esra, 2019). Having printed the QR codes, the teacher can supplement them with methodological manuals, notes or student workbooks, diversify the theoretical part of the discipline textbook.

5. Conclusion

The undeniable benefits of Augmented Reality technology are interactivity and visibility, which are important factors in the learning process. Augmented reality tools cannot completely replace a teacher, acting as a consultant or partner in communication. This technology is a modern tool in the process of mastering students' language and computer competencies, the effectiveness of which was proved during our experiment.

The introduction and testing of augmented reality technologies in English language classes for students of technical universities proves the effectiveness and convenience in application with educational materials, a justified didactic basis for its application in the context of education. The effective combination of traditional and modern computer and digital technologies is the optimal model for creating pedagogical conditions of study, expanding the teacher's pedagogical portfolio and for forming the necessary language competencies in a foreign language among students.

Studied and analyzed material allows us to come to the following conclusions: augmented reality applications have simple and convenient interfaces; there are ready-made developments and do not need to spend time creating new ones for training purposes; AR applications can be widely used in English language classes to introduce professional and country studies in ways that increase the efficiency and motivation of students. In addition, AR applications help to form the crosscultural and sociocultural competencies of students.

6. Conflict of interests

The authors declare that they have no conflict of interest.

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Digitalization of Higher Education: New Trends and the Factors that are Associated Students' Grades

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Abstract

The purpose of the study is to analyze the factors that are associated the attitude of students to the processes of digitalization of higher education. The key research method is a questionnaire survey of students (N = 1107) conducted in June-November 2021. The results of the study showed that students, for the most part, positively perceive the processes of digitalization of education. Respondents recognize online learning during quarantine restrictions as an integral part of the digitalization of education. Personal experience and assessments of a number of characteristics of online learning have had a significant impact on the attitude to the digitalization of education in general. The dominant factors were a clear control system and clear presentation of the material. The factor "sufficient time to communicate with the teacher" received the least weight. Despite its significance, when answering the clarifying question, students' opinions were divided. Less than half of the respondents (43 %) believe that digital technologies have a negative impact on the learning process by reducing the time of live communication between the teacher and students. At the same time, the students unanimously believe that the use of digital technologies in the educational process is a factor in improving the quality of education, a competitive advantage of an educational organization.

Keywords: digitalization of education, teacher-student interaction, knowledge control and assessment, digital technologies, student attitudes and assessments.

1. Introduction

Digitalization is rapidly changing many spheres of social life: the structure and forms of employment, lifestyle, leisure, consumer practices, communications (Levashov, Grebnyak, 2021).

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The sphere of education, both secondary and higher, has also been seriously affected (Ivanova, Chernyakov, 2021). A number of studies emphasize that the digitalization of education as a complex process affects two aspects. On the one hand, we are talking about the formation of a comprehensive digital infrastructure, intensive use of innovative equipment and software. On the other hand, digitalization implies the development of a high-tech learning environment, new forms of pedagogical work aimed at overcoming time and spatial constraints, ensuring an individual approach to each student (Saari, Sääntti, 2018).

The intensive development of digitalization of education has become a response to epidemiological challenges, an option for implementing an “emergency solution” in order to make distance learning possible (Taglietti, 2021). The transition of education to the virtual space during the pandemic made it possible to protect all participants from epidemiological threats, and also made it possible to rethink the basic concepts and the very concept of education in such aspects as competencies and the role of a teacher in education (Frolova et al., 2020), the development of the digital infrastructure of universities (Al-Msie'deen et al., 2021; Al Sawy, 2021), and educational inequality (Grigoriev, 2021; Zolotareva, 2021). Such an understanding, in our opinion, is extremely necessary, given the fact that mixed, hybrid forms of education integrating virtual and traditional educational practices are becoming a new reality in modern conditions.

Russian and foreign scientific studies emphasize that national governments have not always critically interpreted the experience of an emergency transition to a remote learning format. This conclusion was made in the work of M. Mitescu-Manea, L. Safta-Zecheria, E. Neumann, V. Bodrug-Lungu, V. Milenkova and V. Lendzhova based on the materials of a comparative study in four countries: Romania, Hungary, Bulgaria and the Republic of Moldova. It is noted that the efforts of the authorities were primarily aimed at ensuring the continuity of the educational process. At the same time, the analysis of new emerging dysfunctions, threats, vulnerabilities and needs of students was on the periphery of the attention of the authorities (Mitescu-Manea, 2021). Based on this point of view, the authors of this article believe that modern research on education problems should focus on the needs of students, the risks of intensive digitalization of the educational process. Such risks, first of all, can be attributed to the following: lagging in studies (Canvas, 2020), digital inequality (Márquez-Ramos, 2021), increasing depression, stress and anxiety among students (Ho, Huynh and Chi, 2021), an increase in the burden on teachers (Vinichenko, 2021), a drop in motivation to form sustainable knowledge, a decrease in concentration (Frolova, Rogach, 2021).

In modern conditions, an important factor in increasing the effectiveness of digitalization of education is the development of a productive digital environment in universities, where access to online resources, the knowledge control system has a high level of transparency for students. As emphasized in the study by S.P. Ramasamy, A Shahzad, R Hassan, the ease of using elements of the digital environment has a positive impact on students' grades and their attitude to digital learning (Ramasamy, 2021). Based on these provisions, the authors in their work identify the following as key factors affecting the effectiveness of training in the context of digitalization: a clear control system, and facilitated search for materials. In this context, it is extremely important that universities have the opportunity to choose the vector and pace of modernization of their digital environment independently, taking into account their resources and limitations, the needs of both teachers and students. A number of foreign studies conclude about negative trends caused by organizational pressure on universities, the imposition of certain strategies and tactics for the development of digitalization “from above”. Therefore, S Bayne and M. Gallagher say that universities need to determine the content and forms of “their digital future” independently, based on the principles of collectivity and participation (Bayne, Gallagher, 2021).

An important aspect of research on the problem of digitalization of education is the search for the contours of a new digital pedagogy. A number of scientific articles conclude that it is necessary to integrate the efforts of all stakeholders (teachers, students, local communities) in the design of new curricula (Miller, Liu, 2022). We should note that in modern conditions, the role of local communities could be significantly expanded from management practices for organizing the life support of the territory to participation in the development of the social sphere, including determining the vector of educational policy of local educational institutions (Medvedeva et al., 2021).

G. Ladson-Billings emphasizes the need for curricula to match the culture of students. In his opinion, the new pedagogy assumes reliance on collective experience, decentralization of corporate educational materials, and transformation of the knowledge assessment system, which in modern

conditions should become not so much a “punitive tool” as a means of diagnosing competencies (Ladson-Billings, 2021). Developing this idea, A. Heinonen and S. Tuomainen draw attention to the importance of such factors of control system efficiency in the conditions of digitalization as usability and flexibility (Heinonen et al., 2020)

Special attention in the conditions of intensive digitalization should be paid to the human factor, the preservation of optimal parameters of the communication field between students and teachers (Fenwick, Edwards, 2016). As emphasized in T.A. Chelnokova’s study, digitalization requires a different mentality from the teacher (Chelnokova, 2020), new digital competencies to maintain the required level of interactivity (Grebnyuk, 2020).

Based on the results obtained, the authors, when developing the tools of the questionnaire survey of students, included various indicators characterizing the process of interaction between a teacher and a student in the conditions of digitalization.

The purpose of the study is to analyze the factors that are associated the attitude of students to the processes of digitalization of higher education.

The main hypothesis: the key factors that are associated the attitude of students to the processes of digitalization of higher education are the following: interest in learning tasks, clarity of the knowledge assessment system.

Additional hypotheses:

- Modern students positively assess the processes of digitalization of higher education.
- Reducing the time for interaction with the teacher is not the dominant factor that has a negative impact on attitudes towards digitalization processes.

2. Methods

During the preparation of the article, the authors used both general scientific (analysis, synthesis, comparison) and empirical research methods. The key research method was a questionnaire survey of students of Russian universities (on the Internet). The survey was conducted in June-November 2021. The questionnaire was posted on the Google platform. Participation in the survey was voluntary. The principles of forming a sample of respondents: the snowball method (students sent an invitation to participate in the survey), spontaneous selection (the link to the questionnaire was distributed through social networks, virtual student communities). The total number of the respondents was 1107 people. During the interpretation of the survey results, Pearson’s Chi-Square test of independence has been used to determine if there is a significant relationship between two nominal (categorical) variables, which made it possible to identify the relationship between factorial and effective signs.

To study the dynamics of the respondents’ assessments, the authors conducted a comparative analysis of the results of this survey with a survey conducted in February – April 2020 (N = 1553).

3. Results

The experience of distance learning during the pandemic has not changed the positive attitude towards the digitalization of education (Figure 1). Therefore, in 2020, 16.2 % of the respondents assessed these processes “negatively” or “rather negatively”, in 2021, while maintaining the overall distribution (16.1 %), there was a slight increase in the share of categorically minded respondents. In 2020, the answer “negative phenomenon” was chosen by 4.6 % of the respondents, then in 2021 – 8.2 %.

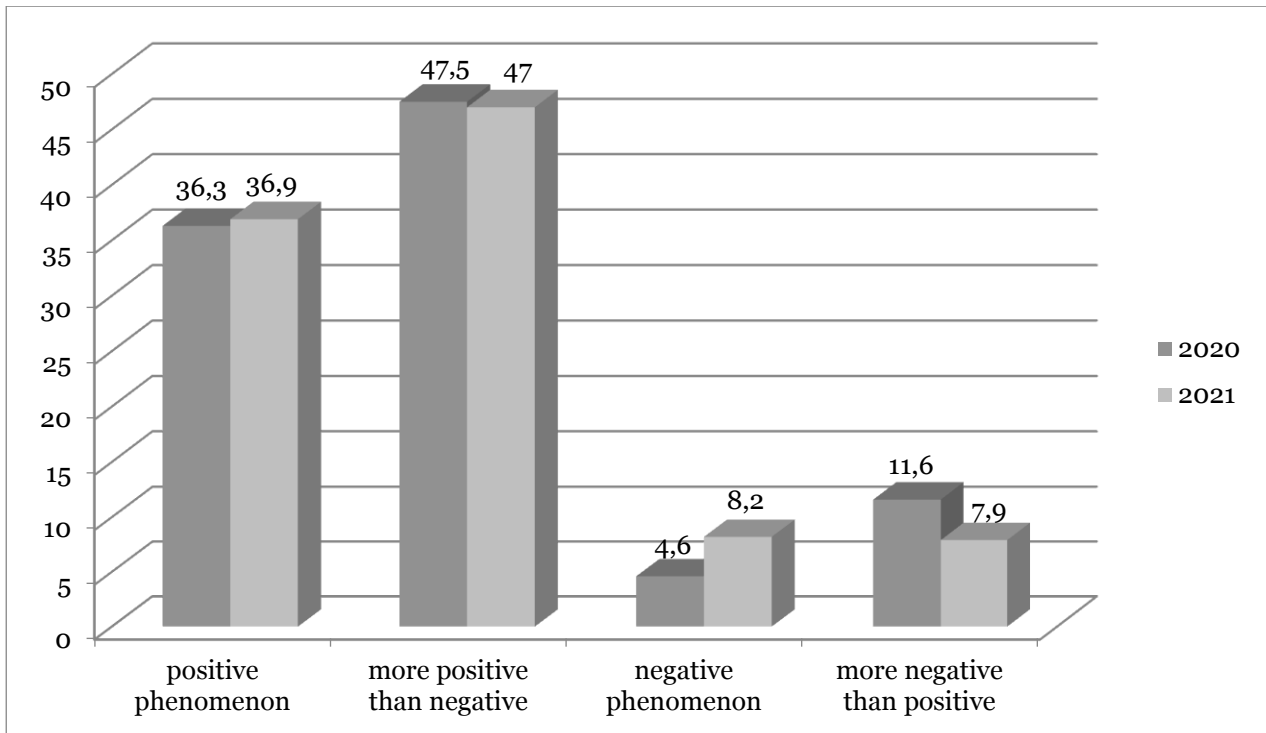


Fig 1. Distribution of answers to the question: «How do you think the digitalization of education in general is ...» in 2020 and 2021, %

Based on the data obtained, we established a relationship between the attitude of the students to digitalization and their assessment of the quality of tasks performed (Table 1). In particular, the students who, by personal example, evaluate the teacher’s tasks as uninteresting are more likely to consider digitalization a negative phenomenon (grades are higher than the sample average by 8.4 percentage points).

Table 1. Distribution between students’ attitude to digitalization and their perception of the quality of tasks performed (criterion “interesting”), pers

| Evaluate on a personal example the characteristics of the educational process in the context of digitalization: interesting tasks | Do you think that digitalization of education is ...? | | Total |
|---|---|---|-------|
| | «negative phenomenon» and «more negative than positive» | «positive phenomenon» and «more positive than negative» | |
| Possible answer | | | |
| Yes | 101 | 688 | 789 |
| No | 78 | 240 | 318 |

The value of the Pearson's chi-square test is 22.996. At a significance level of $p = 0.01$, the critical value of χ^2 is 6.635. Distribution between factorial and performance characteristics is statistically significant at the level of perception $p < 0.01$. The significance level is $p < 0.01$.

The data presented in Table 2 illustrate the importance of another factor influencing the attitude of students to the processes of digitalization. Among the students who negatively assessed the clarity of the control system in the conditions of remote learning, the proportion of those who

have a negative attitude to the digitalization of education is higher (26.5 %, which is higher than the average values by 10.4 percentage points).

Table 2. Distribution between students' attitude to digitalization and their assessments of the clarity of the control system, pers

| Evaluate on a personal example the characteristics of the educational process in the context of digitalization: clear control system | Do you think that digitalization of education is ...? | | Total |
|--|---|---|-------|
| | Possible answer | «negative phenomenon» and «more negative than positive» | |
| Yes | 88 | 675 | 763 |
| No | 91 | 253 | 344 |

The value of the Pearson's chi-square test is 38.938. With a significance level of $p = 0.01$, the critical value of χ^2 is 6.635. Distribution between factorial and operational characteristics is statistically significant at the perception level of $p < 0.01$. The significance level is $p < 0.01$. Thus, the value of χ^2 in assessing the factor "clarity of the control system" has more weight for the students than interesting tasks.

Table 3 shows the distribution of the students' responses when assessing such characteristics of the educational process as a facilitated search for materials in the conditions of digitalization and the general attitude to the digitalization of education. The data obtained in the course of the study allow us to conclude that the facilitated search for materials in the conditions of digitalization, being a significant factor, nevertheless does not belong to the dominant ones. The generation of digital aborigines (D'yakova, Sechkareva, 2019) feel free in the Internet space and for the most part do not have difficulty finding information. An indirect confirmation of this conclusion is the distribution of time that the students spend searching for information. In particular, only 8.1 % of the respondents spend more than 60 minutes searching for the necessary information in preparation for a lesson. The majority of students take no more than half an hour for this (58.1 %)

Table 3. Distribution between students' attitudes towards digitalization and their ratings of ease of finding materials, pers

| Evaluate on a personal example the characteristics of the educational process in the context of digitalization: easy search for materials | Do you think that digitalization of education is ...? | | Total |
|---|---|---|-------|
| | Possible answer | «negative phenomenon» and «more negative than positive» | |
| Yes | 124 | 782 | 906 |
| No | 55 | 146 | 201 |

The value of the Pearson's chi-square test is 22.700. With a significance level of $p = 0.01$, the critical value of χ^2 is 6.635. Distribution between factorial and operational characteristics is statistically significant at the perception level of $p < 0.01$. The significance level is $p < 0.01$. Thus, the value χ^2 illustrates the fact that the factor of facilitated search of materials is less associated than the clarity of the control system (38,938) and interesting tasks (22,996).

During the analysis of the data presented in Table 4, the hypothesis was partially confirmed that the reduction of time for interaction with the teacher is not the dominant factor that has a negative impact on attitudes towards digitalization processes. In particular, in the group of students who confirmed the lack of time to communicate with a teacher in the conditions of digitalization, the proportion of those who assess the processes of digitalization of education in a negative way is slightly higher (20.7 %, which is higher than the average values by 4.6 percentage points).

Table 4. Distribution between students' attitude to digitalization and their estimates of the adequacy of time to communicate with the teacher, pers

| Evaluate on a personal example the characteristics of the educational process in the context of digitalization: little time to communicate with the teacher | Do you think that digitalization of education is ...? | | Total |
|---|---|---|-------|
| | Possible answer | «negative phenomenon» and «more negative than positive» | |
| Yes | 135 | 516 | 651 |
| No | 44 | 412 | 456 |

The value of the Pearson's chi-square test is 24.323. At a significance level of $p = 0.01$, the critical value of χ^2 is 6.635. Distribution between factorial and performance characteristics is statistically significant at the level of perception $p < 0.01$. The significance level is $p < 0.01$.

Despite the presence of a connection between these signs, the impact of reducing the time spent on communicating with the teacher is not the dominant factor in the formation of negative ratings digitalization of education in general.

A comparative analysis of the materials of the first and second waves of the study (Figure 2) allows us to conclude that there have been no significant transformations in the opinion of the students during the period of distance learning. At the same time, we can talk about the emerging trend. Having adapted to the new conditions, the students feel less lack of time to communicate with the teacher. At the same time, more than half of the respondents surveyed, both in 2020 and in 2021, admit that the digitalization of education reduces the time of their interaction with the teacher.

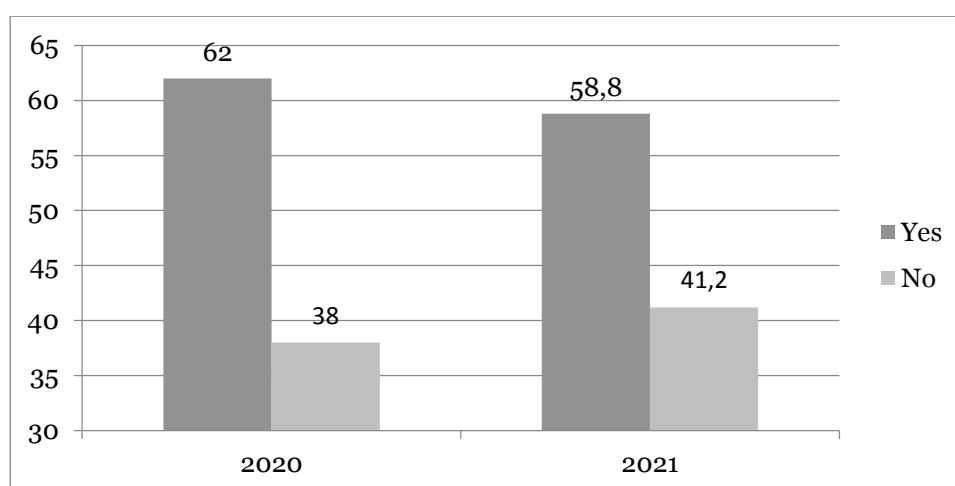


Fig. 2. Distribution of answers to the question: “Do you agree with the statement that in the context of digitalization, a student has little time to communicate with a teacher?”, %

In addition to this question, the study attempted to find out the respondents' attitude to the compression of the boundaries of direct interaction between a teacher and a student. We should note that the results of the study illustrate the lack of an unambiguous opinion of the students on this aspect of the digitalization of education. Answering the question: "Do you agree with the statement that digital technologies negatively affect the learning process by reducing the time of live communication between the teacher and students?" 43 % gave a positive answer, 38.2 % disagreed with this statement. Almost every fifth respondent (18.8 %) found it difficult to answer. Interestingly, when answering the question whether the use of digital technologies in teaching is a competitive advantage of an educational institution, the respondents were more unanimous in their assessments. Almost 2/3 (65.7 %) of the surveyed students answered yes to this question. 70.1 % believe that digitalization is an important condition for improving the quality of education. In 2020, 67.4 % of the respondents agreed with this statement.

The analysis of the data in Table 5 allowed us to establish a factor that is a dominant associated on the attitude of students to processes of the digitalization of education. Of interest is the fact that the introduction of digital technologies into the educational process allows you not to spend a lot of time searching for information in preparation for the lesson, but at the same time actualizes the factor of accessibility of presentation materials from the teacher.

Table 5. Distribution between students' attitudes towards digitalization and their assessments of the accessibility of presenting materials, pers

| Evaluate on a personal example the characteristics of the educational process in the context of digitalization: clear presentation of materials | Do you think that digitalization of education is ...? | | Total |
|---|---|---|-------|
| | Possible answer | «negative phenomenon» and «more negative than positive» | |
| Yes | 82 | 658 | 740 |
| No | 97 | 270 | 367 |

The value of the Pearson's chi-square test is 42.641. The critical value of χ^2 at the significance level $p = 0.01$ is 6.635. Distribution between factorial and performance characteristics is statistically significant at the significance level $p < 0.01$. The significance level $p < 0.001$. Thus, these values show the strongest relationship between the attitude of students to the digitalization and the availability of presentation materials. Among those students who, by personal example, did not experience difficulties with the educational material, the vast majority of 88.9 % positively assessed the digitalization processes, which is higher than the average values by 5 percentage points. An even more pronounced dependence is characteristic of a group of students who negatively assessed the availability of presentation materials in the conditions of digitalization. Among them, one in four (26.4 %) negatively perceives the introduction of digital technologies into the educational process (above average values by 10.3 percentage points).

Summarizing earlier conclusions, we can conclude that the hypotheses of the study have found partial confirmation. The key factors in the formation of students' assessments of the processes of the digitalization of education are the following: accessibility of presentation of materials, clarity of the control system. The interest in assignments, the facilitated search for materials and the sufficiency of time to communicate with the teacher, while remaining statistically significant factors, at the same time do not occupy leading positions.

4. Discussion

The analysis of the obtained results illustrates the “digital optimism” in the student environment, the respondents’ assessments of the digitalization of education are centered in the boundaries from “positive phenomenon” (36.9 %) to “rather positive” (47 %). The results of the study showed the existence of a stable relationship between the students’ personal learning experience and their estimates of digitalization. Among all the characteristics of the educational process, the value of the indicators “clear presentation of materials” and “clarity of the control system” has the greatest weight. We can assume that in the conditions of remote learning and the reduction of personal contacts with the teacher, students are interested in an accessible understanding of the material, transparent criteria for assessing knowledge. As emphasized in the study by O. Zlatkin-Troitschanskaia, J. Schlux and J. Jitomirski, fairness in the system of control of students’ knowledge is one of the most important criteria for the quality of education (Zlatkin-Troitschanskaia et al., 2019). In the conditions of digitalization, the knowledge assessment system is most susceptible to algorithmization. Tests as forms of knowledge control are becoming the most common practice in modern universities. The results of education are converted into digital form: from “the learning process in the classroom and knowledge assessment” to “management and administration” (Williamson 2017). A number of authors see a positive impact of the digitalization processes on the modernization of the students’ knowledge assessment system. In particular, the opinion is given that digital technologies provide updating of existing performance monitoring tools, and ensure transparency of assessment results (Campelj et al., 2019). In contrast to this point of view, C. Malott puts on the agenda a number of issues related to the effectiveness of algorithmized knowledge assessment systems. The idea is expressed that algorithms, approved protocols of knowledge assessment and compulsory practices limit creativity of a teacher and a creative approach in teaching. Considering alternatives to trends in the development of education in the future, the scientist suggests that algorithmic training programs, bots, can replace the teacher (Malott, 2020). Complementing this point of view, M. Manikovskaya believes that the formalization of the educational process, the deterioration of interpersonal communication skills are key threats to the digitalization of education (Manikovskaya, 2019)

At the same time, the results of the study showed that the students perceive the reduction of direct contacts with the teacher in the conditions of digitalization very ambiguously. The respondents’ opinions were divided on this issue, however, those students who personally experienced a lack of time to communicate with the teacher, in general, perceive the process of digitalization more critically, considering it a negative phenomenon. We should mention that there is also no consensus in the scientific literature on this issue. S. Bayne and P. Jandrić disputes the claim that personal interaction and presence is a privileged form of learning and the most authentic way to gain knowledge. Scientists believe that online learning is becoming a new reality, and with the right approach, it will provide access to high-quality education for the general population (Bayne and Jandrić, 2017). N.B. Strekalova, in contrast to this opinion, believes that the reduction of personal contacts in the learning process leads to a loss of fundamental education (Strekalova, 2019). Of interest is the point of view of J. Suoranta, which justifies the need to integrate traditional pedagogical forms of work into the digital educational environment, considers teaching, on the one hand, as an art, and, on the other hand, as an algorithm of actions with mandatory reliance on digital technologies (Suoranta et al., 2021).

The results of our study are compatible with these conclusions. Such characteristics of the educational process as “interesting tasks”, “clear presentation of the material”, “a clear control system” have a significant impact on perception of the digitalization process in the student environment. In modern conditions, the formation of a creative learning environment is the most important factor in maintaining interest in learning. In this context, it is important to integrate the teacher’s pedagogical skills and innovative digital technologies embedded in the educational infrastructure of the university. The study showed that modern students are no longer as interested in the personal presence of a teacher. While the use of digital technologies, in their opinion, is an important competitive advantage of an educational institution, a condition for improving the quality of education.

5. Conclusion

The results of the study show that students of Russian universities positively perceive the process of digitalization of higher education. Distant learning, the introduction of quarantine restrictions did not have a significant impact on the respondents' assessments. A comparative analysis of the results of two surveys in 2020 and 2021 showed that the proportion of the students who positively assess the processes of digitalization has practically not changed. We should note that the majority of the respondents believe that digitalization is an important condition for improving the quality of education (67.4 % in 2020, 70.1 % in 2021). The correlation analysis revealed determinants that determine the perception of digitalization in the student environment: a clear control system, clear presentation of the material, interesting tasks, facilitated search for materials, and the amount of time allotted for communication with the teacher. Despite the fact that those respondents who feel a lack of time to communicate with a teacher, for the most part, more often assess digitalization as a negative impact, the results of the study illustrate the lack of unambiguous opinions regarding these trends. Students' opinions were divided when answering the question: "Do you agree with the statement that digital technologies negatively affect the learning process by reducing the time of live communication between the teacher and students?" Similarly, there are polar positions in scientific discourse. On the one hand, there are concerns about the risks of formalization of learning, deterioration of communication skills in conditions of compression of the boundaries of interaction between a teacher and a student. On the other hand, the conclusion is justified that "live communication" today is not an attribute of privileged learning, a factor in improving the quality of education. It can be assumed that direct communication between a teacher and a student is not one of the dominant needs of young people today. While the use of digital technologies in the educational process is unanimously perceived as a factor in improving the quality of education, the competitive advantage of the university.

Taking into account the students' request for the introduction of digital technologies into the educational process, further research directions on this topic may be the following: mechanisms for integrating traditional and digital pedagogy, analysis of the long-term consequences of reducing the boundaries of teacher and student communication, search for alternative forms of the educational process, compensators for negative consequences of the digitalization of education.

6. Limitations

The limitations of this study include the use of random sampling, which does not fully represent all categories of students. Studies of the digitalization of education on the example of higher education justify the choice of a spontaneous sample, but further analysis of digitalization processes requires coverage of a wider range of respondents with all the characteristics of representativeness.

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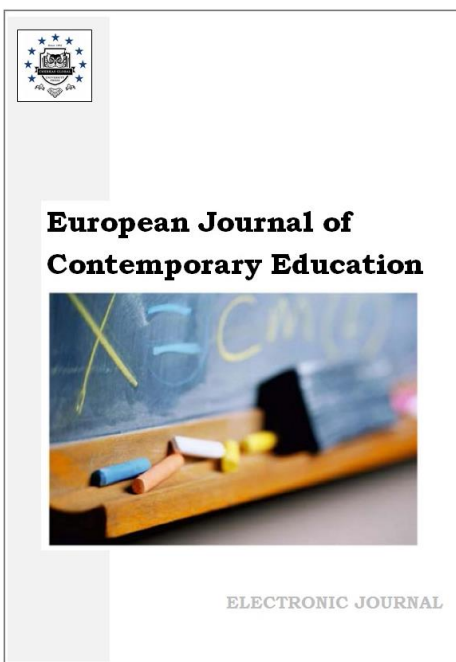
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The Engaged Living Of Vietnamese High School Students: Accessed from the Social and Emotional Health Perspective

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Abstract

Social and emotional learning (SEL) is not only beneficial for relationship building among students and their teachers, but it also has positive effects on their mental health. The core competencies of SEL are essential to understanding emotions and developing coping strategies to deal with mental health disorders, also called social and emotional health (SEH). This article focuses on exploring the SEH of Vietnamese high school students, emphasizing the engaged living component. The current study used a mixed-methods by combining the questionnaire and interviews on 474 students, with the supplementary from teachers, school counselors, and school administrators. The results reflected that students had a high level of engaged living. They had a good perception of engaged living through three indicators of gratitude, zest, and optimistic; but could not practice due to the gap between the knowledge taught and the practical application. The findings provide the engaged living data for schools to refer to and impact life value education's implementation. This is the foundation to strengthen SEH for students.

Keywords: engaged living, social and emotional learning, social and emotional health, mental health, life value education.

1. Introduction

Defined by the Collaborative for Academic, Social, and Emotional Learning (CASEL, 2017), social-emotional learning (SEL) is the process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. Not only is SEL beneficial for relationship building among students and their teachers/guardians, but it also has positive effects on mental

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health, such as reducing stress, negative social behaviors, emotional distress, and attitudes towards the self (Greenberg et al., 2017).

According to WHO (2019), one in five children show signs of a mental health disorder each year. While not a substitute for treatment, SEL is a helpful tool in managing mental health symptoms directly in the classroom or at home (Daunic et al., 2013). The core competencies of SEL are essential to understanding emotions and developing coping strategies to deal with them healthily. When children can manage their feelings, they can better interact with family, friends, teachers, and the rest of the world around them. Weare (2010) provided an overview of the practical principles in promoting school-based mental health care and uncovers some of the debate in the field. This study examined the basis for the SEL's effects on high school students' learning and mental health. In addition, this study outlined several principles rooted in rapidly growing practical experience: (1) screening for the need for support, research, and psychological assessment in schools; (2) implementing consistently a school-wide access, ensuring clear and balanced prevention programs; and (3) defining goals, encouraging teamwork in school, and encouraging the school's autonomy. From here, the term social-emotional health (SEH) appeared. SEH is defined as the intrinsic psychological balance that allows individuals to perceive resilience in their lives, cope with and overcome mental health disorders; studying/work effectively, and contribute to society (Furlong et al., 2018). You et al. (2015) and Furlong et al. (2018) have begun developing a concept-based assessment model and tool for SEH to measure core positive psychological predispositions from a mental health perspective, manageable in a school environment. The SEH model is based on the premise that prosperity and success are grounded in the conditions of an individual's life, promoting the development of internal psychological tendencies that focus on four main components: (1) Belief-in-Self, (2) Belief-in-Others, (3) Emotional competence, and (4) Engaged living.

High school students (HS) can be seen increasingly under the complex effects of an increasingly developed and integrated society. The integration into modern society and the mental health of HS in the context of the 4.0 technology era (Maputra, 2019) or the COVID-19 pandemic (Pfefferbaum, North, 2020) have had a significant impact on their SEH. Many students become irresponsible, even to themselves (Duan et al., 2020), and lack the positive value they should have (Gray et al., 2017). Positive life values are the core living values that every human being needs: love, kindness, peace, self-esteem, solidarity, and altruism (Frisch, 2005). The life value education (LVE) for HS helps them study and live positively. Many countries recognize that the LVE is an essential pillar for students' moral education (Kaur, 2015). Some other countries consider LVE their primary educational principles (Williams, Brown, 2013). In Vietnam, LVE is recognized as both an educational principle and a pillar of moral education for students, both in the old and new general education curriculum (Ministry of Education and Training, 2018). LVE can increase the engaged living component due to the similarity in content (Froh et al., 2011; Oberle et al., 2010). Concerning the above, if students have a low level of engaged living in the SEH, they will encounter many mental health disorders related to which LVE can create positive value at the school-based prevention level (Oberle et al., 2011).

In the current study, we focus on exploring the engaged living component of Vietnamese HS based on the SEH model. The discovery of Vietnamese students' engaged living will help to propose more effective LVE when approached from the perspective of developing competencies and qualities in the 2018-general education curriculum and provide more data on HS' SEH in developing countries, where have been gradually applying SEL to education.

2. Theoretical framework

According to Furlong et al. (2020), the SEH model includes many socio-emotional skills and psychological orientations associated with positive human development. Engaged living is one of the four main components in the SEH model, which relates to the individual capacity to participate in and connect with activities in life. From the SEH model and definition of SEH, we define engaged living as a practical attachment, connection, and interaction between an individual and his/her life to creating positive life values as the foundation for motivating individuals to happiness. Engaged living includes the three dependent components: (1) Gratitude – Remember and appreciate what you give and receive in life. (2) Zest – Show a deep interest in a topic or activity, as well as a willingness to engage in action.

(3) Optimistic – Expresses belief or hope about the outcome of some particular endeavor, which is positive, favorable, and desirable (Furlong et al., 2020).

With the definition of engaged living, we recognize the impact of this component on the mental health of adolescents/HSSs in previous studies. Proctor et al. (2010) believe that a positive attitude to life is an essential spiritual foundation to help HS achieve well-being while studying. Veronese et al. (2012) agree that HSSs' effective connection and interaction with friends, parents, teachers, and life events have a substantial impact on their resilience and coping with mental health disorders. Educators reported that teaching students emotional and social skills to interact effectively with life, such as gratitude, perseverance, enthusiasm, and positive thinking, will bring about mental health disorders preventive effects for students, as well as promote the development of their social-emotional competence (Wong, Lim, 2009). Engaged living helps students develop the essential skills to be effective in life, gain the skills needed to handle themselves and relationships, and work effectively and ethically. These skills include recognizing and managing emotions, developing concern and concern for others, making responsible decisions, establishing positive relationships, and handling challenging situations effectively (CASEL, 2017).

Vietnamese HSSs currently have a lot of stress-related disorders (Van-Son et al., 2019) and traumatic-related disorders (Thai, Nguyen, 2018), especially in the context of the COVID-19 pandemic and extended online learning (Nguyen, Vu, 2020). Vietnamese current studies almost reported that these mental-related problems negatively affected the attachment, connection, and interaction between an individual and his/her life to creating positive life values; or the engaged living of the SEH model. HSSs' engaged living is not yet claimed to be below, but it cannot exceed the average because social problems are rooted mainly in students' social skills (Minh-Hong et al., 2020). The findings on Vietnamese HSSs' engaged living have not been verified objectively. In addition, we also found that some previous studies on LVE in Vietnam mentioned the development of engaged living for students through skill training (Hang, 2021; Huynh, 2017; Nguyen, 2018; Tran, 2020). However, from the perspective of education and training, the effectiveness of these LVE studies is not practical; because up to now, there are still many social problems related to the imbalance in HSSs' engaged living in particular or the SEH in general (Minh-Hong et al., 2020; Hang, 2021). The following section will present our research design process to discover Vietnamese HSSs' engaged living situation.

3. Methods

Study design

The study used a mixed research methodology to clarify the current situation of Vietnamese HSSs' engaged living. We focused on two major cities in Vietnam that tested the SEL model: Ho Chi Minh City and Da Nang City. Then, Can Tho City and Soc Trang City – two areas that started applying SEL to education activities.

The study used the self-developed questionnaire (self-reported questionnaire) based on the SEH model as the primary method, which contained two parts:

- Part 1 was the demographic information;

- Part 2 was the structure of the 36-items questionnaire (coding I for each item). In particular, I1-9 assessed the belief-in-yourself, I10-18 assessed the belief-in-others, I19-27 assessed the emotional competence, I28-36 assessed the engaged living. In the engaged living self-reported items, I28-30 assessed the gratitude expressions, I31-33 assessed the zest expressions, and I 34-36 assessed the optimistic expressions.

HSSs were asked to choose an answer that most accurately reflected them from five options based on the Likert-5 scale: 1 = completely incorrect, 2 = partially correct, 3 = confused, 4 = quite right, and 5 = completely right.

Simultaneously, the interviews were used to shed light on the questionnaire results of engaged living. The interviews were conducted with four groups of participants related to SEH and the mental health of Vietnamese HSSs: HSSs (leading participant), school counselors, teachers, school administrators – the auxiliary participants, to add more information in clarifying the questionnaire results. Open-end interview questions are based on the questionnaire, which focused on the expressions of the HSSs' engaged living and what they did to cope with the SEH-related problems/mental health disorders.

We contacted the school administration for permission to conduct the study for data collection. Then, we connected with the homeroom teacher and sent the questionnaire to HSs to do directly in 30 minutes (at the end of the class time). We randomly selected groups of participants at the schools to which we distributed the questionnaires with interview data. Each interview took 15 to 30 minutes at break-time in the school counseling office to ensure privacy and safety. All interviews had written consent from the participants, and consent was obtained for recording during the interviews. The researchers submitted questionnaires and interview data to the participants about compliance with professional ethics, with no conflict of interest and only for scientific purposes. The data collection process took place over three months in the identified areas from October 2020 to December 2020.

Participants

474 valid questionnaires were collected based on the 600 issued. The criterion for choosing a valid questionnaire is that the participants fully complete the questionnaire; this rate is 79 %. In which, 74 students agreed to participate in the interview section of the study. In the interview section, 10 teachers, 4 school counselors, and 6 school administrators participated for the auxiliary participants. The participants' demographic information is described as follows:

In terms of gender, out of 474 students who participated, 273 were female (57.6 %), and 191 male students (40.3 %). There were 10 students (2.1 %) who were predominantly LGBT. This rate was not much, but it proved that the Vietnamese HSs were initially more aware of gender and knew how to express gender appropriately.

In terms of grades, the participants were spread relatively evenly in 10, 11, 12 grades with the corresponding percentage of 38.2 %, 31.4 %, 30.4 %.

In terms of ethnicity, HSs with Vietnamese groups accounted for the most significant proportion with 70.9 % (336 students), ranked second as Chinese with 16.5 % (78 students), ranked third as Khmer with 12.4 % (59 students).

In terms of academic results, 304 students (64.1 %) were excellent, 155 (32.7 %) were good, 13 (2.7 %) were average and 2 (0.4 %) were fair.

In terms of living places, 191 students lived in the Ho Chi Minh City (40.3 %), 119 students lived in Soc Trang City (25.1 %), 102 students lived in Can Tho City (21.5 %), and 62 students lived in Da Nang City (13.1 %).

In terms of family traditions, 52.3 % of students do not have or do not know about their family traditions, 22.2 % had a career tradition in the family, 15 % had a religious tradition in the family, and 10.5 % lived in families with revolutionary traditions.

Data analysis

We used the Likert-5 point for range value and point division for data coding. In this study, the current range was 0.8. Therefore, the meanings are as follow: [1;1.80] = Very low; [1.81;2.61] = Low; [2.62;3.42] = Average; [3.43;4.23] = High; [4.24;5] = Very high. We encoded 'HS' for students, 'T' for teachers, 'SC' for school counselors, and 'SA' for school administrators for interview citation. Ordinal numbers were placed after the coding words to distinguish citations from different participants.

SPSS for Windows software version 20.0 was used to analyze the questionnaire data. Inference statistical calculations are used: mean (M), standard deviation (SD), ranking (R), percentage (%), and Anova One-way test.

ATLAS. Tis 9 was used to store and cite the interview data from the participants. Three authors listened carefully to all the critical sentences, ideas, and keywords from the tape to highlight the shared experience. Using the thematic analysis, the authors systematize different themes related to the expressions associated with the defined engaged living.

4. Results

Questionnaire results of the engaged living of Vietnamese high school students

Table 1. The engaged living of Vietnamese high school students

| Expressions | Level | | | | | Mean | SD | Ranking |
|---|-------|------|------|------|------|-------------|--------------|---------|
| | 1 | 2 | 3 | 4 | 5 | | | |
| (I28) Think positive and wait for joys and positive things every day | N 10 | 24 | 34 | 88 | 318 | 4.43 | 0.973 | 2 |
| | % 2.1 | 5.1 | 7.2 | 18.6 | 67.1 | | | |
| (I29) Expect good, positive things to come to you | N 10 | 17 | 23 | 83 | 341 | 4.53 | 0.903 | 1 |
| | % 2.1 | 3.6 | 4.9 | 17.5 | 71.9 | | | |
| (I30) Maintain existing relationships well, and constantly strengthen and develop positive relationships for yourself | N 11 | 22 | 33 | 106 | 302 | 4.40 | 0.969 | 3 |
| | % 2.3 | 4.6 | 7.0 | 22.4 | 63.7 | | | |
| (I31) Be grateful for life and be active to create great things in your own life | N 23 | 70 | 116 | 148 | 117 | 3.56 | 1.152 | 6 |
| | % 4.9 | 14.8 | 24.5 | 31.2 | 24.7 | | | |
| (I32) Grateful to those who have merits to nurture, teach, and protect | N 13 | 58 | 82 | 154 | 167 | 3.85 | 1.114 | 4 |
| | % 2.7 | 12.2 | 17.3 | 32.5 | 35.2 | | | |
| (I33) Accept reality, do not be fussy, and stick to existing values (relationships, self-limitations, personal goals, etc.) | N 24 | 58 | 90 | 138 | 164 | 3.76 | 1.194 | 5 |
| | % 5.1 | 12.2 | 19.0 | 29.1 | 34.6 | | | |
| (I34) Communicate, behave energetically, proactively, enthusiastic | N 30 | 90 | 106 | 172 | 76 | 3.37 | 1.146 | 9 |
| | % 6.3 | 19.0 | 22.4 | 36.3 | 16.0 | | | |
| (I35) Cooperation, coordination and teamwork in a way that is attentive and good listener | N 21 | 101 | 105 | 167 | 80 | 3.39 | 1.126 | 8 |
| | % 4.4 | 21.3 | 22.2 | 35.2 | 16.9 | | | |
| (I36) Always strive to build a better self-image, create every day towards happiness, optimism, and peace | N 23 | 90 | 120 | 156 | 85 | 3.40 | 1.128 | 7 |
| | % 4.9 | 19.0 | 25.3 | 32.9 | 17.9 | | | |
| Average | | | | | | 3.85 | 1.078 | |

Table 1 describes the average mean of Vietnamese HSS' engaged living reached $M = 3.85$, $SD = 1.078$, corresponding to the High level. The first ranking is I29 with $M = 4.53$, $SD = 0.903$ (Very high level). The second ranking is I28 with $M = 4.43$, $SD = 0.973$ (Very high level). The third ranking is I30 with $M = 4.40$, $SD = 0.969$ (Very high level). All these three expressions belong to the gratitude in engaged living.

Next is the group of zest expressions with a ranking of 4, 5, 6, including I32 ($M = 3.85$, $SD = 1.114$, high level), I33 ($M = 3.76$, $SD = 1.194$, high level), I31 ($M = 3.56$, $SD = 1.152$, high level).

The last ranked group belongs to the optimistic expressions, including I36 (ranked 7th, $M = 3.40$, $SD = 1.128$, average level); I35 (ranked 8th, $M = 3.39$, $SD = 1.126$, average level); I34 (ranked 9th, $M = 3.37$, $SD = 1.146$, average level).

Table 2. ANOVA test for the difference between gender, grades, ethnicity, academic results, living places, family traditions, and the HSs' engaged living

| Variables | Gender | | | Grade | | | Ethnicity | | | Academic results | | | | Living place | | | | Family tradition | | | |
|-----------|--------|--------|--------|-------|----|----|------------|---------|-------|------------------|------|---------|------|--------------|---------|---------|-----------|------------------|------------------|-----------------------|---------------------|
| | Male | Female | Others | 10 | 11 | 12 | Vietnamese | Chinese | Khmer | Excellent | Good | Average | Fair | Ho Chi Minh | Da Nang | Can Tho | Soc Trang | None | Career tradition | Revolutionary traitin | Religious tradition |
| F | 5.127 | | | 2.335 | | | 2.445 | | | 2.739 | | | | 6.655 | | | | 3.772 | | | |
| Sig. | 0.031 | | | 0.291 | | | 0.204 | | | 0.162 | | | | 0.001 | | | | 0.034 | | | |

Table 2 described the one-way ANOVA test for the difference between gender, grades, ethnicity, academic results, living places, family traditions, and the HSs' engaged living. The terms of grade ($F = 2.335$, $p = .291$), academic results ($F = 2.739$, $p = .162$), ethnicity ($F = 2.445$, $p = .204$) have no significant difference ($p > .05$) with HSs' engaged living. The terms of gender ($F = 5.127$, $p = .031$), living place ($F = 6.655$, $p = .001$), and family tradition ($F = 3.772$, $p = .034$) have the significant difference ($p < .05$) with HSs' engaged living.

Interview findings of the engaged living of Vietnamese high school students

The findings from the interview data are presented into themes corresponding to the leading participant and the auxiliary participants.

High school students: They were grateful and appreciative of life, but their living attitude was quite forced

HSs thought positively. They did not mind the difficulties and challenges that happened in their life. They are ready to take on these challenges. However, when we discovered some problems. HS1 (grade 10) said:

'I always hope tomorrow will be a good day for me. My family belongs to near-poor households. I am not discouraged because I know that I will help my mother get rid of suffering one day.'

It can be seen that behind the thoughts and desires of a good day for students are events that help them grow. No matter how difficult or challenging it is, it will not discourage and deter students from expecting the joys that appear in their lives. HS2 (grade 11) và HS3 (grade 12) reported:

'Anyone who does not expect to have much fun every day. I want to have at least one joy with me every day. It is what drives me to go to school every day.'

'It is impossible to live without joy. To be happy, we must first make our lives happy. Joy will make it easier for sadness to drift away, help anger calm down more quickly, and help the fear no longer be too great.'

These findings reflected that Vietnamese HS always hope and expect good things to come rather than bad things. But can you avoid these bad things when you always try to deny them in your thoughts? Interview data from some students give us other aspects of the problem. HS4 (grade 12), HS5 (grade 11) and HS6 (grade 12) shared that:

'I always want better things for the worse. But my reality has not changed. My father still abused my mother and me. I don't know how long I can maintain this optimism. I am reaching my sufferance.'

'I often hear that 1 % is intelligence to succeed, and 99 % is due to our self-study and self-creation. However, even though I worked hard and studied a lot, I still could not improve. For some reason, all my efforts seem to go unanswered.' (HS5)

'My parents have often corrected me that I must be polite when I talk to adults... But, sometimes I see my parents angry and arguing loudly with neighbors.' (HS6)

In general, it is suitable for students to think about optimistic things, but not performing actions that are consistent with thinking will not create good values. This finding reflects the reality of Vietnamese students' living values today.

High school teachers, school counselors, and school administrators understood the life value, but their expression was not appropriate.

When HSs talked about optimism, they often talked about thoughts. Some students took action to make that thought a reality, but some stopped coming up with ideas. To shape and clarify this view, we interviewed the auxiliary participants. T1 shared:

'My students are optimistic in life. There is hardly any event that can shake their optimism. I thought this was good at first, but later I hesitated. I found that my class members were innocent, carefree, and optimistic in all situations because they always had support and were protected by their parents. They have almost no problem, even if their academic results are bad. This is dependence and lack of learning motivation. If their family is in trouble, are they sure they will still confidently express this optimism?'

In a different perspective, when evaluating the current gratitude of HSs, T2 said:

"Gratitude is a topic students have learned and experienced from primary school. More or less, it has an impact on their mental health. They show this gratitude to the little things or the relationships that result from that long ritual educational process. However, some students are misaligned and engage in contrary behaviors, such as hatred, jealousy, selfishness contrary to the national educational values, most specifically the phenomenon of insulting teachers on social networks today."

SA1 commented: "I always organize a seminar on gratitude at least once a year for students. My students express the values of gratitude and propagate this positivity to friends and family. The problem I am concerned about is their performance. Many of them know about it, but they do not know how to show it is right for them. Because it takes real emotions from the heart to show up and touch the heart. I would love to give students intensive lessons to guide them to express their gratitude in line with their personality."

With these findings, the proposal of training and training measures on expressing/expressing gratitude skills is appropriate and practical for HSs. T3 reported that:

"My students are not very interested in learning. They all have parents' lobby. Some of them plan to work after graduation, so they are not interested in studying. They think very openly about studying, exams, like passing, it is okay to drop. I am worried about their future."

T4 agreed with T3, 'Does the indulgence of parents, the indulgence of the students themselves today, inadvertently create a lack of motivation for learning, enthusiasm, dynamism, striving to overcome challenges in life? My students are very active in school. However, when doing it halfway, they are conflicted, at odds, and then quit working. They are active initially, but the more they step, the more they falter.'

SC1 shared the experience: 'Students are not motivated to study. They do not enjoy learning and do not actively study because they are not instructed to learn effectively and how to motivate learning. They lack the skills to train and apply to the reality of their studies and life. The school organizes many educational programs and activities to propagate the spirit of optimism, gratitude and learning motivation... Just at the level of understanding, not applying and not giving skills.'

SC2 analyzed the situation: 'Students do not know how to express life values following their perception. They lack skills! They are not guided to practice life values through educational activities properly. They always think positively and optimistically in all aspects of life. We need to rely on this foundation to provide them with knowledge and skills to help them deploy their ideas and realize their positive things. Only in this way can they overcome difficulties and challenges, as well as minimize denial and patch up the past with unreal positive thoughts.'

SC3 agreed that: 'The lessons of life values in schools today are formal and have almost no content. It is impossible to create a positive and engaged lifestyle effect in students. They know it. It is just that they are not interested in giving feedback on the school's value education method.'

We see only the floating – the right perception of life values and the deviant behavior as it is now. If change is to be made, it is necessary to include a skills training program to correct the bottom part of the problem. The sink [right view of life value and right behavior] is left unresolved by no one because I cannot produce that effect myself.'

5. Discussion

The current study used a mixed-method (questionnaire and interview) to explore the engaged living component in SEH of Vietnamese HS in areas where the SEL model has been applied to educational activities. The skill-based approach in the original SEH term is to equip students with knowledge and skills to perceive resilience in their lives, copes with and overcome mental health disorders, study/work effectively, and contribute to society; we explored the expressions of these aspects in Vietnamese HSs with an emphasis on the engaged living component. Based on the questionnaire results, we conducted random interviews with the participants to shape the features of HS's engaged living. Participants related to SEH and students' mental health were interviewed to clarify the findings. Accordingly, we discovered that Vietnamese HS's level of engaged living is high, but there are many potential risks of misrepresenting life values and negatively affecting their SEH.

The questionnaire results reflected that Vietnamese HS showed gratitude, enthusiasm, and positivity in life. They are engaged and think positively about relationships and learning. This is an essential indicator for SEH development to reach social-emotional well-being (Watson, Emery, 2012). However, the group that showed an optimistic component was average. This result made us concerned about the enthusiasm for learning, social relationships, or HSs' mental health. This proved that there were still students who did not feel interested in learning, self-developing, or connecting with others and therefore were not optimistic. Are the results of zest and gratitude components for analysis really at a high level? Or is that just the floating of the problem? According to the theory of learning motivation of Schunk and Zimmerman (2012), the spirit of curiosity, positivity, trust, and gratitude in life will create motivation to motivate individuals to learn and develop. Thus, if the student's enthusiasm for learning and life is average, it proves that the two indicators of zest and gratitude only reflect the problem's surface. This is explained because HSs initially knew about life values and living closely but did not understand deeply and could not apply what they knew to life, or it might be self-study so they used it in the wrong way. In Vietnam, the cause of misunderstanding of life values or LVE stemmed from teachers teaching subjectively or theoretically (Huynh, 2017; Nguyen, 2018). This caused the students not to know how to practice these life values. Therefore, the engaged living in SEH can hardly be adequately formed and consolidated. Our results reinforce the current situation of LVE for Vietnamese HSs about mental health. Existing LVE programs are ineffective and do not produce a preventive effect on mental health disorders or a positive attitude for students.

The findings of the interview results shaped the questionnaire results. They provided us a more profound knowledge about the current obstruction of the Vietnamese HSs' engaged living, which lay in how they express the practical attachment, connection, and interaction between an individual and his/her life through the three indicators of gratitude, zest, and optimistic. Vietnamese HSs knew and understood the meaning of gratitude, zest, and optimistic in learning and life, but they did not yet know how to express and apply these values to life in the right ways. They met some obstacles in practice and application the life values. Findings in HSs' interviews showed us the compulsive life values practicing. The findings in the auxiliary participants' interviews clearly defined the cause of this compulsive practice in students, which was the current inappropriate and unsuitable LVE method in schools. LVE is the primary method to help form and develop life values for students (Ministry of Education and Training, 2018), strengthening their engaged living. If the implementation of the educational content of LVE is not suitable with the students' psychological characteristics of the social context, it will negatively affect students' engaged living in the current context (Kaur, 2015; Oberle et al., 2010). Huang (2008) confirmed that LVE must associate with the diversity of cultures, social contexts, and social phenomena to provide learners with the most appropriate life values and ensure the principle of conformity in learning and teaching. Therefore, to enhance the engaged living and the student's SEH, it is essential to propose measures related to skill-based training competency-based implementing and must be followed the principle of conformity in learning and teaching.

Analyzing the ANOVA's results, there is a statistically significant difference between the HSs' engaged living and the gender, living place, and family tradition factors. These results allow us to discuss and suggest appropriate ways to impact students' engaged living. Firstly, focus on living experiences and practicing life values of different genders to broaden their views on society. Secondly, the programs or content of LVE must be suitable to the geographical location and geographical characteristics of the learners' living place so that they have the best experience following the characteristics of their culture and society. Thirdly, pay attention to the cooperation with families to improve engaged living for students, especially in family traditions, to increase students' gratitude, zest, and optimism.

In this study, we also recognized some limitations. Firstly, the findings did not cover all four SEH components of Vietnamese students. Therefore, we could only analyze the engaged living aspect of students. The impact of the remaining components has not been emphasized. Secondly, our data processing techniques were only descriptive. We have not deeply analyzed the factors affecting students' engaged living. Thirdly, we approached the content of engaged living in SEH, which is similar to LVE in Vietnam, as a perspective of moral and lifestyle education, and this may be controversial with some other countries when they are defined at LVE differently.

6. Conclusion

This study focused on exploring the current situation of Vietnamese HSs' engaged living approaching from the SEH term of Furlong et al. (2020) as a foundation to promote research on LVE. The results showed that students had a high level of engaged living. However, this component currently faces obstacles in practice. This is why HSs have a good perception of life values and engaged living through three indicators of gratitude, zest, and optimistic; but could not practice due to the gap between the knowledge taught and the practical application. The educational methodology of LVE in Vietnamese schools is currently not suitable with the psychological characteristics of students' age and social context. This fact leads to LVE in Vietnam not following the principle of conformity in teaching and learning. The results also reflected that the basis for proposing measures to improve engaged living and building a prevention program must be based on gender, living place, and family tradition. In addition, measures must instruct students how to practice life values, focusing on how to show a practical attachment, connection, and interaction between individuals and their lives to create positive life values as the foundation for motivating individuals to happiness. Only when Vietnamese HSs are guaranteed engaged living through school educational activities can they develop. These findings are the basis for designing LVE programs and data to be inherited in empirical SEH studies in Vietnam.

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The Intellectually Developed Model for Community Participatory Management of Child Care Centers during the COVID-19 Outbreak

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Abstract

The appropriate model was investigated for participatory management for the intellectual development of children in kindergarten during the COVID-19 outbreak in 1,590 municipal and subdistrict administration areas in Northeastern Thailand. The study was based on community participation, with the key elements being: 1) the child's family; 2) the kindergarten; 3) organizations/agencies involved; and 4) childcare volunteers and small supportive groups providing childcare support. The driving mechanism to create the processes involved the development of a management model that included: 1) studying the situation; 2) observing the community; 3) presentation of the data; 4) planning to solve the problem; 5) designating responsibility; 6) monitoring work and evaluation; and 7) developing conclusions and evaluating performance. The elements of the model and driving mechanism in terms of measures/strategies and activities resulting from the model were similar except for the frequency, duration, and form of participatory development. The intellectual development model should further enhance basic childcare in Thailand that is focused on temples and schools. The model proved effective and appropriate in providing childcare support and management for protection against COVID-19 through participation.

Keywords: intellectual, children, protection, participation, kindergarten, COVID-19.

1. Introduction

There is a current outbreak of the coronavirus disease 2019 (COVID-19) that has spread globally. With the rapid increase in the overall number of infections, there has been a concomitant increase in the number of children with COVID-19 (UNAIDS, 2020; Cui et al., 2021). The impact of COVID-19 on children can be viewed in a number of different ways, including changes to their

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education while staying home with the family, changes to the way they are supported by health services, as well as changes to their emotional health and wellbeing (Umakanthan et al., 2020; Erika Molteni et al., 2020). Management of COVID-19 is mainly by supportive therapy along with mechanical support; nonetheless, the COVID-19 pandemic has upended the lives of children and their families around the world. UNICEF is working with health experts to promote facts over fear, providing trustworthy guidance and answering some of the questions that families might have (Li et al., 2020; Ludvigsson et al., 2020). Children and young people are experiencing the impact of restricted ventilation in severe cases. Preventive strategies form the major role in reducing the public spread of the virus, along with successful disease isolation and community containment. (UNESCO, 2020; UNICEF, 2014) This crisis has exposed the many inadequacies and inequities in our education systems—from access to the broadband and computers needed for online education to the supportive environment needed to focus on learning and the misalignment between resources and needs (OECD, 2020). Community participation is essential in the collective response to COVID-19, from compliance with lockdown to the steps that need to be taken as countries ease restrictions, to community support through volunteering. Communities clearly want to help (UNICEF, 2021; Public Health England, 2020).

In modern Thai society, parents choose to raise children themselves or search for a professional to act on their behalf. Those with experience in childcare, such as the child's grandparents, can help lighten the load and provide much needed childcare support for parents. Thai society has changed from an agricultural society to an industrial one. Members of the family of working age tend to spend more time away from home in the pursuit of income to provide for their spouse and maintain their lifestyle (WHO, 2015; UNITED, 2016). This major change in childcare means that children may be less cared for and not always receive close attention. The alternatives of finding professional childcare support other than grandparents include child day care centers and centers located within their community (The World Bank Group, 2018; WHO, 2018).

These local centers which may be operated under private or government administration are increasingly in demand and it is important that they all cover childcare activities in 6 areas: 1) promote good health; 2) promote child development; 3) provide safe food; 4) have a clean and safe environment; 5) be run by qualified childcare staff; and 6) involve participation by parents, community organizations, local government and related agencies (Charuek, Yutthasat, 2005). Participation is the foundation for all stages of development, especially in communities where participation will help community members to identify problems and offer appropriate guidance and solutions. Participation will also bring about joint operational decisions and evaluation and mutual benefits and successes (Fischer et al., 2015). Consequently, community participation is an important process that will help develop good management in child development centers. The success of childcare centers depends on the participation of all parties involved, particularly the participation of the parents that are directly involved. However, the current joint activities of many childcare centers in Thailand continue to experience problems with participation (Phitthaya, 2007; Phakdeekul et al., 2011; Nueakhumung et al., 2020). Many parents will attend activities, but without much dedicated interest in cooperating and creating efficient solutions. Many parents simply lack the necessary skills (Barry, Nigel, 2010). The important aspects of achieving participation are motivation, good staff, volunteer management, and good communication between childcare staff and the community (Suraiya et al., 2003; Phakdeekul, Kedthongma, 2019). Therefore, this article aimed to explore community participatory management for the intellectual development of children in kindergarten during the COVID-19 outbreak and factors related to the level of Disease Free Kindergarten (DFK) in Northeastern Thailand.

2. Materials and methods

This research involved participation action research that studied kindergartens that had a model of management already in place and centers under municipal and sub-district administration in Northeastern Thailand. In total, there are 1,590 subdistricts ($n = 1,590$) in districts in Northeastern provinces. The research was conducted from February 2020 to October 2021. The collected quality data was gathered by document analysis and in-depth interviews with 54 key informants, such as parents, monks involved with a local kindergarten, managers of local administration, public health officials, community leaders, and children within the community. The research tools were a questionnaire created by the researcher, combined with joint

development tools from the focus group. Data analysis was performed utilizing descriptive statistics (frequency, percentage and standard deviation), inferential statistical comparisons with variables related to child intellectual development, such as the chi-square statistic and class differences were compared using the odds ratio and the 95 % confidence interval of the odds ratio, as well as content analysis for the explained qualitative data.

Ethics

This study was conducted in accordance with the Declaration of Helsinki. The study protocol was approved by the Sakon Nakhon Provincial Public Health Office (SKN REC 2019-021).

3. Results

3.1 Differences in Community Participatory Management for Intellectual Development of Children in Kindergarten

All the centers chosen for the study had a range of physical, biological, religious, social, cultural, traditional, economic, and environmental characteristics of rural Thai municipalities which could be considered as semi-rural towns. The first rural childcare center was operated by locals at the temple for children from villages, with a ratio of childcare staff to children of 1:19.

The second rural center was a kindergarten at the subdistrict administrative organization (SAO) level that provides services for children from villages in the area, with a ratio of childcare staff to children of 1:20.

The remaining two centers were operated by: 1) the municipal administration (MA) for a kindergarten that received children from villages, with a ratio of childcare staff to children of 1:12; and 2) a childcare center in a town municipality (TM), which only received children from within the community and had a ratio of 1:13. All these centers faced the same problem of the lack of community participation, a lack of quality service, and the managers of the local administrations rarely provided the opportunity for the community to participate in management and development.

The childcare centers at SAO and MA are located in the same geographic context and share similarities in their original management models. The study and development of an improved model implementing community participation included the factors of: 1) the parent; 2) childcare staff; 3) local municipality management and board members of the local municipality; and 4) administrators and staff at the center. The working group consisted of 30–36 individuals working jointly to create a systematic model which was finalized into processes: 1) to inform the purpose of developing the model; 2) to identify key individuals to carry out the tasks; 3) to divide the work into groups; 4) to specify the processes and proceedings of the team; and 5) to report the end results.

3.2 Organizations and Groups that Played Important Roles in the Development of Children and Childcare Centers According to the Model

Temple: Childcare centers that are operated by the municipality are located in temples and monastery within the community. The centers are ministered by the abbot who has the support of the community and he performs as the committee chairman. Within the center, there are also Buddhist priests and novices engaged in supportive activities who provide services such as being narrators for various topics to teach the children. They also help to gather funds and motivate others to donate to the center. This is in contrast to centers located at the subdistrict level, where the centers are not located in temples and there is minimal participation on behalf of the clergy in activities to support childcare centers.

Municipal, Subdistrict administration and committee members: Kindergartens that are operated by the municipal or subdistrict administration share similarities as activities are formal and informal regarding the involvement of committee members and staff at events. However, formal invitation letters had to be provided to invite the chairman of the committee to get participation. Kindergartens in municipal areas receive very little budgetary support, while the centers at the subdistrict level did not receive any budget at all.

Community Health Centers: The management of kindergartens at both the municipal and subdistrict levels in the past were similar because both centers are governed by the same community health center. However, the frequency and number of staff at municipality centers is much more than those at subdistrict locations because the municipal childcare centers are located near many public schools. The municipal kindergarten committee and organizational structure

includes health teachers and teachers who voluntarily participate in the center's activities and operation. There are at least 4 teachers involved in municipal centers, while subdistrict centers only have 1 teacher. Nonetheless, the subdistrict administration centers did have an advantage as coordination was much easier and less formal. Both centers have volunteers willing to participate in the operation and activities. However, municipal childcare centers have more volunteers than subdistrict centers.

3.3 Activities

Child intellectual development promoted through activities such as food and nutrition for children and environmental development were similar to each other; however, the centers operated by the municipality had more goals and sub-activities. The overall techniques used by all centers were similar in their utilization of training, demonstration, practice sessions, credibility enhancement, creating incentives, and motivation to participate in the activities. Differences in these techniques were noticeable in centers operated by the municipality, where they use the technique of acknowledging and crediting the success to the managers and executives of the municipality. This technique is highly political and is considered political support but is accepted by the overall community. This technique has resulted in good cooperation between groups, adequate funding for organizing meetings, but can involve training that is sometimes in contrast with infrastructure budget and is not always reliable. This is different for kindergartens operated by local administrations. When denied funding, subdistrict centers will go directly to their Member of the House of Representatives to seek funds. All centers perform their duties well when it comes to achieving the objectives set and the efficient use of resources was very appropriate.

Participation according to the model of community participatory management for intellectual development of children in kindergarten during the COVID-19 outbreak was obtained through hard work. The success required many elements which stimulated or propelled individuals to participate in the development. In some cases, this inspiration came from groups or from a technical process.

Many factors came from individuals such as: repeated stories about "Doctors confirming the cause of a 5-year-old child being diagnosed with kidney disease came from consuming too many soft drinks and MaMa noodles since 2 years old". These types of stories are techniques referred to as "urban legends" or rumors which were utilized by the childcare development team to reiterate the dangers of harmful junk food. The rumors influenced parents and guardians to be aware of the problems and to promote the benefits of consuming healthy food substances for children.

The competitive situation of each organization currently focused on developing the potential to be accepted by society. This has affected the management of each organization to be aware and to compete actively. The development created inspiration for communities within the municipality to promote their childcare centers to receive awards and acknowledgement. This competitive nature was evident in centers that knew they were still in the development phase but chose to compete anyway with the powerful sense of the development and unity that it brought to their community members. The feeling of participation, to continue with further development until they could achieve their goal and receive awards for their kindergarten mobilized a partnership network from the subdistrict, district, and provincial levels to unite and develop the municipality.

The prestige of Buddhist monks is an important force of faith that can strongly motivate parents and community members to participate in activities toward the development of the municipality's kindergarten at a temple. There has always been a relationship between the temples and kindergartens before the municipality took over management and that bond still exist within the community. When mechanisms according to the new model were implemented, it encouraged the relationship and faith, which increased the energy of participation.

Acknowledging and honoring local administrative management, especially for kindergartens at the local municipality level is considered within the control and interest of the local community and municipality. Doing so benefits both sides, where the manager receives a reward through acknowledgement and gratitude which will help their political popularity, while the community receives budgetary support towards the development of their children.

Groups involved in the development of the model proposed that there should be mainstay or key individuals to lead the operation. Selecting key leaders should be by selecting individuals who are respected and have the community's faith and trust. These key leaders were later recognized as childcare volunteers. This process was an important technique that the groups devised and the

volunteers performed their duties with great efficiency. Having childcare volunteers meant there was someone the community respects and trusts to carry out activities and events to benefit the children. The creations of childcare volunteers help promote automatic community participation.

The concept of participation was very useful in providing the opportunity for community members to be involved in the thinking process. Many individuals felt that the development was a good challenge for their talents. Many were motivated by the activities and events to participate. There was also the individual desire to be recognized. After they started to gather data and information regarding children and childcare, they were soon confronted with many negative findings. This negativity created an awareness and genuine concern for care of the health of the children and inspired them to look for solutions to the problems. There were many activities, ideas, and methods of participation, with many people involved and many groups or organizations in the development. All these elements created an enormous exchange of knowledge, created an appropriate model for the community, and was accepted by all within the community. The process was self-sufficient in creating a strong community that didn't have to wait for outside help to solve their own problems.

However, this study included other important factors of development associated with the children's family members, childcare staff, and directly related groups and networks, such as temples, schools, local administration, local community health centers, childcare volunteers, and local individuals who attended the activities and events. These elements that the development model was based on further enhanced the basics of 'Bawon' which was based primarily on temples and schools and matches the current status and is appropriate to address the many changes in modern Thai society.

3.4 Model Impact

This research focused on presenting the model results by considering the standards for a disease-free children center and the development criteria of children as determined by the Ministry of Public Health, Thailand. They consisted of the growth of oral health and food management, development and learning according to the age of children, internal and external environment management for kindergartens, prevention and control of communicable diseases, and participation of parents of local communities and related agencies. The results showed that 72 % of the kindergartens passed the standard (scores ≥ 80 %). In addition, the factors related to DFK for protection against COVID-19 were the children's family, childcare staff and directly related groups and networks such as temples, schools, local administrations, local community health centers, childcare volunteers and local individuals were significant ($p < 0.05$), as shown in [Table 1](#).

Table 1. Factors Relating to Level of Disease Free Kindergarten (DFK) for Protection against COVID-19 (n = 1590)

| Factor | χ^2 | OR | 95% CI | P-value |
|--|----------|-------|---------------|----------|
| Children's family | 17.85 | 3.643 | 1.520 - 18.06 | 0.0001** |
| Childcare staff | 5.008 | 1.627 | 1.062-2.495 | 0.02* |
| Directly related groups and networks | 2.424 | 1.643 | 1.087-3.079 | 0.04* |
| Local administrations | 3.697 | 1.519 | 1.099-2.330 | 0.05* |
| Local community health centers | 15.697 | 2.119 | 1.099-4.530 | 0.003* |
| Childcare volunteers and local individuals | 32.162 | 3.697 | 1.099-7.330 | 0.0001** |

*($p < 0.05$), **($p < 0.0001$)

4. Discussion

The reasons for differences is speculated to stem from the fact that municipalities have a larger governing area and a larger budget which was reported by in the study of the Bureau of Health Policy and Planning ([Ministry of Public Health, 2021](#)). That study showed clearly participation in all sectors which created role relationships that resulted in equal opportunity and equality. There was independence and not domination, with the process being continuous and

related to its parts, with participation from all processes. This result was not consistent regarding context with other studies (Maria et al., 2004; Lee et al., 2014).

The intellectual development model of community participatory management for childcare centers is a model that has been developed to suit the context of the local community. Implementing the model created participation between networks of all the relevant sectors which encompassed temples and schools. This model is in compliance with his Rama IX the Great's principle announced in 1981, entitled '*Bawon*' meaning development, which originates from the stimulus to create development by focusing on the intricate social interactions between temples, schools, and households to cherish each other like in past Thai society. '*Bawon*' is needed, so that the country will grow and prosper on foundations which will create a strong and stable country. (1st Army Area Civil Affairs Division, 2004; Brenner M. et al., 2016) However, the current study included other important factors of development, namely the children's family, childcare staff and directly related groups and networks, such as temples, schools, local administrations, local community health centers, childcare volunteers, and local individuals who attended the activities and events. These elements that the development model was based on, further enhance the basics of '*Bawon*' which are based primarily on temples and schools and also matches the current status and is appropriate to address the many changes in modern Thai society (Phakdeekul, Kedthongma, 2021).

5. Conclusion

The key elements of the model were: 1) the children's family; 2) the kindergarten; 3) the organizations/agencies involved; 4) childcare volunteers and small supportive groups providing childcare support; 5) having a plan to solve problems; 5) designating responsibility; 6) monitoring work and evaluation; and 7) presenting conclusions and evaluation of performance. These elements are the drive mechanism in terms of measures/strategies and activities resulting from the model and were consistent among the sites studied. However, there were differences in the frequency, duration, and form of the participatory development. Centers operated by the municipality had more people participating in the activities, individuals participated more frequently and were involved for longer durations, and most of the development process and activities were more professional. Centers operated by the subdistrict/local administration were simple and easy going according to a rural lifestyle. In addition, these factors will affect the success of the management for intellectual development of children in kindergartens and for disease surveillance. The success is partly due to the unity of the people in the community and awareness of information through all channels, so that people can help each other in their combined surveillance of COVID 19.

6. Suggestions and Recommendations

The model of development that was created from this research was limited to the municipality and subdistrict levels and therefore should be tested at other levels, such as provincial and regional. Modifications and improvements due to the limitations of the geographical resources, such as key individuals, should be considered for what is appropriate in a specific area. Future developments and improvements should conform to system management and the childcare processes of kindergarten standards. Statistical analysis should be integrated into the model to compare the results before, between, and after testing the factors that are related. To complete the process, a handbook should be created compiling all the innovations that were identified in this study for use in supporting childcare centers throughout Thailand.

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Teaching And Exploring Mathematics through the Analysis of Student's Errors in Solving Mathematical Problems

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Abstract

For decades already, the pedagogy of mathematics education has relied primarily on the role of the teacher, who demonstrates well-functioning model examples for students to motivate and encourage their tasks. This relatively routine and stereotypical procedure: interpretation of theory - examples – independent solution of assigned tasks, we decided to research in-depth within our pedagogical practice by incorporating error as a teacher's educational strategy into mathematics teaching. We believe that explaining and justifying correct and incorrect solutions to problems is more beneficial for achieving better results in mathematics education than justifying the right solutions. Such a teaching process can lead to a more informal and better understanding of mathematical concepts. In our study, we try to reveal the potential of students' incorrect solutions in conjunction with the analysis and justification of incorrect steps when reaching the final result.

We also want to point out the difference in mathematical success when error analysis is included in teaching, compared to the traditional teaching approach only in presenting the right solutions. We tested the hypothesis statistically: If we incorporate the justification and explanation of incorrect solutions of mathematical problems into the teaching process, it is possible to achieve better results in education compared to the traditional instructional teaching process only through correct examples.

Keywords: mathematical education, potential of the errors, common errors in mathematics, pedagogical experiment, t-test.

1. Introduction

The error plays an important, sometimes even essential role in the student's life and each person. We also understand it as a specific cultural and social value. Therefore, it is necessary to

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think about, describe, and identify the place and role of error in learning theory. The emotional perception of error in the Christian tradition opposes the rational perception of error in ancient culture – here, the error is perceived as a means for a more correct, consistent and more profound knowledge of reality.

In our school, the mistake or error is often perceived as an undesirable phenomenon, as something to be avoided, as something that both the teacher and the student are afraid of. However, the error understood in this way de-motivates (deactivates). Every failure or error in the teaching process can be productive for a person; it depends on the attitude taken in this particular situation. If mathematics teaching is understood only as of the transfer of knowledge in the form of an explanation or lecture, the teacher must avoid any mistake - not sharing incorrect information (Kuřina, 2017). Any student's lack or error must be punished in such a case because he "failed to master the subject".

If we strive to teach a creative, interactive, constructive process, errors are like milestones along the way. They point in the right direction when looking for solutions and provide us with the option to find the right results. Teaching is thus realized between two poles: Error either cursed – error either praised (Kuřina, 2017). In the introduction of our paper, we discuss how different teaching theories in the past understood errors in the learning process. Above all, we were interested in accepting the error as a positive, as a "potential for the student" in the future. We analyze different approaches of the teacher to the errors done by students. We ask ourselves questions: how to change the perception of error into a source of better understanding and education, how to remove anxiety and respect from mathematics (the source of this anxiety often lies in the approach to errors by the student's teacher). In analyzing errors, we see the benefit of the student learning to argue meaningfully, construct viable arguments, and comment on the arguments of others. Students trying to justify the logical rationale will learn more than those who do not.

Literature review

In the professional literature, we find several studies on the use of error analysis in mathematics (Adamas, 2014; McLaren 2015). The study carried out for this article differs from previous studies in mathematical content, the number of teachers and students involved in the study, and online teaching.

Loibl and Rummel (Loibl, Rummel, 2014) found that secondary school students became more aware of their knowledge gaps when analyzing exercises with errors. Demonstrative comparisons of wrong-done tasks with correctly calculated tasks have filled learning gaps. Gadgil et al. (2012) conducted a study in which students who compared incorrectly solved tasks with correctly solved tasks gained a more remarkable ability to correct their errors than students who only explained the correct procedures and problem-solving. This conclusion was subsequently supported by other researchers (Durkin, Rittle-Johnson, 2012; Kawasaki, 2010; Stark et al., 2011). Each of these researchers found students at all levels of mathematics education, from elementary school to secondary school students, who learned more than students who only faced the correct solutions of the task when analyzing them and at the same time incorrect solutions to the task. This was particularly the case when the tasks with errors done were similar to the errors they made (Kawasaki, 2010; Stark et al., 2011) added that it is essential for students to be given sufficient explanation in well-designed examples before and in addition to erroneous tasks with errors. Hejný (Hejný et al., 2004) perceives error as an element of the teacher's educational strategy and emphasizes the requirement to suppress the student's unwanted fear of error, requiring the teacher not to perceive error as an undesirable phenomenon. The error detection and process to solve it is divided into six phases:

1. identification (error presence noted),
2. error localization,
3. factual analysis of the error (why the given idea is incorrect, or what is this wrong idea related to and with which other mathematical concepts it is connected),
4. elimination of the error
5. process analysis of the error (how this error occurred),
6. forming the conclusion.

Common errors in Mathematics

This section describes the errors that we have frequently seen in undergraduate mathematics, the likely errors, and their remedies. At the beginning of each semester, we notify students of these "chronically recurring" errors. Unfortunately, we must say that the situation is not improving; on the contrary, it is getting worse. In addition, the last two years, affected by the corona crisis have worsened the situation as well.

In carrying out our experiment, we, therefore, began by identifying the most frequently recurring mathematical errors of secondary school graduates, dividing them into two groups: the errors of gymnasium secondary school students and the errors of vocational secondary school students. We used as the source the test results that students got before the start of the first semester and the final reports on the results of the Matura examination in mathematics in 2018. When completing mathematical errors, we were also interested in other countries' situations and processed information from Eric Schechter's website (more than 500 teachers from different countries published their observations on errors in the subject of mathematics in school), Paul Cox's website, as well as publications by Bradis, Minkovsky and E.A. Maxwell. We divided errors made by students into several categories.

Communication errors

These negative aspects can be relatively quickly eliminated by the teacher with sufficient supervision and thus improve the quality of work. We register them in the teacher-student relationship (or vice versa, student-teacher). The teacher often perceives the student as the enemy, is not open to students' questions, and is more focused on mathematics than on the student (whether and how the student understands the explained subject matter). The hidden negative attitude of the teacher implies the fear of students, their inability to ask questions, engage in fruitful discussion, and be an active member of the teaching process. The teacher is often tempted to communicate more with gifted or active students. Nevertheless, these are exactly the slower ones in need of our help. If we focus on students' facial expressions while teaching them, it is relatively easy to grasp their understanding (or misunderstanding) – from their facial expressions.

Many problems in teaching mathematics are also related to students' poor reading comprehension skills. In Slovakia, we have registered a significant reduction in pupils' and students' level of language culture in recent years (as evidenced by several research within the OECD countries – PISA). Students often do not understand the context or do not read the tasks to the very end, or are distracted and inconsistent when reading them. At the same time, the language of mathematics uses, in addition to the general language, specific terminology, the language of formulas, algebra and requires an understanding of nonverbal expression using diagrams, graphs and figures.

It is also necessary to include in the category of communication errors related to the student's unreadable handwriting (the student understands his written text poorly or the teacher cannot guess the content of the student's work).

Algebra errors

We can conclude that we register each of the errors we mention in this paragraph at all levels of mathematics education. Many of them are caused by the usual lack of attention or poor concentration of students at work. Sometimes it would be enough to count slower, with more focus paid to the task. Many errors could be avoided in this way. In general, we could divide these errors into errors at the primary level and errors caused by a lack of more profound theoretical knowledge. We difference many types of the algebra errors:

- Bad manipulation with algebraic expressions;
- Expression extraction errors;
- Bad/lost/assumed parenthesis;
- Not comprehensible notations,
- The errors caused by improper distribution of expressions,
- The errors caused by division by zero,
- The errors caused by formal and inaccurate knowledge,
- The errors caused by accepting non correct additive assumptions,
- The mistakes in solving quadratic equations,
- The errors caused by unwarranted generalizations – the formula or notation may work properly in one context, but some students try to apply it in the broader context, where it may not work correctly at all. Robin Chapman also calls this type of error "crass formalism".

The errors caused by reating with infinity as with a number

2. Materials and methods

Following the theoretical basis described above, we carried out our pedagogical experiment in three steps:

1. Entry diagnostic test – the aim was to find out what mathematical errors are most often made by students of the first year of technical specialization universities.

2. Experimental teaching – students of the 1st year of the faculty of of the University of Zilina Faculty of Operation and Economics of Transport and Communications within the teaching of the subject Mathematics 2 were exposed to alternative teaching. Error analysis was included in the teaching and homework of the experimental group students. Students had to look for errors in solutions, explain the errors and make appropriate means of correction. The control group students traditionally completed the teaching only on correctly solved tasks.

3. Statistical analysis of the final test results, which the experimental and control group students passed after the completion of the subject Mathematics 2. We verified the difference in students' mathematical results if error analysis was included in teaching and homework compared to the traditional learning approach using only the correct tasks.

Phase 1. Entry diagnostic test – results evaluation

The first stage of the pedagogical experiment evidenced the participation of, in total, 65 students of specialization in the transport of the first year of the of the University of Zilina Faculty of Operation and Economics of Transport and Communications, of which 37 were graduates of vocational secondary schools and 28 graduates of gymnasium secondary schools.

In the first week of the semester, students passed a diagnostic test. This consisted of 20 solved tasks of secondary school mathematics. Their task was to evaluate the correctness (incorrectness) of solving each of the twenty assigned tasks. They received 1 point for each correct statement. The maximum number of possible points was 20. The evaluation of the test reflects which errors are most common among students and which areas need to be deeper and more precisely focused on when teaching university mathematics.

We checked the test results considering two points of view. We focused on the score obtained by individual students, the average number of points in subgroups (a group of grammar secondary school students and a group of students from secondary vocational schools) and the average number of points from the test as a whole (Table 1). The maximum number of points achieved by the student was 18 and the minimum 3 points (Figure 1).

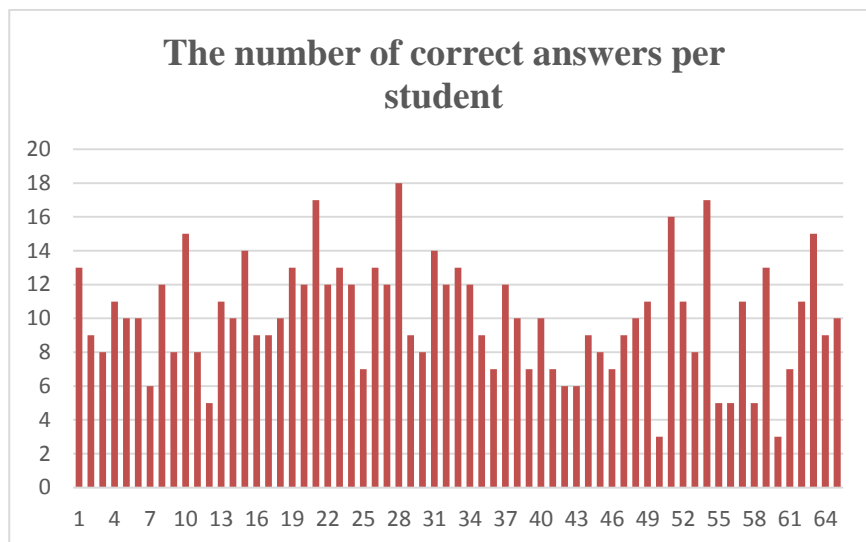


Fig. 1. Results of a diagnostic test for individual students

Table 1. Diagnostic test results by groups

| Groups | Count | Average | Variance |
|--|-------|---------|----------|
| Grammar school students | 37 | 12,03 | 10,83 |
| students of secondary vocational schools | 28 | 8,59 | 11,15 |
| all students together | 65 | 10,31 | 10,99 |

The test results were not surprising (Figures 2, 3). Although the test contained simple tasks, which should be usual for every secondary school graduate, we observe that the average number of points obtained is at level 10 (success rate 50 %). The reasons for this situation are clear – since there is a voluntary secondary school Matura exam from the subject of Mathematics in the Slovak Republic, fewer and fewer students are opting for this "unpopular" subject. Thus, students usually experience only 3 years of mathematics in secondary school, which is insufficient, especially for those who choose universities with technical specialization.

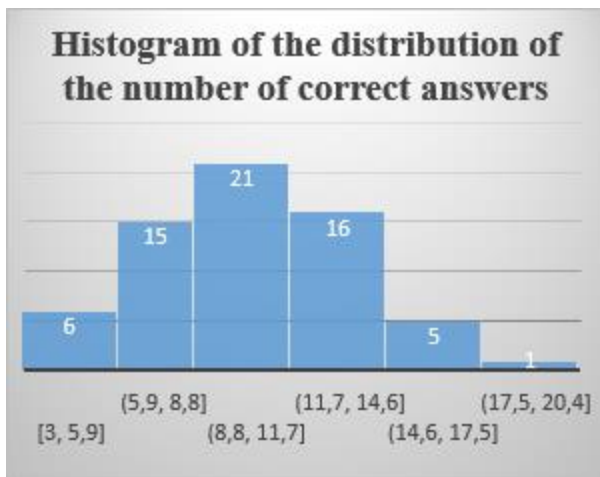


Fig. 2. Histogram of the distribution of the number of correct answers

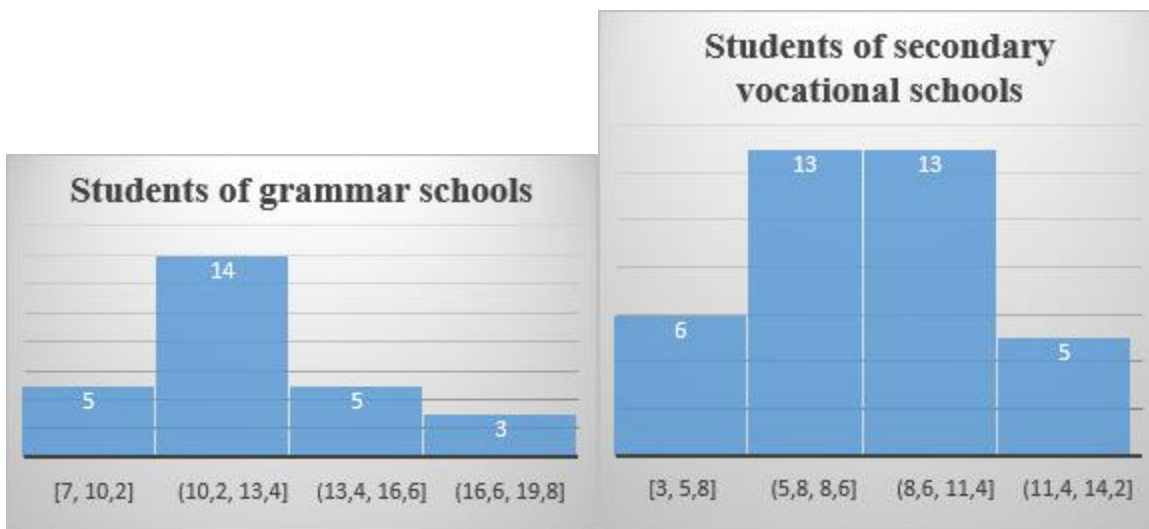


Fig. 3. Histogram of the distribution of the number of correct answers by groups

Phase 2. Experimental teaching

The information obtained from the test mentioned above was then used in the second phase of the experiment to practice examples in seminars and assign homework tasks. As part of the pedagogical experiment, we verified the effectiveness of a new way of teaching selected thematic units of the subject Mathematics 2. As mentioned above, 65 students of the first year of the University of Zilina.

Faculty of Operation and Economics of Transport and Communications participated in our experiment. The experimental group consisted of 32 students from the Air Transport Department. The teaching here was carried out experimentally. In the other groups, teaching was in a regular mode. From these groups, a control group consisting of 33 students was set up at random. The same teacher taught all groups involved in the experiment. The teaching included the analysis of incorrect solutions of assigned tasks in lectures, seminars, and homework in the experimental group. Students in the experimental group were allowed to detect errors, explain and justify errors, and discuss the correct ways to solve the assigned tasks.

Phase 3. Statistical analysis of the entrance test results

At the end of the semester, both groups were given the identical post-test from the syllabus from the subject Mathematics 2. The maximum number of points from the test was 100.

Table 2. Post-test results

| | <i>n</i> | % | \bar{x} | s_x^2 |
|--------------------|----------|---------|-----------|---------|
| Experimental group | 32 | 73,12 % | 73,12 | 216,9 |
| Control group | 33 | 65,78 % | 65,78 | 162,9 |

The purpose of our study was to find out whether students of the experimental group can achieve better results from the subject Mathematics 2 if they learn using incorrectly solved assigned tasks and error analysis compared to the traditional instructional approach only with correctly solved tasks.

The following questions were answered in this study:

What was the difference in mathematical achievement when error analysis was included in students' lessons and assignments versus a traditional learning approach through correct examples only?

What kind of benefits or disadvantages did the students and teacher observe when error analysis was included in students' lessons and assignments versus a traditional learning approach through correct examples only?

Based on the formulation of the pedagogical experiment's aim, the following hypothesis was set:

H_1 : The students educated with the error analysis will obtain at least an equal standard of knowledge at the end of the academic year compared to students educated without error analysis being used.

Applied tool

We analyzed the final test scores for significant differences in mean values using a two-sample parametric t-test. The observed features are X, Y, where X is the level of knowledge of students taught experimentally and Y is the level of knowledge students regularly taught. Due to the way both samples are selected, the X, Y characters are independent.

Preliminary analyses were carried out to evaluate assumptions for the t-test. Those assumptions include (a) the independence, (b) normality tested using the Shapiro-Wilk test, and (c) homogeneity of variance tested using the F test.

Methodology

To verify the hypothesis H_1 , we selected a significance level $\alpha = 0,05$. The outcome of an experimental method we consider to be a random sample from a normal distribution $N(\mu_1, \sigma_1^2)$. The outcome of a traditional method we consider to be a random sample from a normal distribution $N(\mu_2, \sigma_2^2)$, where $\mu_1, \sigma_1^2, \mu_2, \sigma_2^2$, are unknown parameters. We had two independent files $m = 32, n = 33$.

b) We used the Shapiro-Wilka test. This test allows verifying the matching rate of the empirical probability distribution with the normal distribution. Let (X_1, X_2, \dots, X_m) be a random

selection from a base set with an unknown probability distribution. We will test the null hypothesis H_0 , that the empirical and average probability distributions do not differ statistically and demonstrably from the alternative hypothesis that they differ.

Since $p\text{-value} > \alpha$, we accepted H_0 . It is assumed that the data is usually distributed. In other words, the difference between the data sample and the normal distribution is not big enough to be statistically significant.

For the character set X we get $p = 0,4336$; hence, if we would reject H_0 , the chance of type I error would be too high: 0.4336 (43.36%).

The larger the $p\text{-value}$, the more it supports H_0 . For the character set Y we get $p = 0,1811$; hence, if we would reject H_0 , the chance of type I error would be 0.1811 (18.11 %). The assumption of a normal distribution of both samples is fulfilled.

c) We calculated the sample characteristics and by using F test, we found out that the difference between their variances is not statistically significant.

Table 3. F test results

| F test Two-Sample for Variances | | |
|-----------------------------------|------------|-------------|
| | 66 | 62 |
| Mean | 73,3548387 | 65,90625 |
| | 1 | |
| Variance | 229,636559 | 172,9909274 |
| | 1 | |
| Observations | 31 | 32 |
| Df | 30 | 31 |
| F | 1,32744857 | |
| $P(F \leq f)$ one-tail | 0,21858275 | |
| | 6 | |
| F Critical one-tail | 1,82834475 | |
| | 6 | |

The value of $P(F \leq f)$, which is stated in the row before the last one of [Table 3](#), is the probability of error we make when we reject the tested hypothesis of equality of variances in favor of a one-sided alternative hypothesis. If this probability is less than 0,05 or 0,01, we reject the tested hypothesis at the significance level $\alpha = 0,05$. Since the probability value $P(F \leq f) = 0,21$, we cannot reject the tested hypothesis. The observed differences between the variances σ_1^2, σ_2^2 of samples are not statistically significant. All hypotheses for using the Student $t\text{-test}$ were met.

We tested the difference between the two groups by a two-sample location *Student's t-test* with equal variances. We tested the hypothesis concerning the fact whether the effects of both teaching methods are the same:

$$H_0: \mu_1 = \mu_2 \quad \text{versus} \quad H_0: \mu_1 \neq \mu_2$$

The value of test statistics is $t = 2,11$ and $p = 0,038$ ([Table 4](#)).

When comparing it with the critical values of a $t\text{-test}$, we obtained:

$$t = 2,11 > t_{critical}(63) = 1,99.$$

H_0 hypothesis was rejected. The selective average on the selected significance level differs from the value of the average of the basic file. When using the stated teaching methods, different study results were obtained. If we apply the one-sided hypothesis

$$H_0: \mu_1 = \mu_2 \quad \text{versus} \quad H_0: \mu_1 > \mu_2$$

then H_0 is rejected on the significance level α if $t > t_{2\alpha}(n + m - 2)$. This was confirmed in our case as it is true that

$$2,11 > t_{2\alpha}(n + m - 2) = t_{0,1}(63) = 1,67.$$

The one-sided hypothesis was rejected and the difference between mean values for the stated selective file was considered statistically significant. With the help of statistical methods, it was confirmed that students educated by an innovative teaching method with the error analysis would

obtain a higher standard of knowledge at the end of the academic year compared to students educated without error analysis use.

Table 4. *t*-test results

| <i>t</i> -test: Two-Sample Assuming Equal Variances | Variable 1 | Variable 2 |
|---|------------|-------------|
| Mean | 73,125 | 65,78787879 |
| Variance | 223,919354 | 168,0473485 |
| Observations | 8 | 33 |
| Pooled Variance | 195,539923 | |
| Hypothesized Mean Difference | 0 | |
| Df | 63 | |
| <i>t</i> Stat | 2,11486794 | |
| | 5 | |
| P(T<= <i>t</i>) one-tail | 0,0192016 | |
| | 06 | |
| <i>t</i> Critical one-tail | 1,6694022 | |
| | 22 | |
| P(T<= <i>t</i>) two-tail | 0,0384032 | |
| | 11 | |
| <i>t</i> Critical two-tail | 1,9983405 | |
| | 43 | |

3. Results and discussion

The main result of the described experiment was the confirmation of the hypothesis about the positive impact of an innovative teaching method with the analysis of tasks solved with errors in the teaching of the higher level of mathematics. Students who were systematically aware of the problem areas in solving examples (the most common mistakes) achieved better results in the final tests than students educated only in a traditional way by presenting the correct solutions to tasks.

The sample of students of the experimental group was from the Air Transport Department. Such sample was not random, therefore, experimental data cannot be generalized for the entire student's population.

An essential part of the implemented pedagogical experiment was the final discussion with students about their perception of the benefits (or negatives) through errors. Various open-ended questions were raised in the discussion: (a) what is your view on the use of error analysis in teaching (b) the group discussion on errors was rather constructive (productive) or confusing, (c) describe the pros or cons of using error analysis compared to by not using error analysis in the classroom teaching.

Some teachers with whom we communicated this issue had specific objections about the described teaching style. Above all, they feared the time-consuming nature of such a procedure and the possibility that students would "be confused even more" when using this way of teaching. A similar idea is shared by (Tsovaltzi et al., 2010) in their study. They concluded that exposing students to errors made could lead them later to make these errors themselves.

We were surprised by the feedback from the students that was primarily positive. The students stated that class discussions and analysis of errors in tasks and tests helped them solve their homework correctly. Two of them stated that the analysis of errors significantly helped them be better aware of their own mistakes and they enjoyed this way of teaching very much. Students also noted that error analysis has more pros than cons. In addition to the two students whose responses were unequivocally negative, another 30 students in the experimental group had positive comments on the analysis of errors. The analysis of solutions with errors provided students with the opportunity to become more involved in discussing, "explaining" and correcting the errors of the presented task and their own mistakes, which were activities that increased their interest in

the learning process. The mistake acted as a specific "element of surprise" in teaching; such assignments attracted their attention, motivated them more.

4. Conclusion

The main goal of mathematics education is to support students in transitioning from their intuitive, often erroneous or incomplete knowledge to a deeper understanding of mathematical concepts. We label this informal understanding of the basic principles and interrelationships of the knowledge components as conceptual knowledge (Durkin, Rittle-Johnson, 2012). Conceptual knowledge is reflected, for example, in analytical thinking, in the ability to combine different representations of mathematical concepts, in the ability to apply mathematical knowledge in practice.

The lower tier of knowledge is formed by the procedural skills and abilities that students acquire through instructional, simple learning of standard procedures (Adams et al., 2014; Sleeman et al., 1989). Unlike procedural skills, conceptual knowledge can only be acquired through deep sensory processes. These sensory processes allow students to combine new information with previous knowledge and intuitive ideas.

To progress from procedural skills to deep conceptual understanding, students must be aware of gaps in their knowledge. Our experiment explored the possibilities of error as an element of a teacher's educational strategy. The student's error is precious information for the teacher about the level of understanding of mathematics, but above all it can be a means of finding the right way to explain concepts to students. It is a challenging but undoubtedly beneficial way (Kuřina, 2017). Implementing erroneous solutions allowed students participating in our experiment to solve a specific type of examples directly and analyze the whole context of a mathematical problem. Such practice then potentiates students to construct viable arguments, comment on their thoughts and also on the reflections of others.

Students have learned to justify a logical sequence of steps. The error analysis process has created an opportunity for them to have in-depth and meaningful discussions on alternative solutions. Learning through error analysis was enjoyable for most of the students involved. It is appropriate if the teacher is able and willing to let his students criticize and analyze the thoughts of others and make viable arguments. This is the way to reach real education. We believe that this article has opened a discussion and contributed several findings: (a) for students with significant prior knowledge of mathematics, learning incorrect solutions with errors can have positive effects on their performance and shift towards non-formal and conceptual mathematics education, (b) as we expected, the errors contained in the solutions attract the student's attention and evoke related active learning processes that activate and motivate the student, (c) if the student is unable to find the error and eliminate it, there is a problem of the lower level of the knowledge gap, such a situation needs to be diagnosed and reeducation started, (d) mistakes become a productive element of learning, especially for students who do not have profound knowledge gaps from previous mathematics education.

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Anxiety towards Mathematics in Middle School Students in Tuxtepec, Oaxaca

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Abstract

Anxiety towards mathematics has been a phenomenon that is frequently present in students. In the Mexican context, it has been a severe problem observed since secondary education. According to the results of the Program for International Student Assessment of the Organization for Economic Cooperation and Development (OECD), 56 % of young people who graduate from middle school in Mexico have a low level of proficiency in mathematics. The present study focuses on determining the dimension that best explains anxiety towards mathematics in middle school students, as well as identifying if there is a difference by gender, age and school grade. For this purpose, the scale designed by Muñoz and Mato (2007) was used, which consists of 24 items that are integrated into five dimensions. The participants were 200 students enrolled in grades 2nd and 3rd of a middle school in the city of Tuxtepec, Oaxaca. For data analysis, reliability, internal consistency and normality were verified, which is acceptable ($\alpha > 0.08$). For the hypothesis test, in order to determine if there is a difference by gender, age, and school grade in the five dimensions of the scale used, the ANOVA test is utilized. The findings showed that there is no difference in relation to gender, age and school grade, and that the dimension that best explains anxiety towards mathematics is anxiety before real-life mathematical situations (ATRLMS) followed by anxiety before mathematics evaluation (ATE).

Keywords: Anxiety, mathematics, middle school students.

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1. Introduction

According to the 2018 Program for International Student Assessment (PISA), 56 % of Mexican students obtained a low score in mathematics and only 1 % obtained a performance at the highest levels of proficiency in at least one area (reading, mathematics and science) that this test evaluates, in contrast to the 16 % obtained on average by the other OECD countries. Regarding gender, the results show that male students outperformed women in mathematics by 12 points, when in the rest of the countries this difference was on average 5 % (OECD, 2019).

The PLANEA test is carried out in Mexico by the Ministry of Public Education (SEP) in order to know to what extent students are able to master a set of essential knowledge at the end of secondary education in the fields of language and communication and mathematics (SEP, 2019). According to the results on its last application in 2019, 55 % of third year middle school students had a poor school performance in mathematics and only 9 % reached an outstanding level (Cervantes, 2019).

For some, poor math test scores are the result of anxiety, distress, restlessness, or worry feelings they experience when solving math problems. Over the years, a large body of studies has indicated that many people have extremely negative attitudes towards mathematics, which sometimes amounts to severe anxiety (Hembree, 1990; Ashcraft, 2002; Maloney, Beilock, 2012).

This phenomenon was first reported by Tobias (1978) and since then it has been the main subject of numerous publications (Beilock et al., 2010; Punaro, Reeve, 2012; Hill et al., 2016; among others), showing that it can be considered a serious problem that affects many students around the world.

Conceptually, mathematical anxiety has been defined in the following terms “a general fear or tension associated with situations that involve interaction with mathematics” (Legg, Locker, 2009: 471). Researchers also argue that math anxiety can lead to negative situations such as avoiding math courses and avoiding careers that involve frequent use of math.

On the other hand, Leppävirta (2011: 425) defines mathematical anxiety as “a feeling of tension and anxiety that interferes with the manipulation of numbers and with the solution of mathematical problems”. According to Eccius-Wellmann and Lara-Barragan (2016), the causes for anxiety towards mathematics can be classified into three categories: disposition, situation and environment. The first refers to psychological and emotional factors such as attitudes towards mathematics, self-concept and learning styles. The factors that refer to situation are a direct result of mathematics courses, such as the nature of the course and its design, the way it is taught, and so on. The factors that have to do with the environment are those prior to the mathematics courses at school, such as age, gender, undergraduate degree they choose and previous experiences.

Hence the question: What is the dimension that explains anxiety towards mathematics the most in middle school students? And, is there a difference according to gender, age and school grade in relation to anxiety towards mathematics? In order to answer these questions, a research at the Federal Middle School José Vasconcelos, in the city of San Juan Bautista Tuxtepec, Oaxaca in Mexico was carried out. The objective of the research is to determine the dimension that best explains anxiety towards mathematics in middle school students, as well as to determine if there is a difference based on gender, age and school grade.

2. Literature review

Anxiety towards mathematics has been considered one of the greatest problems around the world. It is not a recent problem. Half a century ago, Richardson and Suinn (1972) described math anxiety as feelings of apprehension, tension, or discomfort experienced by large numbers of individuals when performing mathematical tasks or in a mathematical context. In general, higher levels of math anxiety are associated with lower math performance. Although math anxiety may not be the only variable related to math performance, it is a strong predictor. In OECD countries, 14 % of the variation in mathematical performance is explained by levels of mathematical anxiety, and among the highest performing students this relationship remains strong regardless of gender and socioeconomic status (Chang, Beilock, 2016).

Ashcraft (2002) explained that, compared to people who do not have math anxiety, the highly math-anxious individual undergoes lower math achievement and competence. The great interest in the subject of anxiety towards mathematics may arise from the attempt to find solutions to this serious problem. Recent studies by Ersozlu and Karakus (2019) show the trend of scientific studies

in this area. Currently, there is a global push to carry out scientific studies in this field of research in response to the growing problems of modern society in the teaching of mathematics.

Numerous studies over the years have indicated that quite a few people have extremely negative attitudes towards mathematics, sometimes amounting to severe anxiety (Hembree, 1990; Ashcraft, 2002; Maloney, Beilock, 2012). The concept of mathematical anxiety has been associated with cognitive difficulties in performing mathematical tasks, potentially because anxiety interferes with the ability to hold and manipulate information in the mind (working memory), but it is predominantly an emotional problem (Ashcraft, Krause, 2007).

Although many studies treat math anxiety as a single entity, it appears that it may consist of more than one component. Wigfield and Meece (1988) found two different dimensions in the anxiety that four sixth-grade primary and secondary school students experienced towards mathematics: the cognitive and affective dimensions. Dimensions similar to those previously identified by Liebert and Morris (1967) in the area of anxiety towards tests.

The cognitive dimension, called "worry" refers to concern about performance and the consequences of failure, and the affective dimension, called "emotion", refers to nervousness and tension in test situations and the respective autonomous reactions (Liebert, Morris, 1967).

Anxiety interferes with performance, and poor performance increases anxiety, acting as a vicious cycle (Carey et al., 2016). Therefore, it is not a minor disorder since those who are affected avoid mathematics, which affects their academic performance and may condition their future, since they tend to choose activities or university degrees that do not require this subject (Ashcraft, Krause, 2007).

Peper, Harvey, Mason and Lin (2018) explain that many students have problems performing cognitive tasks such as mental arithmetic when they are or feel they are in threatening situations and there are several studies that corroborate these statements (Moore et al., 2012; Schmader et al., 2015). Therefore, to promote students' academic performance, not only should study programs and their teaching be taken into account, but also psychological and emotional aspects that can facilitate their school and professional development (García-Santillán et al., 2017)

2.1. Mathematical anxiety and academic performance and its relationship with gender, age and school grade.

Anxiety towards mathematics seems to worsen as the student gets older. Studies suggest that attitudes towards mathematics tend to deteriorate with age from childhood and adolescence (Wigfield, Meece, 1988; Ma, Kishor, 1997). Anxiety towards mathematics has been observed in children around 6 years of age (Beilock et al., 2010; Krinzinger et al., 2009; Thomas, Dowker, 2000; Vukovic Kieffer et al., 2013) and it increases as children reach secondary education, persisting and worsening during later education and as the student gets older (Wigfield, Meece, 1988; Ma, Kishor, 1997).

The study by Devine, Fawcett, Szűcs et al. (2012) focused on measuring performance in mathematics and levels of anxiety towards mathematics among girls and boys at middle school level. To do this, they applied mental math tests and anxiety tests to 433 middle school students in the United Kingdom. The results showed that there is no gender difference in math performance, but levels of math anxiety and tests anxiety were higher for girls than for boys. Girls and boys showed a positive correlation between math anxiety and tests anxiety and a negative correlation between math anxiety and math performance, but this relationship was stronger for girls than for boys. Regression analyses revealed that math anxiety was a significant predictor of achievement for girls but not for boys.

Reali, Jiménez-Leal, Maldonado-Carreño, Devine and Szűcs (2016) carried out a study on the relationship between math anxiety and math performance in which 296 Colombian students participated in an age range of 8 to 16 years old. In this study, they carried out the analysis based on gender and school grade and found that there is no difference in levels of anxiety towards mathematics based on gender. They also identified that there is great variability between grades regarding the strength of association between math anxiety and performance based on gender.

Villamizar, Araujo and Trujillo (2020) have a similar study who analyzed the relationship between mathematical anxiety and academic performance in mathematics of 127 middle school students from Colombia (68 girls and 59 boys) whose average age was 14.34 years old. The results showed that the academic average is high according to the criteria of the Ministry of National

Education of Colombia. In addition, the young girls presented a higher average and a higher level of anxiety than that of the boys. They identified an inverse relationship between mathematical anxiety and academic performance in mathematics, the higher the anxiety, the lower the academic performance.

Stanley, Nyarko, and Frimpong (2021) explore the impact of math anxiety on academic performance in secondary school students in the Bogo district of Ghana. 492 students participated in their study. The findings identified that math anxiety affects students' math performance, and also revealed that gender plays a very important role, with female students experiencing higher levels of math anxiety.

Van Mier, Schleepen and Van der Berg (2019) carried out a study among 124 children in second and fourth grade, identifying that both their level of anxiety and their performance in mathematics were similar between girls and boys, but only among girls, was there a correlation between math anxiety and performance.

Based on the above, the following hypotheses are established to be tested:

H1: There is a dimension that better explains anxiety towards mathematics in middle school students. H2: There is a difference in the dimensions that explain anxiety towards mathematics based on gender. H3: There is a difference in the dimensions that explain anxiety towards mathematics based on age. H4: There is a difference in the dimensions that explain anxiety towards mathematics based on the school grade.

3. Methodology

Our research is approached from the positivist paradigm and the analysis is a descriptive exploratory one. We applied a survey with the anxiety test towards mathematics by Muñoz and Mato (2007). The test is made up of 24 items with response options on a five-point Likert scale, where Totally disagree is 1 and Totally agree 5. The 24 items are integrated into five dimensions whose structure is described in Table 1.

Table 1. Dimensions of the Anxiety towards mathematics scale

| Dimension | Ítems |
|---|--|
| Anxiety towards evaluation (ATE) | 1, 2, 8, 10, 11, 14, 15, 18, 20, 22 y 23 |
| Anxiety towards temporality (ATT) | 4, 6, 7, y 12 |
| Anxiety towards math problems understanding (ATMPU) | 5, 17 y 19 |
| Anxiety towards numbers and math tasks (ATNMT) | 3, 13, 16 |
| Anxiety towards real-life math situations (ATRLMS) | 9, 21 y 24 |

Source: designed based on Muñoz and Mato (2007).

The test was applied face to face to 200, second and third year students from General José Vasconcelos Middle School in Tuxtepec, Oaxaca on March 10, 2020. The sample was made up of 50.5 % boys and 49.5 % girls. The average age is 14 years. 69 % of the students were in their second year of middle school and 31 % were in their third (Table 2).

Table 2. Descriptive profiles of the participants

| Gender | Frequency | % | Σ& |
|--------|----------------------|-----|-------|
| Valids | Male | 101 | 50.5 |
| | Female | 99 | 49.5 |
| | Total | 200 | 100.0 |
| Grade | Frequency | % | Σ& |
| Valids | 2 ^o year | 138 | 69.0 |
| | 3 ^{er} year | 62 | 31.0 |
| | Total | 200 | 100.0 |
| Age | Frequency | % | Σ& |
| Valids | 13 years old | 81 | 40.5 |

| | | | |
|--------------|-----|-------|-------|
| 14 years old | 86 | 43.0 | 83.5 |
| 15 years old | 26 | 13.0 | 96.5 |
| 16 years old | 7 | 3.5 | 100.0 |
| Total | 200 | 100.0 | |

Statistical procedure. First, the reliability and normality tests are carried out: to measure the internal consistency of the items, the Cronbach's alpha and the normality of the data are calculated using the 1-sample KS test. Subsequently, to test the hypotheses that indicate the possible existence of difference in relation to gender, school grade and age, the ANOVA is carried out to determine if there is a difference in means in each of the dimensions indicated in [Table 1](#).

4. Results

The result obtained from the 27 items of the test including age, school grade and gender was 0.897 and the 24 items of the scale give us 0.903 for which both are acceptable and with good internal consistency, so it is considered acceptable according to the criterion suggested by Hair et al (1999) and the validity of the questionnaire was confirmed ([Table 3](#)).

Table 3. Test reliability and internal consistency

| Cases | N | % | Cronbach`s Alpha | Number of elements |
|--------------|-----|-----|------------------|--------------------|
| Valid | 200 | 100 | 0.8976 | 27 |
| Excludes (a) | 0 | 0 | | |
| Total | 200 | 100 | 0.9036 | 24 |

The Kolmogorov-Smirnov test is used to contrast the hypothesis of normality of the population, hence the test statistic is the maximum difference:

$$D = \max |F_n(x) - F_0(x)|$$

Where: $F_n(x)$ the sample distribution function and $F_0(x)$ the theoretical function or corresponding to the normal population specified in the null hypothesis.

[Table 4](#) shows the values of the KS statistic with df and asymptotic significance for each of the dimensions of the test described in [Table 1](#). The values of asymptotic significance (bilateral) provide evidence of the level of normality of the data: in this case the five dimensions have a normal distribution.

Table 4. KS-1 Normality Test

| Anxiety dimensions | Grade | Gender | Age |
|-----------------------|-------|--------|-------|
| Temporality (ATT) | 0.028 | 0.033 | 0.156 |
| Evaluation (ATE) | 0.037 | 0.219 | 0.200 |
| Numbers (ATNMT) | 0.023 | 0.034 | 0.049 |
| Real-life (ATRLMS) | 0.200 | 0.013 | 0.196 |
| Comprehension (ATMPU) | 0.310 | 0.026 | 0.200 |

As can be seen in [Table 4](#), the values of the normality test for the three variables: academic grade, gender and age, for the five dimensions of the scale, present normality, so it is feasible to develop the exploratory factor analysis for determine if the matrix is an identity matrix. In addition, the dimension that weighs the most and best explains anxiety towards mathematics in middle school students is identified, as well as the ANOVA to contrast the hypotheses of difference of means in relation to academic grade, gender and age.

With the exploratory factor analysis, the Bartlett test of Sphericity and the KMO sample adequacy measure with Kaiser, the χ^2 goodness of fit with n df and statistical significance (α), the correlation matrix and the anti-image matrix were developed. The correlation matrix between

the scale dimensions is shown below to see if they present significant correlations, as well as the Bartlett test of Sphericity (Table 5).

Table 5. Correlation matrix and anti-image

| Correlation | ATE | ATT | ATMPU | ATNMT | ATRLMS | MSA* |
|---|-------|-------|-------|-------|--------|---------------------|
| ATE | 1.000 | | | | | .821 ^(a) |
| ATT | .687 | 1.000 | | | | .836 ^(a) |
| ATMPU | .623 | .681 | 1.000 | | | .820 ^(a) |
| ATNMT | .644 | .652 | .601 | 1.000 | | .869 ^(a) |
| ATRLMS | .268 | .369 | .513 | .378 | 1.000 | .777 ^(a) |
| Kaiser-Meyer-Olkin measure of sampling adequacy 0.830 | | | | | | |
| Aprox. Chi-squared | | | | | | 474.981 |
| Barlett´s sphericity test | | | | | | <i>df</i> 10 |
| | | | | | | Sig. .000 |

*measure sample adequacy

As can be seen in Table 5, the matrix presents acceptable correlations and the values of the sample adequacy measure exceed the recommended value of 0.5, so that the five dimensions that make up the 24 items proposed by Muñoz and Mato (2007) are statistically significant. In addition, the KMO value of 0.830, the Bartlett test of Sphericity test with a Chi² of 474.981 with 10 *df* and p-value 0.000 support the performance of the exploratory factor analysis. Subsequently, the percentage of explained variance is extracted, by the method of principal components with the criterion of values > 0.1 which is shown in Table 6, as well as the orthogonal rotation by the method of Varimax Normalization with Kaiser (Table 7).

Table 6. Total variance explained. Initial eigenvalues

| Component | Total | % variance | % of accumulated |
|-----------|-------|------------|------------------|
| 1 | 3.210 | 64.195 | 64.195 |
| 2 | .805 | 16.098 | 80.292 |
| 3 | .390 | 7.807 | 88.099 |
| 4 | .307 | 6.145 | 94.244 |
| 5 | .288 | 5.756 | 100.000 |

The value of the eigenvalue of 3,210 represents 64,195 % of the total variance extracted from the data matrix, which is grouped in the five dimensions of the scale.

Table 7. Rotated components matrix (a)

| Dimensions | Components | | | | |
|------------|------------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 |
| ATRLMS | .962 | | | | |
| ATE | | .875 | | | |
| ATNMT | | | .880 | | |
| ATT | | | | .843 | |
| ATMPU | | | | | .842 |

Extraction method: analysis of main components. Rotation method: Varimax with Kaiser normalization. ^a Rotation has converged in 5 iterations.

The rotated matrix shows us the behavior of each component, where it is observed that anxiety towards real-life math situations (ATRLMS) was the one that presented the highest factor load, followed by anxiety towards evaluation (ATE), then anxiety towards numbers and math tasks (ATNMT), anxiety towards temporality (ATT) and finally anxiety towards math problems understanding (ATMPU). It should be noted that as a whole all the components presented significant loads > at 0.8, which justifies the purpose that was sought with the Varimax rotation, since the characteristic of this orthogonal rotation method is precisely the identification of the variables with the highest factorial loads.

To contrast the hypotheses on differences by gender, age and school grade, the ANOVA procedure is carried out, which provides the F statistic and its level of significance, for which the theoretical criterion is taken that indicates that if the significance intra-group is less than or equal to 0.05, the hypothesis of equality of means is rejected, otherwise if it is greater, equality of means is accepted (Tables 8a, 8b and 8c).

Table 8a. Age

| Dimension | | Sum of squares | df | Mean square | F | Sig. |
|-----------|----------------|----------------|-----|-------------|------|------|
| ATMPU | Between groups | .058 | 1 | .058 | .150 | .699 |
| | Within groups | 76.64 | 198 | .387 | | |
| | Total | 76.69 | 199 | | | |
| ATT | Between groups | 1.50 | 1 | 1.503 | .087 | .769 |
| | Within groups | 3429.89 | 198 | 17.323 | | |
| | Total | 3431.39 | 199 | | | |
| ATNMT | Between groups | 1.93 | 1 | 1.934 | .202 | .654 |
| | Within groups | 1898.06 | 198 | 9.586 | | |
| | Total | 1900.00 | 199 | | | |
| ANSIESIT | Between groups | 1.57 | 1 | 1.559 | .177 | .674 |
| | Within groups | 1741.99 | 198 | 8.798 | | |
| | Total | 1743.55 | 199 | | | |
| ATE | Between groups | 3.53 | 1 | 3.532 | .034 | .853 |
| | Within groups | 20327.66 | 198 | 102.665 | | |
| | Total | 20331.19 | 199 | | | |

Table 8b. Gender

| Dimension | | Sum of squares | df | Mean square | F | Sig. |
|-----------|----------------|----------------|-----|-------------|--------|------|
| ATMPU | Between groups | .915 | 1 | .915 | 2.391 | .124 |
| | Within groups | 75.779 | 198 | .383 | | |
| | Total | 76.694 | 199 | | | |
| ATT | Between groups | 81.149 | 1 | 81.149 | 4.796 | .030 |
| | Within groups | 3350.246 | 198 | 16.920 | | |
| | Total | 3431.395 | 199 | | | |
| ATNMT | Between groups | 74.672 | 1 | 74.672 | 8.100 | .005 |
| | Within groups | 1825.328 | 198 | 9.219 | | |
| | Total | 1900.000 | 199 | | | |
| ANSIESIT | Between groups | .569 | 1 | .569 | .065 | .800 |
| | Within groups | 1742.986 | 198 | 8.803 | | |
| | Total | 1743.555 | 199 | | | |
| ATE | Between groups | 1304.765 | 1 | 1304.765 | 13.578 | .000 |
| | Within groups | 19026.430 | 198 | 96.093 | | |
| | Total | 20331.195 | 199 | | | |

Tabla 8c. Grade ANOVA

| Dimension | | Sum of squares | df | Mean square | F | Sig. |
|-----------|----------------|----------------|-----|-------------|-------|------|
| ATMPU | Between groups | .019 | 1 | .019 | .049 | .825 |
| | Within groups | 76.675 | 198 | .387 | | |
| | Total | 76.694 | 199 | | | |
| ATT | Between groups | 1.116 | 1 | 1.116 | .064 | .800 |
| | Within groups | 3430.279 | 198 | 17.325 | | |
| | Total | 3431.395 | 199 | | | |
| ATNMT | Between groups | 3.255 | 1 | 3.255 | .340 | .561 |
| | Within groups | 1896.745 | 198 | 9.580 | | |
| | Total | 1900.000 | 199 | | | |
| ANSIESIT | Between groups | .778 | 1 | .778 | .088 | .767 |
| | Within groups | 1742.777 | 198 | 8.802 | | |
| | Total | 1743.555 | 199 | | | |
| ATE | Between groups | 248.520 | 1 | 248.520 | 2.450 | .119 |
| | Within groups | 20082.675 | 198 | 101.428 | | |
| | Total | 20331.195 | 199 | | | |

The result shown in [Tables 8a, 8b](#) and [8c](#) suggests the following: in [Tables 8a](#) and [8c](#) called Age and Academic Grade, intra-group values higher than 0.05 are observed, which implies the existence of equality of means in the five dimensions of the scale. In the case of the gender variable, the significance values for the dimensions of ATT, ATNMT, and ATE are less than 0.05, so it is assumed that there is no equality of means, not so in the dimensions ATMPU and ATRLMS where there is equality in their means.

5. Discussion

The results of the research report very acceptable and concordant values with those obtained by Muñoz and Mato (2007), in terms of reliability and internal consistency of the scale, as well as the exploratory factor analysis. With the multivariate normality test of the data and the reliability of the scale, it was feasible to develop the exploratory factor analysis, which supports the result of our study, and which also presented acceptable values in terms of the correlation matrix and the Bartlett's test of Sphericity with Kaiser, with significance > 0.000 with n degrees of freedom.

Regarding the variance explained in the pilot test and in the final one, very significant factor loadings were found. For example, in the pilot test four factors explained 65.13 % of the variance, rising in the final test to 85.55 %, being this last one higher than that reported in this study (64.195 % [Table 6](#)).

In relation to the results on the possible differences with respect to gender, age and school grade, we report that there is no difference in the anxiety that students face towards the five dimensions of the scale based on age and school grade, However, differences were found based on gender in the dimensions of anxiety towards temporality, anxiety towards evaluation and anxiety towards numbers and math tasks.

The findings reported here, in which no differences were found in anxiety towards mathematics as a function of age and school grade, contrast with the studies by Wigfield and Meece (1988) and Ma and Kishor (1997) whose indicate that anxiety towards math tends to worsen with age. A possible explanation for this result could be due to the small age range of the participants in this research. 85.6 % are between 13 and 14 years of age.

Unlike, Reali, Jiménez-Leal, Maldonado-Carreño, Devine and Szücs (2016); Van Mier, Schleepen and Van der Berg (2019) and Devine, Fawcett, Szücs et al. (2012), whose studies on anxiety towards mathematics did not identify a difference based on gender, in this study

differences in this sense were found in three of the five dimensions of the scale, which coincides with the findings reported by Villamizar, Araujo and Trujillo (2020) and Stanley, Nyarko and Frimpong (2021).

6. Conclusion

Mathematical anxiety is a phenomenon that is present in different activities carried out by human beings, and in a very particular way in the academic field. Students constitute a world population that has been the object of constant studies with the firm intention of understanding this phenomenon better every day. Of course, not all the world population has the same anxiety indices or indicators, much will depend on the context in which it is analyzed.

The study on the subject of mathematical anxiety that young people especially suffer when they face situations that are related to mathematics, such as homework or exams, is increasingly recurrent. This has led to an almost general concern of the academic authorities of public and private institutions in all countries, since this phenomenon has been characterized as an important problem that limits the success of the educational teaching-learning process.

From the results presented here, there is a concern for future research related to anxiety towards mathematics and differences based on gender. If different levels of anxiety between boys and girls could be presented in a larger sample of students in different contexts.

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Empowering Intercultural Communication Competence for Foreign Language-Majoring Students through Collaboration-Oriented Reflection Activities

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Abstract

The changes in educational theory and practice have been made to be compatible with the global and integrated context of nations. In teaching a foreign language, intercultural communication competence (ICC) has been considered an imperative factor influencing the 21st century learners' academic achievement. Consequently, a great number of teaching approaches have been endorsed to facilitate students to enhance ICC. This paper focuses English major students' evaluation of the significance of collaboration-oriented reflection activities (CoRAs) in the ICC course; examines the influence of CoRAs on students' intercultural communication motivation and practice; and explores students' beliefs about the feasibility of collaboration-oriented reflection activities in overcoming the challenges of learning the ICC course. A mixed-research method was implemented with the research instruments, such as questionnaires, interviews, paper-based tests and performance-based tests. The results indicated that collaboration-oriented reflection activities brought about various benefits. Integrating collaboration-oriented reflection activities into teaching culture had positive effects on students' intercultural communication motivation and competence. From the qualitative data, participants manifested that applying CoRAs in the course was and will be feasible, effective and prospective despite the challenges they had to encounter. Accordingly, exhaustive solutions for teachers and students were recommended to fulfill the course properly.

Keywords: collaborative learning, intercultural communication competence, learning motivation, reflective learning, teaching and learning culture.

1. Introduction

In the context of integration and globalization, a comprehensive understanding of different cultures is currently in demand, and ICC are an indispensable component in international

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communication situations. Consequently, teaching and doing research on how to address the issues of ICC has become a priority concern for educators and researchers. With numerous different ideologies, beliefs, norms, and values clashing on a daily basis, the situation, if not properly comprehended, could give rise to a wave of conservatism or even isolationism. Acknowledging the prevalent impact of IC on a massive scale, culture-related subjects have been integrated into the curriculum of tertiary academic institutions, and strategies for improving ICC have been explored to equip students with more knowledge and skills in different intercultural settings. The pressure to be exposed to cultural diversity and engaged in the multicultural community has urged educators to explore efficient culture teaching approaches.

In 21st century education, students are expected to go beyond the basic knowledge in textbooks to be involved in experiences and practical activities. Students tend to absorb a great amount of knowledge about the target culture; however, to achieve competence in IC, they must be engaged in the in-action reflection activities that are built on collaboration. To improve ICC, intercultural awareness or knowledge is insufficient. It is vital to get students involved in performance, such as group work, interaction, and cooperation. Recognizing the prominence of teaching intercultural communication in collaborative reflection education, the researcher presents this study with the aim of elucidating effective ICC teaching and learning approaches through collaboration-oriented reflection activities (CoRAs).

This paper focuses on English major students' evaluation of the significance of CoRAs in ICC course, examines the influence of CoRAs on students' intercultural communication motivation and competence, and explores student beliefs about the feasibility of collaboration-oriented reflection activities in encountering the obstacles of learning IC and improving ICC. This study proposes several solutions and recommendations to help learners develop their ICC effectively. Based on the aims of the study, three questions were emphasized to guide the research process:

1. What are English-majoring students' evaluations of the significance of collaboration-oriented reflection activities in the ICC course?
2. How do collaboration-oriented reflection activities influence students' IC learning motivation and ICC?
3. What are students' beliefs about the feasibility of collaboration-oriented reflection activities in overcoming the challenges of learning ICC course?

Intercultural communication competence

Despite the differences in how to express and explain the definition of intercultural competence, numerous scholars have consented that ICC is one's effective and appropriate interaction ability in particular intercultural settings on the basis of intercultural knowledge, skills, and attitudes (Griffith et al., 2016; Jackson, 2018), in which communicators express a willing attitude to be involved in cross-cultural situations, sufficient cultural knowledge (Alred et al., 2003), self-awareness (Phipps, Gonzalez, 2004), and the ability to address issues relevant to different cultures effectively and flexibly (Guilherme, 2002; Sercu, 2005). In the same way, Byram (2000) identified critical understanding and awareness of our 'own and of other cultures as the prominent features of ICC (Byram, 2000). Meanwhile, Crahay (Crahay, 2005: 5) defines competence in a simple way, saying that it is "an integrated network of items of knowledge, which can be activated to accomplish tasks". Stone (Stone, 2005a) acknowledged ICC as "intercultural effectiveness" that indicates "the ability to interact with people from different cultures to optimize the probability of mutually successful outcomes" (p. 338). Similarly, Chao (Chao, 2014) described ICC as the most influential factor in foreign languages, in which communicators execute communication behaviors effectively to negotiate in a culturally diverse environment.

To evaluate ICC, a wide range of models of ICC have been built based on the major components. The most common ICC model comprises three components, comprising knowledge, attitudes and skills, which are expanded to include the following five elements: attitudes (*savoir être*), knowledge (*savoirs*), interpreting and relating skills (*savoir comprendre*), discovery and interaction skills (*savoir apprendre/faire*), and critical cultural awareness/political education (*savoir s'engager*) (Byram, 2008; Fantini, 2009; Griffith, 2016). The development of ICC should be a critical combination of the above elements, since positive attitudes can help a person explore his/her own culture and surrounding cultures. Consequently, one's knowledge, skill of interpreting, discovering, analysing, and critical awareness will allow him or her to cope with multicultural

differences to effectively and appropriately interact with others in a globalized community. Apart from attitude, intercultural communicative competence includes knowledge of how society functions about other people, how other people perceive us and skills to interpret this knowledge. One should possess skills to acquire new knowledge and operate it in real time and interaction. Kosareva et al. (2019) recommended a model of ICC with the components, consisting of world knowledge, foreign language proficiency, communication competence (Szczurek-Boruta, 2015), cultural empathy, approval of foreign people and cultures (Lambert, 1994). Fantini (2011) also stressed awareness as an important dimension of intercultural communicative competence. Respect for human dignity and equality of human rights is the democratic basis for social interaction. One must possess the ability to value and evaluate in other cultures, as well as in one's own. As cultures change, human diversity, cultures and lifestyles expand. Wiseman (2001) suggested that intercultural communication competence is comprised of knowledge, skills, and motivation needed to interact effectively and appropriately with persons from different cultures. Chao (2014) and Byram (2000), emphasized the importance of language (linguistic competence), identity and cultural understanding in the conceptualization on in his model of intercultural communicative competence. Accordingly, a comprehensive definition of intercultural communicative competence should include the social context and nonverbal dimensions of communication.

With the aim of orienting to globally integrated education, intercultural competence has been pervasively proposed into EFL classrooms (Liaw, 2006, Spitzberg, Changnon, 2009). Consequently, a variety of intercultural communicative competence models have been recommended for teaching to foster students' ICC (Deardorff, 2006; Spitzberg, 2000; Stier, 2006). In a study on intercultural performance by teams, Schneider and Romberg (2011) recommended a three-phase intercultural model comprising three factors: intercultural awareness (not only full intercultural understanding but also acceptance ability of different cultures), a shared performance system (a set of acceptable common behaviors), and intercultural communication (skills to communicate effectively in particular intercultural situations). Meanwhile, Garson (2016) recommended a model of intercultural communication skills with functional abilities to understand other intercultural views, adaption ability to their own behaviour, conflict-solving ability in communication, recognize the right to different values, norms of behaviour (Byram et al., 2002) which is becoming most popular. These factors, together with tolerance ability in communication provide a basis for professional development, preparation for better living condition, obtaining achievements, and generating opportunities for professional self-realization (Liu et al., 2015).

Reflection in Learning and Teaching

It is acknowledged that reflection is a "meaning-making" process through which learners set goals, applying previous knowledge or theory into practice, taking future action for changes, improvement and development, and making meaning implications in real life because it is transformative (Ash, Clayton, 2009; Rodgers, 2002). To emphasize the prevalent role of reflection, Ash & Clayton (2009) revealed that without reflection, plain experience only helps learners generate stereotypes, explore superficial solutions to drastic problems and make inaccurate conclusions with limited data. The authors asserted that integrating critical reflection in the learning process gives students more opportunities to question issues, encounter challenges, and clarify correlation as well as contrast in theory with practice that reinforce critical evaluation and knowledge transfer (Ash, Clayton, 2009: 27). Tsuei et al. (2019) asserted that the key component education is the application of reflective practice to improve the incorporation. Reflection has been implemented to boost deeper learning, to make practice meaningful, and provide an autonomous learning process. Similarly, reflecting on action means the interrogation about and looking back on what we have done to uncover unexpected outcomes that are likely to occur in the future (Cook, 2016).

Akbari (2007) categorized reflection into 2 types: the type associated with "conceptual problems" and the one pertaining to "practical problems". He also argued that reflection emphasizes such retrospective memory rather than anticipatory reflection and imagination (Conway, 2001; Freese, 2006).

The impact is said to be the highest if the process incorporates collaborative learning and collective construction of knowledge and meaning. In a close investigation into English language

learning, Mason & Rennie (2006) manifested that if there is an incorporation in collaborative learning and collective construction of knowledge, the impact of reflection on academic outcomes is higher. Elif Burhan (2015) indicated the same opinion that in essence, reflection is an embedded and collaborative process.

The most common categorization is subdivided into three interrelated chronological categories: reflection-on-action, reflection-in-action, and reflection-for-action (Wilson, 2008; Farrell, 2012). These are mostly applied in professional process. Reflection-on-action illustrates the examination and observation of previous performance and experiences to determine the gaps, washback and encounters that hinder the outcomes, to evaluate the results and make appropriate changes for the future. On the other hand, reflection-in-action is generated in the progress of the present action. It is called active reflection, conscious thinking and modification while on the job (Farrell, 2012). Meanwhile, reflection-for-action is known as an anticipatory reflection that occurs before the performance to take the possible problems or situations into consideration. Accordingly, through reflection, practitioners diagnose the strengths and weaknesses and assess the effectiveness of the strategies or techniques used to moderate the performance (Pedro et al., 2012).

Collaboration in Learning and Teaching

Collaborative learning has recently been pervasive in educational environments, from primary school to higher academic institutions. Researchers have taken more interest in defining, featuring and exploring the significance of cooperative learning. Yuan & Wang (2006), based on the A collaborative learning perspective on EFL large class, defined learning requiring a cooperation with the group-working ability, contribution, and responsibility of the members to achieve the ultimate academic targets.

Several researchers have emphasized the major elements of CL, including positive interdependence, team formation, accountability, social skills, and structuring; working ability in heterogeneous groups and in positive interdependence, accountability, purposeful learning ability, cooperative skills (Harman, 2004); group goals, individual accountability, equal opportunities for success, team competition, task specialization, and adaptation to individual needs (Gillies, 2007).

From the various classifications, the authors agreed that in CL, it is imperative to require students to work together effectively for shared academic achievement. Active and positive contributions and accountability are highly evaluated. All the members must be held liable for their performances and the common results. In addition, they must try to create incentives for others to speak out because the core value of collaboration is unit and efficacy. Furthermore, Olivares (2007) acknowledged the critical role of sufficient social skills in CL that can control and moderate the relationship among the members of each group. One more factor affecting the effectiveness of CL is team reflection, through which groups receive feedback from the other members to make assessments or self-assessments and then make suitable changes to fix the drawbacks and improve future performance (Jarvis, 2004). The main factors and fundamental principles of CL are explored in the study by Gillies (2007). Jin (2004) took the essential role of culture in CL into serious consideration as teaching language cannot be separated from teaching culture and the efficiency of collaborative learning is embedded in shared culture (Alptekin, 2002). They recommended particular strategies to resolve encounters learners face, covering mediating cultural barriers, participating in debates with teachers and classmates to express viewpoints and defend against issues.

Collaboration-oriented Reflection Activities Integrated in ICC Course

Collaboration-oriented Reflection Activities or collaborative reflection activities are comprised of the tasks relevant to reflection practice in groups in learning process to develop a cohesive learning community (Onyura et al., 2017). Similarly, Steinert et al. (2016) argued that CoRAs consist of collectively reflecting efforts to provide the feedback in the aim of making learning better and build a collaborative learning community. The individual pre-reflection is defined as prerequisites for group reflection. In learning languages, instructors ask students brainstorm together on what they implemented in the past, reflected and explored the strategies to reconstruct understanding and make more changes for development. The collaborative reflection is evaluated as the greatest value if participants generate peer supported prereflection. CoRAs could be:

Writing diary from the real experiences and seminars. Students in each group reflected their experiences related to ICC occurring in their life or or the stories told by the others. They clarified what happened, how the communicator reacted in each intercultural situation, your reflection about their actions, behaviors and performance, your recommendations for the issues. Writing diary may be implemented through notebooks, posters, videos or online.

Writing journals on webs. Google-sites was built to be functioned as boards, e-portfolios or virtual classrooms that featured students' work and assignments, presented the findings on particular research, listed course materials with links, posted videos and classroom activities and held quizzes or competitions.

Involving discussion and problem-based tasks. Using Skype and Zoom in the classroom facilitated students to make unlimited interactions. The teacher might take students to many new destinations around the world with various experiences and virtual trips. Through Skype and Zoom, students can be involved in the discussion and problem-based tasks relevant to intercultural situations with many peers, teachers and experts from a variety of nations.

Using social networks as online learning community. Students created their accounts on social networks to directly or indirectly invite others to visit their homes for discussion and together build an intercultural communication community. After each week, each group reported what activities their group and the members of the community did, highlighting the significance and influence of the activities on ICC learning achievement.

Using blogs, Facebook or websites as e-journals. Students were encouraged to write journal entries via blogs, Facebook or websites that prompted students to upload their knowledge, news, and presentation and to share with peers. Through blogs, students empowered their critical and analytical writing skills as journalists.

Creating games and quizzes to build a "academic playground". On each group's web, blog or Facebook students proposed the quizzes, games hold as a competition for everyone to join in the questions about culture awareness and intercultural situations. The visitors or viewers who left the correct answers were awarded a prize from the host team.

Assessing the others' achievements and self-assessing their performance over the weeks. At the end of each week, students had a chance to visit the pages created by the other students or groups and make the assessment by leaving the comments or score for the groups' performance. Simultaneously, each student looked back to their product to have reflection and self-assessment.

2. Methodology

Participants

The participants were selected with as many matching demographic categorizations as possible within the allowed context of the research. A total of 122 participants were involved in the research, of whom there were 42 boys (33.9 %) and 82 (66.1 %) girls. their ages rank from 20 to 23. They had finished language-skill courses such as grammar, listening, speaking, reading and writing and were learning specialized subjects. The ICC course was followed by the British-American Culture course. They were third-year students of a foreign language faculty at a foreign language university in Vietnam. Their English proficiency level must reach B2 to have sufficient conditions for graduation. At that time, only approximately 50 % of students had B2 degrees according to the Common European Framework of Reference for Languages.

The sample size in the experimental research was limited in the number of students who were enrolled in the classrooms of ICC course at a university in Vietnam. The research questions mostly focus on these students' perspectives, evaluation and academic performance. Thus, 122 participants were justified to be sufficient to guarantee the desired level of accuracy and validity (Maxwell, Kelley, 2011). 62 students in the experimental group and 60 ones in the control group was meaningful to eliminate errors and to collect the best results. The number of participants in each group was approximately equal, so the sample size was reasonable to be used in the research.

Data Collection Instruments

Consequently, questionnaires, interviews, and tests were applied to collect data. This data collection instrument allows for a wider range of subjects to be addressed by a larger number of participants and eases the process of information gathering. The content of the questionnaire was

designed by the researcher with previous studies in mind, as well as the goal of the current research. The questionnaire comprises questions divided into 4 parts:

-Part 1: Background information (6 items)

-Part 2: English major students' evaluations of the significance of collaboration-oriented reflection activities in ICC (16 items)

-Part 3: The influence of collaboration-oriented reflection activities on students' IC learning motivation and ICC (15 items)

To measure students' ICC, the author created paper-based tests and performance-based tests constructed on the combination of ICC models Chao (2014) to propose a four-criteria model with the following components: culture knowledge, intercultural communication awareness, IC skills, and behavioral performance.

The questionnaire consists of opinion-based questions aimed at determining how the participants perceive the statements given within the questionnaire. The questionnaire consists of 5 options based on 5 Likert scales: Strongly disagree, Disagree, Neutral, Agree and Strongly agree or *very low; low; neutral; high; and very high*.

Interviews: The writer posed questions to interview students about the challenges of learning ICC course and the feasibility of collaboration-oriented reflection activities in improving ICC (2 questions).

Data Collection Procedures

The data collection procedure is embedded in the course schedule. It lasted 15 weeks for 45 credit periods. A total of 122 students enrolled in the ICC course were divided into two classes: control and experimental classes. In the control class, students were taught in the traditional methods with the primary support of textbooks. In experimental classes, students are instructed in a blended teaching approach with the integration of CoRAs in the course.

Stage 1: Pretests to measure intercultural awareness of the control and experimental classes before invention of using CoRA to guarantee that the knowledge of students from two classes are equal.

Stage 2: Integrating collaboration-oriented reflection activities (CoRA) over the course of experimental classes.

Stage 3: Posttests comprise paper-based tests in which students answer the questions relevant to intercultural knowledge and performance-based tests in which students were involved in the intercultural situations to solve problems.

Stage 4: Conduct the survey and interviews to measure students' evaluations of the significance of CoRAs, the effect of CoRAs on students' ICCs, and students' viewpoints about the application of CoRAs. Teachers scored students' tests based on the criteria of ICC as shown in and made the comparison between two classes, plus the scores from performance based on CoRAs.

At the beginning, the researcher employed printed copies of the questionnaire to conduct the survey.

Data analysis

The main method of data analysis in the research is the quantitative method through the use of questionnaires and qualitative method from the interviews. The quantitative data were analysed with the assistance of descriptive statistics IBM SPSS 25.0 software. The demographic information of the participants was analysed based on a frequency descriptive test. Exploratory factor analysis (EFA) was implemented to explore the satisfactory reliability of the dependent variables. To identify the significance of collaboration-oriented reflection activities in the ICC course, a frequency test was applied. To evaluate the influence of collaboration-oriented reflection activities on students' ICC, a paired-sample test was implemented to compare the effects between two classes. Since the means of two populations are compared with the sample size less than 30, then T-Test and paired-sample test are utilized.

The qualitative data about student beliefs about the challenges of learning ICC course and the feasibility of collaboration-oriented reflection activities in improving ICC were treated by means of the coding technique "Auto-Coding", which selects the specific text passages, classifies and encodes the passage with codes. The data collected from the interviews were organized and arranged based on the repetition of indigenous categories or specialized vocabulary; key words in context; compare

and contrast, metaphors, and analogies to be grouped into codes and common themes (Gibbs, 2010; Bernard, Ryam, 2010).

3. Findings

Cronbach's Alpha and EFA

Cronbach's alpha value of the variables in the questionnaires are at 0.83 (>0.7) on average. 3 variables are excluded with values less than 0.7. This indicated that the variables left have enough reliability for the treating other data in the next steps (Ozkip, 2009, Hair et al., 2012; Hair et al., 2017). These findings made a good unidimensionality validity for variables to ensure proper data treatment for the research questions. The results of exploratory factor analysis (EFA) for variables are analyzed as follows (Observable variables excluded in the previous Cronbach Alpha step will not be included for EFA testing): The KMO value is >0.5 that indicated the correlation coefficient between the variables with the correlation coefficient of the partial variables, which guarantee the suitability of factor analysis EFA. This result is a sufficient condition for factor analysis to be appropriate.

English-majoring Students' Evaluations of the Significance of Collaboration-oriented Reflection Activities in the ICC Course

The results from Table 2 indicate that collaboration-oriented reflection activities in the ICC course brought about many benefits. Particularly, a number of participants highly appreciated that CoRAs are beneficial for inspiring collaboration and cooperation, with the highest mean value (M = 4.00, SD = ,769). Successively, the significance of CoRAs is presented in broadening students' cultural knowledge, promoting students' ICC, enhancing students' critical reflection, increasing self-evaluation and assessment ability, upsurging student learning motivation, and enhancing interaction among students, with mean values above 3.5 at M= 3,73 (SD = ,862); M = 3,76 (SD = ,936); M = 3,61 (SD = ,857); M = 3,80 (SD = ,935); M = 3,70 (SD = 1,051); M = 3,65 (SD = ,995); M = 3,60 (SD = ,987) respectively.

Table 1. Students' evaluations towards benefits of CoRA

| | Minimum | Maximum | Mean | Std. Deviation |
|--|---------|---------|------|----------------|
| Broadening students' culture knowledge | 1 | 5 | 3,73 | ,862 |
| Reinforcing students' communication skills | 1 | 5 | 3,44 | ,954 |
| Promoting students' ICC | 1 | 5 | 3,76 | ,936 |
| Boosting critical thinking skills | 1 | 5 | 3,02 | ,863 |
| Enhancing students' critical reflection | 2 | 5 | 3,61 | ,857 |
| Improving students' language proficiency | 2 | 5 | 3,34 | 1,029 |
| Developing students' problem-solving skills | 1 | 5 | 3,02 | 1,029 |
| Making positive changes in attitudes to other cultures | 1 | 5 | 3,64 | 1,094 |
| Inspiring collaboration and cooperation | 2 | 5 | 4,00 | ,769 |
| Improving group-working skills through teams | 2 | 5 | 3,14 | ,826 |
| Increasing self-evaluation and assessment ability | 1 | 5 | 3,57 | ,891 |
| Upsurging student learning motivation | 2 | 5 | 3,80 | ,935 |
| Enhancing interaction among students | 2 | 5 | 3,70 | 1,051 |
| Making students more confident | 1 | 5 | 3,65 | ,995 |
| Rising students' creativity | 1 | 5 | 3,39 | ,904 |
| Making students more interested in the course | 2 | 4 | 3,60 | ,987 |

0–1.79 very low; 1.8–2.59 low; 2.6–3.39 neutral; 3.4–4.19 high; 4.2–5.0 very high

In addition, participants highly approved CoRA because they reinforced students' communication skills (M = 3,44; SD = 0.954) and increased self-evaluation and assessment ability. Students also admitted that involvement in the activities made them more creative, with a mean

value of 3,39 (SD = ,904). Meanwhile, an average proportion of participants (M = 3.02) agreed that CoRA could facilitate students to promote critical thinking skills and problem-solving skills. These rank the last orders of all benefits students acknowledged in the survey with M=3.02 (SD = 0,863; SD = 1,029).

The influence of collaboration-oriented reflection activities on IC motivation and ICC

The correlation of collaboration-oriented reflection activities and IC motivation

The influence of collaboration-oriented reflection activities on IC motivation is illustrated through the correlations among CoRAs, engagement in intercultural communication activities, and willingness to solve IC-related problems. The data are treated and investigated by means of a linear regression test. The value Sig. (0.00) in ANOVA test is smaller than 0.05, which reveals that that the variables meet the requirements for linear regression test.

Table 2. The correlation of collaboration-oriented reflection activities and IC motivation

| Model | Coefficients | | | | | Collinearity Statistics | |
|--|-----------------------------|------------|---------------------------|-------|------|-------------------------|-------|
| | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Tolerance | VIF |
| | B | Std. Error | Beta | | | | |
| Engagement in CoRA | 2,256 | ,252 | | 8,969 | ,000 | | |
| Willingness to solve the IC-related problems | ,261 | ,058 | ,360 | 4,487 | ,000 | ,912 | 1,096 |
| IC Engagement time | ,286 | ,073 | ,379 | 3,907 | ,000 | ,621 | 1,610 |

Table 2 indicates the correlation effects among the three variables: engagement in CoRAs, IC learning motivation, and willingness to solve the IC-related problems. Obviously, when the values of Sig. are below 0.05, three variables that are valid and are included in the linear regression model are correlated from one side. The coefficients ViF of the variables are less than 2, so no multicollinearity occurs. That Beta regression coefficients higher than 0.0 indicates the one-way impact of the independent variable on the dependent variables. Of the two correlations, the correlation between engagement in CoRAs and IC learning motivation is stronger with a higher beta value (B = 0,379) than the correlation between engagement in CoRAs and willingness to solve IC-related problems, with B=0.360. Accordingly, although engagement in CoRAs brings about positive effects, engagement in CoRAs has a greater impact on IC learning motivation than willingness to solve IC-related problems. This result can be taken for granted in an IC learning environment with few chances to involve students in IC-related problems.

The influence of collaboration-oriented reflection activities on ICC

Table 3. ICC in control and experimental classes

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|-------------------|-----------------------------|--------------------|----------------|------------|---|-------|-------|----|-----------------|
| | | Mean | Std. Deviation | Std. Error | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Culture knowledge | General cultural knowledge | ,197 | 1,195 | ,153 | ,503 | ,109 | 1,286 | 60 | ,203 |
| | Specific cultural knowledge | 1,115 | ,950 | ,122 | 1,358 | ,871 | 9,161 | 60 | ,100 |
| | Intercultural knowledge | ,820 | 1,057 | ,135 | 1,090 | ,549 | 6,057 | 60 | ,000 |

| | | | | | | | | | |
|---------------------------------------|--------------------------------------|-------|-------|------|-------|------|-------|----|------|
| intercultural communication awareness | Respect | ,590 | 1,283 | ,164 | ,919 | ,262 | 3,593 | 60 | ,001 |
| | Empathy | 1,000 | 1,080 | ,138 | 1,277 | ,723 | 7,231 | 60 | ,000 |
| | Tolerance for Ambiguity | ,672 | 1,165 | ,149 | ,971 | ,374 | 4,506 | 60 | ,000 |
| IC skills | Interaction Management | ,475 | 1,233 | ,158 | ,791 | ,160 | 3,011 | 60 | ,004 |
| | intercultural problem-solving skills | 1,213 | 1,185 | ,152 | 1,517 | ,710 | 7,997 | 60 | ,000 |
| | interpersonal harmony and mediation | ,656 | ,929 | ,119 | ,894 | ,418 | 5,514 | 60 | ,000 |
| Behavioral performance | effective communication strategies | ,852 | 1,108 | ,142 | 1,136 | ,569 | 6,008 | 60 | ,000 |
| | English proficiency | 1,197 | 1,077 | ,138 | 1,473 | ,921 | 8,676 | 60 | ,000 |
| | appropriate interactive behaviors | ,508 | 1,135 | ,145 | ,799 | ,218 | 3,498 | 60 | ,001 |

As shown from [Table 3](#), the values Sig. 2-tailed tests of all variables are lower than 0.05, excluding two variables of general cultural knowledge and specific cultural knowledge, which indicates that there are differences between the results of the control and experimental classes in the items of intercultural communication awareness, IC skills, and behavioral performance. The greatest difference is clearly shown in the elements: effective communication strategies (with the Confidence Interval of the Difference is between 1,090 and 549); intercultural problem-solving skills (1,517 higher and 0.710 lower); and Intercultural knowledge (1,136 higher and 0.569 lower). In contrast, general and specific cultural knowledge, which was represented in the written test, was the same in both classes. Students in the control and experimental classes revealed their general cultural knowledge equally. This might be explained by the fact that although the students in control classes had fewer chances to be engaged in collaboration-oriented reflection activities, they spent more time reading the materials about other cultures and countries. Consequently, knowledge about culture was learned properly in classes. However, it is clear that because there was little intercultural interaction or engagement in intercultural communication in fact and in the virtual environment, the intercultural communication awareness, IC skills, and behavioral performance of the students from control classes was worse.

Student Beliefs about the Feasibility of Collaboration-oriented Reflection Activities

When inquired about the feasibility of collaboration-oriented reflection activities in overcoming the challenges of ICC course with the questions “How do you think about the feasibility of collaboration-oriented reflection activities?” and “Do you think the implementation of the CoRAs in the ICC course can facilitate students in facing the challenges?”, most interviewees consented that extra experiences through CoRAs are beneficial for their development in cultural knowledge and ICC. L. A said, “Actually, the subject would have been the same as the other theoretical ones we had ever learned without the activities that prompted our reflection on the what we absorbed through involvement in performance-based activities in groups. We had many chances to develop intercultural knowledge and skills. It is useful, so it is vital to get it pervaded in all subjects”. CoRAs are highly evaluated thanks to their prevalence in enhancing IC skills and awareness. Similarly, H.G. expressed, “To optimize the benefits of intercultural communication, CoRAs require us to make most of the online experience via the Internet network. The practical experience combined with the study of documents helped us soon have both a knowledge base and realistic views of culture around the world.”. Additionally, many students acknowledged that they had meaningful and exciting experiences through the CoRAs in collaboration with our teammates. We empowered our strength through team activities. Our mates shared with us the obstacles in learning ICC – a difficult-defined subject by previous learners. Through CoRAs, we not only read, understand but also see that they are embarked into the other intercultural situations. From that, we realized that an empathy, a tolerance and sharing towards different cultures was born in our hearts. We had a comprehensive look at the world without prejudice or stereotyping” H.K. expressed.

Regarding the tasks assigned in CoRAs, students revealed that they had more opportunities to get closer to other cultures and build an intercultural community. L.D. manifested “In the

modern technology era, there are many ways for a person to improve intercultural communication ability, which can be done in many ways, such as participating in social networks and communicating more often with travelers or partners from different countries. We were acquainted to be involved in a multicultural communication environment and felt confident to solve situations. Practice makes perfect, so some webpages or online communities were built to support our learning ICC". H.M. acknowledged: "The key to improving intercultural communication competence is engaging ourselves in intercultural situations and thinking about your responses or solutions, based on the ICC improvement tools we learned. Do not let the knowledge that you have learned die. We should practice and go into real communication. Most of the most valuable lessons come from our real lives.

With the requirements of CoRAs about the provisions of materials such as videos, clips, movies, and stories on made-by-team webs, students were exposed to various sources to learn. This was implemented successfully and brought about certain significance. Many students indicated that watching movies is an effective and entertaining way to gain more knowledge of intercultural communication. By observing their basic language and actions, learners could have a better understanding of the norms, values, identity and social practice of people from different cultures. Posting the images, videos and real material on our webs contributes to providing viewers' intercultural knowledge and skills. Meanwhile, K.H. confessed that: That teachers asked us to write down the stories occurring in our experiences with the other from various culture in e-portfolios such as Facebook and Blog is also an easy and comfortable way to improve ICC skills. Additionally, extracurricular activities such as competitions, seminars and webinars that involved people introducing their understanding about IC were beneficial and valuable to learners.

4. Discussion

The quantitative survey revealed some highlighted points of English-majoring students' evaluations of the significance of collaboration-oriented reflection activities in the ICC course. Most of the participants expressed their positive perceptions of CoRAs in learning ICCs. CoRAs brought about the noticeable benefits that are relevant to reflection in IC activities, collaboration-based tasks, and skills development. Obviously, the majority of English major students acknowledged that CoRAs play an extremely important role in improving culture and enhancing ICC. This is confirmed by the results analysed in the interviews and open questions. Additionally, a large number of students in this survey chose the options "Strongly Agree" và "Agree" to express a high evaluation of the prevalent importance of CoRAs. This result is in alignment with that in previous studies (Cook, 2016; Garson, 2016; Liu et al., 2015; Tsuei et al., 2019).

On the other hand, although English major students had good awareness of the roles and positions of IC and ICC in learning foreign languages, they still did not demonstrate their abilities by studying and receiving cultural information or directly participating in intercultural communication situations to raise their own ICC. In other words, the students seemed not to be absolutely conscious in actively studying the culture of other countries or nations, especially English-speaking countries. To the author's point of view, they might be missing other important elements: practice and motivation. In the survey to explore the influence of CoRAs on IC motivation and ICC, the study illustrates the results that in comparison with the control classes without the intervention, students in experimental classes had more learning motivation and performed the intercultural communication-oriented activities better. The findings are akin to the conclusion from previous studies (Chao, 2014; Farrell, 2012; Jamhoo, 2005; Harman, 2004; Olivares, 2007)

In light of the qualitative data of the students' viewpoints about the feasibility of collaboration-oriented reflection activities in overcoming the challenges of learning the ICC course. Most students expressed positive perspectives about the implementation of CoRAs. In particular, CoRAs provided students with more opportunities for practical IC learning and communication. Learners are facilitated and supported to overcome the challenges they have to face in the learning process and involvement in the intercultural community. They believed that implementation of CoRAs was and will be beneficial. The approach could be applied in practice, and foreign language learners may be easier to access new cultures. Obviously, at any age or level of study, foreign language learners can practice intercultural communication and develop ICC in many different ways. More importantly, some of the given solutions in this study are similar to the opinions of

Galante (2015) that incorporating intercultural knowledge into the EFL curriculum is crucial to assist learners in efficiently gaining proficiency in ICC for effective and appropriate intercultural communication.

From the experience of integrating IC into the curriculum and applying CoRAs in the course, the authors offered recommendations as follows:

- Teachers should regularly facilitate students' interaction and communication with students in the class and participate in intercultural community activities; create many interesting practical activities throughout the learning process, such as role plays, competition, games, seminars, talk shows, or intercultural experimental trips to encourage students to be involved in communication activities; and develop intercultural communication competence.

- Assessment types of this subject should be reformed to be adaptive to open teaching and learning approaches. There should be more diverse assessment forms to expose comprehensive evaluation to learners in terms of knowledge and skills, including written tests combined with performance on stage to solve intercultural situations, virtual cultural trips, competitions, movies and stories.

- Teachers should advise learners to form open thinking, objective attitudes and respect for other cultures. Teaching is not only for knowledge and skills but also for morality and attitudes.

- Collaboration-oriented activities should be placed in a prior position to empower learners' autonomy, activeness, creation, critical thinking, management skills, and responsibility.

- Information technology (IT) should be thoroughly applied in teaching IC. Learners will be exposed to a wide range of significant advantages and convenience thanks to assistive IT tools. What students learn will go beyond the four walls of the classroom with the assistance of IT.

It is not easy to integrate IC and ICC into training and practice in schools in Vietnam. Many difficulties were found and received with high agreement from people answering the questionnaire. It must be acknowledged that each learner's ICC is the reception and performance of cultural knowledge throughout a long and continuous process, requiring learners to always strive and strive to cultivate and learn. Therefore, the difficulties that learners often face when learning foreign languages or when using foreign languages to communicate with foreigners are diverse and quite complicated. Similarly, the causes of those difficulties also come from both subjective and objective factors.

5. Conclusion

This study enlightens English major students' evaluation of the benefits of collaboration-oriented reflection activities in the ICC course, examines the influence of collaboration-oriented reflection activities on students' IC motivation and practice, and explores student beliefs about the challenges of learning ICC and the feasibility of collaboration-oriented reflection activities in improving ICC. A mixed-research method was implemented with the research instruments, such as questionnaires, interviews and tests. The results indicated that collaboration-oriented reflection activities brought about various benefits in the ICC course. Integrating collaboration-oriented reflection activities into teaching culture had positive effects on students' intercultural communication motivation and practice. Although several challenges still existed, students believed in the feasibility of collaboration-oriented reflection activities in improving ICC. Accordingly, comprehensive solutions for teachers and students were recommended.

There is little room for doubt that the occurrence of intercultural communication events is ineluctable due to the interaction and integration amongst people on a global scale. Along with intercultural communication, cultural barriers serve as a deterrent to the success of communication. Hence, the magnitude of gaining intercultural communication competence is apparent. Throughout the paper, various aspects, an overview of intercultural communication competence, a brief introduction of the intercultural communication concepts, and the analysis and discussion have been covered in depth. Moreover, several valuable suggestions were made to overcome existing cultural barriers in the story and to offer practical recommendations to learn intercultural communication competence effectively. Taking everything into consideration, there is no denial of the significance of ICC in a joined-up world like today. Due to some reasons, the paper bears the limitations in research scope that will be expected to be addressed in the next coming study.

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Enablers and Barriers for Quality Assurance: A Comparative Study of Vietnamese Case and International Trends

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Abstract

The study aimed to explore the internal and external enablers to quality assurance (QA) and identify barriers to QA in Vietnam as compared with international trends. Data was collected through a survey questionnaire on enablers and barriers to QA which were delivered to institutional leaders, middle administrators, lecturers, and support staff of 13 HEIs. Stratified sampling was used to select 13 out of 44 HEIs (both public and private) in one city of Vietnam. Data analysis includes descriptive statistics of factors or variables of interest identified. The results show that both internal and external forces contributed to the development of QA. Wide participation of all staff and the quantity and quality of QA staff were perceived as the most influential internal drivers respectively, followed by other internal factors. The desires to enhance HEI's image and the state policies were prompted as the major external drivers, followed by other external factors. The biggest challenges to the QA implementation were staff resistance and incompetent QA staff. The comparison across responding universities reveals several significant differences among the surveyed universities. The findings suggest that decentralisation in governance and autonomy be given to HEIs so that their responsibilities to QA endeavours can be exercised through self-regulation and self-improvement.

Keywords: internal and external enablers to QA, barriers to QA, international trends, Vietnamese case, capacity of QA staff, participation of all staff.

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1. Introduction

Quality assurance was first introduced into higher education systems worldwide more than 100 years ago under an accreditation approach in the US and now has been implemented in almost all countries worldwide with more than 300 members (INQAAHE, 2021). This global phenomenon, however, has been implemented differently. The differences are evident as shown in the literature, including the ways quality and quality assurance have been conceptualised; QA objectives; QA approaches and methods; actors in QA at various levels: macro, meso, and micro; mandated or voluntary QA mechanisms; the QA focus (institutional or programmatic); and QA procedures (Elassy, 2013; Pham, 2019). Various factors have been found affecting the effectiveness and the success of QA (Cardoso et al., 2017; Cardoso et al., 2019; IIEP, 2017; Kristensen, 2010; Pham, 2019). These factors could be categorised as external and internal drivers (IIEP, 2017; Martin, Parikh, 2017; Westhuizen, 2002). External drivers are usually reported as policy changes or government initiatives to reform higher education with two primary purposes: accountability and quality improvement (Danø, Stensaker, 2007; Horsburgh, 1997; Kristensen, 2010; Lemaitre, 2004; Westhuizen, 2002) forming an external component of the QA mechanism (EQA). External enablers could be from the market and society (Agasisti et al., 2017). Internal drivers of QA are usually reported as driving forces for forming internal quality assurance, another component of the QA mechanism (IQA). Related studies have reported common internal drivers of IQA, including institutional leadership, wide participation of various stakeholders in higher education, collaboration, and cultures (EUA, 2005; IIEP, 2018; Lange, Kriel, 2017; Santos, Dias, 2017; Stalmeijer et al., 2016).

2. Results and discussion

Quality assurance in higher education

Research and reports show that global changes in economics and societies have contributed to the introduction of QA mechanisms worldwide in a way that HEIs are required to have a more transparent role in these changes (Bigalke, Neubauer, 2009). This happens when higher education quality is no longer an internal issue of this sector; it becomes a public debate (Green, 1994) since higher education has been transferred from elite to massification together with the widespread development of private institutions. This has demanded more accountability and transparency from HEIs (Smidt, 2015).

These pressures triggered a new form of public management labelled as new public management (Homburg et al., 2007). Managerialism of this reform applies 'business-type management into the public sector and emphasises more freedom for managers to manage, explicit standards and performance measures, output controls, use of private sector management techniques, and more efficient use of resources' (Pham, 2013: 22). This requires institutions to be internally managed effectively and efficiently. For external pressures, institutions are required to be accountable to the public for educational quality. In this management model, QA systems are created to evaluate the performance of institutions (Ntsohe, Letseka, 2010).

During globalisation, QA has become a universal concept. Almost every single country has established its QA system based on different methods: accreditation, audit, evaluation, benchmarking and rankings with legal frameworks to address public and societal expectations of quality (Singh, 2010; Weber, 2010). Some countries are successful in developing their approach matching the local needs, but some others seem to be still at a developing and piloting stage of completing their QA systems (Niedermeier, Pohlenz, 2016; Weber, 2010).

There are two claimed primary purposes of this approach: accountability and improvement (Sachs, 1994). In practice, Harvey and Newton (2004) believed, 'Compliance and accountability have been the dominant purposes and any improvement element has been secondary' (p. 152). This echoes with the argument made by Harvey and Knight (1996) that QA approaches had rapidly developed and become the dominant approach of accountability.

To be effective and able to fulfil both purposes of a QA mechanism, the system needs to be a vital tool to help stakeholders all do a better job for students, society, and themselves (Williams, 2011). Research shows that a successful QA system should be built with a focus on processes by institutions to convince both internal and external stakeholders that the institutions are able to provide high-quality outcomes. The process needs to be continuous, active, and responsive with strong evaluation and feedback loops (Wilger, 1997). To be specific, Weber, Mahfooz, and Hovde

(2010) identified five lessons for such a system. It should (1) examine the missions and strategies followed by an institution; (2) focus on QA processes more than on pre-defined criteria; (3) be as much institution-driven as agency-driven, meaning that internal quality assurance procedures are an important element of quality assurance; and (4) be as light as possible; and (5) be adapted to the types of institutions in the country (p. 3). Such a system, in general, should promote self-regulation and self-improvement.

Quality assurance and accreditation system in Vietnam

The QA system in Vietnam (a Southeast-Asian developing country), which has been developed for nearly 20 years to primarily control and assure the quality of Vietnam's higher education, depends on mandatory accreditation of HEIs and programmes (Do et al., 2017). The system consists of three levels: the macro, the meso, and the micro (Nguyen, 2021). The macro level includes the Vietnam Education Quality Management Agency (VQA), Ministry of Education and Training (MOET), which is in charge of making QA policies and offering guidance and monitoring QA practices of all HEIs in Vietnam. The meso level includes accrediting agencies established by MOET that offer external assessment and accreditation at institutional and programme levels based on MOET's QA standards. The micro-level is whereby HEIs exercise their QA and accreditation activities in compliance with regulations and guidelines issued by VQA and MOET (Pham, 2019; Tran, Vu, 2019).

It is essential to note that the meso level is also marked by the presence of international accreditation agencies in addition to the domestic ones (Pham, Nguyen, 2020). By July 2021, there have been five domestic accreditation agencies under operation and two other newly-established ones in progress for full operation. Although Vietnam's QA system was developed in 2003, it is until 2016 when external evaluation was implemented. From then to May 2021, 167 HEIs out of 237 ones were accredited; and 426 programmes out of more than 5,000 programmes were accredited by both domestic and international accreditation agencies (MoET, 2021a; MoET, 2021b).

There still exist many challenges for the QA system in Vietnam. First of all, it is a lack of qualified QA staff of all levels (Nguyen, 2021). Then, there is a lack of a comprehensive QA framework (Nguyen, 2021; Pham, 2019) because the IQA component did not receive attention. It is also noted that the QA system appears to rely on accreditation agencies (Pham, Nguyen, 2020), thus leading to coping strategies for compliance (Pham, 2018). Yet, Vietnam has used the AUN-QA guidelines for its QA policies whereby IQA is one accreditation criterion at the institutional level. However, there still lack guidelines for implementation, and the IQA system by AUN-QA in 2006 that HEIs have adapted (AUN-QA, 2016; Tran, 2015) appears to be excluded from the AUN-QA framework (AUN-QA, 2020).

International trends for external and internal drivers and challenges for quality assurance

This section summarises the results from an international study by Martin and Parikh (2017) to examine drivers of and challenges to the development of QA worldwide. A questionnaire was sent to HEIs across the world. A total of 400 institutions responded, of which 311 were included in the analysis after data screening. The results of the study were used to compare with the results in this study for the Vietnam QA system.

External drivers

Institutions were asked to identify the importance of five external drivers in the development of QA. The order of importance is: (1) national requirements (89 %), followed closely by (2) the university aspirations to improve its image (87 %), (3) desires of international partners (80 %), and (4) government requests to comply with a national qualification framework (77 %) and to develop QA (75 %), the least important factor. The international study was designed to allow regional comparisons, variations across regions were found in terms of the most important factor. In Asia and Pacific, policy changes requiring higher education to develop a national QA system and reputation are the most driving forces. For Africa, they are the enhancement of self-image and international aspiration. That Europe and North America require to establish external QA mechanisms most motivates the development of QA.

Internal drivers

Martin and Parikh (2017)'s study found that for internal driving forces, the importance of nine pre-defined factors is: (1) leadership support (90 %), (2) participation of staff (88 %), (3) data available to support the analysis of quality issues (82 %), (4) adequate involvement of academic

departments (80 %), (5) clarity on the benefits of QA (79 %), (6) transparent and well-known QA procedures (79 %), (7) qualified QA practitioners (77 %), (8) the participation of students in QA activities (68 %), and finally the least recognised factor, (9) incentives for academic staff to participate in QA (around 55 %).

The regions in the study vary in identifying the most and least internal forces. The most important factor for Africa, Asia and Pacific and European, and LAC institutions was leadership support whereas for North America, it was academics' participation in QA. The most equally important one for Africa is transparent and well-developed QA procedures. The factor comes second for European and LAC institutions is the participation of staff. The least important driver for Africa and LAC is the participation of students in QA development, for Asia and Pacific and also for European and LAC institutions is the incentives for QA participation.

Challenges

As regards the obstacle to QA in developing and implementing QA worldwide, the pre-defined challenges suggested in the literature no longer exist at the surveyed institutions with remarkably low variations across regions. The study was not able to conclude on the most important barriers for the 311 institutions. Around only a fourth of responding universities faced these suggested challenges. For regional comparisons, Asia and Pacific reported the highest level of challenges, followed by Africa, and limited challenges were identified in Europe, LAC, and North America.

Theoretical framework for enablers and barriers of quality assurance

Based on a framework designed to survey QA internationally by Martin and Parikh (2017) (Figure 1), a questionnaire was developed to explore enablers and barriers of quality assurance in a city in Vietnam. The questionnaire was modified to suit the Vietnamese context, in particular, the challenges of quality assurance (Figure 2).

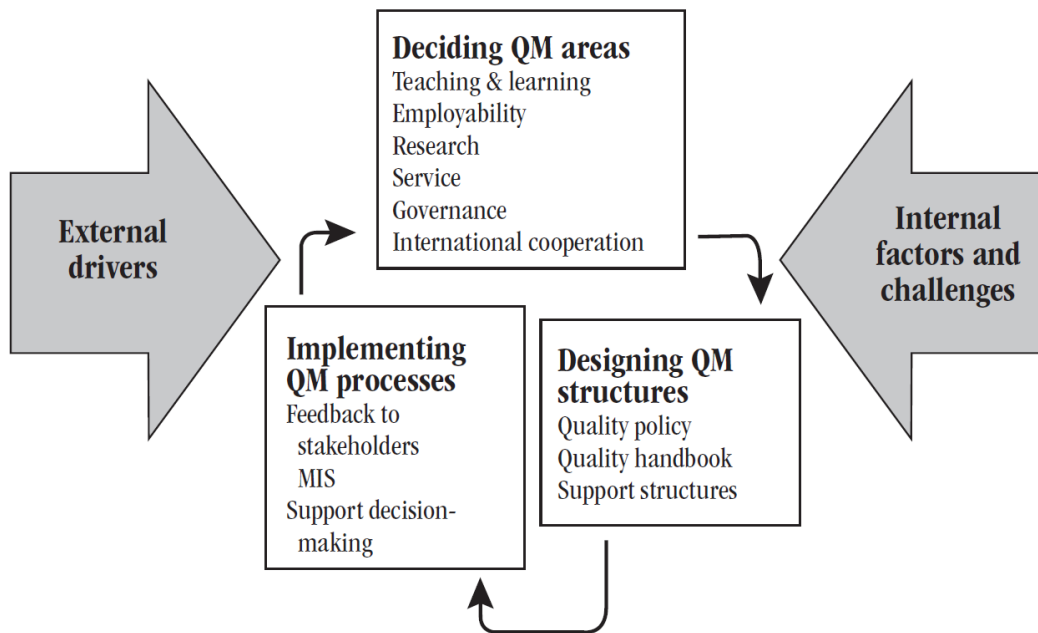


Fig. 1. Systemic view of quality assurance (Martin, Parikh, 2017: 20)

External drivers

External drivers were identified based on “the state–market dichotomy” covering governance reforms (QA schemes and national qualification frameworks) and “the enhancement of external image or an aspiration for international visibility” (the market position of an HEI). So, external drivers can be conditioned by public policy or the market (Martin, Parikh, 2017).

Internal drivers

Research has shown that QA, as a management tool, has to be supported internally for quality improvement. Some internal factors that are frequently expressed in the literature are the

support of top management leaders, wide participation of various stakeholders outside and inside of HEIs as well as all departments of the HEI, clear purposes of QA, transparency of the QA system, appropriate system to manage information, and adequate recognition and reward schemes/incentives QA participation (Martin, Parikh, 2017).

Challenges

There are particular challenges to the development of QM that emerge from the literature. Four types of challenges have been identified: (1) *staff resistance*, in part attributable to the increased workload for both administrators and academic staff, depending on the particular nature of QM in a given HEI; (2) *integration of QA with strategic planning*; (3) *integration of QA with academic planning*, and (4) *the use of data collected from QA processes*. Frequent complaints were found related to the limited usages of huge data generated from QA activities. In other words, knowledge from QA “is not necessarily well integrated with planning, decision-making, and change” (Martin, Parikh, 2017).

The review of the associated literature also shows particular challenges for the Vietnamese QA scheme. One of them is related to the professional competencies of QA practitioners (Nguyen, 2021), insufficient financial support for QA activities, and lack of support from top management of the HEI. These challenges were added to the questionnaire.

Figure 2 presents the foundations to revise the questionnaire for the Vietnamese case.

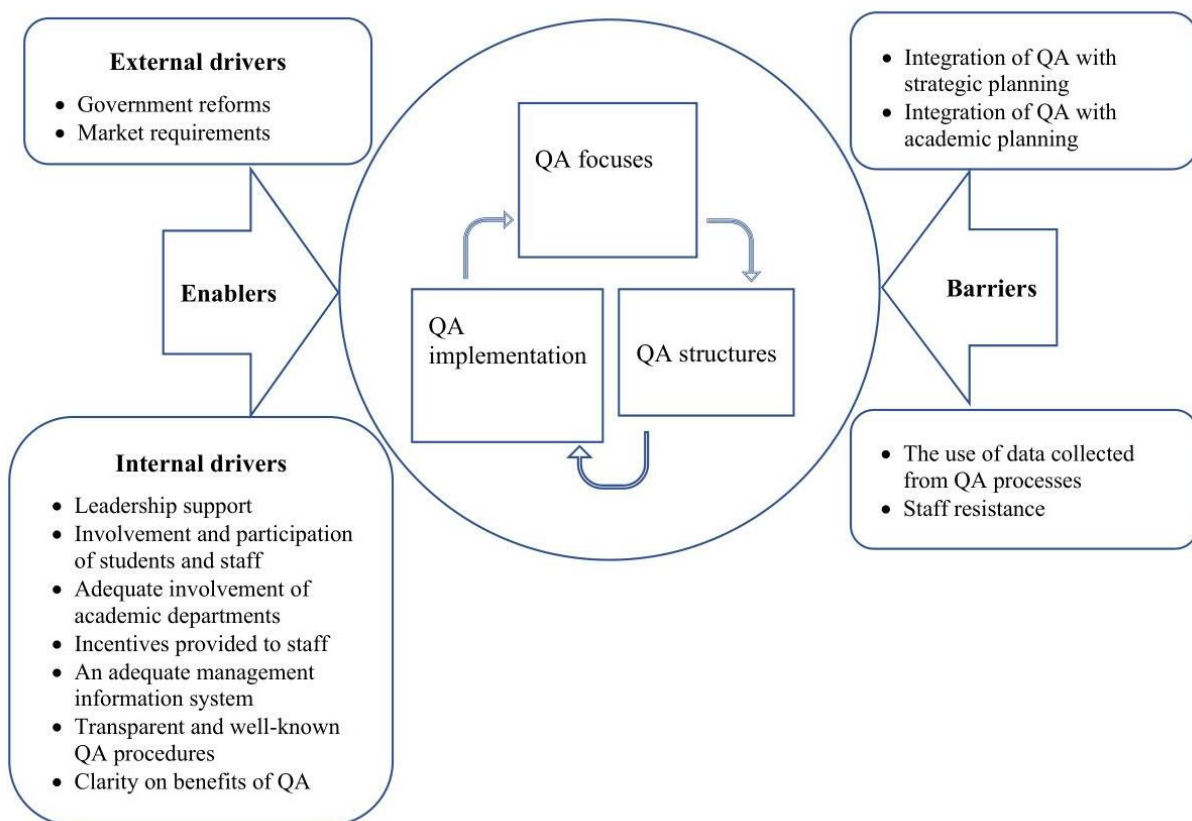


Fig. 2. Enablers and barriers to QA

Methods and participants

The study was carried out with a survey method. A questionnaire was designed to survey institutional leaders, middle administrators, lecturers, and support staff on enablers and barriers to QA. Stratified sampling was applied in this study to select 13 out of 44 universities in one city of Vietnam, representing different types of universities (public and private), accounting for approximately 30 % total number of higher education institutions in one big city of Vietnam. In addition, another criterion was applied to select universities to participate in the research: the participating universities have been externally evaluated and recognized.

Sample of the study

After data screening and cleaning, 769 responses were used for further analysis. In general, in terms of the positions of participants for each university, the sample structure is satisfactory for the analysis and is relatively consistent with the general structure of a university. For statistical analysis, participants were grouped into five positions: (1) university leaders, (2) QA practitioners, (3) faculty/department leaders, (4) lecturers and researchers, and (5) other support staff (Table 1).

Table 1. Sample: University – Position

| Positions | University A | University B | University C | University D | University E | University F | University G | University H | University I | University J | University K | University L | University M | Total | Missing |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------|-----------|
| Chairperson of University Council | 2 | 2 | | | | | | | | | | | | 4 | |
| Vice-Chairperson of University Council | | | | | 2 | | | | | | | | | 2 | |
| Rectors (or equivalent) | | | | 1 | | | | | | | | | | 1 | |
| Vice-Rectors (or equivalent) | 1 | | | | | | | | | | | | | 1 | 1 |
| Leader of QA unit | 2 | | 2 | 7 | | 2 | | | 1 | 1 | | | 2 | 17 | 8 |
| QA staff members | 1 | 1 | 2 | 15 | 3 | 1 | | 1 | 4 | 3 | 1 | | 1 | 33 | 5 |
| Head of functional departments | 2 | | 1 | 11 | | 1 | | | | | 1 | 1 | | 17 | |
| Head of academic departments | 3 | | 7 | 5 | 2 | 6 | 4 | | 3 | 4 | 5 | 2 | 3 | 44 | 3 |
| Head of professional divisions | 10 | | 3 | 14 | 6 | 1 | 2 | 3 | 1 | 7 | 11 | 1 | 2 | 61 | 4 |
| Lecturers | 52 | 23 | 58 | 22 | 35 | 30 | 45 | 12 | 21 | 34 | 3 | 10 | 8 | 353 | 13 |
| Researchers | 1 | 1 | | 1 | | | | | | | | | | 3 | 2 |
| Other support staff | 12 | 11 | 30 | 28 | 5 | 9 | 4 | 3 | 2 | 17 | | 1 | 6 | 128 | 6 |
| Others | 6 | | 1 | | | | 2 | | 3 | 2 | | | | 14 | |
| Total | 92 | 38 | 104 | 104 | 53 | 50 | 57 | 19 | 35 | 68 | 21 | 15 | 22 | 678 | 81 |
| <i>Missing</i> | <i>1</i> | | | | | | | | | | | | | | <i>10</i> |
| Head of HEI | 3 | 2 | | 1 | 2 | | | | | | | | | 8 | 1 |
| QA practitioners | 3 | 1 | 4 | 22 | 3 | 3 | | 1 | 5 | 4 | 1 | | 3 | 50 | 13 |
| Head of units | 15 | | 11 | 30 | 8 | 8 | 6 | 3 | 4 | 11 | 17 | 4 | 5 | 122 | 20 |
| Lecturers | 53 | 24 | 58 | 23 | 35 | 30 | 45 | 12 | 21 | 34 | 3 | 10 | 8 | 356 | 41 |
| Support staff | 18 | 11 | 31 | 28 | 5 | 9 | 6 | 3 | 5 | 19 | | 1 | 6 | 142 | 6 |
| Total | 92 | 38 | 104 | 104 | 53 | 50 | 57 | 19 | 35 | 68 | 21 | 15 | 22 | 678 | 81 |
| <i>Missing</i> | <i>1</i> | | | | | | | | | | | | | | <i>10</i> |

Information related to the types of HEI, orientation, and nature of HEI is presented in Table 2.

Table 2. Universities – Characteristics

| | | University A | University B | University C | University D | University E | University F | University G | University H | University I | University J | University K | University L | University M |
|-------------|------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Ownership | Public | 1 | 1 | 2 | 3 | 1 | 1 | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| | Private | | | | | | | | | | | | | |
| Nature | Public, state funding | 1 | 1 | 1 | | | 1 | | | 2 | 2 | | 3 | |
| | Public, autonomous financing | 1 | | | | 1 | | | | | | 2 | | 2 |
| | Private, not for profit | | | | 2 | | | | | | | | | |
| | Private, for profit | | | | 2 | | | 3 | 2 | | | | | |
| Orientation | Research-oriented | 1 | | | 2 | | | | | | 2 | 2 | 3 | 2 |
| | Teaching-oriented | 1 | 1 | | 2 | 2 | 1 | 3 | 2 | | | | | |
| | Research + teaching | | | 3 | 1 | | 1 | | 3 | 2 | | | | |
| | Others | | | | | 1 | | | | | | | | |

External drivers of QA in Vietnam

The results of surveying participants on external drivers were presented in [Table 3](#), showing that

- For factor analysis, one factor (external drivers 1) is formed from six variables ($\alpha = .909$), and accountability to government and society forms another external factor (external driver 2 with one variable)

- It can be seen that the external driving forces (of factor 1) are generally perceived of equal importance (means of 3.0 and 3.1), except for the requirements and desires of the international partners ($M = 2.7$).

- Among participating universities, there is a remarkable difference for factor 1, the highest is University B ($M = 3.5$), University M and University K (both with $M = 3.3$), the lowest is University H ($M = 2.4$) and University G ($M = 2.5$). The importance of accountability to the development of QA was similarly reported.

Table 3. External drivers: importance for IQA development

| EXTERNAL drivers | University A | University B | University C | University D | University E | University F | University G | University H | University I | University J | University K | University L | University M | Mean |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------|
| Requirements of the national QA system | 2.8 | 3.7 | 3.2 | 3.2 | 3.1 | 3.0 | 2.7 | 2.3 | 3.2 | 2.9 | 3.3 | 2.6 | 3.0 | 3.0 |
| Requirements of the national qualifications framework | 2.9 | 3.4 | 3.1 | 3.3 | 3.0 | 3.0 | 2.6 | 2.3 | 3.0 | 2.8 | 3.0 | 2.6 | 3.1 | 3.0 |

| | | | | | | | | | | | | | | |
|--|-----|------------|-----|-----|-----|-----|------------|------------|-----|-----|------------|-----|------------|------------|
| Government request to develop QA | 2.9 | 3.5 | 3.1 | 3.2 | 3.1 | 3.1 | 2.5 | 2.6 | 3.0 | 2.8 | 3.1 | 2.5 | 3.3 | 3.0 |
| Requirements and desires of international partners | 2.7 | 3.2 | 2.6 | 2.6 | 2.8 | 2.9 | 2.5 | 2.4 | 2.9 | 2.5 | 3.3 | 2.7 | 3.2 | 2.7 |
| Enhancement of the image of the HEI | 2.9 | 3.6 | 3.1 | 3.1 | 3.2 | 3.1 | 2.5 | 2.5 | 3.5 | 2.8 | 3.6 | 2.8 | 3.6 | 3.1 |
| International aspiration of the HEI | 2.8 | 3.4 | 2.9 | 3.1 | 3.2 | 3.0 | 2.3 | 2.7 | 3.4 | 2.8 | 3.6 | 2.9 | 3.6 | 3.0 |
| Total for EXTERNAL drivers 1 | 2.8 | 3.5 | 3.0 | 3.1 | 3.1 | 3.0 | 2.5 | 2.5 | 3.2 | 2.8 | 3.3 | 2.7 | 3.3 | 3.0 |
| Accountability EXTERNAL driver 2 | 2.7 | 3.6 | 2.9 | 3.2 | 2.9 | 3.1 | 2.4 | 2.2 | 3.1 | 2.7 | 3.2 | 2.7 | 3.3 | 2.9 |
| N | 82 | 38 | 103 | 104 | 53 | 47 | 56 | 14 | 36 | 61 | 20 | 15 | 22 | 650 |

Internal drivers

Participants were asked to evaluate the importance of internal factors affecting the QA developments at their HEI (Table 4). The results show that,

- For factor analysis, one factor (internal drivers 1) is formed from eight items ($\alpha = .929$), participation of staff in the QA procedures is separated to form another factor (Internal driver 2).

- Internal drivers played an equal importance role in developing the QA system at the investigated universities with no significant differences. For descriptive statistics, the highest equal importance lies with leadership support and competent QA practitioners ($M = 3.3$), lowest is for the participation of students in the QA procedures (2.9). In particular, the participation of academic staff and support staff in the QA procedures (Internal driver 2) is reported to be rather high ($M = 3.2$).

- There is a certain difference between participating universities, for internal factors 1, the highest is University M ($M = 3.6$), University B and University K (both with $M = 3.5$), the lowest is University L ($M = 2.7$) and University H ($M = 2.9$). The participation of academic staff and support staff in the QA procedures received a similar disparity among the universities.

Table Internal drivers: importance for the development of QA system

| INTERNAL drivers | University A | University B | University C | University D | University E | University F | University G | University H | University I | University J | University K | University L | University M | Mean |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|
| Leadership support for QA | 2.9 | 3.5 | 3.3 | 3.5 | 3.1 | 3.3 | 3.2 | 2.9 | 3.5 | 3.0 | 3.5 | 2.7 | 3.5 | 3.3 |
| Competent QA practitioners | 3.0 | 3.5 | 3.5 | 3.5 | 3.2 | 3.3 | 3.2 | 2.9 | 3.5 | 3.0 | 3.5 | 2.8 | 3.6 | 3.3 |
| Participation of students in the QA procedures | 2.9 | 3.1 | 3.0 | 2.6 | 2.9 | 3.2 | 2.9 | 2.9 | 3.3 | 2.8 | 3.3 | 2.7 | 3.3 | 2.9 |
| Clarity on benefits of QA | 3.0 | 3.0 | 3.0 | 3.2 | 3.0 | 3.4 | 2.9 | 2.9 | 3.2 | 3.1 | 3.1 | 2.9 | 3.5 | 3.1 |

| | | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Statistical information available to support analysis of quality issues | 3.0 | 3.0 | 3.2 | 3.2 | 3.1 | 3.3 | 2.9 | 2.7 | 3.3 | 3.0 | 3.4 | 2.9 | 3.3 | 3.1 |
| Technically qualified staff available to support QA processes | 2.9 | 3.1 | 3.1 | 3.1 | 3.0 | 3.3 | 3.0 | 2.5 | 3.2 | 3.0 | 3.2 | 2.9 | 3.5 | 3.1 |
| Incentives for staff to participate in QA processes | 3.1 | 3.0 | 3.0 | 3.2 | 3.1 | 3.2 | 2.8 | 2.6 | 3.4 | 2.8 | 3.3 | 2.7 | 3.0 | 3.0 |
| Adequate involvement of the department(s) in the responsibilities for QA | 3.1 | 3.3 | 3.1 | 3.1 | 3.0 | 3.2 | 2.8 | 2.5 | 3.4 | 2.8 | 3.4 | 2.9 | 3.2 | 3.1 |
| Total for INTERNAL drivers 1 | 3.0 | 3.2 | 3.2 | 3.2 | 3.0 | 3.3 | 2.9 | 2.7 | 3.3 | 2.9 | 3.3 | 2.8 | 3.4 | 3.1 |
| Participation of staff in the QA procedures INTERNAL driver 2 (one variable) | 3.0 | 3.5 | 3.2 | 3.3 | 3.0 | 3.3 | 3.2 | 2.9 | 3.4 | 3.0 | 3.5 | 2.7 | 3.6 | 3.2 |
| N | 83 | 36 | 102 | 104 | 53 | 51 | 56 | 14 | 36 | 64 | 20 | 15 | 22 | 656 |

Challenges

With the pre-defined obstacles to QA development at the HEI, the results are displayed in [Table 5](#), showing that

- For factor analysis, two factors are formed. The first factor consists of three items ($\alpha = .931$) of challenges related to the competence of QA practitioners. The second factor consists of six items ($\alpha = .941$) for other internal challenges to the development of IQA: the participation of all departments/units in QA activities, resources and policies for QA implementation.

- QA practitioners were believed to be incompetent, and this is consistent across the institutions (means of 2.0 to 2.3). This type of challenges is evaluated to be higher than other internal challenges.

- For other internal challenges, the most challenge is the awareness of the staff about the importance of QA ($M = 1.9$), lack of incentives to engage staff in QA activities, and limited use of QA data for quality improvements ($M = 1.8$). Leadership support and the integration of QA into academic and strategic planning seems not to be challenges ($M = 1.5$).

- As regards the competence of QA practitioners, the results for Universities F ($M = 2.8$), E and I ($M = 2.6$) are significantly different from those for Universities C ($M = 1.6$), D and H ($M = 1.7$).

- Regarding other internal barriers, some universities reported a higher level of challenges are Universities G ($M = 2.4$) and F ($M = 2.3$) whereas there seems to be no challenges facing some other universities, including Universities C ($M = 1.1$), D, and I ($M = 1.3$).

Table 5. Obstacles to the development of QA

| Obstacles to QA development | University A | University B | University C | University D | University E | University F | University G | University H | University I | University J | University K | University L | University M | Mean |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|
| Lack of QA staff | 2.4 | 1.9 | 2.0 | 2.0 | 2.6 | 3.0 | 2.5 | 1.8 | 2.7 | 2.6 | 2.3 | 2.5 | 2.3 | 2.3 |
| Unqualified QA staff | 2.2 | 2.1 | 1.6 | 1.5 | 2.5 | 2.8 | 2.6 | 1.7 | 2.6 | 2.5 | 1.9 | 2.2 | 1.6 | 2.1 |
| Inexperienced QA staff | 2.1 | 2.1 | 1.4 | 1.5 | 2.6 | 2.7 | 2.4 | 1.6 | 2.6 | 2.3 | 1.6 | 2.3 | 1.6 | 2.0 |
| Factor 1: Challenges related to QA staff | 2.2 | 2.0 | 1.6 | 1.7 | 2.6 | 2.8 | 2.5 | 1.7 | 2.6 | 2.5 | 1.9 | 2.3 | 1.8 | 2.1 |
| Leadership support | 1.9 | 1.7 | 0.9 | 0.9 | 1.9 | 2.1 | 2.4 | 1.5 | 1.2 | 1.6 | 1.6 | 1.8 | 1.1 | 1.5 |
| Awareness of QA importance/purposes | 2.0 | 2.4 | 1.3 | 1.8 | 2.1 | 2.4 | 2.3 | 1.6 | 1.5 | 2.0 | 1.9 | 2.0 | 1.5 | 1.9 |
| Integration of QA into strategic planning | 1.7 | 1.3 | 1.0 | 0.8 | 2.0 | 2.1 | 2.4 | 1.7 | 1.4 | 1.7 | 1.2 | 1.9 | 1.0 | 1.5 |
| Use of QA data for improvements | 1.7 | 1.8 | 1.2 | 1.7 | 2.1 | 2.5 | 2.4 | 1.8 | 1.6 | 1.7 | 1.7 | 2.1 | 1.1 | 1.8 |
| Incentives to engage staff in QA activities | 1.8 | 2.9 | 1.2 | 1.3 | 2.1 | 2.5 | 2.4 | 1.7 | 1.2 | 1.8 | 1.7 | 2.0 | 1.5 | 1.8 |
| Financial support for QA | 1.7 | 3.1 | 1.1 | 1.1 | 1.9 | 2.2 | 2.4 | 2.2 | 1.1 | 1.7 | 1.4 | 2.1 | 1.4 | 1.7 |
| Factor 2: Other internal obstacles | 1.8 | 2.2 | 1.1 | 1.3 | 2.0 | 2.3 | 2.4 | 1.7 | 1.3 | 1.7 | 1.6 | 2.0 | 1.2 | 1.7 |
| N | 73 | 34 | 96 | 103 | 52 | 49 | 55 | 13 | 36 | 58 | 20 | 15 | 21 | 626 |

Institutional variations

Table 6 displays a synthesis of the results on drivers and challenges to QA development in higher education institutions in one big city of Vietnam. Participants from three large universities with the autonomous financing mechanism (Universities B, K, and M) believed that the development of QA at their universities are supported by many internal and external drivers with a higher level of confirmation than other universities, in particular two private universities (Universities G and H) with the lowest level of support both internal and external. In addition, the participating universities faced various challenges to QA with different levels.

Table 6. Drivers and barriers to the development of the QA system

| Drivers and barriers to the development of the QA system | University A | University B | University C | University D | University E | University F | University G | University H | University I | University J | University K | University L | University M | Mean |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|
| EXTERNAL drivers | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | |
| State requirements and image enhancement | 2.8 | 3.5 | 3.0 | 3.1 | 3.1 | 3.0 | 2.5 | 2.5 | 3.2 | 2.8 | 3.3 | 2.7 | 3.3 | 3.0 |
| EXTERNAL driver 2 | | | | | | | | | | | | | | |
| Accountability to state and society | 2.7 | 3.6 | 2.9 | 3.2 | 2.9 | 3.1 | 2.4 | 2.2 | 3.1 | 2.7 | 3.2 | 2.7 | 3.3 | 2.9 |
| INTERNAL drivers | 3.0 | 3.5 | 3.2 | 3.3 | 3.0 | 3.3 | 3.2 | 2.9 | 3.4 | 3.0 | 3.5 | 2.7 | 3.6 | 3.2 |

| Drivers and barriers to the development of the QA system | University A | University B | University C | University D | University E | University F | University G | University H | University I | University J | University K | University L | University M | Mean |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------|
| 1 Participation of staff in QA procedures | | | | | | | | | | | | | | |
| INTERNAL drivers | | | | | | | | | | | | | | |
| 2 Participation of all units to QA procedures, QA data, and transparency of QA system | 3.0 | 3.2 | 3.2 | 3.2 | 3.0 | 3.3 | 2.9 | 2.7 | 3.3 | 2.9 | 3.3 | 2.8 | 3.4 | 3.1 |
| Challenges 1 QA practitioners | 2.2 | 2.0 | 1.6 | 1.7 | 2.6 | 2.8 | 2.5 | 1.7 | 2.6 | 2.5 | 1.9 | 2.3 | 1.8 | 2.1 |
| Challenges 2 Other internal challenges (leadership, academic staff, support staff, data, strategic planning, and budget for QA) | 1.8 | 2.2 | 1.1 | 1.3 | 2.0 | 2.3 | 2.4 | 1.7 | 1.3 | 1.7 | 1.6 | 2.0 | 1.2 | 1.7 |
| Ownership-nature of HEI* | CN | CN | CN | TT | CT | CN | TT | TT | CN | CN | CT | CN | CT | |
| Size of student body** | n | L | L | L | L | n | n | n | n | n | L | n | L | |

Notes:

* CN: Public, state budget, CT: Public, autonomous in finance, TT: Private, for profit

** : L: large university, >20,000 students, n: small university, <20,000 students

Discussion

This section will compare the results collected from 13 universities in one city in Vietnam with the international trends reported in a study by Martin and Parikh (2017), followed by lessons learnt for Vietnam higher education in an attempt to strive for quality and future development of a successful QA system.

Similar to international trends, this study also confirmed the contribution of both external and internal factors to the growth and development of the QA system in individual universities in Vietnam. From the three initial categories of external and internal drivers and challenges, the results of this study show that there are two subgroups of each category emerged from the data, forming six groups of factors affecting the QA maturity. Out of these six factors, wide participation of all staff of the HEI seems to be the biggest driver of QA development, followed by other internal drivers. Also related to human resources, there is a concern with QA practitioners both quantitatively and qualitatively as this is reported to most negatively affect the maturity of QA.

This study reflects some similarities to and differences from the international trends. For external drivers, the QA development in the participating universities in Vietnam is most driven by the desires to enhance their images, followed by the state policies and least by the requirements of international partners. This is a difference from the international trends regarding the order of importance of these two drivers. The global results have identified government requirements as the most driver of QA, followed by image enhancement. The Vietnamese results do not reflect exactly any regional trends as analysed in Martin and Parikh (2017)'s study. It could be only said that for the most important external driver, Vietnam shares the same result with the LAC region, of which the reputation of the HEI (self-image) is central. Nevertheless, for the general tendency of all external drivers, Vietnam shares similar results with Asia and Pacific region.

As regards internal factors driving QA activities, the Vietnamese results share a similar tendency with the international survey. They all believed that leadership support plays an important role in the success of QA. Interestingly, the results of this study indicate that competent QA practitioners are equally a key element as leadership support. Despite being part of Asia-Pacific, yet the Vietnamese case is similar to countries in Africa with the most important factor being leadership and the least important one being students' participation in QA.

The third aspect that has been investigated in this study is internal challenges. The global study only surveyed two major challenges to QA that have emerged in the literature, i.e., staff resistance and integration of QA into strategic and academic planning. While these obstacles are no longer concerns for the surveyed institutions in the international trends, staff resistance is still the most obstacle to QA implementation in Vietnam. For the Vietnamese QA development, as confirmed in other studies, QA practitioners, if qualified would be a key driver for the QA implementation at the university and if not, would become a major obstacle to QA, the biggest challenge as founded in this study. The results are somehow similar to the Asian and Pacific region.

Based on the results, this paper offers some suggestions for the future development and implementation of the QA system for individual universities. First and foremost, it is evident in this study that while external requirements could be a prerequisite of QA development and implementation at a certain HEI, the success and effectiveness of the QA system depend largely on internal forces. The former could only result in compliance whereas internal intentions and efforts would contribute to meaningful QA activities. Out of internal drivers affecting QA, participation of all staff both academic and support to QA procedures would be a key indicator of success. This echoes with the extant literature on factors for the successful development of IQA and quality culture which requires the daily commitment of every single staff to quality (Tavares et al., 2017; Vukasovic, 2014). Sufficient empirical data have shown the correlation between participation and enhanced academics' ownership in research and teaching (Cardoso et al., 2018; Hou et al., 2018; Pham, 2014). Therefore, it is suggested that HEIs in Vietnam take actions to involve as many as possible academic and support staff in its QA endeavours. This might take universities years to make this happen, yet worthwhile. The second prevalent factor is also internal, consisting of other internal drivers: collaboration of all departments, QA data, and clarity and transparency of QA procedures. This perhaps correlates with the capacities of QA practitioners, the first and ultimate challenge to the Vietnam QA, also reported in the recent study by Nguyen (2021), which leads to the second suggestion. Vietnam HEIs should train more staff to work at various levels. For the current QA staff members, continuous professional development and training in QA competencies is essential, similar with the Nguyen (2021)'s suggestion. Last but not least suggestion to the QA development connects to the comparison results of 13 institutions joining the survey. Public universities with financial autonomy seem to be more successful in developing the QA systems. This result aligns with other studies in Vietnam discussing that universities that enjoy full autonomy are likely to take responsibility for the quality of education offered (Le, Hayden, 2017; Pham, Nguyen, 2020). The findings of this study present another evidence for the Vietnamese government to speed up the reform of higher education governance to decentralisation so that individual institutions could be self-regulated and self-improved instead of compliance and, consequently, increased bureaucracy for QA activities.

3. Conclusion

The study identified both external and internal factors that are perceived to contribute to the development of the QA system in individual universities in Vietnam. The key internal drivers include the wide participation of all staff as the most influential, followed by the quantity and quality of QA staff and other internal factors. The key external drivers include the desire to promote the reputation of the university as the major factor, followed by the state policies as well as other external factors. In addition, staff resistance and incompetent QA staff were perceived as the major challenges to the QA implementation. The findings suggest that greater attention be given to both internal and external forces for individual HEIs' future development and implementation of the QA system to be successful. Specifically, it is necessary to develop a quality culture to promote staff participation in the QA process. Then, continuous professional development and training in QA competencies for QA practitioners is vital to success because they are the mediators and

collaborators in the QA process. Finally, decentralisation in governance and autonomy should be granted to HEIs so that they could be self-regulated and self-improved for QA endeavours.

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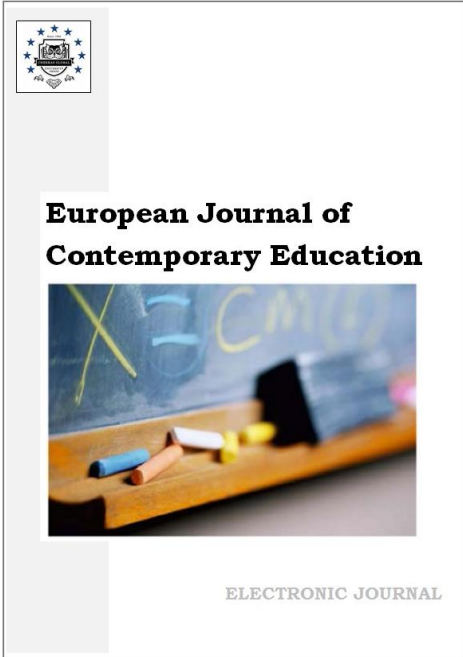
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A New Focus on Research Strategies in Determining the Structure of the Motivational Field of Scientific and Pedagogical Staff of Agricultural Universities

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Abstract

The article presents new research technologies that determine the features of motivational field structure of scientific and pedagogical staff (SPS) in the system of higher agricultural education in Russia based on mathematical statistics tools. Theoretical review of publications confirms the high relevance of the study of the motivational field by new tools: using mathematical apparatus based on principal components, estimates of structural similarity and amount of information. In the empirical part of the study, a comparative analysis of the motivational field structure of young scientific and pedagogical employees of agrarian universities (age group under 30) and the older generation (over 50) was conducted. For young workers the value of satisfaction from professional activity is defined due to qualitative improvement of labor processes and in general organization of labor on the basis of optimal ratio of labor costs and wages with preservation of good relations in labor collective. For the older age group – the value of constant increase in knowledge and interest in professional development with an active deterrent of the relationship with the immediate supervisor and the predominance of interest in work over wages.

The new research strategy increases the objectivity of the conclusions and the high interpretability of the results of sociological research.

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1. Introduction

Higher education is an important social institution in Russian society. In recent decades, it has been undergoing permanent institutional changes, which has not always had a positive effect on the motivation of scientific and pedagogical staff to work. The situation in the higher agricultural education system is complicated by the fact that despite the actively developing segment of the economy – the agricultural sector, for which agricultural universities of the country train personnel. There are still difficulties with student recruitment, changes in FSES, insufficient funding of the research sector and many other things that generally do not give stability to the staffing situation in agricultural universities. The importance of the study of the motivational field also increases because the training of scientific and pedagogical staff, capable of conducting both teaching and research activities, taking into account the continuity of scientific practices, takes a long time: about 10-12 years, taking into account the levels of higher education: bachelor, master (in some cases specialist's degree) and postgraduate studies. The requirements to work as scientific and pedagogical staff are currently high, which against the background of relatively low salaries of young teachers, hurts the motivation to work and professional development. Accordingly, there is a negative trend in the dynamics of human resources potential not only in higher education in agriculture (the potential of those who teach) but also in the agricultural sector (those who are taught), which has now made a serious bid for success and active development in Russia, including in the field of new technological breakthroughs and digitalization.

Studies of the motivational field of employees of enterprises and organizations, including scientific and pedagogical workers of higher agricultural education, are usually carried out using quantitative methods, particularly the questionnaire survey method. However, at present, sociologists' arsenal of mathematical statistics tools available in the specialized software programs Statistica, SPSS and others do not fully solve the problem of assessing the structure of quantitative information of the survey database and the objective selection of the critical influence factor.

2. Materials and methods

The task of this study is to propose and test a new method of mathematical statistics based on principal components, assessment of structural similarity and amount of information to characterize the structure of motivational field of scientific and pedagogical employees of Stavropol State Agrarian Education, as a typical representative of higher agrarian education in Russia.

In order to solve the task a survey of scientific and pedagogical employees of Stavropol State Agrarian University was organized. To compare the structure of motivational field two age categories were selected: under 30 years old and over 50 years old, which characterizes such an important parameter of research and teaching activities as preservation of continuity and professional traditions in the field of agricultural education. Thus, the general population was defined by three target characteristics:

- first feature – belonging to the number of scientific and pedagogical employees of Stavropol State Agrarian University, as a typical higher educational institution of higher agrarian education of Russia;

- the second feature – employment contract on the permanent basis;

- the third feature – belonging to the age group "up to 30 years old" and "over 50 years old".

The sample was built taking into account the organizational structure of the university and included representatives of all faculties: agrobiolgy and land resources, biotechnology, veterinary medicine, mechanization of agriculture, socio-cultural service and tourism, ecology and landscape architecture, economics, accounting and finance, and electric power. The total number of scientific and pedagogical staff with permanent labor contracts at the university is 119 people in the age group "up to 30 years" and 159 people in the age group "over 50 years" among the scientific and pedagogical staff of all faculties. Since there were 401 full-time scientific and pedagogical employees in the university in 2020 (i.e. the size of the general population is up to 500 people) stratified sampling was used in the study of the structure of motivational field. Identified strata: belonging to the age group "under 30 years" and "over 50 years" and participation of at least 80 % of scientific and pedagogical employees of each of these age groups in the university departments.

A total of 95 scientific-pedagogical workers of the age group "up to 30 years" and 127 respondents of the age group "over 50 years" took part in the survey conducted by the method of handout individual questionnaire. At a confidence level of 95 %, the general population of 401 people, comparable to the sample of 222 people, the error of the results of the study is about 4.0 %.

To develop the questionnaire the interpretation of the concept of labor motivation was carried out, indicators characterizing 8 significant characteristics were developed: interest to work, achievements in work, relationship with employees, relationship with management, pretensions in professional activity, preference of work for high wages, working conditions and general satisfaction with work. These characteristics are disclosed in the research toolkit (questionnaire) in 19 indicators:

- Indicator 1: What I do at work interests me;
- Indicator 2. In recent years, I have made progress in my profession;
- Indicator 3. I have good relationships with people in my team;
- Indicator 4. Job satisfaction is more important than earning a high salary;
- Indicator 5. My job title does not match my abilities;
- Indicator 6. What I like about my job is that I get to learn new things;
- Indicator 7. From year to year, I feel my knowledge and skills are improving;
- Indicator 8. People with whom I work respect me;
- Indicator 9. There are often situations in life where you can't do all the work you're asked to do;
- Indicator 10. My bosses have been very satisfied with my work recently;
- Indicator 11. The job I do cannot be done by someone with lower qualifications;
- Indicator 12. I enjoy doing my job;
- Indicator 13. I am not satisfied with the organisation of work in our team;
- Indicator 14. I often have disagreements with my colleagues at work;
- Indicator 15. I am rarely rewarded for my work;
- Indicator 16. Even if I was offered a higher salary, I would not change my job;
- Indicator 17. My line manager often doesn't understand or doesn't want to understand me;
- Indicator 18. Good working conditions at my company;
- Indicator 19. I set and achieve goals in my work.

The 19 indicators of job satisfaction at the University were rated from -5 to +5, where -5 is total dissatisfaction; +5 is total satisfaction.

To characterize and comparatively analyze the structure of motivational field of scientific and pedagogical employees we will use a mathematical apparatus based on principal components, estimates of structural similarity and amount of information.

Structural similarity coefficient and assessment of age-related changes

The original observations for each age group is a sample matrix (table) \mathbf{Y} of dimension $m \times n$, where $m = 19$ is the number of questions and n is the number of respondents. For the first group, under 30, $n = 95$, and for the second group, over 50, $n = 127$. We denote the elements of the sampling matrix by y_{ij} ($i = 1, 2, \dots, m; j = 1, 2, \dots, n$) respectively. Based on these data, a correlation matrix \mathbf{R} of dimension $m \times m$ and an orthogonal matrix \mathbf{Q} of dimension $m \times m$, converting the matrix to a diagonal form, are calculated for each group using the SPSS Statistics package. Thus the following equation is fulfilled

$$\mathbf{Q}^T \mathbf{R} \mathbf{Q} = \mathbf{\Lambda} = \text{diag}(\lambda_1, \lambda_2, \dots, \lambda_m), \quad (1)$$

provided the spectrum is ordered in descending order $\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_m$, where T is the transposition operator. SPSS Statistics automatically selected the first k ($k = 5$) spectral values (the central part of the spectrum) to which the first k columns of the matrix \mathbf{Q} correspond. [Table 1](#) shows the full spectrum $\{\lambda_1, \lambda_2, \dots, \lambda_m\}$ (2nd column, the main part in bold) and the first five columns of the orthogonal matrix \mathbf{Q} (from 3rd to 7th columns of Table 1) for the first age group. [Table 2](#) presents similar results of the statistical analysis for the second age group. Hereafter, membership in the second group is indicated by a wavy line ($\tilde{\mathbf{R}}, \tilde{\mathbf{Q}}$).

Table 1. The spectrum of the correlation matrix **R** and first five columns of the orthogonal transformation matrix **Q** for the first age group

| No <i>i</i> | Matrix R spectrum(λ_i) | The first five columns of the matrix Q | | | | |
|----------------|--|---|--------|--------|--------|--------|
| 1 | 6,207 | 0,314 | 0,112 | 0,045 | 0,087 | 0,135 |
| 2 | 2,187 | 0,226 | 0,121 | -0,371 | -0,100 | -0,124 |
| 3 | 1,601 | 0,296 | -0,158 | 0,074 | 0,242 | 0,280 |
| 4 | 1,366 | 0,177 | 0,090 | 0,264 | -0,472 | 0,389 |
| 5 | 1,07 | -0,190 | 0,212 | 0,232 | -0,083 | -0,134 |
| 6 | 0,88 | 0,154 | 0,221 | 0,423 | -0,175 | -0,203 |
| 7 | 0,8 | 0,252 | 0,130 | -0,163 | 0,068 | -0,144 |
| 8 | 0,75 | 0,297 | -0,010 | 0,064 | 0,325 | 0,147 |
| 9 | 0,719 | -0,048 | 0,335 | 0,312 | 0,384 | -0,192 |
| 10 | 0,647 | 0,170 | 0,235 | -0,288 | 0,105 | -0,077 |
| 11 | 0,582 | 0,149 | 0,371 | -0,375 | -0,027 | -0,057 |
| 12 | 0,47 | 0,313 | 0,083 | 0,319 | 0,027 | -0,066 |
| 13 | 0,412 | -0,204 | 0,229 | -0,058 | 0,101 | 0,588 |
| 14 | 0,35 | -0,152 | 0,436 | -0,047 | 0,036 | -0,170 |
| 15 | 0,281 | -0,179 | 0,322 | 0,159 | 0,262 | 0,040 |
| 16 | 0,245 | 0,188 | 0,257 | 0,045 | -0,524 | -0,006 |
| 17 | 0,204 | -0,220 | 0,313 | -0,124 | -0,026 | 0,426 |
| 18 | 0,14 | 0,322 | 0,034 | 0,144 | 0,195 | 0,164 |
| 19 | 0,089 | 0,288 | 0,071 | -0,175 | 0,012 | 0,031 |

Table 2. The spectrum of the correlation matrix $\tilde{\mathbf{R}}$ and first five columns of the orthogonal transformation matrix $\tilde{\mathbf{Q}}$ for the second age group

| No <i>i</i> | Matrix $\tilde{\mathbf{R}}$ spectrum ($\tilde{\lambda}_i$) | The first five columns of the matrix $\tilde{\mathbf{Q}}$ | | | | |
|----------------|--|---|--------|--------|--------|--------|
| 1 | 5,052 | 0,265 | 0,122 | 0,288 | -0,337 | 0,082 |
| 2 | 2,806 | 0,259 | 0,302 | 0,009 | -0,066 | -0,167 |
| 3 | 1,621 | 0,237 | -0,093 | -0,038 | -0,346 | 0,415 |
| 4 | 1,17 | 0,213 | 0,163 | -0,434 | 0,075 | 0,257 |
| 5 | 1,121 | -0,195 | 0,342 | -0,063 | 0,097 | 0,326 |
| 6 | 0,892 | 0,148 | 0,135 | 0,280 | 0,424 | 0,312 |
| 7 | 0,851 | 0,243 | 0,279 | 0,229 | -0,250 | -0,202 |
| 8 | 0,801 | 0,207 | 0,115 | 0,270 | 0,116 | 0,356 |
| 9 | 0,732 | -0,259 | 0,082 | 0,311 | 0,025 | -0,110 |
| 10 | 0,702 | 0,137 | 0,183 | -0,338 | 0,246 | -0,229 |
| 11 | 0,673 | 0,035 | 0,368 | -0,257 | -0,165 | -0,142 |
| 12 | 0,554 | 0,258 | -0,014 | -0,025 | -0,066 | 0,303 |
| 13 | 0,474 | -0,291 | 0,190 | -0,168 | -0,246 | 0,195 |
| 14 | 0,357 | -0,264 | 0,283 | -0,005 | -0,084 | 0,035 |
| 15 | 0,307 | -0,184 | 0,281 | 0,225 | 0,306 | 0,141 |
| 16 | 0,282 | 0,179 | 0,318 | -0,256 | 0,204 | -0,051 |
| 17 | 0,252 | -0,290 | 0,325 | 0,185 | -0,057 | -0,062 |
| 18 | 0,186 | 0,269 | -0,078 | 0,116 | 0,411 | -0,209 |
| 19 | 0,166 | 0,264 | 0,222 | 0,222 | -0,152 | -0,267 |

To assess overall age-related changes, we calculate the structural similarity coefficient (see [1])

$$s = \max_{\varphi(i)} \frac{\sum_{i=1}^k \sqrt{\lambda_i \tilde{\lambda}_{\varphi(i)}} |\mathbf{q}_i^T \tilde{\mathbf{q}}_{\varphi(i)}|}{\sqrt{\sum_{i=1}^k \lambda_i \sum_{i=1}^k \tilde{\lambda}_i}}, \quad (2)$$

where \mathbf{q}_i stands for the i -th column of the matrix \mathbf{Q} , the wave, as above, marks the columns and values belonging to the second age group, and the maximum is taken by all possible permutations (φ) of elements of the set number $\{1, 2, \dots, k\}$, k being five in our case ($k = 5$, see above). $\{\mathbf{q}_i\}_{i=1}^k$ is the basis of the principal components.

To calculate the structural similarity coefficient, let us compose two matrices $\mathbf{A} = (\sqrt{\lambda_1} \mathbf{q}_1, \sqrt{\lambda_2} \mathbf{q}_2, \dots, \sqrt{\lambda_k} \mathbf{q}_k)$ и $\tilde{\mathbf{A}} = (\sqrt{\tilde{\lambda}_1} \tilde{\mathbf{q}}_1, \sqrt{\tilde{\lambda}_2} \tilde{\mathbf{q}}_2, \dots, \sqrt{\tilde{\lambda}_k} \tilde{\mathbf{q}}_k)$. As we see, these matrices are made up of the columns of the orthogonal matrix \mathbf{Q} and $\tilde{\mathbf{Q}}$, multiplied by the square roots of the corresponding eigenvalues. Then we have

$$\mathbf{A}^T \tilde{\mathbf{A}} = \begin{pmatrix} \mathbf{5,304} & 0,588 & 0,273 & -0,131 & 0,072 \\ -0,714 & \mathbf{2,171} & 0,087 & 0,221 & -0,027 \\ -0,097 & -0,419 & 0,399 & 0,549 & \mathbf{0,858} \\ -0,442 & -0,310 & \mathbf{0,843} & -0,177 & 0,014 \\ -0,094 & 0,131 & -0,241 & \mathbf{-0,271} & 0,323 \end{pmatrix}.$$

By selecting one number from each column and each row so that the total sum of the modules is maximal, we obtain the numerator of formula (2). In our case it equals 9,446 (the result of selection is marked in bold). Further, by dividing by the denominator, which in our case is 12,096, we obtain the value of structural similarity coefficient $s = 0,781$. As shown in (Pichugin, 2018), if the regression relation between the numerator elements, with a corresponding permutation (φ) and a change of sign of some columns ($\tilde{\mathbf{q}}_{\varphi(i)}$, see above), does not have a free term, then we can test hypothesis $\mathbf{H}: s = 0$. Checking the above condition showed that the required condition can be considered satisfied since the t-statistic for its verification gives a value of 1,221 versus the critical value of $t_{\nu}^{\alpha/2} = 2,779$, at $\alpha=0,05$. This allows hypothesis H to be tested by means of t-statistics (see (Pichugin, 2018))

$$\gamma = \frac{s\sqrt{mk-1}}{\sqrt{1-s^2}},$$

Which gives the value $\gamma = 12,121$, which significantly exceeds the critical value and at significance level $\alpha = 0,01$, i.e. hypothesis H is firmly rejected (the number of degrees of freedom in both cases is $\nu = mk - 1 = 94$). See below for a discussion of this result.

3. Results

Results of information ordering

As a result of information ordering, we have a sequence of values of the quantity of information I_j . In addition, it is convenient to consider a descending sequence of information

quantity increments an auxiliary $\Delta I_j = I_j - I_{j-1}$, (see below) sequence of information quantity ratios $\Delta I_{j+1} / \Delta I_j$ and (most importantly) a sequence of question numbers in descending order of information quantity increments $i = \mu(j)$ ($j=1, 2, \dots, m$).

Table 3 shows the results of the information ordering for the first age group. Table 4 shows similar values for the second age group. The graphical representation of the third columns of Tables 3 and 4 (information growth I_j) shows no significant difference. Most revealing are the fourth columns containing decreasing sequences of information increments (ΔI_j). These columns are graphically represented in Figure 1 and Figure 2, respectively. The last – fifth columns of Tables 3 and 4 are of an auxiliary nature and serve to clarify the boundaries of the most or least informative (important) questions for the age groups considered (see below).

Table 3. Results of information sequencing (first age group)

| No selection step j | No question $\mu(j)$ | Amount of information I_j (%) | Increment of the amount of information ΔI_j (%) | Ratio of consecutive increments of the amount of information $\Delta I_{j+1} / \Delta I_j$ |
|-----------------------|----------------------|---------------------------------|---|--|
| 1 | 12 | 11,74 | 11,74 | |
| 2 | 11 | 22,03 | 10,28 | 0,88 |
| 3 | 9 | 32,22 | 10,19 | 0,99 |
| 4 | 13 | 41,86 | 9,64 | 0,95 |
| 5 | 4 | 51,09 | 9,23 | 0,96 |
| 6 | 3 | 59,47 | 8,38 | 0,91 |
| 7 | 16 | 65,05 | 5,58 | 0,67 |
| 8 | 17 | 69,65 | 4,59 | 0,82 |
| 9 | 8 | 73,96 | 4,31 | 0,94 |
| 10 | 2 | 78,10 | 4,14 | 0,96 |
| 11 | 6 | 82,11 | 4,01 | 0,97 |
| 12 | 14 | 85,63 | 3,51 | 0,88 |
| 13 | 18 | 88,38 | 2,75 | 0,78 |
| 14 | 15 | 91,06 | 2,69 | 0,98 |
| 15 | 10 | 93,55 | 2,49 | 0,93 |
| 16 | 5 | 95,37 | 1,82 | 0,73 |
| 17 | 1 | 97,14 | 1,77 | 0,97 |
| 18 | 7 | 98,68 | 1,54 | 0,87 |
| 19 | 19 | 100,00 | 1,32 | 0,86 |

Table 4. Results of information sequencing (second age group)

| No selection step j | No question $\tilde{\mu}(j)$ | Amount of information \tilde{I}_j (%) | Increment of the amount of information $\Delta \tilde{I}_j$ (%) | Ratio of consecutive increments of the amount of information $\Delta \tilde{I}_{j+1} / \Delta \tilde{I}_j$ |
|-----------------------|------------------------------|---|---|--|
| 1 | 17 | 11,54 | 0,46 | |
| 2 | 7 | 22,48 | 0,90 | 0,95 |
| 3 | 4 | 32,06 | 1,28 | 0,88 |
| 4 | 6 | 41,27 | 1,65 | 0,96 |
| 5 | 3 | 48,68 | 1,95 | 0,80 |
| 6 | 18 | 55,22 | 2,21 | 0,88 |
| 7 | 5 | 60,81 | 2,43 | 0,86 |

| | | | | |
|----|----|--------|------|-------------|
| 8 | 10 | 66,07 | 2,64 | 0,94 |
| 9 | 1 | 70,87 | 2,83 | 0,91 |
| 10 | 11 | 75,13 | 3,00 | 0,89 |
| 11 | 15 | 78,88 | 3,15 | 0,88 |
| 12 | 19 | 82,56 | 3,30 | 0,98 |
| 13 | 13 | 85,75 | 3,43 | 0,86 |
| 14 | 16 | 88,86 | 3,55 | 0,98 |
| 15 | 8 | 91,94 | 3,68 | 0,99 |
| 16 | 9 | 94,23 | 3,77 | 0,74 |
| 17 | 2 | 96,42 | 3,86 | 0,96 |
| 18 | 14 | 98,30 | 3,93 | 0,86 |
| 19 | 12 | 100,00 | 4,00 | 0,90 |

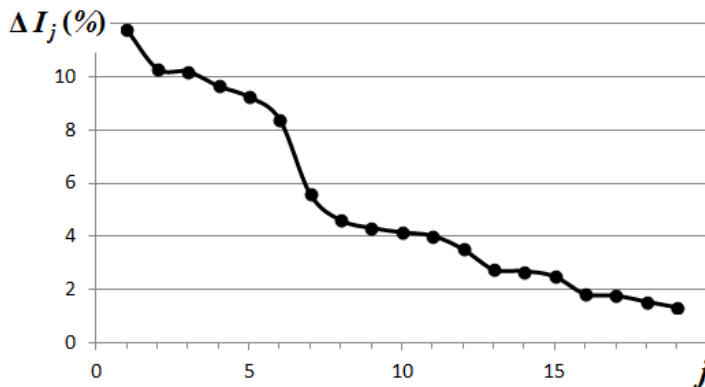


Fig. 1. Decreasing increments in the amount of information when a sequential selection of questions (age group 1)

Figure 1 shows the decrease in the increments of the relative amount of information in the sequential selection. Figure 1 shows that starting from the 7th selection step there is a noticeable decrease in the increments of the amount of information. In the last column of Table 3, a relatively low value $\Delta I_{j+1} / \Delta I_j = 0,67$ corresponds to the boundary of this transition (this "step") (shown in bold). Consequently, for the first age group, the 6 questions are the most important (the numbers of these questions in the second column of Table 3 are in bold). On the other hand (see "tail" of the graph), it is possible to identify a group of four questions which the first age group considers unimportant. The relatively low value $\Delta I_{j+1} / \Delta I_j = 0,73$ in the last column of Table 3 also serves as a boundary here (the numbers of irrelevant questions are in italics).

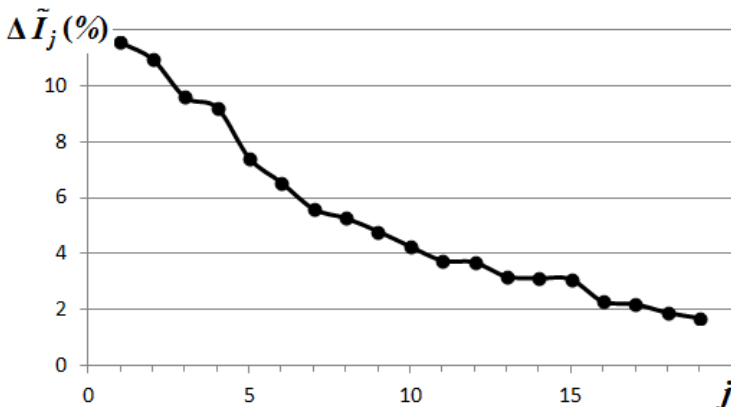


Fig. 2. Decreasing increments in the amount of information when a sequential selection of questions (age group 2)

Compared to the first age group, the second group (see Figure 2 and the last column of Table 4) does not highlight the most important questions so sharply (a relatively smoother drop in the graph). Their number is limited to four questions. However, the number of relatively little questions in the second age group is the same as in the first group, although the numbers of little questions are different (also highlighted in italics in Table 4).

Before turning to the substantive part of the results obtained, let us note the essential point of this research method's general ideology. In model (6), the components of the vector \mathbf{Z} are interpreted as intrinsic latent motives in numerical terms. Thus, the most informative questions identified in the above procedure are strongly related to intrinsic motivation. Mathematically, this means that from the test results for the most informative questions, we can more accurately (than for any other questions) estimate the components of vector \mathbf{Z} , for which, in turn, we can reproduce the test results for the remaining questions with the minor mistake (Pichugin, 2019).

Sociological conclusions

Let us now consider the content side of selecting variables based on the results of information order. The data are presented in Table 5.

Table 5. Content characteristics of the work motivation indicators in the young and older age groups of scientific and pedagogical staff (list ordered by statistical procedures)

| Scientific and pedagogical staff up to 30 | Scientific and pedagogical staff over 50 |
|--|---|
| Indicator 12. I enjoy the process of working | Indicator 17. My line manager often does not understand or does not want to understand me |
| Indicator 11. Someone cannot do the work I do with lower qualifications | Indicator 7. Every year I feel my professional knowledge is growing |
| Indicator 9. There are often situations in life where you cannot do all the work assigned to you | Indicator 4. Job satisfaction is more important than earning a high salary |
| Indicator 13. I am not satisfied with the organisation of work in our company | Indicator 6. What I like about my job is that I get to learn new things |
| Indicator 4. Job satisfaction is more important than high salaries | – |
| Indicator 3. I have a good relationship with my co-workers | – |

Summarising the internal, most significant motives for young scientific-pedagogical employees (up to 30 years old) makes it possible to formulate a vector of increasing motivation to work. Satisfaction from the professional activity is valued due to the qualitative improvement of work processes and, in general, organisation of work based on an optimal ratio of labour costs and wages while maintaining good relations in the work collective.

The structure of critical motives of the older age group (scientific and pedagogical employees over 50 years of age) includes the value of the continuous increase in knowledge and interest in professional development with the active deterrence of the relationship with the immediate supervisor, and the predominance of interest in work overpay.

Thus, the most informative issues highlighted through the above procedure of mathematical statistics, most strongly associated with intrinsic motivation, were aggregated into the critical values of scientific and pedagogical employees of higher agricultural education. This information can serve as an objective basis for making managerial decisions aimed at increasing the motivation of this category of employees to work (Pichugin, 2020).

4. Discussion

A review of the literature on research strategies for studying the motivational field of employees in companies and organisations exposes the relevance of finding new solutions.

Authors C. Gerhardt, N.K. Semmer, S. Sauter, B. Ulrich, A. Elfering conducted a meta-analysis of 557 studies and examined correlations between social stress factors and health and well-being outcomes (Gerhardt et al., 2021). The quantitative analysis of a large body of information, for which the tools of mathematical statistics are essential, is noteworthy. The study found that the most substantial effects were job dissatisfaction, emotional burnout and unproductive work behaviour. All of this harmed people's overall health and well-being. On the one hand, this study confirms the importance of exploratory analysis of the work sphere and job satisfaction. On the other hand, we see the need for mathematical, statistical tools, which are also in active development. These are essential arguments in favour of new research strategies and a specific proposed method for determining the structure of the motivational field of employees.

The issues of professional identity, job satisfaction, and burnout to change jobs have been addressed by Chinese researchers T. Zhang, J. Feng, H. Jiang, B. Pu, Y. Gang (Zhang et al., 2021). The study was conducted in China and analyzed data from a national survey of health care professionals conducted on a stratified multistage sample of 3,236 general practitioners. The proposed indicators of job satisfaction assessment had scale values to enable in-depth analysis of the data through mathematical statistics. This study also confirms the relevance of the methods used in our paper to study personnel satisfaction with work. The issues of job satisfaction are also discussed in the articles (Sung et al., 2021; Golob et al., 2021; Qu et al., 2021).

Questions of quality of work processes in the structure of personnel work satisfaction are raised by the authors F. Alazmani-Noodeh, K. Abdi, H. Ranjbar (Alazmani-Noodeh, 2021). The research results emphasize the significance of goal-setting of work activity in stressful situations. The same conclusions about the influence of an organization's goals and mission on the staff's satisfaction with work are presented in several publications (Javanmardnejad et al., 2021; Nurmeksela et al., 2021; Molina-Hernández et al., 2021; Bakeret et al., 2021).

It is essential to maintain an optimal balance between effort and reward of employees (Ge et al., 2021). This aspect of job satisfaction occupies an important place in Russian organisations and is articulated in other countries (Akuffo et al., 2021; Deng et al., 2021; Keku et al., 2021). In our study, this motivational factor was voiced both in young scientific and pedagogical workers of higher agricultural education and in the older age group. It was the only recurring factor in the structure of the motivational field of the compared categories of employees.

5. Conclusion

This work shows that the application of modern methods of multivariate mathematical statistics opens up entirely new possibilities in sociological research. These methods are undoubtedly objective, which, in turn, makes it possible to draw more valid conclusions from the research results. The overall interpretability of the results, which does not cause any difficulties, also supports the objectivity.

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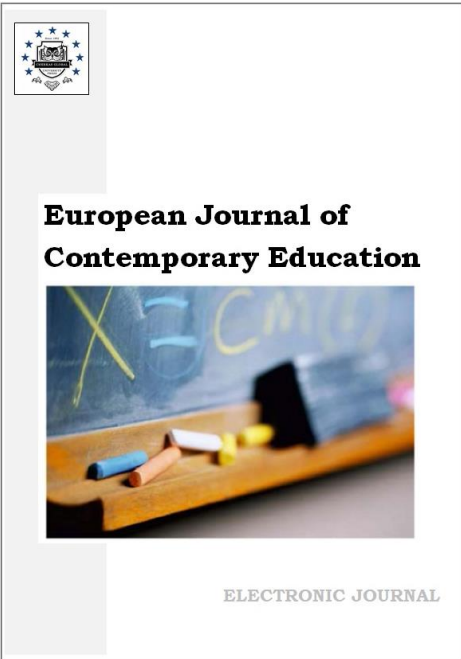
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Theoretical Foundations for Education of Positive Behavior Skills Among Young Athletes: A Qualitative Study

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Abstract

The increase in aggressiveness and disrespect to their peers in physically active teenagers and adolescents has become a major topic in the academic world. Risky behavior in teenagers has been attributed to biological, psychological and social factors. Therefore, it is essential to pay much attention to educational programs that develop a person's physical, emotional, social and cognitive aspects. It has been concluded that positive behavior skills education may be beneficial in personality development. However, there are not many educational programs based on the current theoretical knowledge about the development of positive behavior skills. In addition to this, no educational program, that is based on the positive behavior skills, has been applied in the education of young sportspeople. The aim of our qualitative study was to analyze the theoretical foundations for education of positive behavior skills among young athletes. This qualitative study is based on a directed content analysis strategy. The methods used in the course of this study are analysis of academic literature, synthesis, summarizing, grouping and comparing. It has been highlighted that the construct of positive behavior skills comprises positive personal, positive social and positive emotional skills, that create a multi-layered structural model of positive behavior skills. The types of positive personal, positive social and positive emotional behavior skills are crucial when putting together educational programs for young sportspeople and their well-being. Concluding the results of our theoretical analysis, positive social, positive personal and positive emotional skills should be prioritized in educational programs that develop young athletes' positive behavior skills.

Keywords: skills education, positive behavior skills, personal skills, social skills, emotional skills, young athletes.

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1. Introduction

During the teenage years, our personalities go through fast and important changes. We develop biologically, psychologically and socially and we learn to live independently. The psychosocial part of the development process is strongly influenced by the interaction between the development in earlier stages of life and the biological, social and cultural factors that happen during the teenage years (Salavera et al., 2017). A teenager has to become an independent adult by finding their identity and building strong relationships with their peers during a time when their social life is unstable and fast-changing (Blakemore, 2018).

The increase in aggressiveness and disrespect to their peers among professional and not professional adolescent sportspeople has become a major topic discussed widely not only in social media but also in the academic world (Cristello et al., 2020; Jewett et al., 2020; Mays, Thompson, 2009; Whitley et al., 2019). The competitiveness routinely observed in sports can create social exclusion (Cote, Hancock, 2014), disrupt close relationships, stimulate social division and even social delinquency among teenagers and adolescents (Ferreira et al., 2007; Pabayo et al., 2014; Whitley et al., 2019). Waid and Urich (2020) underline biological, psychological and social factors that are linked to risky behavior in teenagers. Biological factors comprise physical growth and pubescence, social factors include social and emotional changes, while psychological factors include changes in identity and self-control (Chick, 2015; Waid, Urich, 2020). Educational programs based on physical, emotional, social and identity development are essential when evaluating these factors (Bailey, 2006; Whitley et al., 2019). Hemphill et al. (2019) suggests that education in positive behavior skills may be beneficial for the emotional, social and cognitive development. It is clear that the current sports-based programs focus on physical well-being. However, recently more attention has been drawn to the social and emotional development as well (Akelaitis, 2017; Kochanek, Erickson, 2020). Unfortunately, there is a limited number of educational programs that are based on integrated skills development as opposed to focusing on either social or emotional skills. In addition to this, no educational program, that is based on the positive behavior skills, has been applied in the education of young sportspeople. Therefore, this paper aims to find out what positive behavior skills should be the base of education programs for young athletes.

Purpose of the present study: to analyze the theoretical foundations of the development of positive behavior skills in young sportspeople.

Aims of the study:

1. To analyze existing models of positive behavior skills development.
2. To substantiate the complex of the positive behavior skills that could be used as the basis of an educational program for young athletes.

2. Methods

Research strategy and logic. The qualitative study is based on a directed content analysis strategy that is an independent methodological strategy. Qualitative directed content analysis (in our case key concepts and definitions analysis) means in a broad sense interpretation and generalization of written data. Content analysis using a directed approach is guided by a structured process. Using existing theory or prior research, researchers begin by identifying key concepts or variables as initial coding categories (Elo, Kyngäs, 2008). Next, operational definitions for each category are determined using the theory. After the analysis, new models, concepts or categories for the research objects are found to describe.

The research methods used in the course of this study are analysis of scientific literature, synthesis, summarizing, grouping and comparing.

3. Results

In scientific literature, positive behavior skills are often the objective of research in positive behavior paradigm in youth (Chartier et al., 2021; Deb, 2018; Deutsch, 2017; Hemphill et al., 2019; Holt et al., 2020; Lerner, 2017). Pearson et al. (2021) concludes that positive behavior skills are the ability to create one's well-being while interacting with people or groups of people under diverse environmental and cultural circumstances. Often the academic literature on positive behavior development in youth focuses on life skills that can be observed in various life scenarios. For example, Holt et al. (2020) suggests that positive behavior skills comprise transferable

personal and social life skills. Hemphill et al. (2019), on the other hand, identifies the development of social, emotional and personal skills as the subject of the positive behavior development research. This is supported by other authors (Holt et al., 2020; Napolitano et al., 2021; Soto et al., 2021; Weis, Wiese, 2009), who consider these skills necessary when developing strong, positive social relations and learning to control one’s emotions and behavior. This highlights the necessity to develop positive personal skills as part of the set of positive skills oriented to the changes in self-cognition and self-control during the teenage years.

Sin, Jone and Petocz (2007) state that the terms *personal skills* and *interpersonal skill* are interchangeable as they both mean the ability to control oneself or being in unison with oneself. This is well illustrated in the variety of the definitions of *personal skills* (Table 1). Geisinger (2016) describes personal skills as a set of skills that helps develop a positive relationship with one’s thoughts. Kolb and Handley-Maxwell (2003) comment that positive behavior skills are those that help develop one’s identity, being in a positive relationship with oneself. To summarize, personal skills are positive personal skills. Personal skills are related to the development of one’s identity (Widjaja, Saragih 2018). The development of personal skills is focused on consciousness, self-confidence, positive interpersonal communication (prosocial behavior) and the ability to take responsibility (Prajapati et al., 2017). According to Sambaiah and Aneel (2016), personal skills are considered essential for a healthy relationship with oneself that, in turn, in means a better relationship with others.

Table 1. Definitions of personal skills

| Definition | Author |
|--|--------------------------|
| The ability to perceive and control oneself. | Bar-on, 1997 |
| The ability to reflect on oneself. | Caena, Punie, 2019 |
| The ability and motivation to react to oneself in a positive way in the context of surrounding social systems. | Fetro et al., 2010 |
| The ability to focus one’s state of mind on an important goal. | Fitzsimons, Bargh, 2004 |
| Skills that develop a positive relationship with one’s thoughts. | Geisinger, 2016 |
| The ability to change, maintain and divert one’s behavior in order to achieve an important goal. | Ilkowska, Engle 2010 |
| The ability to control oneself. | Purwoastuti et al., 2015 |
| The skills related to the relationship to oneself. | Raudeliūnaitė, 2007 |

There are multiple personal skills models and therefore the classification of personal skills varies. It is important to note that personal skills are similar to social skills in the sense that they both are linked to diverse life situations. This is the reason for a variety of personal skills types (Table 2). Nevertheless, there has been no consensus on a universal personal skills model definition in the current academic literature. The academic community is only beginning to discuss the importance of positive personal skills in the context of the development of positive behavior skills.

Table 2. Types of personal skills

| Author | Types of personal skills |
|--------------------|---|
| Chalkiadaki, 2018 | Self-improvement Autonomy Creative skills Critical thinking skills Problem-solving skills Self-control Ability to adapt |
| Fetro et al., 2010 | Building a relationship with oneself Building relationships with others Overcoming skills Resolution skills |

| | |
|----------------------|--|
| Gammie et al., 2002 | Writing curriculum vitae Ability to give interviews Ability to look for a job Time management skills Teamwork skills Public speaking skills |
| Griffin et al., 2001 | Decision making skills Self-control skills Self-regulation skills |
| Sunarto, 2015 | Being proactive Being ethical/fair Critical thinking skills Ability to learn Ability to commit Motivation Enthusiasm Creativity |

Given the variety and diversity of these definitions, it has not been established what personal skills are the most important in developing positive behavior skills in youth. The academic papers analyzed over the course of this research highlight three important personal skills that may be the most significant when developing positive behavior.

Habashi, Graziano and Hoover (2016) conclude that prosocial behavior skills are some of the positive personal skills due to being closely linked to individual differences (individual relations) that determine the manifestation of different prosocial behavior. The ability to take responsibility is also one of the positive personal skills constructs (Filiz, Demirham, 2019; Newman, 2020; Smithikrai et al., 2015). Asumeng (2014) states that positive personal skills must also include a positive self-evaluation that allows one to make positive assumptions about oneself. We therefore presume that positive personal skills comprise prosocial behavior, the ability to take responsibility and positive self-evaluation.

Another positive behavior skillset is positive social skills. The academic community has been discussing social skills for a long time. However, there has not been one universal definition of social skills (Nangle et al., 2020). Table 3 illustrates a variety of social skills definitions encountered in various papers. They highlight two main parts of social skills: communication and relation to others. While these definitions differ, there is a certain agreement regarding the education of social skills. Social skills constitute learned behaviors that involve initiated behavior and its feedback when communicating with others (Little et al., 2017). In short, social skills are the skills that enable individuals to function competently in various social tasks (Cook et al., 2008). Lawhon and Lawhon (2000) indicate that well-developed social skills are the reason behind a positive experience when communicating with others. In short, we may say that the best way to define social skills is ‘the ability to interact in socially acceptable ways’ (Šniras, 2005) because this definition includes the most frequently mentioned parts of the definition of social skills, in addition to reflecting the components of the positive behavior development paradigm that are highlighted when creating positive, long-lasting relationships between youngsters and adults and teaching adolescents to use social skills in their communities (Holt et al., 2020; Lerner, 2004).

Table 3. Definitions of social skills

| Definition | Author |
|--|------------------------------|
| Learned behaviors that enable individuals to function competently in various social tasks. | Cook et al., 2008 |
| Social behaviors valued in a given culture that increase the likelihood of favorable results for the individual, their group and the community, and can contribute to a socially competent performance in tasks related to interpersonal skills. | Del Prette, Del Prette, 2021 |

| | |
|---|------------------------------|
| Category of socially accepted behaviors that are necessary for social competences. | Del Prette, Del Prette, 2021 |
| Skills that help individuals initiate and maintain relationships, develop friendships and be accepted by their peers. | Gresham et al., 2006. |
| Culturally-linked behavior learned during communication with peers and adults. | Ladd, 2005 |
| Ability to interact in socially accepted ways. | Šniras, 2005 |

The definitions of social skills and social competences are often used interchangeably. They are linked but have different models (Nangle et al., 2020). Social skills are part of social competences and are considered essential when developing the ability to react appropriately in social situations. Competences are the process of evaluation, while skills are necessary to function competently in various social tasks. The definition of social competences is important in order to comprehend interpersonal relationships. The term *social competences* is the evaluation of behavior and interpersonal communication, which is why Del Prette and Del Prette (2021) believe the definition of social competences should include 3 aspects: the recognition of one’s behavior (thoughts, feelings, actions) evaluated during an interpersonal task; matching one’s personal goals that are appropriate in a particular situation and culture; guaranteeing positive results when measured along instrumental and ethical criteria.

There has also been no consensus as to what social skills are the main ones, partially because it is often difficult to distinguish the main skills from the manifestations of social competences (Junge et al., 2020).

Table 4. Types of social skills

| Author | Types of social skills |
|------------------------------|--|
| Del Prette, Del Prette, 2021 | Communication skills Active citizenship Friendliness and ability to maintain friendships Empathy Ability to convince Showing solidarity Conflict management and interpersonal problem solving Love and intimacy Team management skills Public speaking skills |
| Nangle, 2020 | Ability to communicate Ability to control emotions Cognition Problem solving skills |
| Gresham et al., 2011 | Cooperation skills Perseverance Empathy Self-control Ability to take responsibility |
| Johnston et al., 2013 | Communication skills Conflict resolution skills Cooperation skills Leadership skills |
| Junge et al., 2020 | Social coding skills Social problem-solving skills Ability to control emotions Communication skills Empathy |

Table 4 illustrates the variety and diversity of social skills that are needed to be considered socially competent. It is clear that there is no consensus on the main skills that comprise social competency. However, the social skills suggested by Gresham et al. (2011) are most commonly used in research papers. These social skills are: cooperation skills, perseverance, empathy, self-control and ability to take responsibility (Gresham et al., 2011). The social skills types that Elliott, Frey and Davies (2015) proposed – cooperation skills, perseverance, empathy, self-control, social control, the ability to take responsibility and commit – are frequently chosen and used in education programs. Little et al. (2017) comment that due to practical reasons social skills are conceptualized using evaluation tools that enable accurate measurement. Therefore, the skills that Gresham et al. (2011) highlight can be measured in a reliable way using those evaluation tools (Gresham, Elliott, 1990). We conclude that positive social skills comprise the skills mentioned in the Gesham et al. (2011) model.

The last positive behavior skills construct is emotional skills. As with the definitions of personal and social skills, the definition of emotional skills has not been agreed upon (Salokivi et al., 2021). The diversity of definitions is shown in Table 5. Nevertheless, all of these definitions share certain features: the ability to understand (comprehend) emotions, the ability to evaluate emotions, the ability to express emotions, the ability to use the information about emotions in order to control one’s behavior or thought process, the ability to control emotions. These features reflect abilities (skills). We can summarize those positive emotional skills are ‘the ability to control one’s emotions and other people’s emotions that allows one to achieve communication goals and maintain positive relationships with other people’ (Legkauskas, 2012). This definition matches one of the components of the positive behavior development in youth paradigm linked to positive and long-term relationships between youngsters and adults (Holt et al., 2020). Saloviki et al. (2021) claims that the term *emotional skills* could be used in a general way in order to understand the topic easier. However, the definitions of emotional skills cannot be used separately from each other as only the sum of them can reflect the complexity of emotional intelligence (Terzioglu, 2018).

Table 5. Definitions of emotional skills

| Definition | Author |
|--|-----------------------|
| Ability to understand and accurately convey emotions, use emotions to facilitate thoughts, to understand emotions and to control them. | Brackett et al., 2004 |
| Conscious ability to understand one’s emotions and those of others by correctly identifying and conveying them. | Faupel, 2003 |
| Components of emotional intelligence that enable one to recognize, understand and comprehend emotional experiences. | Gohm, Clore, 2002 |
| Ability to control positive and negative emotions intra- and interpersonally, ability to control strong emotions. | Luebbers et al., 2007 |
| Ability to recognize, process and use emotional information. | Petrides et al., 2001 |
| Ability to observe and recognize emotions and feelings intra- and interpersonally to facilitate thought and control behavior. | Salovey, Mayer, 1990 |

Emotional intelligence is described as a psychological process that enables one to use, understand and control emotions in self and others by controlling behavior and solving problems (Salovey, Mayer, 1990). This indicates that emotional intelligence is linked to a complex usage of emotional skills in individual and social tasks. From the social skills’ perspective, emotional intelligence is described as a cognitive skill based on processing emotional information. Academic literature mentions various emotional skills types that give basis to the definition of emotional intelligence (Table 6). However, there are three most prevalent models of the emotional intelligence: 1) Bar-On (Bar-On, 2006) 2) Goleman (Goleman, 1996), and 3) Salovey and Mayer (Salovey, Mayer, 1990).

Table 6. Types of emotional skills

| Author | Types of emotional skills |
|--|---|
| Bar-on, 2006 | Intrapersonal skills Self-expression skills Interpersonal skills Decision making skills Stress Management |
| Brackett et al., 2011; Palmer, 2003; Salokivi et al., 2021; Salovey, Mayer, 1990 | Ability to control emotions Ability to understand and analyze emotions Ability to utilize previous positive experiences Ability to evaluate and express emotions |
| CASEL, 2013; Zins et al., 2004 | Self-awareness Self-management Social awareness Relationship skills Responsible decision making |
| Goleman, Cherniss, 2001 | Self-awareness Self-control Social awareness Relationship skills |
| Holsen et al., 2008 | Problem-solving skills Perspective taking Empathy Self-control Emotional control |
| Johnston et al., 2013 | Empathy Emotional self-control Networking skills |
| Merrell et al., 2007 | Ability to identify emotions Ability to overcome negative thoughts Ability to relax Ability to set goals Ability to think positively |

Salovey and Mayer (1990) define emotional intelligence as the ability to observe, recognize one’s own and others’ feelings and emotions and use that information in order to control one’s thoughts and behavior. Contrary to Bar-On and Goleman, Salovey and Mayer base their emotional intelligence model on skills, which is why they consider emotional intelligence a form of intelligence. Troth et al. (2012) defines these skills as positive emotional skills. Salokivi and others (2021) discuss the main emotional skills construct in their scope review on emotional skills. They have found that the main emotional skills are: expressing emotions, monitoring emotions, identifying emotions, understanding emotions, regulating emotions, using one’s positive emotional experience. We can conclude that the emotional skills classification suggested by Salokivi et al. (2021) matches the concept of emotional intelligence proposed by Salovey and Mayer (1990). Due to this, we deduce that positive emotional skills are the ones that comprise the model introduced by Salovey and Mayer (1990).

The research analysis on the theoretical foundations of positive behavior skills has presented their construct, existing models and the skills they involve. Table 7 shows a model of positive behavior skills that could be interpreted as the conceptual basis of educational programs for the development of positive behavior skills. These positive personal, positive social and positive emotional skills and the abilities that comprise them are essential when creating educational programs for young athletes as well.

Table 7. Structural model of positive behavior skills for young athletes (created by authors)

| Skill type | Skill title | Skill definition |
|---------------------------|--|--|
| Positive personal skills | Taking responsibility | ability to take responsibility for one's actions, ability to engage actively in different tasks (Campayo-Munoz et al., 2020) |
| | Positive self-evaluation | ability to believe in one's right to be happy, ability to feel one's worth, to understand one's right to express one's wishes, ability to enjoy one's achievements (Branden, 2021) |
| | Prosocial behavior | ability to share in order to provide for the ones that are lacking, ability to cooperate in order to achieve common goals (Dunfield, Kuhlmeier, 2013) |
| Positive social skills | Cooperation | ability to cooperate to achieve common goals (Johnston et al., 2013) |
| | Assertiveness | ability to defend one's right without intending to inflict harm on others (Hazavehei et al., 2008; Lange, Jakubowski, 1976) |
| | Empathy | ability to take another person's stance and see their perspective (Junge et al., 2020) |
| | Self-control | ability to control one's short-term desires and goals in order to reach more important long-term goals (Pan, Zhu, 2018) |
| | Taking social responsibility | ability to take responsibility for one's actions and towards others (Parker, Stiehl, 2005) |
| Positive emotional skills | Ability to evaluate and convey emotions | ability to recognize emotions intra- and inter-personally, as well as in objects (e.g. pictures); ability to express one's emotions accurately (Ackley, 2016) |
| | Ability to utilize one's positive emotional experience | ability to prioritize thoughts and utilize emotions as a tool to solve issues (Ackley, 2016) |
| | Ability to comprehend and analyze emotions | ability to distinguish emotions, comprehend the relation between emotions and feelings and their development (Ackley, 2016) |
| | Ability to control emotions | ability to stay open to feelings, to distance oneself from feelings, to control emotions and be able to influence the emotions of others (Ackley, 2016) |

4. Discussion

This scientific literature analysis (Ackley, 2016; Branden, 2021; Campayo-Munoz et al., 2020; Johnston et al., 2013; Junge et al., 2020; Pan, Zhu, 2018; Parker, Stiehl, 2005) on positive behavior skill development shows that the construct of positive behavior skills comprises positive personal, positive social and positive emotional skills. It proves that the structural model of positive behavior skills is multi-layered and involves various positive personal, positive social and positive emotional skills. Our theoretical analysis demonstrates that the group of positive personal skills includes positive self-evaluations, prosocial behavior and taking responsibility. The positive social skills group constitutes of cooperation, assertiveness, empathy, self-control and social responsibility skills. The ability to evaluate and convey emotions, utilize one's positive experiences, to comprehend, analyze and control emotions are attributed to the positive emotional skills group.

5. Conclusion

To summarize the results of this literature analysis, future educational programs for young athletes should stress the development of positive personal, positive social and positive emotional skills. These educational programs should be based on the structural positive behavior skills model

and adapted to young sportspeople. Succeeding studies can empirically evaluate the effect of such educational programs to young athletes.

One of the benefits of the positive behavior paradigm is that the positive behavior skills are applicable not only in sports education but also in general life situations (Pearson et al., 2021). Therefore, future research can evaluate the benefits of positive behavior skills not only in the education of young athletes but also to their personal lives.

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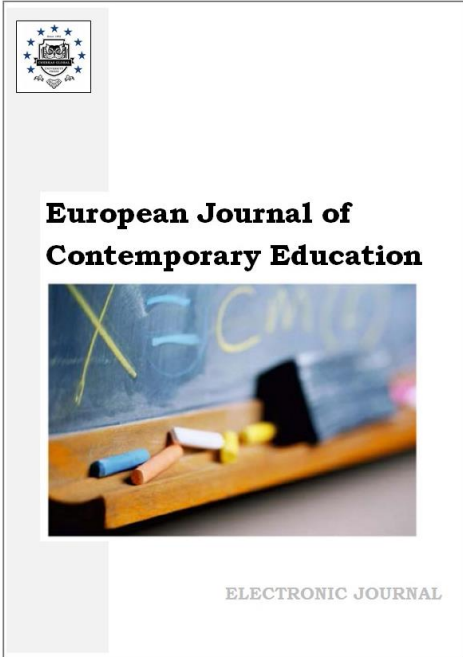
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Scientific Basis of Improving the Quality of Secondary Education: on the Example of Kazakhstan

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Abstract

This article discusses the issue of improving the quality of secondary education on a scientific basis. Improving the quality of secondary education is an urgent problem. In this regard, the unsatisfactory results of international studies, such as PISA, PIRLS, which determine the quality of secondary education, have led to the need for research on this problem. Before the study, the quality of education in developed countries was analyzed and the scientific literature was studied. A concept and formula for improving the quality of secondary education on a scientific basis was developed, and a study was organized according to this formula.

The experiment was carried out on the basis of a four-sided memorandum signed by the Academy of Pedagogical Sciences, the Turkestan Regional Department of Education, the Nazarbayev Intellectual School and the South Kazakhstan State University named after M. Auezov.

In the 2019–2020 academic year 39 schools, 2733 students and 353 teachers from Ordabasy, Tolebi and Otyrar districts of Turkestan region took part in the experiment.

The article provides information on the course and results of the experiment. In the course of the experiment, a comparative analysis of quarterly grades was carried out to determine the quality of students' knowledge after work on improving the quality of secondary education.

Keywords: pedagogy, education, the quality of education, quality of secondary education, study, scientific base, concept.

1. Introduction

The education system is a complex system. This process which goes hand in hand with the development of society is constantly undergoing changes and transformations. The development of

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innovative technologies and growing number of information technologies. In turn, it has affected the attitude and worldwide view of man. The formation of a person's personality is necessarily the main subject of the process of education and upbringing. The education system which promotes the role of the pupils, students and the applicants is now associated with the paradigm of continuing education.

Knowledge is a familiarity, awareness, or understanding of someone or something, such as facts (propositional knowledge), skills (procedural knowledge), or objects (acquaintance knowledge). By all accounts, knowledge can be acquired in many different ways and from many sources, but not limited to perception, reason, memory, testimony, scientific inquiry, education, and practice. The philosophical study of knowledge is called epistemology.

The term "knowledge" can refer to a theoretical or practical understanding of a subject. It can be implicit (as with practical skill or expertise) or explicit (as with the theoretical understanding of a subject); formal or informal; systematic or particular (Sametova, 2011). The philosopher Plato famously pointed out the need for a distinction between knowledge and true belief in the Theaetetus, leading many to attribute to him a definition of knowledge as "justified true belief". The difficulties with this definition raised by the Gettier problem have been the subject of extensive debate in epistemology for more than half a century (The Analysis of Knowledge, 2001).

The fourth meeting of the National Public Trust Council was held on 22th October 2020. In this meeting President Kassym-Zhomart Tokayev paid special attention to the content of school education. The results of a reputable international study show that the skills of our students in reading literacy are not sufficiently developed. Therefore, the introduction of culture of reading, the development of reading literacy should become a priority in secondary education in the country. The child's interest in learning, knowledge of the environment through books should be formed within the school, – said the President (Tokaev, 2020).

Issues related to the education system in the country are considered on the basis of the Law on Education.

All countries concerns about the quality of secondary education. For example, America's 13-year-olds continue to languish in the middle of the pack internationally in math and science achievement. This question is always relevant in many articles by American scientists (Barshay, 2018).

Scientific systematization of the quality of secondary education, which is the basis of the scientific article, is a modern requirement. Kazakhstani schoolchildren participate in international projects aimed at comparative study of student achievement, such as TIMSS, PISA. The results of this study are unsatisfactory. In this case, our country's secondary education system still needs additions and scientific justification.

It is obvious that the education system consists of several stages: pre-school education, secondary education, higher education, postgraduate education. In particular, if the foundation of the secondary education system is not reliable, it will undoubtedly have a significant impact on the quality of subsequent ones because it all starts from the foundation. Covering each stages, differs in content, quality and it consists of several system components. There are 8 components of the secondary education system.

In order to scientifically substantiate the secondary education system, the following formula was developed. This formula is used as the formula of academician A.Kusainov:

$$Q_{\text{edu}} = Q_{\text{std}} + Q_{\text{lit}} + Q_{\text{pqt}} + Q_{\text{mon}} + Q_{\text{upb}} + Q_{\text{rw}} + Q_{\text{ms}} + Q_{\text{mtb}}$$

Q_{edu} – quality of education;

Q_{std} – quality of educational standards and curricula;

Q_{lit} – quality of educational literature;

Q_{pqt} – quality professional qualification of teachers;

Q_{mon} – quality monitoring of education;

Q_{upb} – the quality of spiritual, moral and patriotic upbringing;

Q_{rw} – the quality of research work;

Q_{ms} – quality of management system;

Q_{mtb} – quality of material and technical base.

It is known that the education system is a complex system. The novelty of this study is the mobilization of internal reserves on a scientific basis, formulating the system components of the secondary education system. In order to improve the quality of education, it is necessary to improve the quality of these components on a scientific basis, on a regular basis for each child, each class.

The [Figure 1](#) below shows the idea of improving the quality of student knowledge in accordance with the formula.

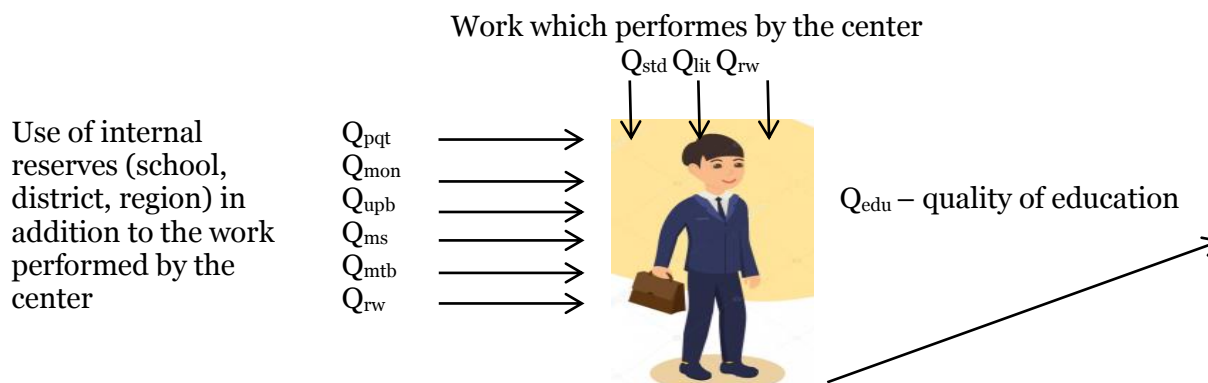


Fig. 1. The idea of improving the quality of student knowledge in accordance with the formula

Improving the quality of Q_{std} , Q_{lit} , Q_{rw} is carried out in a centralized manner and the improvement of Q_{pqt} , Q_{mon} , Q_{upb} , Q_{ms} , Q_{mtb} and Q_{rw} (in relation to the experiment) provides for the widespread use of additional internal reserves in addition to the centralized work.

The Minister of Education and Science A. Aimagambetov on behalf of the President developed a new state program for the development of education and science in 2020–2025, based on a number of strategic and program documents on 19th December, 2019. The program raises the issue of improving the quality of secondary education in rural areas, and one of the most important tasks is to reduce the gap in the quality of education between urban and rural schools. To this end, it is planned to provide small schools with qualified teaching staffs, change the system of remuneration, provide rural schools with teaching materials, computer equipment and digital devices ([The state program..., 2019](#)).

In order to improve the quality of secondary education on a scientific basis, the experiment was conducted in the districts of Turkestan region.

The purpose of the experiment: to improve the quality of secondary education on a scientific basis.

Research hypothesis: if the work on improving the quality of education components is carried out systematically, with the extensive use of internal reserves, aimed at improving the quality of education of one child, one class, then the quality of education of students in that class will increase.

To organize this experiment, the concept of improving the quality of secondary education was developed on a scientific basis. The purpose of the concept is to improve the quality of education of pupils in the experimental schools of Turkestan region.

Tasks of the concept:

- professional development of school teachers;
- improving the quality of educational assessment;
- improving the quality of spiritual, moral and patriotic upbringing of the individual;
- conducting research related to the experiment;
- improving the quality of the management system;
- improving the material and technical base of schools, experimental classes.

Expected results of the research work: theoretically: the development of a methodological framework for improving the quality of secondary education, the achievement of accurate predictions. From a practical point of view: improving the quality of secondary education on a scientific basis. Introduction of the conception in scientific circulation.

Literature review

The experimental method is an empirical scientific method. The series of activities proposed during the experiment is based on a number of scientific papers, the experience of countries with

developed education systems. Before the experiment, a comparative analysis of a number of works on this topic was made.

Modern pedagogical science has a well-known fund of humanities education for the analysis and solution of problems of improving the quality of school education. E.B. Sorokina's "Pedagogical conditions for improving the quality of teaching students in new types of schools" (Sorokina, 2007); M.A. Nikiforova's "Improving the quality of learning outcomes of primary school students in rural areas through pedagogical diagnostics" (Nikiforova, 2011); V.F. Pokasov's research "Concepts of quality of education" (Pokasov, 2012) covers certain parts of the quality of school education. There are also a number of studies by other authors on this issue. Among them are A.G. Sergeeva (Sergeeva, 2009), N.V. Shekhireva (Yagubova, 2017), M.A. Kanabekova (Kanabekova, 2011), S.S. Andreeva (Andreev, 2002), G. Becker (Becker, 1997), A.M. Zharkenova (Zharkenova, 2020), N.V. Timofeeva (Timofeeva et al., 2010) and others.

In Kazakhstan, there are departmental organizations that study local issues of the education system. National reports on the education system of the Republic of Kazakhstan are published annually, in which the facts are presented without a comprehensive analysis with subsequent recommendations.

We can highlight the works of AK Kusainov in domestic pedagogy. "Quality of education in the world and in Kazakhstan" (Kusainov, 2013), "Crisis in secondary education: ways out" (Kusainov, 2016) and others were the basis for the development and implementation of this idea.

One of the most important components of the quality of secondary education is the quality of textbooks. In this context, A.K. Kusainov, A.T. Duysebek, F. Sametova, R.K. Mikhalev, Zh.B. Konyrova is a co-author of the book "Scientific and pedagogical assessment of the quality of textbooks" (Kusainov et al., 2020), were published guidelines for improving the quality of educational literature (Kusainov et al., 2019).

Were taken into account scientific works on assessing the quality of the textbook, criteria for the didactic tasks of the textbook by B.S. Karimova, A.K. Kusainov, F.T. Sametova, A.T. Duysebek, R. Mikhaleva, A. D. Ryskulbekova (Karimova et al., 2019), F.T. Sametova (Sametova, 2020) and G.A. Orynkhanova (Sametova, Orynkhanova, 2019).

2. Materials and methods

The experiment was conducted under the direction of A.K. Kusainov, Chairman of the Board of the Academy of Pedagogical Sciences, Doctor of Pedagogical Sciences, Professor.

Studying the best international and domestic practices for improving the quality of education, The Academy of Pedagogical Sciences (APS), proposed to carry out experiment for this purpose on a scientific basis to improve the quality of education in the region. The proposal was approved by the regional Department of Education.

In order to support the experiment, a quadripartite Memorandum was signed between the Department of Education of Turkestan region, the Academy of Pedagogical Sciences, M. Auezov South Kazakhstan State University and Nazarbayev Intellectual Schools.

The experiment was conducted in 2018–2019 academic year and in 2019–2020 academic year. In 2019–2020 academic year, the experiment involved 39 schools, 2733 students and 353 teachers in Ordabasy, Tolebi, Otyrar districts of Turkestan region. More information about the participants is given in the Table 1.

Table 1. Information about the participants of the experiment in 2019–2020 academic year

| No | Districts | Schools | Class | Students | Teachers |
|----|-----------|---------|-------|----------|----------|
| 1 | Ordabasy | 4 | 2 | 183 | 10 |
| | | | 3 | 177 | 10 |
| | | | 6 | 188 | 30 |
| | | | 7 | 184 | 50 |
| | Total | 4 | | 732 | 100 |
| 2 | Tolebi | 30 | 2 | 597 | 30 |
| | | | 3 | 218 | 10 |

| | | | | | |
|---|---------|----|---------|------|-----|
| | | | 6 | 613 | 110 |
| | | | 7 | 214 | 61 |
| | Total | 30 | | 1642 | 211 |
| 3 | Otyrar | 5 | 2 | 185 | 9 |
| | | | 6 | 174 | 33 |
| | Total | 5 | | 359 | 42 |
| | General | 39 | 2;3;6;7 | 2733 | 353 |

A lot of work is being done in the country to improve the quality of all components of the system, for this purpose the Academy of Education, institutes and centers have been established. International experience shows that the quality of education can be improved only in countries where this work is carried out on a scientific basis.

The main goal of the experiment is to have a systematic work on a scientific basis with the aim of improving the quality of the components of the education system using the internal resources of schools, districts, regions, in addition to the work carried out by the Ministry of Education and Science.

If we look closely at the components of this system, the quality of educational standards and curricula, the quality of textbooks, the quality of research work carried out for the development of the education system is managed at the national level. The quality of professional qualifications of teachers; quality of education monitoring; quality of spiritual, moral and patriotic upbringing; quality of management work; the quality of the material and technical base of experimental classes, schools, as well as the quality of research work related to the experiment can be improved with the extensive use of internal reserves. It is a best practice of the world (Kubeev et al., 2017).

Prior to the start of the experiment, the administration should identify the people responsible for the experiment, the participating districts and schools, explain the purpose of the experiment and instruct them to carry out other organizational work. In order to systematically plan and manage the activities of the participants of the experiment, the Program of the experiment was developed in Turkestan region in order to improve the quality of education on a scientific basis.

The content of the program indicates the actions to be performed in order to improve the quality of each system component and when these actions should be performed and by whom. Also provided additional information on each event. For example, members of center for teaching excellence, Nazarbayev Intellectual School, M. Auezov South Kazakhstan State University, which intends to participate in the experiment and assist in its quality, can present themselves in this section.

Implementation of the program:

- professional development of teachers;
- to create a system of realistic assessment of the quality of education;
- to improve the spiritual, moral and patriotic upbringing of the individual;
- create an effective management system to improve the quality of education;
- to carry out the necessary research work for the effective conduct of the experiment;
- provide experimental schools and classrooms with the necessary equipment;
- improving the quality of education in experimental subjects in experimental classrooms with extensive use of internal reserves in the region.

In order to improve the quality of education in Turkestan region on a scientific basis, work plans were developed and approved by the Turkestan Regional Department of Education and the Academy of Pedagogical Sciences. The work plan was developed individually for the regional methodical office, for the district methodical office and for the experimental schools.

A sample work plan was provided by the academy and it is based on a direct experimental program. The work plan fully covers the 6 components of the education system that can be affected by internal reserves. For each components there are tables for activities and responsible persons.

In the work plan, the participants of the experiment presented their action plans.

We can see from the following model that the organization of the experiment on a scientific basis was carried out systematically.

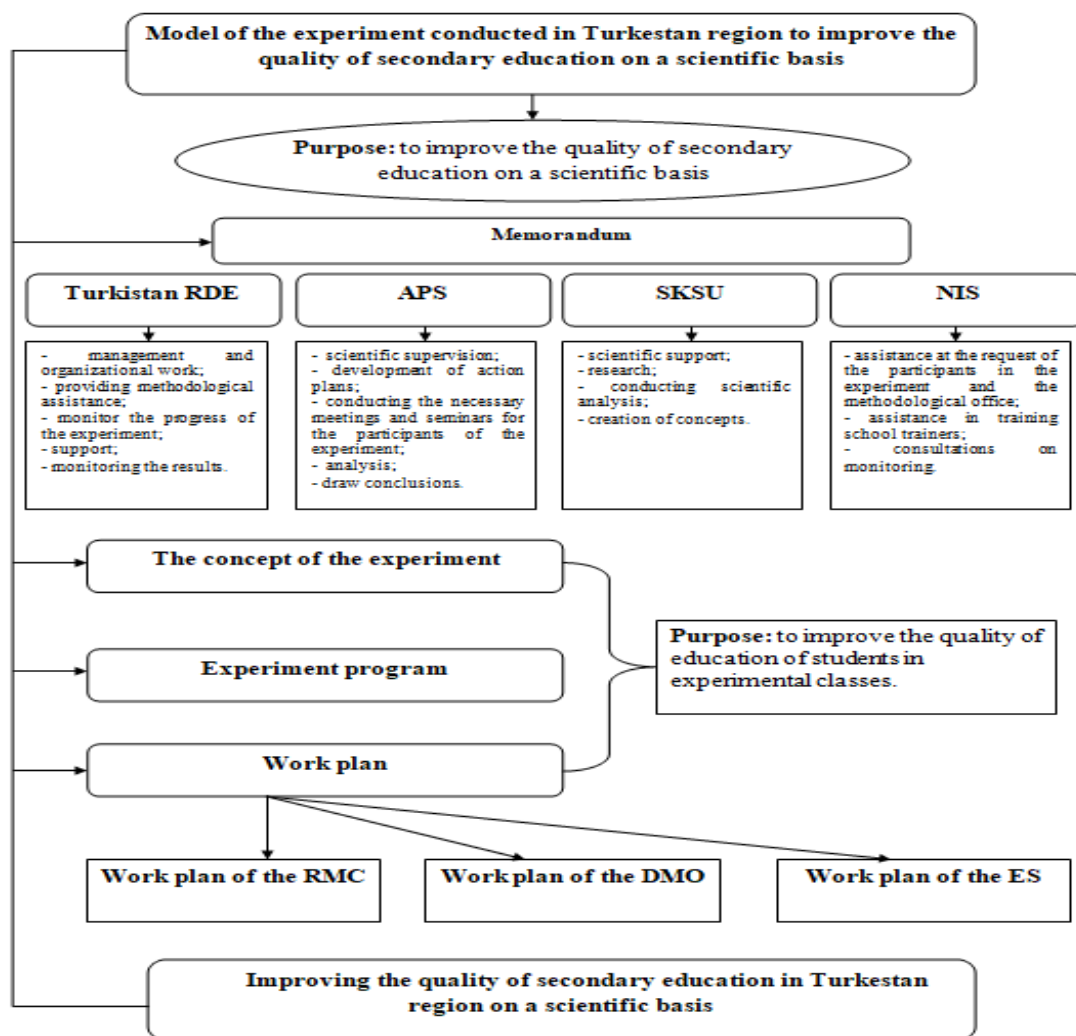


Fig. 2. The model of the experiment conducted in Turkestan region to improve the quality of secondary education on a scientific basis

Notes:

- RDE – Regional Department of Education
- APS – Academy of Pedagogical Sciences
- SKSU – South Kazakhstan State University
- NIS – Nazarbayev Intellectual School
- RMC – regional methodical center
- DMO – district methodical office
- ES – experimental school

To prove the effectiveness and reality of the experiment, schools were initially selected in areas remote from large cities, where there are always more educational opportunities.

The concept of "quality of education" has no generally accepted definition. This is quite natural, given that different groups of consumers put their own meaning into it, and researchers interpret it depending on the research task. Nevertheless, there are two main approaches to the concept of quality:

- in the first case, it is considered, in the sense of compliance with the standard, and as the quality of the learning process conditions;
- in the second case, it is interpreted as compliance with the requirements and expectations of external customers and consumers.

For the purposes of quality management of education within the framework of territorial (regional, municipal) educational systems, it seems appropriate to combine these two approaches and consider the quality of education as a level of solving a set of educational tasks, including:

educational results, socialization of graduates, including mastering the skills of orientation and functioning in modern society, the development of civic consciousness.

This definition does not claim to be universal and is formed in relation to the task of managing the quality of general education within territorial educational systems based on a system of indicators and indicators. We proceed from the fact that it is not possible to directly manage the quality of education – its improvement can be provided only indirectly, through a purposeful impact on the system, in a broad sense – on the resources of the territorial education system.

During our experiment, we had an impact on the qualitative change in education, but the indicators of the quality of education remained the same indicators specified in the state educational standard. The level of education of students was assessed on a 10-point scale (10-8 points – very good, 7-6 points – good, 5-4 points – satisfactory)

3. Results

The quality of education of students participating in the experiment is comparable in 3 areas: first, among 10 schools in Tolebi district, which have been participating in the experiment since the 2018–2019 academic year, and 20 schools participating in the 2019–2020 academic year; secondly, between 5 schools that participated in the experiment and 5 schools that did not participate in Otyrar district; thirdly, among the 4 schools participating in the experiment in Ordabasy district since the 2018–2019 academic year, it was identified between the classes that participated in the experiment and the classes that did not.

1. The results of comparative education of students of Tolebi district are shown in [Table 2](#). 10 schools from Tolebi district participated in the experiment in the 2018-2019 academic year, 20 schools in the 2019–2020 academic year, a total of 30 schools. Therefore, we decided to compare the quality of education of 10 schools participating in the experiment for 2 years in a row and 20 schools participating this year alone. In this comparative analysis, we can see that the quality of education in all subjects increased in the third quarter compared to the first quarter.

For the experiment in the 2nd grade were taken 4 subjects: Kazakh language, reading literature, mathematics, natural sciences. According to the results of 3 quarters on the basis of these disciplines, the quality of education of students of 10 schools involved in the experiment was 8.2 % higher than the quality of education of students of 20 schools.

For 6th grade were taken 4 subjects: Kazakh language, history of Kazakhstan, mathematics, natural sciences. The quality of education of students in 10 schools was 8.1 % higher than the quality of education of students of 20 schools.

For the 3rd grade were taken 4 subjects: Kazakh language, Literature reading, Mathematics, Natural sciences. The quality of education of students in 10 schools was 4.5 % higher than the quality of education of students of 20 schools.

For 7th grade were taken 7 subjects: History of Kazakhstan, Mathematics, Physics, Chemistry, Biology, Kazakh language, Geography. The quality of education of students in 10 schools was 5.1 % higher than the quality of education of students of 20 schools.

Table 2. Comparative indicator of the quality of education of students in the Tolebi district of the South Kazakhstan region of the Republic of Kazakhstan

| Grade | ES (2018–2019 a.y.) | | ES (2019–2020 a.y.) | | Comparative results,% |
|-------------------|---------------------|------------------------|---------------------|------------------------|-----------------------|
| | Number of students | Quality of education,% | Number of students | Quality of education,% | |
| 2 | 219 | 66,5 | 369 | 58,3 | 8,2 |
| 3 | 215 | 67,1 | 377 | 62,6 | 4,5 |
| 6 | 221 | 62,3 | 393 | 54,2 | 8,1 |
| 7 | 217 | 62,1 | 399 | 57,0 | 5,1 |
| 2; 3; 6; 7 | 872 | 64,5 | 1538 | 58,0 | 6,5 |

As an experimental school (ES), comparative indicators of the quality of education of students from 10 schools participating from the 2018–2019 academic year and 20 schools joining in the 2019–2020 academic year were presented.

2. The quality of education in Otrar and Ordabasy districts was calculated by comparing the quality of education of schoolchildren who participated in the experiment and those who did not participate in the experiment. The total number of students in the two districts who participated in the experiment was 1,091, and the number of students who did not participate in the experiment was 1,141. The results are shown in [Table 3](#).

In Otrar and Ordabasy districts, the quality of education of 2nd grade students who participated in the experiment was 60.9 %, the quality of education of students in schools that did not participate in the experiment was 54.3 %. The quality of education of students in the schools participating in the experiment is 6.6 % higher ([Nurseiit, 2015](#)).

The quality of education of 3rd grade students who participated in the experiment was 61.3 %, the quality of education of students who did not participate in the experiment was 55.1 %. The quality of education of students in the schools participating in the experiment is 6.2 % higher.

The quality of education of 6th grade students who participated in the experiment was 58.9 %, the quality of education of students who did not participate in the experiment was 53.0 %. The quality of education of students in the schools participating in the experiment is 5.9 % higher.

The quality of education of 7th grade students who participated in the experiment was 60.6 %, the quality of education of students in schools that did not participate in the experiment was 51.0 %. The quality of education of students in the schools participating in the experiment is 9.6 % higher.

Table 3. Comparative indicator of the quality of education of students of the experimental school (ES) and non-experimental school (NES) in the Otrar and Ordabasy districts of the South Kazakhstan region of the Republic of Kazakhstan.

| Grade | ES | | NES | | Comparative results,% |
|-------------------|--------------------|------------------------|--------------------|------------------------|-----------------------|
| | Number of students | Quality of education,% | Number of students | Quality of education,% | |
| 2 | 368 | 60,9 | 434 | 54,3 | 6,6 |
| 3 | 177 | 61,3 | 180 | 55,1 | 6,2 |
| 6 | 362 | 58,9 | 337 | 53,0 | 5,9 |
| 7 | 184 | 60,6 | 190 | 51,0 | 9,6 |
| 2; 3; 6; 7 | 1091 | 60,4 | 1141 | 53,4 | 7,0 |

This is the result of only one academic year. Moreover, rural schools, where initially the quality of education was lower than in urban schools, also in these experimental schools there was a weak material base and there was a shortage of highly qualified teaching staff, so a slight improvement in quality in one year can be considered a good result. Work in this direction has been suspended due to quarantine measures, but will continue.

4. Conclusion

There were some difficulties in organizing the experiment. During the experiment, organized on the initiative of the Academy of Pedagogical Sciences, school teachers had to do additional work. Of course, they did not deviate from the state education program. In this regard, in order to improve the skills of teachers, consulting classes were organized as part of the experiment. Open days were also organized. On a quarterly basis, teachers were required to submit final reports on experimental classes to the academy, which is the organizer of the experiment.

The experiment was not funded by the state, it was an initiative unfunded experiment. Therefore, the costs of visiting the experimental center and organizing conferences were minimal. The biggest difficulty in organizing the experiment, of course, was the global COVID-19 pandemic. Due to the pandemic, the experiment had to be stopped, as schools switched to distance learning. However, the relationship between the academy and the school team involved in the experiment is still strong.

As a result of these comparative studies, the following conclusions can be drawn:

- In order to improve the quality of education in Tolebi district, the school staffs, trained for at least a year to work systematically in 6 areas using internal reserves and was able to provide better education to pupils than school staffs who did not have such experiences;

- The Methodical Cabinet of Otyrar district and the staff of schools participating in the experiment achieved better results than schools that did not participate in the experiment, due to the systematic work to improve the quality of education in 6 areas;

- The experience of the Ordabasy region shows that the quality of teaching pupils in schools where their work to improve the quality of education was carried out systematically in 6 areas is higher than in classes where such work was not systematically carried out.

Comparative research has shown that the quality of education of one child, one class has improved if the work was carried out systematically to improve the quality of education of one child, one class with the use of internal reserves.

The results of the experiment were discussed in the annual August conference.

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Conflict of interest

The authors declare that they have no competing interests.

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A Comparative Analysis of Changes in the Learning Motivation of Russian and Foreign Medical Students during the COVID-19 Pandemic

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Abstract

This paper tests the hypothesis that the structure of the learning motivation of Russian and foreign medical students have undergone changes during the COVID-19 pandemic. The authors explored the learning motives of students studying the same medical specialty at the same university. The comparative analysis of changes in the principal learning motives (professional, cognitive, developmental, creative self-actualisation, communicative, social, avoidance- and prestige-driven) from February 2019 to June 2021 was made using the assessment of students' learning motivation developed by Rean and Yakunin, as modified by Badmaeva. SPSS Statistics 22.0 was used for statistical analysis. The results confirmed the research hypothesis: the structure and manifestation of medical students' learning motives have undergone changes during the COVID-19 pandemic. Before the pandemic, most of the learning motives of Russian and foreign medical students show a high level, with primarily professional motives, which evidences a professional orientation and a conscious choice of the profession. However, such important motives as cognitive, developmental and creative self-actualisation are significantly less expressed than professional ones. During the COVID-19 pandemic, there was a much higher manifestation of professional motives in Russian medical students. From the authors' point of view, this can be explained by extended practice with patients while there was an increase in creative self-actualisation and a decrease in communicative and social motives. Foreign medical students show a decrease in prestige-driven motives and some decrease in social motives. The obtained results open up prospects for improving medical education and for developing the personal and professional potential of Russian and foreign medical students.

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1. Introduction

Confronting the COVID-19 pandemic, which is affecting all spheres of society, shows that crisis situations can be overcome only jointly and based on the humanistic principles (United Nations, 2020; Akimov et al., 2020). In this regard, the role of education is being revised and concrete steps are being taken to develop the potential of individuals and to create a basis for moving towards a future filled with hope. In particular, this involves the evolution of learning principles, the modernisation of the concept of lifelong learning, and the digitalisation of education based on flexible learning methods, digital technologies and updated curricula (Guterres, 2017; Pluzhnikova, 2021).

By adopting the dignity of life as a universal humanistic principle, we create a framework for realising the true purpose of education—to help a person in answering the fundamental questions on the meaning and purpose of human existence: what a person should represent as an individual and in what way they should live (Toynbee, Ikeda, 1976; Sadovnichiy, Ikeda, 2013). This reference point is particularly important for medical education. It is accepted today that a medical graduate should have a professional schooling in his specialty, communication abilities and emotional intelligence (Vetluzhskaya et al., 2019). From the authors' point of view, no less important is the medical graduate's moral consciousness and responsible attitude to the society. This has been confirmed by a number of studies. The studies devoted to the problems of professional burnout, the symptoms of medical workers' emotional ill-being and distress during the COVID-19 pandemic testify that mindfulness and responsibility and the most important psychological predictors of medical workers' viability (Petrikov et al., 2020).

A common point of view is that overcoming various difficulties caused by the pandemic, including separation from fellow students, the use of new forms of learning, and the disruption of plans, requires students to make independent decisions, manifestation of their creative potential (Dijk-Groeneboer, 2020).

During the pandemic, medical students have been widely involved in the medical care of patients, including those with COVID-19. This professional experience had a transformational impact on the professional identity and learning motivation of medical students, which has been observed in a number of studies (Tempski et al., 2000; Lovri' et al., 2020).

Learning motivation in different contexts has been the subject of extensive scientific analysis which helped to develop a typology of learning motivation, to study the formation and development of learning motivation with regard to students' age, to undertake experimental testing of methods and the psychological and pedagogical conditions for actualising learning motivation (Ilyin, 2011; Nikitskaya et al., 2018). However, according to Kusrkar et al., today's student training curricula are based on cognitive approaches rather than on motivation theory and they conclude that learning motivation has been underestimated (Kusrkar et al., 2012).

Distance learning during the pandemic has intensified the study of student motivation in the new educational environment. However, the research has been more about identifying the risks of the digitalisation of education, and technical, academic and emotional support for participants in the learning process (Frolova et al., 2021; Anstey et al., 2020; Al-Okaily et al., 2020).

A number of authors consider motivation to be a partially compensating factor for insufficiently developed knowledge, skills and capacities. Thus, motivation has a leading role in learning success (Lutskova, Rusina, 2012). From this point of view, it seems reasonable to define learning motivation with regard to the learning and professional goals which a student strives to achieve, along with the internal activity of their character; high learning motivation is expressed through a student's acceptance of the learning goals and objectives as personally significant and necessary.

In methodological terms, according to Maslow's theory of motivation and need, it is important to consider the constructive and destructive processes that coexist in the inner world of any individual. However, the presence of a certain emotional environment favours continually increased motivation (Maslow, 2013).

In this context, Murray's study is specifically notable. He drew attention to the following basic needs amongst the whole spectrum of behaviour determinants: achievement, domination, independence, and affiliation (Hall, Lindsay, 2008).

Many studies investigate the psychological and pedagogical conditions for increasing the learning motivation of students in specific professions or academic disciplines (Zhukov et al., 2013; Zubkov et al., 2019; Makarov et al., 2018; Pelaccia, Viau, 2017).

Many researchers consider adolescence as the main stage of the development of professional identity, which determines the subsequent degree of professional performance, burnout and-or satisfaction (Bolotova, Molchanova et al., 2005).

A number of studies investigate the relations between motivation, the axiological sphere of a personality, and medical students' attitudes towards professional development and self-development (Makarova, Gorbunova, 2019).

A hierarchy of major motives for getting a degree was revealed in pharmaceutical students (in descending order): gaining knowledge, mastering the profession, and receiving a degree. In addition, a difference in the learning motives of males and females, and a distinction depending on performance in study groups was revealed (Antipova, 2017).

A study of the learning motives and the motives for getting higher education revealed some changes in the dominant learning motives in the 1st and 5th year medical students (Gavrilova, Shamray, 2017).

A study of the motivation of first-year medical students showed that the initial motivation to enter a medical university remained unchanged and was accompanied by a willingness to work at medical institutions to the extent of their abilities despite the increased occupational risks associated with the COVID-19 pandemic (Grigoryan et al., 2020).

Edgar et al. believe that if we attach more importance to the question of why students learn, this will help to guide teachers in choosing an approach to teaching and in influencing the students' learning outcomes (Edgar et al., 2019). This is especially true for medical students whose attitudes are not sufficiently explored because it is assumed that they are already motivated to learn (Martin, 2004).

In view of the above, the authors believe that learning motivation, while traditionally being one of the central problems of education, is underestimated in relation to medical students and requires further research, especially in the context of the COVID-19 pandemic.

2. Materials and methods

The research hypothesis is that the structure of learning motivation of Russian and foreign medical students has undergone changes during the COVID-19 pandemic.

The study participants were second- to fourth-year students in a 6-year medical programme at Sechenov First Moscow State Medical University. First-year and final-year students were not involved in the study. The first-year students had not yet formed a clear idea of the educational process, they had not fully felt the impact of the educational environment, and their adaptation to learning and socialisation in the student environment had not been fully completed. Final year students were already focused on their future plans.

The respondents were selected by random sampling among the Russian students studying at the Institute of Clinical Medicine and foreign students studying (in English) at the Centre for Foreign Education. Participation in the survey was voluntary and anonymous. All the respondents provided written consent to participate in the survey and to the consolidated processing of the results.

The survey was conducted between February 2019 and June 2021 at three stages to identify the structure of and changes in learning motivation. The stages were as follows:

- first stage, before the COVID-19 pandemic (February–March 2019) – 154 Russian students and 109 foreign students,
- second stage, the beginning of the COVID-19 pandemic (March 2020) – 130 Russian students and 90 foreign students,
- third stage, after the second wave of the COVID-19 pandemic (June 2021) – 106 Russian students and 70 foreign students.

The methodology developed by Rean and Yakunin and modified by Badmaeva for assessing students' learning motivation was used as a psychodiagnostic tool. It distinguishes seven principal

motives: communicative, avoidance-driven, prestige-driven, professional, creative self-realisation-driven, cognitive-developmental, and social. Each of them is assessed using a 5-point scale (Badmaeva, 2004).

Microsoft Excel spreadsheets and SPSS Statistics 22.0 software package were used to process the results. Fisher's ϕ -test was used for the comparative analysis of the learning motivation indicators at each stage of the study; Student's t-test for dependent samples was used to identify changes in the structure of motivation of Russian and foreign students in connection with the COVID-19 pandemic.

3. Results

The mean values of learning motives in Russian and foreign medical students obtained before the COVID-19 pandemic (February–March 2019) are given in (Table 1).

Table 1. Average values of educational motives of Russian and foreign medical students before the COVID-19 pandemic (February–March 2019)

| Motives | Russian students | | Foreign students | | F-test |
|---------------------------|------------------|--------|------------------|--------|--------|
| | Average value | Level | Average value | Level | |
| Communicative | 3,8 | High | 4,0 | High | 0,009* |
| Avoidance | 2,7 | Medium | 3,6 | Medium | 0,000* |
| Prestige | 3,0 | Medium | 3,7 | High | 0,000* |
| Professional | 4,3 | High | 4,3 | High | 0,744 |
| Creative self-realization | 3,4 | Medium | 3,9 | High | 0,000* |
| Cognitive-developmental | 3,8 | High | 3,9 | High | 0,073 |
| Social | 3,7 | High | 4,3 | High | 0,000* |

Note: * means $p < 0,01$

The results showed that the mean values of the learning motivation level before the pandemic in both groups of students were high for most of the motives. For both groups of students, the avoidance motives were characterised by a medium level, but the motives of prestige and creative self-actualisation showed a medium level only in the Russian students. In both groups, the motives of avoidance and prestige are lowest, while the professional motives are highest. Foreign students also have strong social motives.

A comparative analysis of the mean values of learning motives in the Russian and foreign students confirmed the absence of a statistically significant difference between them in professional motives and in the cognitive-developmental motives that are close to them. However, the average values of other motives in foreign students are higher ($p < 0.01$).

At the beginning of the COVID-19 pandemic, both Russian and foreign medical students showed high levels of professional, cognitive-developmental and creative self-actualisation motives. No statistically significant differences between these groups of students for these motives are observed (Table 2).

Table 2. Average values of educational motives of Russian and foreign medical students at the beginning of the COVID-19 pandemic (March 2020)

| Motives | Russian students | | Foreign students | | F-test |
|---------------------------|------------------|--------|------------------|--------|--------|
| | Average value | Level | Average value | Level | |
| Communicative | 3,5 | Medium | 4,0 | High | 0,000* |
| Avoidance | 2,8 | Medium | 3,5 | Medium | 0,000* |
| Prestige | 2,9 | Medium | 3,5 | Medium | 0,000* |
| Professionals | 4,3 | High | 4,3 | High | 0,704 |
| Creative self-realization | 3,7 | High | 3,8 | High | 0,327 |
| Cognitive-developmental | 3,8 | High | 3,9 | High | 0,559 |

| Motives | Russian students | | Foreign students | | F-test |
|---------|------------------|--------|------------------|-------|--------|
| | Average value | Level | Average value | Level | |
| Social | 3,3 | Medium | 3,8 | High | 0,000* |

Note: * means $\rho < 0,01$

An increase in the creative self-actualisation motive amongst Russian students occurred since the beginning of the COVID-19 pandemic; this was at a medium level before the pandemic. Similarity in the structure of learning activity motives in both groups of students is also observed for the motives of avoidance and prestige, where the indicator values are at the medium level. However, foreign students showed more higher indicators than the Russian students ($\rho < 0.01$). Since the beginning of the pandemic, foreign students showed a decrease in the prestige motive, compared to early 2019.

The communicative and social motives also show a medium level in the Russian students' learning motives. The level of indicators for these motives was higher before the COVID-19 pandemic. The communicative and social motives continue to rank highly among foreign students; however, the average indicator for social motives decreased.

By the end of the second wave of the COVID-19 pandemic, the learning motives were characterised by a high level of professional, cognitive-developmental and creative self-actualisation motives for both the Russian and foreign students (Table 3).

Table 3. Average values of educational motives of Russian and foreign medical students by the end of the second wave of the COVID-19 pandemic (June 2021)

| Motives | Russian students | | Foreign students | | F-test |
|---------------------------|------------------|--------|------------------|--------|---------|
| | Average value | Level | Average value | Level | |
| Communicative | 3,5 | Medium | 3,9 | High | 0,000** |
| Avoidance | 2,8 | Medium | 3,5 | Medium | 0,000** |
| Prestige | 3,0 | Medium | 3,6 | Medium | 0,000** |
| Professional | 4,6 | High | 4,2 | High | 0,000** |
| Creative self-realization | 3,7 | High | 3,9 | High | 0,019* |
| Cognitive-developmental | 3,8 | High | 3,9 | High | 0,820 |
| Social | 3,5 | Medium | 4,2 | High | 0,000** |

Notes: * means $\rho < 0,05$, ** means $\rho < 0,01$

The structure of learning motives in both groups of students has, in general, remained the same since the beginning of the COVID-19 pandemic, with a slight change in the manifestation of some indicators.

Professional motives are more pronounced in Russian students compared to foreign students ($\rho \leq 0.01$), while the creative self-actualisation motive is more pronounced among foreign students ($\rho \leq 0.05$).

The motives of avoidance and prestige have medium values in both groups, while the communicative and social motives also have medium values for the Russian students. There is a slight increase in the social motives, compared to the beginning of the COVID-19 pandemic, which is more pronounced in foreign students.

The changes in the structure of learning motivation of Russian and foreign students before the COVID-19 pandemic (2019) and at the end of the second wave of the pandemic in 2021 were also assessed and the results are given in (Table 4).

Table 4. Changes in the structure of the educational motivation of Russian and foreign students in 2019 and 2021 (before the COVID-19 pandemic and at the end of the second wave of the pandemic)

| Motives | Russian students | | | Foreign students | | |
|---------------------------|------------------|------|--------|------------------|------|--------|
| | 2019 | 2021 | t-test | 2019 | 2021 | t-test |
| Communicative | 3,8 | 3,5 | 0,055 | 4,0 | 3,9 | 0,098 |
| Avoidance | 2,7 | 2,8 | 0,287 | 3,6 | 3,5 | 0,105 |
| Prestige | 3,0 | 3,0 | 0,529 | 3,7 | 3,6 | 0,453 |
| Professional | 4,3 | 4,6 | 0,000* | 4,3 | 4,2 | 0,081 |
| Creative self-realization | 3,4 | 3,7 | 0,106 | 3,9 | 3,9 | 0,496 |
| Cognitive-developmental | 3,8 | 3,8 | 0,562 | 3,9 | 3,9 | 0,324 |
| Social | 3,7 | 3,5 | 0,053 | 4,3 | 4,2 | 0,185 |

Note: * means $p < 0,01$

Table 4 demonstrates some statistically significant shifts ($p < 0.01$) in the level of professional motivation of the Russian students; the changes in the foreign students' learning motivation are not statistically significant.

4. Discussion

The results show that before the pandemic most Russian and foreign medical students' learning motives had a similar structure: high levels of professional, cognitive-developmental, social, and communicative motives and a medium level of avoidance motives. Professional motives showed the highest values in both groups; while the foreign students also demonstrated higher social motives than the Russian students.

The priority of professional motives in the hierarchy of both groups evidences the professional orientation and conscious choice of profession by the majority of students. The students are characterised by the desire to achieve success in their professional activities, by focusing on professional self-development, the acquisition of knowledge, skills and abilities, and the demonstration of professional abilities. This is a substantiation of the high level of professional identity, an awareness of the learners' professional purpose, and an affiliation with the professional group.

The high cognitive-developmental motive shows that Russian and foreign students are well aware of the need to make the most of the opportunities of the current educational environment. Medical students are characterised by a pronounced desire to acquire the knowledge and skills required for their future professional activities.

The social motives reflect the students' orientation towards social approval. Many students believe their learning performance predetermines their future professional success, the level of material welfare and social recognition in the future. The COVID-19 pandemic emphasises the importance of the social orientation of the medical profession and the importance of the professionalism and humanism of medical doctors. This agrees with Erickson's epigenetic concept according to which an individual's personality and society should not be opposed. Society contributes to the development of the personality, provided that the individual accepts and performs certain rituals, follows the traditions of the society or group, including their professional community (Freud, 2002).

Before the COVID-19 pandemic, communicative and professional motives were at the forefront in the general hierarchy of motives in both groups of students. This is indicative of the fact that the majority of Russian and foreign students are aware of the need to communicate with different people in their professional activities—patients, patients' relatives, colleagues – which requires the possession of knowledge and communication skills appropriate to the social context. The communicative motive is significantly higher among the foreign students. This could be explained by the fact that these students consider their profession and their respective social position in society as a condition for meeting and communication with others. The desire to gain the respect of colleagues and to feel self-confident is another communicative motive of learning. Russian medical students, however, may underestimate the importance of communication with increasingly technical emphasis in contemporary medicine.

Although avoidance motives showed medium figures in both groups, these indicators were significantly higher for the foreign students. This demonstrates that they have a stronger desire to avoid mistakes and failures and a greater responsibility for the results of their work, compared to their Russian peers.

Other differences in motives were, for instance, the motives of creative self-actualisation and prestige, which were higher among the foreign students. This could be connected to the fact that foreign students gain prestige through mastering a profession earlier than Russian students. This is confirmed by the structure and dynamics of the motivation in the students' personality. The research showed that the desire to acquire prestige through professional status is typical for students of all years of study; however, the motivation of senior medical students is dominated by professional and social motivation (Karabinskaya et al., 2010).

The greater extent of the maturity in the professional choice of foreign students compared with Russian students could be attributed to their greater creative self-actualisation. This conclusion is also confirmed by other researchers. For instance, Denisova et al., in their study of students' learning motivation at Omsk State Medical University, noted the possibility of personal intellectual and creative actualisation as a significant factor in the learners' professional choice (Denisova, 2019).

Since the beginning of the pandemic, the structure of the motives changed in both groups of students, but in a slightly different way. The motive of creative self-actualisation in the Russian students increased to a high level and statistically ceased to differ from that of the foreign students. This can be explained by an increasing professional awareness due to the extended practice with patients, which could have activated this form of motivation. This confirmed the results of a survey where the motivation of student volunteers was assessed. These students provided aid to people who found themselves at risk of suffering complications of the coronavirus. Along with having specialised knowledge, the student volunteers noted the need for a number of personal qualities, including mental adaptivity and creativity (Tavstukha, 2020).

The communicative and social motives in the Russian students lowered to a medium level. The foreign students also showed a decrease in social motives, but they remained at a high level. The foreign students' prestige motives indicators decreased to a medium level but were still higher than those of the Russian students. In the authors' opinion, these changes can be explained by the students' focusing on professional activity in connection with the pandemic, the reevaluation of difficult and even extreme conditions of medical work and the development of a sense of commitment and professional responsibility.

By the end of the second wave of the pandemic, the motive structure in both groups retained the changes that emerged at the beginning. There were increased social motives in the foreign students, and increased indicators for professional motives in the Russian students.

During the early pandemic period, statistically significant changes in the level of professional motives were observed only in the Russian students. This is indicative of a change in their learning motivation: to be successful in their future professional activity, to fully use their abilities and aptitudes in the realisation of their chosen profession, and an expressed concern for professional growth.

The results could be explained by the fact that the Russian students, unlike foreign ones, were actively involved in working with coronavirus and other patients during the COVID-19 pandemic; their study took place in parallel with more extended practice where they gained valuable experience under the guidance of working doctors. By observing these doctors, Russian students learnt how to act in various emergency situations and the doctors themselves often realised that these students would soon become their colleagues, so they treated them attentively, sharing experiences and answering questions. Many of the students, after working in such conditions, began to understand how difficult the profession they have chosen is, and perceived the pandemic as a kind of challenge to their future professionalism. Therefore, medical students have a more conscious attitude to their studies.

These results are consistent with the findings of a survey conducted among the students and attending physicians of Pavlov Ryazan State Medical University who worked in medical institutions as volunteers from the first days of the pandemic (Zholudova, Krestyaninova, 2021). We conclude that the activity of 80 % of medical students is motivated by the actual content of their professional work. The respondents are focused on achieving the desired goals; they wish to apply their

knowledge, skills and abilities in their professional activity, to establish communication, to participate in competitions, to get work experience.

In summary, there has been a change in the structure and manifestation of the learning motives (professional, creative self-actualisation, communicative, social and prestige-driven motives) of Russian and foreign medical students. The assumed research hypothesis that the structure of learning activity motivation of Russian and foreign medical students has undergone changes during the COVID-19 pandemic has been confirmed.

5. Conclusion

The comparative analysis of changes in the basic learning motives of Russian and foreign students receiving medical education in the same specialty at the same university confirmed the research hypothesis that the structure of their learning motivation has changed during the COVID-19 pandemic.

The structure of learning motivation in both Russian and foreign students before the pandemic points to a developed professional orientation and a conscious choice of profession, generally characteristic of medical students: the indicators for most of the motives show a high level, with significant professional motives. However, motives for the formation of a humanistic personality such as cognitive-developmental and creative self-realisation were significantly less expressed than professional ones. During the COVID-19 pandemic, the Russian students showed an increase in the manifestation of professional motives, probably due to earlier practise with patients, and an increased level of creative self-actualisation motives and a decreased level of communicative and social motives. The foreign students showed a decreased level of prestige-driven motives, along with some decrease in the manifestation of social motives.

The results open prospects for the further development of the human potential and professionalism of medical students, which can serve as a basis for improving medical education.

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Child-to-Parent Violence in the Spotlight: Thematic Analysis of Interviews with Parents Who Participated in the VÍNCULO Project of the University of Valencia

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Abstract

Child-to-parent violence has become one of the most important forms of violence at present, due to recent studies and the resulting awareness. Programmes such as VÍNCULO (BOND) assist parents seeking parenting guidance to manage this problem in the family. A complete study was carried out using mixed methods; however, the findings presented here are the result of an exclusively qualitative method due to the scope. We present thematic analysis of 10 interviews conducted with parents suffering from child-to-parent violence. Four supra-themes were analysed, two of which will be presented: the family environment and violent behaviour. The findings obtained reflect a lack of communication between parents and their adolescent children, where verbal and/or psychological violent behaviour are predominant. The essential key point of the project consists in developing emotional connections in the family relationship to strengthen the affective bond. The desperate situation that these families experience is the result of the negative interconnections between an inappropriate parenting style, broken emotional bond and, on many occasions, the perpetuation of a cycle of violence as a normalised relational style.

Keywords: child-to-parent violence, family, parenting style, affective bond, parental intervention.

1. Introduction

The family constitutes the basic social nucleus for living together and both its structure and the relationships produced within it are essential for the correct bio-psycho-social development of each of its members. Minuchin and Fishman (1997) describe the family as the natural group that establishes patterns of interaction over time and which leads to conservation and evolution. It is society's cell group; an institution that has existed throughout history and has always shared the same functions, such as the upbringing of children, survival and common union between its

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members. It is not a static entity but is rather in constant change, just like the social contexts surrounding it.

The family can be an affective space for living together, protection and meeting children's needs, or, on the other hand, it can become a source of conflict and risks, in the form of abandonment of any other type of physical, psychological, emotional or sexual abuse (Aroca et al., 2012). Thus, what takes place within the family context will have a decisive influence on the lives of its members (Cánovas, Sahuquillo, 2014).

Therefore, the family constitutes the most important support system for adolescents' wellbeing and adjustment, as it is the most immediate context for their personal development. However, it has also been analysed as a source of possible risk factors, since the quality of the relationships between parents and children represents one of the most notable predictor variables of antisocial behaviour in adolescent children (Musitu et al., 2006; Lozano et al., 2013).

When child-to-parent violence is understood as the result of the interaction between the different members of the family system, analysing it requires an ecosystemic relational approach (Peligero, 2016; Pereira, 2011). This takes into consideration intrapersonal factors, such as family functioning factors and cultural and community influences.

With regard to family environment, previous studies have established the existence of a relationship between problems of violent behaviour during adolescence and the presence of frequent and intense family conflicts (Gámez, Calvete, 2012; Ibabe, Jaureguizar, 2011; Tobeña, 2012). Child-to-parent violence develops in a cycle of coercion between the abusive child and the victim, which has been defined as the circle of child-to-parent violence (Aroca, 2010). This cycle consists in a process where the use of violence, not only physical, is threatened with the aim of conditioning the behaviour of the members of the family nucleus.

Different studies show a series of family factors that cause child-to-parent violence to appear in the family. The first of these refers to a history of family violence and its use as a way to resolve conflict. The assumption of violence as a way of relating and/or resolving conflicts from an early age can cause children to reproduce the mechanisms that they have learned in order to solve problems that they may encounter over their life cycle (Calvete, Orue, 2011; Routt, Anderson, 2011).

As Martínez et al. (2015) highlight in their study, the variable "being a witness to violence in the family" shows that 50 % to 60 % of children who have witnessed this abuse show aggressive behaviour towards their parents. This factor is closely linked to the intergenerational theory of violence described previously. Thus, it is important to note that having been exposed to highly conflictive family situations, both directly and indirectly, may be considered a risk factor.

Another family factor included in the scientific evidence (Aroca, Cánovas, 2012; Ibabe et al., 2007) refers to the parenting styles used by parents when raising their children. Parenting styles are a compendium of attitudes, behaviour and non-verbal expressions that characterise the nature of the relationships between parents and children in different situations. The combination of high and low levels of affection and control enables four parenting styles to be defined: authoritarian, authoritative, permissive and neglectful (Baumrind, 1971; Maccoby, Martin, 1983).

With regard to child-to-parent violence and parenting styles, Etxebarria et al. (2009) show that there has been a profound transformation of relationships between parents and children in recent years. These relationships are increasingly symmetrical and can be associated with a significant change in the hierarchy of power within the family system (Martínez et al., 2015). Parental socialisation styles have therefore been identified as precedents to aggression between children and parents.

In accordance with these recent changes in parenting styles, it is thought that child-to-parent violence may stem from parents' inability to establish limits on their children's behaviour and set consequences according to this behaviour. In the words of Calvete et al. (2014), child-to-parent violence represents a specific disturbance of the traditional relationships of power, through which adolescents try to control and gain power over family members.

2. Method

2.1. Design

The VÍNCULO project began as an initiative of the University of Valencia to respond to emerging social demand with regards to CPV. It is a free public resource offered by the University Institute of Creativity and Educational Innovation of the University of Valencia and aimed at all

families who need support to manage situations of family violence. It helps parents who suffer recurrent physical and/or psychological violence from their adolescent children.

The specialised assistance offered specifically provides guidance on matters of parenting, aiming to prevent conflicts. Moreover, it suggests new strategies to redirect violent actions in the family. It excludes any type of therapy or clinical psychological treatment for users (both parents and children). To guarantee this line of action, three criteria are stipulated which must be to be met by all families who make use of the service:

1. No legal proceedings have been initiated due to an accusation of CPV.
2. No proceedings for treatment have been initiated by social services.
3. Children must be between 12 and 17 years old.

2.2. Participants

The sample consisted of a total of ten cases compiled between April and December 2019. The families contacted the VÍNCULO project to seek help as they had identified emerging aggressive behaviour in their children.

2.3. Evaluation tools

The main qualitative technique in this study was the use of semi-structured interviews, through which information about the families and adolescent children was gathered in order to understand the current problems of CPV. As the sessions were registered and recorded, it was possible to transcribe the content of the interviews so as to subsequently study them in detail. The complexity of child-to-parent violence and the different factors that contribute to this problem make it necessary for mixed methods to be used, as through this, a wider, deeper and more holistic perspective of the phenomenon studied can be gained, thus reaching greater interpretive wealth. However, due to space, the results presented here come from exclusively qualitative data, due to their scope.

Semi-structured interviews were used as the tool to collect qualitative information and this was analysed and coded through thematic analysis. A personal data collection form for the parents providing general information was used as the tool to gather socio-demographic information about the families. Together with this, a form was developed *ad hoc* to register the violence carried out by the adolescent children, which consisted of different variables relating to the violent behaviour and the type of response given by the parents to these situations.

2.4. Procedure

After the families had contacted the University of Valencia and given their informed consent to participate in the project, they were assisted in a structured way through four phases. The first consisted in initial contact with the parents through a semi-structured interview. All the available information was compiled in addition to socio-demographic data and psychometric tests. In the second, an interview was held with the adolescents (in the event that they voluntarily agreed to participate), who gave their view of the conflict and also completed psychometric tests.

Once the information about the case had been collected, the team of professionals assessed the situation according to the evidence obtained. Feedback was given to parents in the third phase, where they were provided with tools and parenting advice. The last phase consisted in exhaustive monitoring of the users to establish the progress made, or failing this, the need to repeat the procedure.

2.5. Data analysis

In this study, qualitative data (proceeding from the semi-structured interviews) was collected and analysed through thematic analysis. The qualitative data was processed and analysed using thematic analysis (Braun, Clarke, 2006) developed through the different phases and sequences that structure this process of analysis.

Phase 1: Familiarisation with the data and information

In this first phase, the transcriptions of all of the semi-structured interviews were carried out and the available material was reread. This makes it possible to look for structures, patterns and meanings that underlie the discourse of the parents participating in the study.

Phase 2: Creation of categories and initial codes

The second phase focuses on the information coding process. This process was carried out taking into account the following recommendations suggested by Braun & Clarke (2006):

- As many patterns as possible should be coded in the information.

- Enough information should be incorporated into each code so as not to lose perspective of the context.

- It is considered possible to code the same data extract more than once.

The result led to 136 semantic content codes (succinct summaries of the explicit content) being obtained, reflecting possible tendencies and groups of information. The coding process was carried out manually, which allowed our own data matrix to be designed from which it would be possible to work in subsequent phases and within which all of the fragments of text that led to the creation of the identified semantic codes were collected.

Phase 3: Search for themes

This phase is defined by classifying and grouping the different codes obtained previously, giving them shape and meaning. Throughout this phase, relationships between codes are looked for, resulting in the themes and different levels among them (supra-themes and themes), as reflected in [Table 1](#).

Table 1. Supra-themes and themes extracted through thematic analysis

| | |
|--------------------|---|
| Family environment | <ul style="list-style-type: none"> - Relationships with parents, siblings, extended and/or close family - Family intervention as support for the problem - People respected by the child - Family problems stemming from the conflict |
| Violent behaviour | <ul style="list-style-type: none"> - Type, frequency and intensity of behaviour - Profile of the victim - Place where the violent behaviour occurs - Evolution of the violent behaviour - Most serious incidents remembered - Response to situations of conflict (by the child and parents) |

Phase 4: Review of themes

A comprehensive review of the supra-themes, themes and codes previously grouped together was carried out. Due to this, during this phase a set of codes (n = 12) was detected which did not seem to belong to any theme. Therefore, they were eliminated from this study in order to be able to develop them in later research.

Phase 5: Definition and naming of themes

This phase did not lead to any modifications of what had already been established in phase 4, as there were no variations in the definitions of the supra-themes and themes. Likewise, the semantic codes remained in the groups defined in previous phases.

Phase 6: Production of the write-up

The final phase described by Braun & Clarke (2006) refers to the findings obtained following the thematic analysis, thus building a narrative supported by the argument that results from understanding and interpreting the collected information. For the individualised evaluation of the cases, it was essential to have all the information from a range of sources available for sufficient data triangulation to be plausible.

3. Results

The results obtained following thematic analysis showed different thematic groups related to child-to-parent violence and the different spectrums that the phenomenon in question reaches. These are linked to the family environment (ST1) and violent behaviour (ST2).

Firstly, each of the supra-themes will be analysed in relation to the themes and codes that it encompasses, thus indicating the relevance (frequency and percentage) that each of these aspects has in the discourse of the participants interviewed. Secondly, the relationships and connections that exist between the different themes of each supra-theme will be addressed. As has been previously indicated, all of these are interrelated and give shape to the problem of child-to-parent violence, thus making it more complex.

ST1. Family environment

The thematic analysis of this supra-theme revealed the importance of family dynamics and the relationships developed within this system. This information is shown in Table 2, where the frequency and percentage of each of the codes extracted from the analysis of the interviews (n = 10) is presented.

Table 2. Frequency and % of the codes specific to the ‘family environment’ supra-theme

| Codes | F | (%) |
|--|----------|------------|
| Relationships with parents, siblings, extended and/or close family | | |
| Communication problems between the parents and child (Code 1) | 10 | 100 |
| Pejorative labels or value judgements given to parents by the child. (Code 2) | 8 | 80 |
| Parents indicate a series of the child’s attributes and characteristics (Code 3) | 6 | 60 |
| Unity between the mother and child when facing situations of confrontation with the father. (Code 4) | 2 | 20 |
| Positive affective relationships between the child and other family members (Code 5) | 4 | 40 |
| Accounts of episodes of violence and abuse towards the child carried out by the father (Code 6) | 3 | 30 |
| The mother reacts in a protective way against the father’s abuse of the child (Code 7) | 3 | 30 |
| The mother’s emotional dependency on the child (Code 7) | 5 | 50 |
| The relationship between the parents and child becomes colder and more distant over time (Code 9) | 10 | 100 |
| The child constantly states that they do not want to have any contact with the father, breaking their relationship with him (Code 10) | 2 | 20 |
| Family intervention as support for the problem | | |
| The mother considers the child’s father to be absent and so not have a complete understanding of their violent behaviour (Code 11) | 5 | 50 |
| Relatives to whom parents turn for help in order to decrease family conflict (Code 12) | 4 | 40 |
| Lack of family and social support networks (Code 13) | 6 | 60 |
| The child’s sister provides parents with support within the family system (Code 14) | 4 | 40 |
| People respected by the child | | |
| Absence of people respected by the child and considered to be role models (Code 15) | 5 | 60 |
| The child considers the grandparents to be a role model and figure of authority. They accept their rules and there is no expression of violence towards them (Code 16) | 2 | 30 |
| Aunts and/or uncles are the only role model that the child respects (Code 17) | 1 | 10 |
| Family problems stemming from the conflict | | |
| Moments of family leisure are brief and limited (Code 18) | 10 | 100 |
| Parents highlight problems in the family life cycle and marital subsystem due to the child’s behaviour (Code 19) | 5 | 50 |

With regard to theme 1 “relationship with parents, siblings, extended and/or close family”, one of the aspects of special importance when compared with the others was that of

“communication problems between the parents and child (Code 1)”. The participants noted the need to resolve conflicts with their children in a positive way. In other words, conflicts should be used to create a space between what is desirable (for the child) and acceptable (for the parent), in such a way that an area of agreement and consensus is reached. Despite this, all the parents interviewed stated that they could not meet this need, thus finding themselves faced with a family reality where communication is made impossible during times of conflict.

“Didn’t you want to talk?” And I say, “Ok, sure.” We start to talk, then he comes out for dinner, suddenly something gets to him and he gets angry again and goes to his room (...) So then he stops talking to me, this happens all the time, and it can go on for two or three days (PVO01).

Furthermore, this aspect is intrinsically linked to the code “pejorative labels and value judgements given to parents by the child (Code 2)” and with the code “the relationship between the parents and child becomes colder and more distant over time (Code 9)”. Both originate in the context of communication problems, difficulty to resolve conflict in an assertive way and the use of verbal violence as a tool utilised in the power struggle within the family system.

80 % of participating parents revealed that the relationship between themselves and the child became increasingly distant and cold over time. The parents noted that in many cases it was the child who said that they did not want to spend time with them or the rest of the family, adopting an attitude of isolation.

Now it’s not that he doesn’t spend time with me, or with his aunt, or his two cousins, who haven’t done anything to him. They come by and he doesn’t say hi... Now, it’s that he doesn’t eat. He hasn’t eaten with the family for three years (...) Just like that, he doesn’t celebrate Christmas, birthdays, not even my niece’s christening with the family... Nothing (PVO06).

He takes a long time to eat dinner, because he wants to eat dinner alone, have lunch alone, look at his phone and avoid us (PVO07).

Communication problems, tied to the latent violence in the family environment, hinder the possibility of the parts involved being emotionally reconciled with each other. The analysis indicates that 80 % of the families participating in the study have lived with constant conflicts in which the “pejorative labels and value judgements given the parents by the child (Code 2)” become especially relevant through the use of insults, threats and humiliation.

Look, her exact words (referring to what the child says), “Get out of my life, die, I hope you get run over, I hope you get raped, die.” I said, “You don’t know what you’re saying” and she answered, “It’s what I feel and what I want, bitch, whore, die. I know you think that I’m saying it because I’m angry, but the only thing I want is for you to know what it’s like to have a hard time.” I’m convinced that she wants (...) me to feel the pain that she feels (PVO09).

In these situations, the parents state that they do not know how to handle the messages of hate expressed by their children when they argue. 60 % of participating mothers and fathers indicate “a series of the child’s attributes and characteristics (Code 3)”. The attributes assigned depict a violent, controlling child with the ability to manipulate situations through the use of affection or contempt/aggression as they see fit. Furthermore, the child is immature and shows regressive tendencies in their childish behaviour, as well as finding it difficult to manage emotions and make use of assertive techniques to solve problems.

I had to say three positive things about him, three things about his characteristics, something, and it was really hard to find them because I was so angry about what he was doing to us (PVO02).

Some of the informants referred to the search for “positive affective relationships with other family members (Code 5)”, especially when spending leisure time together. The analysis of the interviews reveals that 40 % of children try to maintain affective bonds with a family member, thus establishing a type of connection that keeps them connected to their environment and allows them to feel part of the family reality.

Look, he usually gets on very well with his sister and they support each other a lot, he always asks his sister for advice. If he has to buy some trousers he’ll say, “Well you buy them for me or whatever my sister says.” (PVO02)

I also have to say that there are some lovely moments when he looks for harmony. For example, last night the three siblings were together in the bedroom before going to sleep (PVO03).

The interviews reflected the importance of intergenerational transmission of violence. In three of the families that participated in the study, the children developed violent behaviour towards their mother and siblings after having been exposed to gender-based violence within the family. For this reason, 30 % of families mentioned an “account of episodes of violence and abuse towards the child carried out by the father (Code 6)” in their interviews, while also explaining how “the mother reacts protectively against with the father’s abuse of the child (Code 7)”. Violence learned in childhood should be considered as a risk factor, given that it can affect the recurrence of violence, understood as second-generation violent behaviour.

It should be noted that in 30% of cases where gender violence existed in the home, and where the child had also been directly and indirectly exposed to such violence, the mother adopted an overprotective parenting style towards the child, as shown in code 7. The interviewed mothers stated that they felt the need to convey all the affection that their children had been denied, leading to emotional dependence. This encourages heteronomy, at the expense of the individual autonomy of both the child and the mother herself.

I have a very strong bond with my son, an umbilical cord that feels like it hasn’t been cut and I don’t want to cut it. I don’t know why. (...) Another time I said to him, “Put your socks on, darling” and he answered, “Damn it, how hard is it? You put them on for me”, and as his mum, I was there, as I could, trying to put on his socks” (PV004).

I was completely (...) devoted, devoted to his wellbeing and to everything going well for him. (PV003)

With regard to the analysis of the “unity between the mother and child when facing situations of confrontation with the father. (Code 4)” code and the “child constantly states that they do not want to have any contact with the father, breaking their relationship with him (Code 10)”, it is important to note that both were mentioned by 20 % of participating families.

In both cases, they were mentioned by two of the three mothers who had been victims of gender-based violence. In times of family conflict, the children created a non-agreed alliance against the father. Once the divorce process had been carried out, the children did not want to maintain any kind of contact with their father.

He says that his father is dead to him, and that he doesn’t have a father (PV006).

The first year their father didn’t let me come near them, it was like I didn’t exist for the week they were with him. In fact, the boy still knows when he’s with him, and he already knows because he’s told him, which things they do with their father and not with their mother (PV003).

In theme 2, 60 % of participants highlighted that they had not felt supported by their family, emphasising the “lack of family and social support networks (Code 13)”. As a result of this, they needed external support to be able to distance themselves from the problem. In this regard, 50 % of mothers considered “the child’s father to be absent and so not have a complete understanding of their child’s violent behaviour (Code 11)”, as the mothers are the ones in charge of their children’s care and spend the most time with them.

Theme 2 is closely related to theme 3 “people respected by the child”. 30 % of informants mentioned that the grandparents were figures of respect and authority for the child (Code 16), as were uncles/aunts in 10 % of cases. These results suggest that 60 % of children with violent behaviour lack people they respect in the family environment.

Finally, theme 4 addresses “family problems stemming from the conflict”, which is represented by three codes. On the one hand, all the participants highlighted “the few moments of leisure time that the family share and which enrich relationships between the members of the system (Code 18)”, implying a loss of positive and meaningful experiences with the whole family which help lower the high level of conflict. On the other hand, 50 % of parents stated that they had felt that the child’s behavioural problems were affecting the correct development of the family life cycle, especially the marital subsystem (Code 19).

I said, “Well, let’s go out for lunch or go for a hike”. For a long time I said, “Hey, now you’re doing something related to hiking, lets go for a walk in the mountains. We’ll go anywhere you want” (PV001).

ST2. Violent behaviour

The analysis of the interview points to a great number of codes full of experiences and meanings regarding the violence that parents have suffered at the hands of their children, giving shape to this matter.

Table 3. Frequency and % of the codes specific to the “violent behaviour” supra-theme

| Codes | F | (%) |
|---|----------|------------|
| Type, frequency and intensity of behaviour. Profile of the victim | | |
| There are numerous and continuous conflictive situations caused by the child's violent behaviour towards their parents (Code 20) | 10 | 100 |
| The child releases their violence and aggression on the home furnishings (Code 21) | 5 | 50 |
| Physical violence carried out by the child towards their parents (Code 22) | 6 | 60 |
| Psychological violence carried out by the child towards their parents (Code 23) | 9 | 90 |
| Verbal violence expressed by the child towards their parents (Code 24) | 10 | 100 |
| Parents state that the child steals small quantities of money from them (code 25) | 3 | 30 |
| Parents state that the child has a gaming addiction and this causes an increase in their violent behaviour towards the members of the family system (Code 26) | 7 | 70 |
| The mother and younger sister are the main victims of child-to-parent violence (Code 27) | 10 | 100 |
| Evolution of the violent behaviour | | |
| There is a positive change in the child's attitude following an increase in the parents' affective nearness (Code 28) | 4 | 40 |
| Dynamic cycle of violence (violent phases vs balanced phases) (Code 29) | 7 | 70 |
| The violent behaviour began in childhood with small outbursts of anger, and escalated over the years towards violent behaviour (Code 30) | 8 | 80 |
| Parents state that they did not realise how much their child's violent behaviour was increasing (Code 31) | 2 | 20 |
| Most serious incidents remembered | | |
| Serious episodes of physical and verbal violence between the father and child (Code 32) | 3 | 30 |
| Arguments between the child and parents in which verbal violence plays an important part (Code 33) | 10 | 10 |
| The child throws a piece of furniture at the parents while insulting and threatening them (Code 34) | 3 | 30 |
| Response to situations of conflict (by the child and parents) | | |
| Parents feel overwhelmed by the situation with the child (Code 35) | 7 | 70 |
| When parents express any physical violence during a conflict the child reacts extremely violently (Code 36) | 7 | 70 |
| Parents try to make the child reflect on the gravity of his or her actions (Code 37) | 5 | 50 |
| When the child reflects on their violent behaviour, they show regret and express affection towards the family members involves (Code 38) | 6 | 60 |
| The child states that they not feel remorse for the violent actions carried out against their parents (Code 39) | 4 | 40 |

| | | |
|---|---|----|
| Parents tend to act as though their child's violent behaviour never happened, denying the reality that they are experiencing. | 3 | 30 |
| Parents resort to physical or verbal violence when they do not know how to manage conflicts with their child (Code 41) | 7 | 70 |

Theme 5 refers to the “type, frequency and intensity of behaviour and profile of the victims” and is shown in Table 3. From this analysis, it is been possible to outline a family scenario subject to constant family conflicts (Code 20), which stem from the different expressions of violent behaviour carried out by the children towards their parents.

All of the participants stated that they had felt immersed in a damaged family reality. The participants stated that they had felt like victims, both directly and indirectly, of their children's violence, which took on different forms (physical, psychological, verbal and against the home furnishings). With regard to “verbal violence expressed by the child towards their parents (Code 24)”, it is important to note that all those interviewed admitted to having experienced it over the years. The data extracted from the analysis of the interviews reveal that verbal aggression is the type that is most prevalent over time.

He says to me, “You fat bitch, I hope you die. I'm going to spit on your grave, I'm going to dance on your grave”, and in the evening he's giving me kisses. And another time when he wanted me to help him get dressed, when I told him he was too old for it he shouted, “Put them on for me, damn it! You're disgusting, put them on! (PV004)

Well, for example, he went on to say, “*You're shitty parents*”, “*I hope you die soon.*” (PV007)

Another expression of child-to-parent violence mentioned by family members is related to “psychological violence carried out by the child towards their parents (Code 23)”, which is found in 90 % of cases. This type of violence is connected to constant threats, manipulation, emotional blackmail, coercion and intimidation. In the same way, 60 % of the key participants also said that they had suffered physical violence from the child (Code 22).

She's hurt me if I didn't do what, if she wanted to go out and I didn't let her. Then she'd hit me so I'd let her go. One of the times when she hit me I said, “I'm going to have to call the police if you don't stop hitting me.” (PV009).

I don't remember what it was about (...) in one of those outbursts that he had, he punched me two or three times on my chest and then once on my forehead, that one really hurt me. (PV010)

The different expressions of violence described by the participants always arise when the child is denied something that they want immediately or in the short term, putting their needs before those of the other family members. This behaviour appears as a tool to obtain what they want. It is important to note that half of the parents (50 %) also said that when the child is not in control of the situation or when they denied something that they want to get, this leads to an “release of violence and aggression on the home furnishings (Code 21)”, leaving significant physical damage on the walls or furniture of the home.

My son's destroyed the house twice. He's smashed the TV (...) he's broken a picture. One day he picked up a knife and broke one of those pictures with a print of New York (...) He destroyed it, he kicked it (PV004).

He's got a lot of anger and, lately, he gets it out by hitting himself against the doors and the walls (PV006).

One of the codes that was of special importance regarding violent behaviour refers to gaming addictions (Code 26), which are present in 70 % of the children included in the sample.

Yes, but his addiction doesn't just end with gaming. You try to take away his mobile or the computer and that's when he gets violent (PV003).

She's always on her phone and you can't take it off her (...) I've tried sometimes, but I haven't been able to. When I've got angry and tried to take her mobile away, she's got really aggressive. She hasn't hit me but she gets really defensive and tries to stop me from taking her phone (PV008).

Furthermore, 30 % of the participants in the study stated that they had been victims of small thefts carried out by their child (Code 25). This was due to the fact that the parents refused to give

them money when they demanded it through shouting, insults and threats. These thefts occurred when the victims were not home, so physical violence was not used to get what they wanted to take.

A year ago, he bought several things with my cards, with his father's cards and, as we took them all away from him (...) he started to steal money that we had at home (PVO03).

The analysis of the interviews reveals that "the mother and younger sister are the main victims of child-to-parent violence (Code 27)" in 100 % of the cases included in the sample.

He directly insults his siblings (...) and he said to one of them "hey, you're an idiot, you don't have any friends, you're a loser". He also always knows how to attack where it hurts the most and he has a special ability (...) a special instinct to attack when you can't defend yourself (PVO05).

The participants' discourse shows that the mother and younger siblings are always the main object of the child's violence. They are the ones who usually invest the most time in their children and adopt the role of carer. This gives them greater responsibility in the upbringing of their children and they frequently feel guilty about their bad behaviour.

In theme 6, the "evolution of violent behaviour" carried out by the child over the years, 70 % of participants noted that the "the cycle of violence is dynamic (Code 29)", given that violent episodes are interspersed with moments of harmony and balance in the family, even though they do not last long. This dynamic has been defined as the circle of child-to-parent violence, given that it does not correspond to isolated events, but rather follows a pattern.

He knows how to lead you into a trap, into his circle of traps. So, if he says, "You're a loser" in front of everyone and you don't say anything, he sees it as though you're making him look stupid. If he hits us it's worse because it's in front of everyone (...) so he takes you to situations where he can close you in no matter what you do (PVO05).

In this cycle of child-to-parent violence, 80 % of parents stated that "the violent behaviour began in childhood with small outbursts of anger, and escalated over the years towards violent behaviour (Code 30)", now reaching a level that they do not know how to manage or stop. A large number of parents did state that they were aware of the evolution of their child's behaviour over the years, while 20 % of mothers and fathers included in the study stressed that they did not realise how much their child's violent behaviour was increasing (Code 31)". Moreover, only 40 % of participants reported a "positive change in the child's attitude following an increase in the parents' affective nearness (Code 28)". This is an important aspect that indicates that it is possible to reduce the children's level of violence.

Theme 7 addresses "the most serious incidents remembered". The predominant type is verbal (Code 33), which is shared among all participants. Moments of extreme physical violence between the child and one of the parents (Code 32), where a lack of self-control and uncontrolled anger is expressed through hitting are also noted. Such episodes of violence occurred in 30 % of cases. In another 30 % of cases, the violence carried out by children was directed towards furniture (Code 30) by trying to break and destroy objects of emotional value for the family members.

Lastly, the importance of the "response to situations of conflict" (theme 8) was reinforced. On the one hand, 70 % of parents indicated that they felt overwhelmed by the situation with their child (Code 35), given that they did not have the resources or skills to manage it. The informants noted different responses to violent conflicts, as 50 % of parents used physical punishment and verbal violence to end family conflict or when they do not know how to manage the problem (Code 42), while 50% of the cases also tried to make the child reflect on their violent actions (Code 37).

I tried to make some things clear, and well, it was a disaster of a day. But I don't know how it happened, but since then he's started to change his attitude. The change was incredible after only a few days and it's carried on. The problem where he would start to raise his voice over any little thing doesn't happen anymore and I don't even feel so much contempt in his words (PVO01).

It is important to note that when the parents show any expression of violence during conflict with their child, he or she reacts more violently towards them (Code 36). Thus, there is an escalation of feelings of hate/anger in the child and frustration from the parents, as they do not know how to correctly manage the situation and heighten the latent problem.

Sometimes I hit him when we were arguing and he hit me back afterwards. And I said, "Why are you hurting me?" and he said, "If you can hit me, I'm going to hit too". And I also remember that when he punched me hard, I'd slapped him at the beginning of the argument for something he'd said that had really hurt me (PVO10).

Finally, the parents stated that, in 60 % of cases, the children had shown regret for the actions committed (Code 39); while in the remaining 40 % they stated that they did not feel any remorse for the different types of violence used during discussions. 30 % of parents indicated that when the family conflict had finished, they acted as though the violent actions committed by the child had never happened. This reaction creates an illusion of the reality in which the family are living, using avoidance and lack of acceptance as a strategy to try to separate themselves from the violence they are experiencing.

4. Discussion

As has already been said, the family is understood to be the most important agent of socialisation in the bio-psycho-social development of its members; especially in the earliest stages of life. In fact, the family constitutes the essential nucleus for the socialisation of children. While the family is the setting in which first interactions are developed, these can be both positive and negative. They all affect the dynamics and tendencies of the family towards functionality or dysfunction, in which parenthood, parenting styles and conflict resolution are influential.

Child-to-parent violence, understood as violent behaviour where the main victims are parents, is considered to be a complex phenomenon, since multiple aspects of relational dynamics converge. The exertion of violence does not have only one cause, but is rather formed by a complex, multifaceted issue with multiple causes, which can only be understood from ecological approach that considers both intrapersonal variables and aspects of family functioning and cultural and community influences (Pereira, 2011). Social and cultural changes occurring in recent years have influenced the presence and development of child-to-parent violence in the home. One of the factors commonly mentioned is the transformation of a normative hierarchy based on the authority of the parents into a horizontal position. In other words, it becomes parenting based on democracy (Pereira, 2011).

The most significant results of the analysis of each supra-theme will be presented below. On the one hand, in the family environment, importance is given to communication problems between parents and adolescent children together with pejorative value judgements in conflicts from both sides involved. This can be seen in all cases, and for this reason it can be considered to be widespread. The parents highlighted the need to create spaces for communication in which affection and positive life experiences between family members take precedence. In comparison with the previous point, the presence of learned bidirectional violence is found, which is connected to a family history prone to episodes of gender-based violence. There are many cases (40 % of the sample) in which children have been exposed to some kind of violence in the family, which in turn has been accentuated by the lack of family and community support networks. From the sample analysed, children who have been exposed to this situation have developed more violent relational mechanisms and lack the necessary tools to manage conflicts assertively. The absence of the father figure and lack of shared leisure time were also of particular relevance in the participants' discourse.

On the other hand, with regard to the results concerning the children's violent behaviour, it is important to highlight the main victims of this violence as well as its typology. The analysis shows that violence is mainly carried out against mothers. In relation to this, while violence appears in all types of families (single-parent, reconstituted, adoptive, nuclear or foster), it is single-parent families that constitute a decisive risk factor for the appearance of CPV. In fact, this has been seen in the cases examined here, especially mothers in single-parent families. The risk factors linked to the abuse of mothers have been summarised, and established in this study, as the following: parenting habits characterised by irritability, insufficient intra-family communication, poor parental control and supervision, coercive practices, lack of affection, few, non-existent or inconsistent rules and limits and low levels of family cohesion (Ibabe et al., 2009). This study has shown that the mother is the person most frequently attacked by children, given that she is the carer and main (and sometimes only) parent, which contributes to the appearance of confrontations.

Another of the most noted aspects was the type of violence carried out by the children, by which we refer to verbal or psychological violence and violence towards the home furnishings. All the children verbally attacked their parents, 90 % used psychological violence while 60 % also used physical violence. Releasing violence and aggression on furnishings was not insignificant (prevalent in 50 % of cases). Gaming addictions and the consumption of narcotics generated violent reactions in children when deprived of something they wanted. For this reason, it is not surprising that the reverse hierarchy previously referred to is linked to the purpose of attaining

their objectives (greater control over purchases, money, the use of new technologies etc.) through the use of violence.

The studies reviewed together with the present research indicate that permissiveness, negligence and the absence of the father figure are constantly found in abusive children. CPV directly correlates to parenting practices that fail to encourage the child's emotional and social adjustment, essential for their correct development (Aroca et al., 2014). Moreover, learned violent is understood to be a vicarious form of learning from observation and in the cases that have been monitored, a boomerang effect has been established where children who have been attacked at some stage in their lives have responded in the same way, as they have assimilated violence as a way of relating. In short, the essential key point shown by the VÍNCULO project is the development of a stable, positive and long-lasting affective bond, which that has been developed with the families who use this service in order to equip them with the necessary resources. Thus, the aim of the parenting and social guidance and advice provided has been to enable parents to handle this situation from a conscious and educated perspective and to develop the attitudes and skills needed to face the problems that concern them.

The main limitation of this study is found in the unilateral nature of the information. The parents were the ones who sought help, due to which, in the majority of cases, the children did not consider there to be a problem and were not prepared to share their view of the situation. From the above, there are clear prospects for the future: we must continue to work to reach more families and ensure that the children involved are aware and actively participate so as to obtain more complete and exhaustive information on each of the cases in question. Furthermore, in subsequent studies we aim to look in more depth at other supra-themes of great interest, which have not been possible to cover here owing to a lack of space, and which could shine light on the state of the matter.

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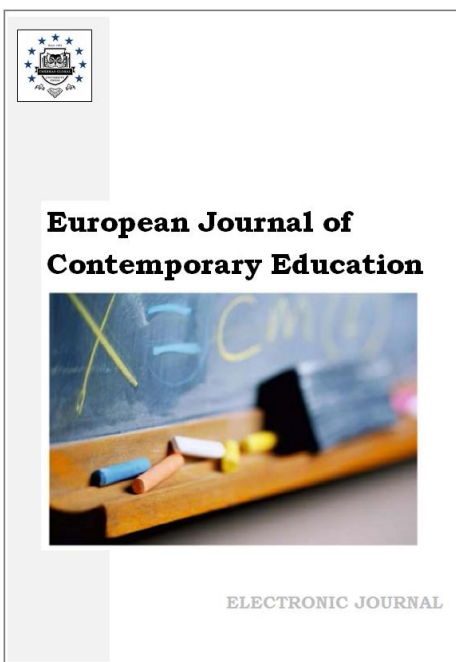
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Student's Categorization Activities in the Educational Process of Second Foreign Language Reading Comprehension

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Abstract

In the educational process of a foreign language study, the student learns about the culture of the language and processes its abstract structure. Reading comprehension in a foreign language is a tool for learning about this structure, and the student encounters many unknown and ambiguous stimuli during reading. In our research, we verify connections between reading comprehension in a second foreign language (French and German) and the student's categorization activities, which we specify in the variables of tolerance of ambiguity and personal need of the structure. The research was carried out with 277 students of secondary schools (grammar and vocational schools) in Slovakia using such research methods as Didactic test of reading comprehension for the German language, Didactic test of reading comprehension for the French language, Personal Need for Structure Questionnaire (PNS) and the Tolerance of Ambiguity Scale (TAS). It turns out that both the tolerance of ambiguity and the personal need for the structure are linked to performance in reading comprehension, but these connections manifest themselves in different ways depending on the different language variants.

Keywords: reading comprehension, second foreign language, foreign language education, personal need for structure, tolerance of ambiguity.

1. Introduction

Effective work with foreign language texts is an integral part of many professions; it is a condition for obtaining, processing and critical evaluation of information that comes to us from various sources from around the world (Gadušová et al., 2019). The research problem in current foreign language education is what aspects of reading comprehension to focus on in developing comprehension, what markers in different types of texts and their corresponding reading strategies to observe in the process

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of developing students' comprehension in order to prepare them for the needs of today's labor market, to get them acquainted with foreign language texts and, especially to enable their understanding (Gadušová et al., 2020a; Gadušová et al., 2020b; Gadušová et al., 2021). Current research (Benčíč, 2013; León, Escudero, 2017; Králik, Máhrik, 2019; Hockicková et al., 2020; Stranovská, Ficze, 2020; Lalinská, 2020; Lalinská et al., 2020; Azizi et al., 2020; Pavlíková, 2021; Khonamri et al., 2020; Khonamri et al., 2021; Hudecová et al., 2021) focuses primarily on the cognitive and functional aspects of reading comprehension and reading competence. For this reason, little attention has been paid to the specific needs of text comprehension with an emphasis on cognitive, motivational and emotional processes such as the ability to receive, perceive experience, interpret and evaluate a literary text and to use the experience of understanding a literary text in communication. Compared to professional (exposition) texts, it is much more difficult to measure and validate the constructs of understanding literary texts. On the other hand, reading professional or factual texts, also called intensive reading, uses comprehension questions. We recommend that students work with academic texts at the level of intensive reading as well as with fictional texts at the level of extensive reading, so that students become familiar with several types of reading comprehension, practice various forms of working with texts and develop reading comprehension at several levels. Monitoring the reader, who chooses the type of reading when processing the text, plays an important role. According to Farris et al. (2004) understanding of the text lies in the fact that the individual is able to effectively approach the meanings of words and integrate them into the context of passages in the text. The ability to draw conclusions and thus combine information in the text is crucial for successful reading and comprehension. Individuals not only integrate information from a text, but also use their knowledge of the world to understand the text being read. The set of these processes represents the categorization activities of the student's cognition, i.e. cognitive structuring. According to McNamara et al. (2007) the categorization of different types of strategies in the reading comprehension process depends on the purpose and success of each strategy in different situations. This means that the reader must distinguish between different situational and contextual factors, organize information into categories, which happens in an ambiguous situation. We call this process categorization or cognitive structuring; taking into account the extent to which individuals need to categorize information and the extent to which they want it, reflecting the personal need for structure. The categorization activities of the student in the process of reading comprehension create a connection between language, thinking and reading comprehension strategies, i.e. the ability of the reader to make appropriate decisions between the context and the ability to decode, organize and categorize information. What strategy the reader chooses and whether he is able to choose the strategy and understand the text, the interaction of linguistic and cognitive-personality variables is necessary. The cognitive-personality variables are the cognitive structuring of knowledge as a personal need for structure and tolerance of ambiguity.

The personal need for structure is a cognitive requirement to classify information from the outer world, and it should be pointed out that this variable is little analyzed in the context of reading comprehension. The personal need for structure according to Bar-Tal (1994) is a desire for constant and clear knowledge, replacing an ambiguity sense, uncertainty and confusion, linked to simple information organization, relatively simple reasoning, thinking, decision making, less willingness to change attitudes and less complex memory structures.

The construct of the personal need for structure is made up of two sub-factors, such as the Desire for a simple structure (F1), the Response to its absence (F2), which can greatly affect the way people understand the outer world, experience and integrate with the world, for example, stereotypical behavior in uncertain situations.

Tolerance of ambiguity (TA) is related to an individual's response in situations that cannot be clearly understood and explained on the basis of available information. Frenkel-Brunswik (1948) characterizes it as a personality variable of a perceptual and emotional nature. Unknown situations cause excessive stress in people with low tolerance of ambiguity, so they may experience intense emotional reactions and avoid ambiguous stimuli. On the contrary, people with a high tolerance of ambiguity perceive similar situations as desirable and interesting (Furnham, Ribchester, 1995; Stranovská et al., 2019). TA as a personality variable affects several areas of an individual's functioning: perception, cognitive style of thinking, interpersonal relationships, and problem solving (Ehrman et al., 2003; Furnham, Marks, 2013). In the context of learning a foreign language, the student is regularly exposed to unknown meanings, so a certain degree of tolerance of ambiguous stimuli can be considered necessary for the success of the process of learning a foreign

language. A person with an optimal degree of tolerance of ambiguity perceives a foreign language in its complexity, one works with several possible interpretations of foreign language texts and flexibly chooses a suitable communication strategy. According to current research, students with medium or higher TA give better performance in understanding a foreign language text (Liu, 2015), experience more success and subjectively evaluate their performance in foreign language reading more positively (Erten, Topkaya, 2009).

Reading comprehension in a second foreign language is considered to be a particularly demanding and specific process, as it requires a higher cognitive load on the side of pupil, which is related to the recognition of language specifics of different foreign languages and the mother tongue. Today's society requires the student to perceive and understand several foreign languages, but the question arises as to what extent society supports the teaching of a second foreign language. One of the priorities of European language policy is to maintain linguistic diversity, cultural identity and, last but not least, to promote effective foreign language learning. European education policy takes into consideration also the impact of teacher quality on learner achievements and points on importance of creation of systems of quality assessment (Hašková et al., 2019; Hašková, Lukáčová, 2017). In line with the principles of plurilingualism, the creators of national education concepts have a vision that in the future most Europeans will be able to communicate in at least two foreign languages (Eurobarometer No. 386, 2012). The Slovak education system responded to this challenge in 2007 by adopting and approving the Concept of Teaching Foreign Languages in Primary and Secondary Schools, which became the starting document for the further direction of foreign language education in Slovakia. Part of the concept are specific proposals for the introduction of the first and second foreign language with regard to ensuring the continuity of language education in the transition from lower to higher education. In the past decade, however, there have been several erroneous decisions and interpretations that have significantly damaged a second foreign language education. In this context, it is possible to mention a reduced lesson allocation for a second foreign language (for example, in grammar schools three lessons are devoted to a second foreign language in the first and second year of its studies, in the following years the lesson allocation for a second foreign language is usually reduced to two lessons per week), the introduction of a second foreign language as an optional subject and the introduction of compulsory English as the first foreign language. Both German and French have a long tradition of teaching in our geographical area, whether in historical, cultural or economic contexts. In the educational context, however, over the last decade they both have become the second foreign language, which has begun to be reflected especially in the significantly declining number of students willing to study these languages. Quantitative indicators in statistical yearbooks show a sixty to seventy-five percent decrease in the number of students learning French at different levels of education. The lower lesson allocation, which is usually set for a second foreign language, in turn affects the quality of knowledge and language skills the student has to acquire in order to be able to communicate adequately and at the required level of proficiency in the given language.

The research goal is to find out the connections between personal-cognitive variables and the language variable Reading Comprehension, while distinguishing the category of a second foreign language.

We operationalize the personality-cognitive variables: Need for structure and Tolerance of ambiguity. Within the Need for structure, we verify and determine the factor of desire for cognitive structure and the factor of reaction to the lack of cognitive structure. Within the tolerance of ambiguity, we verify and determine the factors of novelty, complexity and insolubility. Within the language variable Reading Comprehension, we measure the performance in foreign language texts comprehension of intensive and extensive reading (detailed and global comprehension), taking into account the category of the second foreign language – German and French.

In our study, we set out the following hypotheses, which we verified by correlation analysis.

H1: There is a positive relationship between ambiguity tolerance and reading comprehension performance in German.

H2: There is a positive relationship between ambiguity tolerance and reading comprehension performance in French.

H3: There is a negative relationship between the personal need for structure and reading comprehension performance in German.

H4: There is a negative relationship between the personal need for structure and the reading comprehension performance in French.

2. Methodology

Sample and Procedure

A total of 277 students from different regions of Slovakia took part in the research. The respondents were the third-year upper-secondary school students who were learning German or French as the second foreign language as part of their compulsory schooling (see [Table 1](#)).

Table 1. Characteristics of the research sample

| Foreign language | Number of respondents | Average length of the language study (years) | Type of the upper-secondary school | |
|----------------------|-----------------------|--|------------------------------------|------------|
| | | | Grammar | Vocational |
| German language (A2) | 171 | 5.2 | 96 | 75 |
| French language (A2) | 106 | 4.6 | 86 | 20 |
| Total | 277 | 5.0 | 182 | 95 |

There were a total of 171 students in our sample who were learning German. The average length of their study of the German language was 5.2 years. 106 students of our sample were learning French. Their study of the French language lasted in average 4.6 years. We tested the level of students' text comprehension in both languages at A2 level language proficiency.

Instruments

Research data were collected using questionnaire research methods. The test battery contained the following research methods: German Language Reading Comprehension Test, French Language Reading Comprehension Test, Personal Need for Structure (PNS) Questionnaire, and Tolerance of Ambiguity Scale (TAS).

The tests of the text comprehension in German and French were developed and validated by a team of experts within the project APVV-17-0071 "Support of literacy in the mother tongue and in the foreign language". The tests were written on the basis of valid documents of Slovak and European language policy.

The test of reading comprehension for the German language ([Hockicková et al., 2020](#)) tested the comprehension of German texts. It consists of five texts; two texts are focused on intensive and three texts on extensive reading with a total number of words up to 800. When choosing the texts, the authors relied on topics the students encountered in everyday life, in everyday communication at the level of different social strata (parent, teacher, classmate, sibling, and friend). The topics were as follows: interpersonal relationships (written communication of friends with a description of the way how to come see the friend), environment (how to protect the environment), and entertainment (entertainment magazine Bravo for young people), and leisure time of people of different ages and different areas of work, and board game description and instructions. The test contains a total of 20 items for all texts, three of which are open and the other closed. Respondents use the answer sheet to answer different types of tasks: dichotomous technique (correct-incorrect), simple selection, matching, substitution and ordering items. The reliability rate of the test reached the value of Cronbach's $\alpha = 0.84$ ([Lalinská, 2020](#)).

To test reading comprehension in French the Test of Reading Comprehension for French at A2 level of language proficiency was used ([Lalinská et al., 2020](#)). The test contains 5 texts, each in the range of 100-250 words, including items per text. Selected text topics relate to situations the student encounters in everyday life (eating in the school canteen, orientation in the menu of restaurants and opening hours of restaurants, description of modern music-literary style slam, written correspondence related to booking a hotel, luggage storage when travelling to Paris). The test contains only multiple choice items with an answer choice from three options – one correct answer and two incorrect answers (distractors). The number of items for each text varies depending on the content of the text. The reliability rate of the test reached the value of Cronbach's $\alpha = 0.83$ ([Lalinská, 2020](#)).

The Personal Need for Structure (PNS) questionnaire measured personal structure needs using a two-factor concept based on 12 items. The two subscales of the test are F1 – structure desire

and F2 – response to lack of structure. Respondents should indicate on the six-point Likert scale the extent to which they agree with the statements, such as whether he likes being spontaneous, whether he likes an orderly way of life or whether he does not like changing plans in the last minute. The respondent can achieve the total number of points from 12 to 72. A higher score in the questionnaire indicates a higher degree of personal need for the structure. People with a high degree of need for structure make more of their decisions using category-based judgments, as they are more motivated to find a structure in the given context.

The Tolerance of Ambiguity Scale (TAS) identifies the tolerance of ambiguity as the tendency of an individual to perceive ambiguity as desirable. The scale consists of 16 statements that relate to diverse life situations. Respondents express their opinion on them using a 5-point Likert scale. The respondent can achieve the total number of points from a minimum of 16 to a maximum of 112 points. The statements are divided into three subscales. The different subscales represent different sources of ambiguity according to Budner (1962): novelty of the stimulus, complexity and insolubility, i.e. situations that can be interpreted in several mutually incompatible ways. A higher score in the questionnaire indicates a higher level of intolerance to ambiguous situations.

3. Results

Descriptive statistics of students' performance in reading comprehension in German and French are shown in Table 2. The percentage of pupils' performance in reading comprehension in French was 72.45 % (average gross score 14.49 out of a maximum of 20 points). A group of students learning German performed slightly above the 50 % limit in the German reading comprehension test (51.04 %, average gross score 11.74 out of a maximum of 23 points). In relation to cognitive-personality variables, our sample was characterized by mean scores in the mid-range.

Table 2. Descriptive statistics of students' performance in the reading comprehension test in the second foreign language and cognitive-personality variables

| | N | Mean | Mean% | Median | Min | Max | SD | Var |
|--------------|-----|-------|-------|--------|-----|-----|-------|--------|
| RCG | 171 | 11.74 | 51.04 | 11 | 2 | 23 | 5.075 | 25.760 |
| RCF | 106 | 14.49 | 72.45 | 16 | 4 | 20 | 3.962 | 15.700 |
| TA | 277 | 59.40 | 45.21 | 60 | 33 | 80 | 7.784 | 60.598 |
| Novelty | 277 | 15.43 | 47.63 | 16 | 4 | 28 | 4.030 | 16.241 |
| Complexity | 277 | 31.22 | 41.15 | 31 | 14 | 45 | 5.190 | 26.932 |
| Insolubility | 277 | 12.76 | 54.22 | 13 | 4 | 21 | 2.748 | 7.552 |
| PNS | 277 | 44.26 | 53.77 | 45 | 17 | 67 | 8.940 | 79.925 |
| F1 | 277 | 15.33 | 56.65 | 15 | 4 | 24 | 4.114 | 16.926 |
| F2 | 277 | 26.49 | 55.69 | 27 | 7 | 42 | 5.743 | 32.979 |

Explanations: RCG – reading comprehension in German, RCF – reading comprehension in French, TA – total score of tolerance of ambiguity, PNS – total score of personal need for structure, F1 – desire for structure, F2 – response to lack of structure, SD – standard deviation, Var – variance.

Pearson's correlation was used to test the relationship between reading in a foreign language and the cognitive-personality variable ambiguity tolerance (Table 3). The connection between reading in a second foreign language and the tolerance of ambiguity was not confirmed, the relationship between reading in German, or French language and tolerance of ambiguity did not reach the level of statistical significance. We further tested the relationship between reading comprehension and individual sub-factors of ambiguity tolerance (Budner, 1962), i.e. novelty, complexity and insolubility. The relationship between reading in German and the ambiguity

tolerance sub-factors was not significant in our research. The first hypothesis was rejected. In the case of reading comprehension in French, the most important sub-factor proved to be the tolerance of complexity (negative relationship at the level of statistical significance $p = .041$). The second research hypothesis was partially confirmed.

Table 3. Pearson correlation between reading comprehension in the second foreign language and tolerance of ambiguity

| | | TA | Novelty | Complexity | Insolubility |
|-----|---------------------|-------|---------|------------|--------------|
| RCG | Pearson Correlation | -.061 | -.013 | -.162 | .140 |
| | Sig. (2-tailed) | .472 | .880 | .056 | .101 |
| RCF | Pearson Correlation | -.203 | .023 | -.242* | -.161 |
| | Sig. (2-tailed) | .087 | .848 | .041 | .177 |

Explanations: RCG – reading comprehension in German, RCF – reading comprehension in French, TA – total score of tolerance of ambiguity.

Statistical significance at the level $p = .05$ (*), $p = .01$ (**), $p = .001$ (***)

Pearson's correlation was used in our research to test the possible relationship between reading in a foreign language and the cognitive-personality variable personal need for structure (PNS) (Table 4). Correlation analysis confirmed a statistically significant negative relationship between PNS and reading comprehension in the case of French ($p = .003$), which means that the higher the individual's personal need for structure, the lower is their performance in reading comprehension in French. In the case of the German language, the correlation between reading comprehension and PNS did not reach the level of statistical significance.

Table 4. Pearson's correlation between reading comprehension in the second foreign language and personal need for structure

| | | PNS | F1 | F2 |
|-----|---------------------|---------|---------|--------|
| RCG | Pearson Correlation | -.122 | -.085 | -.144 |
| | Sig. (2-tailed) | .148 | .317 | .088 |
| RCF | Pearson Correlation | -.355** | -.358** | -.274* |
| | Sig. (2-tailed) | .003 | .002 | .022 |

Explanations: RCG – reading comprehension in German, RCF – reading comprehension in French, PNS – total score of personal need for structure, F1 – desire for structure, F2 – response to lack of structure.

Statistical significance at the level $p = .05$ (*), $p = .01$ (**), $p = .001$ (***)

The relationship between reading comprehension in German and PNS sub-factors was not significant in our research. The third research hypothesis was rejected. A significant negative relationship was confirmed between reading comprehension in French and both PNS sub-factors ($p = .002$ for structure desire sub-factor and $p = .022$ for response to structure lack sub-factor), the strength of correlation is more significant for structure desire. Thus, the stronger the desire for structure (or the more strongly expressed emotional response to the lack of structure), the lower the performance in reading comprehension in the French language. The fourth hypothesis of our research was confirmed.

4. Discussion

Student's categorization activities such as the need for structure and tolerance of ambiguity in the direction of complexity are shown in our research as predictors of reading comprehension in the French language. The lower the need for a structure is with students studying French, the higher their success in reading comprehension is and vice versa. This means that the less the students simplify the information read, or the less they experience the cognitive burden of organizing information from the read text, the more they notice semantic, pragmatic and non-textual indicators in the text (cultural specifics, secondary meanings, and others), they do not focus on the rules, word structures and sentence patterns at all costs. On the contrary, the more students simplify the information from the read text, or the more they feel the need for a clear structure, the lower their understanding of the foreign language text in French is. These results are in line with the previous researches (Sarmány-Schuller, 2014; Stranovská, Munková, 2014), which showed a negative relationship between the personal need for structure and verbal intelligence, or foreign language competence. At the same time, in the case of the French language, there was a slightly stronger relationship between the comprehension of texts and the sub-factor of the desire for structure than between the sub-factor of reaction to the lack of structure. In this regard, we support the claim of Steinmetz et al. (2011), who, based on their findings, argues that the desire for structure is more focused on the "need" for a structured, familiar one than the response to a lack of structure. Our results are consistent with the findings of Munková et al. (2014), where a negative connection between the desire for structure and reading comprehension in a foreign language was also demonstrated. We further agree with the research of Carrell (1983) and McNeil (2011), who found that the reader needs to have relevant general knowledge they can activate and can subsequently use the acquired knowledge, together with new information, accordingly.

The importance of the ambiguity tolerance sub-factors for reading comprehension in French was demonstrated by the performance in reading comprehension performance in the case of complexity tolerance (negative correlation with the TAS scale is due to higher values in the questionnaire indicating higher ambiguity intolerance). Tolerance in this context can be understood as a form of flexibility of thought that is relevant at different levels of reading comprehension processes. Cognitive flexibility allows the reader to work flexibly with the text and to choose the right reading strategies in accordance with the type of text being read and the objectives of the reading (Pressley, 2002; Pressley, Gaskins, 2006). In addition, reading in a foreign language places greater demands on the cognitive flexibility of the individual. The recognition of words and various grammatical rules in a foreign language is not fully automated, and therefore executive functions must divide conscious attention among several tasks just as in the case of the mother tongue. An individual with an optimal degree of tolerance of complexity is not limited to the use of already known elements of the language, because he is able to experiment with the foreign language and simultaneously process different layers of the foreign language (Stranovská, 2011; Stranovská, 2020). A positive response to the complexity of the text is also important in terms of processing information from the text: a complexity-tolerant student can flexibly manipulate more information to create the information core of the read text.

Significant correlations of reading comprehension in German with categorization activities (need for structure and tolerance of ambiguity) were not determined. There was a tendency relationship for reading comprehension in German and the sub-factor of the need for structure reaction to the lack of structure and sub-factor ambiguity tolerance for complexity.

The overall cognitive response of an individual to ambiguous stimuli does not appear to support a significant understanding of the German text. We propose to examine this area in another research sample. We relate our research results to the proficiency level in the given foreign language. We can assume that bottom-up reading processes at a lower language proficiency level require a higher cognitive load, as the reader must focus more on the correct decoding of grammatical and semantic structures in the text.

We perceive the differences in the context in the examined variables with respect to the category of French and German as remarkable. A possible explanation of the different results in German and French in relation to the ambiguity tolerance can be found in the different structure of the studied foreign languages. Our results confirm the theory of Colé et al. (2014), according to which not all languages are equally demanding in terms of flexible processing of different layers of the foreign language during reading. In languages where orthography and pronunciation are more complex, an

adequate response to ambiguous stimuli plays an important role. The written form of words is not clear enough, so the reader must look for other possible sources of understanding in order to process semantic and contextual information from the text. The relevance of the ambiguity tolerance is more modest in the case of languages where pronunciation and phonological rules are simpler, for example, in German. As far as French is concerned, mastering the phonological level of the language as well as its grammatical or spelling specifics is quite a challenge for Slovak students (Fanová, 2013).

The reason for the different relationship with cognitive-personality characteristics in different foreign languages in our research may also be the peculiarities of the reading comprehension test in French, or the characteristics of the research sample. Students learning French achieved a relatively high success rate in the test, which suggests that, on average, their command of the foreign language may have been slightly higher in this group than language proficiency level A2. Our findings in this regard point to the fact that cognitive-personality variables predict to a greater extent advanced foreign language learners who to some extent mastered the structure of the foreign language.

5. Conclusion

Based on the research results, it seems that the importance of categorization activities of student cognition, i. e. cognitive-personality characteristics as tolerating ambiguous situations and uncertainties in the educational process of reading comprehension in the second foreign language is related to the level of foreign language proficiency. A teacher in a group of students with a lower language proficiency level should therefore establish the basis for later more intensive work with cognitive structuring and tolerance of ambiguity. At the beginner level, the teacher can also serve as a model in working with ambiguous and less structured stimuli and reduce the cognitive load to which students are undoubtedly exposed while reading the foreign language text. At higher levels of language proficiency, emphasis should be placed on gradual reducing the need for structure in pupils, on moving away from familiar (literal) interpretations of meaning, and on developing a creative, complex and multilevel perception of the foreign language text.

In the presented research, the focus was on correlations in general. The expansion of research with qualitative methods could provide a deeper insight into the nature of the identified links between reading in a foreign language and the cognitive-personality variables of secondary school students.

We consider the categorization activities of student cognition as an important set of factors that can cause different performance and effectiveness of learning for students who, however, study the foreign language under the same conditions. In addition, the tolerance of ambiguity and the personal need for structure belong to the relatively dynamic characteristics of the student, which can be optimized by the intentional action of the teacher to develop reading comprehension skills in the foreign language. We consider dealing with these characteristics to be effective, because by stimulating them we also support the cognitive processes of text comprehension. Many times, students are motivated to read, work with a variety of texts, but are unable to respond adequately to related questions. As a further direction of research, we see the development of targeted pedagogical intervention based on the identified context and its subsequent verification in practice, which serves for awareness and subsequent systematic, in-depth development of a narrower circle of cognitive, and metacognitive processes needed to understand the foreign language text.

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Scientific Expertise of the Psychological and Pedagogical Definition

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Abstract

The methodology of scientific examination of psychological and pedagogical definitions presented in the article is justified by the need to clarify the content of the basic set of definitions that form the core of methodological, research and innovative work in the field of education. First of all, this applies to those definitions that contain a contradictory interpretation of the psychological and pedagogical concepts. The tools under discussion are (the semantic model of the phenomenon, maps of expert assessment of the model and the results of the revision of concepts) and expert-analytical procedures for various stages of such examination (grouping of existing interpretations of the same phenomenon, wording of interpretations, revision of interpretations). The developed methodology ensures the possibility of a consistent revision of the definition of concepts, progressing from the description of the phenomenon to its normative explanation. The proposed tools and procedures are illustrated by the example of scientific expertise of the psychological and pedagogical phenomenon of “didactic difficulty”.

Keywords: psychological-pedagogical phenomenon, psychological-pedagogical definition, methodologies of scientific examination of the definition of the concept, semantic model of the psychological-pedagogical phenomenon, constructs of the semantic model, integrative characteristics of constructs, procedures of scientific examination, results of scientific examination.

1. Introduction

Many educators today are well aware of the situation when the same psychological and pedagogical phenomena are represented by different definitions, often with contradictory interpretations. As a rule, the discrepancy between the content of definitions and the properties of a real phenomenon makes it challenging to make use of the concept, confusing not only those who

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practice but also many of those who research. Concepts with ambiguous and contradictory interpretation obviously require a certain rethinking and clarification. This is certainly an urgent and far from easy task. Attempts to solve it from the position of intuition and available erudition (as it usually happens) don't always work. To solve this problem, scientific expertise is required with its own special methodology, which could make the assessment of definitions of psychological and pedagogical phenomena more reasonable and constructive.

2. Materials and methods

The methodology of scientific expertise is aimed at identifying the semantic unity of the psychological and pedagogical concept and, in this regard, its pedagogical significance in the educational process. The main means of the conducted expertise are the reference (explanatory) model of the psychological and pedagogical phenomenon and expert maps for assessing the adequacy of the model and the expert information obtained with its help. The basis for a holistic description of the initial psychological and pedagogical phenomenon and the deployment of expert evaluation procedures for its various interpretations are the structural components of the model – semantic constructs, logical and semantic cross-sections, integrative characteristics of a phenomenon.

The research material is various definitions of the concept of “didactic difficulty”, presented in the psychological and pedagogical literature. Theoretical and methodological prerequisites for the development of tools and procedures for the scientific examination of psychological and pedagogical definitions are the theory of negotiation (Shakurov, 2003a), the theory of cognitive activity of schoolchildren (Kirsanov, 1982; Lerner, 1974; Lozova, 1990, etc.), studies of reflection in educational activities (Zuckerman, 1994; Elkonin, 1994, etc.) as well as the study of the nature of the definition (Voishvillo, 2007), methodology and analysis of definitions (Gorskij, 1961; Eremin, 2019; Tunnikov, 2020a, 2020b, etc.), the methodology of scientific expertise (Bolshakov, Shamaeva, 2018; Cherepanov, 1989, etc.).

3. Discussion and results

The main tools of the examination are the reference model of the psychological and pedagogical phenomenon and the maps (matrices) of the expert assessment. The reference model of the phenomenon serves as a universal basis for performing an analytical revision of its various conceptual interpretations, primarily from a semantic and didactic point of view.

The model can be refined for a specific task of examination, taking into account the specifics of a particular psychological and pedagogical phenomenon.

The reference model of the phenomenon in its typical description includes:

- semantic constructs designed to reveal and describe the psychological and pedagogical phenomenon in its entirety. These include:

the original system of the phenomenon;

the form of the phenomenon;

the role of the phenomenon in the original system;

the place of the phenomenon in the original system;

mechanism of functioning of the phenomenon.

- integrative characteristics of the phenomenon, revealing the content and features of semantic constructs. Main integrative characteristics include: *systemic activation, functional significance, functional dynamics, functional localization, individual expressiveness;*

- logical and semantic sections of the phenomenon that establish the interrelationships and relationships of semantic constructs adequate to the sequence of the analysis. The cross-sections serve as a reference point for a comprehensive assessment of the relevance of the psychological and pedagogical definition.

An objective analysis of a definition is possible only if we proceed from the very beginning, from the recognition of the necessity of connection and the immanent origin of the differences in the semantic constructs of the phenomenon. The task is to identify and consider one's own evolution of the original relation to semantic constructs. The initial relation is the relation of semantic constructs, under the influence of which ideas are formed about all other relations of constructs, and, at the same time, about the essence of the phenomenon under study, its origin and functioning. During the transition from one relationship of constructs to another, the original

relationship is refracted and the phenomenon is reproduced as a whole, on a new basis through changing its sides and connections.

Therefore, it is necessary to look at what the sides of the original relationship turn into at the next step of the analysis. Then we will have two sides of a new relationship, from which, through analysis, the desired characteristics of the psychological and pedagogical definition are derived and receive their specific content. The origin of the new relationship in this case will be entirely determined by the connection of the parties to the previous relationship. It means the requirement of the immanent origin of differences is respected. Therefore, each section of the phenomenon naturally expresses a consistent change in the content of the sides of the original relationship, since only from the relationship of these sides to each other is the psychological and pedagogical definitions are derived. Thus, tracing the implementation of logical and semantic sections in a given sequence, we gain access to the reproduction of the reference model of the psychological and pedagogical phenomenon and thereby to the expert verification of its conceptual interpretation.

The reference model of the psychological and pedagogical phenomenon uses two logical and semantic sections, which are based on the initial relation *<form – initial system>*.

The logical and semantic cross-section of the first type is the *type of phenomenon (the form is the initial system) – the role* sets the sequence of examining the role of the psychological and pedagogical phenomenon in one interpretation or another. Indeed, before raising the question of the role of a particular phenomenon, it is necessary to lay out the initial correlation. To do this, its form and the initial system in which this phenomenon occurs and functions are determined. The relation of form and system to each other is considered in terms of the transition to the subsequent relation *<form/system – role>*, through which the role of the phenomenon in this system is revealed.

The logical and semantic section of the second type serves as a guideline for analyzing the mechanism of functioning of the phenomenon: *the type of phenomenon (role – place) – mechanism*. The section sets a consistent discourse, which is based on an assessment of the mutual influence of semantic constructs of the phenomenon on the formation of a holistic view of its mechanism. During the analysis, the initial attitude provides a consistent transition to the *<role – place>* relationship and then to the *<role/place – mechanism>* relationship, as a result of which the peculiarities of the mechanism of functioning of the psychological and pedagogical phenomenon and its conceptual interpretation are revealed.

The procedures for analyzing and evaluating interpretations of the psychological and pedagogical phenomenon are carried out in a sequence of the following stages:

1 – grouping of definitions. Definitions reflecting the essential aspects of the psychological and pedagogical phenomenon are grouped in a similar context of genus-species relations. When solving this problem, one should adhere to Leibniz's law or the principle of identification of things, according to which two things are identical if all their properties are common (*Svojstvo*).

2 – wording of definitions. The content of the selected definitions is fixed according to the set of semantic constructs of the reference (explanatory) model;

3 – revision of definitions. Definitions of each group are analyzed based on logical and semantic sections and integrative characteristics of the phenomenon. The work ends with a group expert assessment of the information received. A group of experts selected according to a special methodology (*Cherepanov, 1989*) gets acquainted with the results of an analytical revision of the definitions of the psychological and pedagogical phenomenon and makes a final conclusion.

Let us illustrate the presented methodology by the example of the examination of the psychological and pedagogical definition of “didactic difficulty” (hereinafter – DD).

The stage of grouping the definitions. As a preliminary analysis of the definitions of DD found in the psychological and pedagogical literature shows, it is advisable to group them in three contexts – cognitive, affective and resource-active.

The cognitive context is relative to the obstacles due to which educational and cognitive activity (hereinafter referred to as ECA) slows down or stops completely.

The affective context unites those definitions of DD, which emphasize the psychological state of students that arises in educational activities when faced with a complex obstacle. By highlighting the affective context, we mean that students reflect their psychological state relative to the ECA, thereby evaluating it as a process (the one in progress or upcoming), and as a result (achieved or predicted).

The resource-active context combines definitions that consider DD as a structural gap in the cognitive readiness of students and, in this regard, as a value-normative resource for the functioning and development of the learning process, a strategic means of achieving pedagogical goals.

To demonstrate the methodology of scientific examination of the concept of DD, we will focus on the definitions of the cognitive group.

The synonymic chain of the definition of “obstacle” usually includes the following words and phrases “obstacle”, “hindrance”, “barrier”, “inability”, “factors preventing the achievement of the goal”, “degree of uncertainty or inconsistency of the task”, “violation of the normal pace of mental development”.

Here are some definitions in which the concept of “obstacle” is generic in relation to the concept of “didactic difficulty”.

“Difficulty is a variety of factors that prevent one from achieving a certain goal or complicate its achievement” (Kostyuk, Ball, 1986: 46).

“Difficulties (cognitive) in the most general sense can be defined as the obstacle that students have to overcome in the process of educational activities, the barrier to understanding, conscious assimilation, reproduction and productive use different pieces of educational material, to establish essential relationships between the studied objects and phenomena” (Korzhuev, 2000: 27).

“The difficulty is a measure of uncertainty or inconsistency for the subject of certain aspects of the problem, so to solve a problem means to find a way and the way out of the difficulty” (Yakunin, 1988: 73).

“Difficulty in learning is the inability of a student to accept, understand and fulfill the substantive and procedural aspects of educational activity” (Isaev).

Similar definitions can be found in many researchers (Matusevich; Pilipenko, 1996; Salavatulina, 2004, etc.)

The stage of wording of definitions. In the above definitions, the didactic difficulty has the form of an obstacle. The obstacle can be both external and internal. As for the initial system in which it arises and functions, in fact, in all definitions, the ECA is distinguished in this capacity.

In the presented group of definitions, the obstacle is assigned not only to the property of blocking the ECA, but also to the property of stimulating it. A number of definitions specify the conditions under which these properties manifest themselves. It should be concluded that, according to the authors, the obstacle plays the role of a determinant factor that causes the start or interruption of the ECA.

How is the DD mechanism presented in the above definitions? Since the mechanism is indicated indirectly in the definitions, it can only be judged by other characteristics of the DD. It is easy to find that the obstacle in the analyzed interpretations is given the place of the primary source (starting point) or the “interruption zone” of the ECA. With a given role and place having in the initial system, the mechanism of DD, according to the authors, is a process of overcoming such an obstacle.

The stage of revision of definitions. Within the framework of the selected group of definitions, we will conduct an audit of the interpretations for each logical and semantic cross-section.

Cross-section: *type of phenomenon (form – initial system) – role.* As follows from the cognitive group definitions of DD, the obstacle and ECA are in a significant relationship with each other. Ultimately, this is a fundamental point with which one cannot disagree. Indeed, the obstacle cannot be considered in isolation from the ECA. However, it is necessary to precisely specify an essential feature. The fact is that the functional connection between the obstacle and the ECA is possible only when the obstacle that has arisen is perceived by the learner as an incentive and a target setting, which means it will become a structural element of the ECA system. If this happens (and it must be admitted that this does not always happen), then we are dealing with a fundamentally different, transformed form of an obstacle. In this case, the transformed form of the obstacle is the cognitive barrier. To distinguish between the definition of “obstacle” and the definition of “cognitive barrier”, let us refer to the opinion of R.H. Shakurov, the author of the negotiation theory: “In general, the concept of “barrier” can be defined as a relationship between the elements of the system that restrict the freedom of one of them. Therefore, the essence of the

barrier lies in the impact. It has an energy potential, manifested in the restriction of a movement” (Shakurov, 2001b: 6).

The cognitive barrier does not just show the presence of this or that obstacle in learning, but what is especially important reflects its relations to the ECA system in a specific way. It is with analytical reliance on the cognitive barrier that we have the opportunity to get a more accurate idea of the actual content of DD in each specific situation. Ignoring the cognitive barrier as a transformed form of obstacle leaves its negative imprint on the proposed definitions. First of all, they do not take into account a number of essential characteristics and indicators of the phenomenon of DD and, first of all, such as motivational, emotional, volitional, as well as important qualities of the student’s personality – independence, responsibility, competitiveness, etc. In this regard, we note that in the definitions of the cognitive group DD, many examples of the identification of a cognitive barrier and an obstacle can be found (Kozhukhov, 2000; Pelipenko, 1996, etc.). For the reason mentioned above, such identification dooms definitions to display the internal relations of the DD phenomenon from the point of view of their external visibility.

As you know, the role of the psychological and pedagogical phenomenon follows its form. The interpretations of the cognitive group DD contain an indication that the obstacle plays the role of a determinant factor. However, in terms of determining the essence of the DD phenomenon itself, this is true only in the most general form, and not in specific projections.

Firstly, as has already been shown, the obstacle is not a structural element of the ECA. Here it is appropriate to emphasize once again, it is the cognitive barrier, being a transformed form of an obstacle, that is a significant regulator of ECA.

Secondly, in order to determine the role of DD in its functional significance, it is necessary to find out what exactly regulates the cognitive barrier. To do this, it is necessary to reveal the relationship between the form of DD (in this case, it is a cognitive barrier) and the system in which the barrier is included (relative to ECA). The cognitive barrier manifests its regulatory quality as a source of information. It means it has some content that is presented to the student in one form or another. Note that the content means not only educational information related to the barrier as a source of educational information, but also information about the barrier itself, its level, nature and features. Therefore, the ECA acquires the quality of the goal, in relation to the barrier, for processing the information received.

Thus, if we adhere to the logical and semantic cross-section, the key role of DD (or the main function) should be in the goal-functional and meaningful regulation of ECA. At the same time, it should be noted that working with educational information due to the presence of obstacles associated with perception, search, transformation, memorization and other cognitive procedures requires certain efforts from the student (intellectual, moral, volitional, emotional). However, as the analysis shows, this kind of role distribution is virtually absent in the given definitions.

Let’s turn to the consideration of DD in the following logical and semantic section: *the type of phenomenon <role – place> – mechanism*. The task of a consistent analysis of the transition of the initial relationship *<form – initial system>* requires shifting the focus to the process of overcoming the cognitive barrier itself, that is, to the relationship *<role – place>*, starting from which, it is necessary to proceed to the disclosure of the mechanism of functioning of the DD.

Discussing the question of the location of the DD in the source system, it is necessary to raise the question of the localization of the obstacle in the source system. The position of those authors who consider the obstacle as a kind of source of ECA is quite clear (Vysotskaya, 1974; Grebenkin, 2006). So, S.I. Vysotskaya writes: “The obstacle that a person faces when performing any activity plays the role of the immediate cause of the difficulty as a special mental state” (Vysotskaya, 1974: 27). But in order for the ECA to receive the necessary impetus, the obstacle, as already shown, must first transform into a subjectively significant barrier. A cognitive barrier can arise and be actualized only within a certain situation. This is a situation of cognitive interaction of a student with an obstacle. In the absence of a situation of cognitive interaction, there can be no cognitive barrier, only signal information about the presence of a potentially possible interference will remain. This means that outside the framework of the situation of cognitive interaction of the student with the obstacle, there is no purposeful activity to eliminate the obstacle itself, and hence the formation of DD.

Consequently, the generating cause of DD and, therefore, the source of ECA is not the obstacle itself, but the situation of cognitive interaction of the student with this obstacle. At the

same time, the situation of cognitive interaction itself is just a picture, a subjective representation of the real situation in the individual consciousness of the student.

Thus, we can summarize. The process of folding-deployment of ECA does not happen due to the occurrence of an obstacle, but, first of all, due to the success or failure of purposeful didactic actions in a situation of interaction with an obstacle, which the student perceives, evaluates, interprets subjectively every time.

It follows from what has been said above that the obstacle, taken as such, is not a process of purposeful processing of information and in this sense is not functional at all. In other words, the obstacle is not connected with the mechanism of functioning of the DD until it is perceived (motivated, goal-oriented) by the student as a cognitive barrier and becomes a structural element of his cognitive activity. And the latter is possible only in the situation of cognitive interaction of the student with the obstacle that has arisen. As for DD, unlike an obstacle, it is a process of purposeful search and processing of information for a specific educational task.

It is quite clear that purposeful educational and cognitive actions play an important role in the dynamics of cognitive interaction with this or that obstacle. But there is more to that. There is a thing to be added here that is often overlooked. Along with the process of acquiring new knowledge, essential to overcome the barrier that has arisen, the didactic efforts of the student himself are also in the foreground, which in turn significantly depend on his psychological state. Educational practice shows that didactic efforts with certain values and an adequate psychological mood contribute not only to solving the educational tasks, but also to the personal development of students.

Therefore, the mechanism of DD is directly related to educational and cognitive actions to overcome the cognitive barrier (as a problematic node of educational information) and didactic efforts to overcome the cognitive barrier (as a transformed form of obstacle). Therefore, when organizing ECA with the solution of specific educational tasks, it is necessary to take into account the mechanism of double regulation of DD, when two sides of the same mechanism act in an interconnected and mutually conditioned way. This is expressed in the fact that actions over the barrier are largely determined by the process of regulating didactic efforts, which, in turn, manifest themselves only within the limits and direction of regulating actions to overcome the barrier. At the same time, the process of interrelated regulation of efforts and ways of overcoming the cognitive barrier indicate an individual scope of the severity of each component of the mechanism of didactic difficulty. This understanding of the mechanism is, in fact, nothing more than a detailed expression of the nature of the didactic difficulty itself.

We present the results of the exposition and analytical revision of the interpretations of the definition of DD cognitive group in [Table 1](#).

Table 1. The results of the exposition and analytical revision of the interpretations of the definition of “didactic difficulty” (cognitive group)

| Semantic constructs of the DD phenomenon model | Results of the exposition of the concept of DD | The results of the analytical revision of the concept of DD |
|---|--|--|
| Initial system of the phenomenon | ECA | ECA |
| Form of the phenomenon | Cognitive obstacle | Cognitive barrier |
| Role of the phenomenon in the original system | Interrupter-stimulator of ECA | ECA Controller |
| Place of the phenomenon in the original system | Source, root cause of ECA; “interrupt zone” of ECA (DD outside the system) | Structural element of the ECA (DD element of the system) |
| Mechanism of functioning of the phenomenon | Overcoming obstacles | The process of interrelated regulation of efforts and ways to overcome the cognitive barrier |

The final part of the audit involved filling out an expert card. The map records the degree of correlation between the real psychological and pedagogical phenomenon and its interpretation, taking into account the regulatory requirements for the semantic structure of the definition (Table 2). To solve this problem, according to the methodological recommendations (Orlov, 2002; Cherepanov, 1989), an expert group of five people was formed. Previously, the experts got acquainted with the results of the analytical revision of the interpretations of DD obtained using the reference (explanatory) model of the psychological and pedagogical phenomenon. The expert assessment is carried out differentially within the specified framework of the semantic description of the DD. By means of integrity and consistency criteria, the ability of the proposed definitions to perform their logical functions was established, as well as semantic errors made during the formulation of the concept.

Table 2. Expert assessment of the degree of correspondence between the phenomenon of “didactic difficulty” and its definition

| Requirements for the semantic structure of the definition of “didactic difficulty” | Degree of correlation between the phenomenon and its definition | | |
|---|---|--------------------|---------------------|
| | Full compliance | Partial compliance | Full non-compliance |
| Correlation between the original system of the phenomenon and its representation in the definition | + | | |
| Correlation between the form of the phenomenon and its representation in the definition | | | + |
| Correlation between the role of the phenomenon in the original system and its representation in the definition | | + | |
| Correlation between the place of the phenomenon in the original system and its representation in the definition | | | + |
| Correlation between the functional mechanism of the phenomenon and its representation in the definition | | + | |

First and, perhaps, the main thing is that the results of the group examination confirm: didactic difficulty and obstacle are different concepts and one of them cannot serve as a generic concept in relation to the other.

It can be deduced from Table 2 that there are semantic gaps in the system of relations in which the concept of DD is considered, which in turn indicates a number of semantic errors. The gap in the framework of the *<form – source system>* relationship and the gap in the framework of the *<form/source system – role>* relationship indicate an unlawful expansion of the concept of “obstacle” (the error “trade-off of the reference definition”), as well as an incorrect narrowing of the role of the DD (the error “incomplete description”). The gap within the *<role – place>* relationship and the gap within the *<role/place – mechanism>* relationship indicate that the concept of “place” is considered outside the framework of the original system (the error “contradiction between the basic definitions”), and not all components are taken into account when designating the DD mechanism (the error of the “semantic gap”).

4. Conclusion

In modern pedagogy, psychological and pedagogical definitions with contradictory interpretations are still often used. This leaves a negative imprint on the development of theoretical positions that are of great importance for solving urgent problems of research, innovation and

methodological activities of teachers. The scientific examination of the definition of concepts, equipped with a relevant methodology, is designed to significantly remedy the current situation.

As our research shows, the reference model can serve as the instrumental core of the methodology of scientific examination of the content of psychological and pedagogical definitions, which reveals the semantic unity of a phenomenon in the main logical and semantic sections through flexible semantic constructs and their integrative characteristics. The proposed methodology of scientific expertise (tools, procedures and results) has been tested on the material of expert revision of definitions of such a complex psychological and pedagogical phenomenon as didactic difficulty. The obtained results direct to the universal nature of the developed approach, as well as the possibility of its extrapolation to a fairly wide set of psychological and pedagogical definitions.

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‘Learning to Learn’ Characteristics in Educational Interactions between Teacher and Student in the Classroom

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Abstract

This paper presents the results of a study that aimed to reveal how the components of the concept ‘learning to learn’ are interrelated in the context of teacher–students’ educational interactions in the classroom. The study outlines the characteristics of ‘learning to learn’ and specifics related to content through examining a teacher’s daily educational interactions with students in a classroom. The study involved 336 teachers from different types and levels of schools. The characteristics of ‘learning to learn’ included the self-assessment of teacher’s learning to learn skills, teaching principles applied for implementing ‘learning to learn,’ ‘learning to learn’ skills developed in lessons, student involvement, teacher–student learning co-creation, creating educational environments according to students’ learning differences, opportunities for students to control their learning, and learning strategies. The study proved that the development and improvement of the teacher’s individual educational plans in collaboration with their colleagues and a vision for the future development of the plans were directly related to each other. Moreover, the dissemination of the teacher’s good practices, active cooperation, and involvement in the school’s community activities were interrelated: the teacher’s attitude about the students’ expectations, related to the reflections, determined the students’ achievements in personal and socio-educational life; positive emotions were particularly important for students in achieving their learning goals; and feedback was obtained during the learning process. The study showed the importance of this for both teachers and students, as well as the idea that the teacher must consider the individual differences of the students in creating learning environments that motivate and enable all students to learn. The more opportunities there are for initiating creative problem-solving approaches, the more often students take responsibility for assigned learning tasks; the more often students are encouraged to self-assess and reflect on their learning strengths and

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weaknesses, the easier it is to control learning outcomes and the quality of learning. 'Learning to learn' is particularly important when teachers are no longer a main source of information and knowledge. The findings showed how such a gap can be addressed between current and future teaching-learning performances in a classroom.

Keywords: educational interaction, learning, learning to learn, statistics, student, teacher, teaching.

1. Introduction

When individuals learn to learn, they treat learning activities as objects of inquiry, personal reflection, and self-analysis (Demetriou, 2014). Learning to learn is a lifelong process in which individuals deliberately plan, monitor, and adapt their authentic learning. When students learn to learn, they treat learning activities as objects of everyday inquiry. They interpret tasks, set task-specific goals, experiment with strategies, monitor successes and failures, and implement changes to improve shortcomings. As today's knowledge economy is characterized by increasingly rapid change and shifting demands, 'learning to learn' is a critical aspect of success at school and in the classroom, where teachers and students are connected through a variety of educational interactions (Miller, Hadwin, 2012).

Within the European Union, 'learning to learn' is seen as a competence incorporating seven components: i) the ability to pursue and persist in learning; ii) the ability to organise one's own learning, including through effective management of time and information, both individually and in groups; iii) the awareness of one's learning process and needs, identifying available opportunities; iv) the ability to overcome obstacles in order to learn successfully; v) gaining, processing, and assimilating new knowledge and skills; seeking and making use of guidance; vi) building on prior learning and life experiences at home at work in both education and training; and vii) motivation and confidence (European Parliament, 2006). Thus, 'learning to learn' strategies include any thoughts, behaviours, beliefs, or emotions that facilitate the acquisition, understanding, or application and transfer of new knowledge and skills in various contexts. Furthermore, 'learning to learn' strategies help generate meaning for the new information that is to be learned (Visentin, 2017).

There is a consensus in the international educational community that 'learning to learn' is the most essential educational goal at school. Despite this, there is still no international, uniform research-based evidence regarding how 'learning to learn' is or should be implemented and what exact components it includes in teachers' and students' daily practices in the classroom and at school. Teachers are using 'learning to learn' with many different understandings of its meaning, and it is implemented through a variety of teaching and learning strategies and in different educational environments. School teachers generally have a broad and narrow vision about 'learning to learn,' which is dependent on teacher functions, task conceptions, conceptions of the learning process and the students, and the teachers' instructional approaches in the classroom (Waeytens et al., 2002).

In the literature, approaches to 'learning to learn' involve contrasting conceptions, responses through learning to the teaching subject, contextual variations students' learning demands, and the implications of autonomy and change on students' achievements (Hounsell, 1979; Benó, 2007). Researchers have connected the concept of 'learning to learn' in their studies to the idea of learning of how to learn to use tools in the school setting (James et al., 2006), as well as its improvement of classrooms, schools, and networks (James et al., 2007), teacher learning (Kennedy, 2019), feelings of learning in response to being actively engaged in the classroom (Deslauriers et al., 2019), learning outside the classroom, student concentration and interest (Idros et al., 2010; Vainikainen, Hautamäki, 2020), and the measurement of 'learning to learn' (Hoskins, Fredriksson, 2008).

'Learning to learn' happens within educational interactions in a classroom. Teachers expend significant energy preparing lectures. They must read various texts and synthesize the information, picking out the most important points and organizing them in a cohesive manner, writing lecture notes, and then delivering the information to students who may sit passively, often thinking of topics unrelated to what the teacher is saying (Hurst et al., 2013). Some large-scale, longitudinal studies, including some randomized controlled experiments, have examined the various indicators of quality (that is, structural elements, features of the physical environment, and interactions with

teachers and peers). These studies have shown that students' interactions with teachers can have unique and positive associations with their learning outcomes (Pianta et al., 2016).

Regardless of the abundance of research on 'learning to learn,' there is a gap in understanding its factual and processual aspects within educational interactions between teachers and students in the classroom. The research question raised in this study was as follows: 'How are the components of the characteristics of the concept "learning to learn" interrelated in the context of teacher–student educational interactions in the classroom?'

In this paper, 'learning to learn' is seen as related to learning strategies (Hattie, Donoghue, 2016), action learning (Kember, 2000), constructivist teaching (Kim, 2005; Tobias, Duffy, 2009), experiential learning (Kolb, 1984), active learning (Meyers, Jones, 1993), learning how to learn (Blacka et al., 2006; James et al., 2006; Peculea, Bocos, 2015; Letina, 2020), integrative learning (Wrenn, Wrenn, 2009), and learning and teaching co-creation (Bovill, 2020).

The aim of the present study was to reveal the characteristics of 'learning to learn' and the specifics of the content through teachers' daily educational interactions with students in the classroom.

2. Literature Review

The 'learning to learn' paradigm was developed within two research paradigms: i) cognitive psychology, which focuses on mechanisms used to internalise knowledge (Schunk, 2012; Illeris, 2018); and ii) social-cultural, which focuses on learning embedded within a social context (Wang et al., 2011). The European definition refers to the ability to access, gain, process, and assimilate new knowledge and skills, followed by the ability to reflect critically on the purposes and aims of learning (European Parliament, 2006). The definition of learning to learn also contains numerous references to the ways that learning to learn is embedded in social relationships and the social context; for example, it references group work, 'seeking and making use of guidance,' and building on 'life experiences' (Huhtamaki, Hautamäki, 2001; Deakin Crick et al., 2004; Moreno, Valdez, 2007; Demetriou et al., 2011).

Learning to Learn is Related to Various Concepts

'Learning to learn' strategies. 'Learning to learn' is implemented through strategies that have several characteristics in common (Fredriksson, Hoski, 2007; Visentin, 2017): First, the strategies are goal-directed and used to reach learning goals. Second, they are intentionally invoked; incorporating some level of active selection of one or more of such strategies is determined by several factors, such as a student's prior experience with the strategies, their prior experience with similar learning tasks, their ability to deal with distractions, and their commitment to the student's goals. Third, the strategies require time and involve multiple steps. Thus, a student must be motivated to initiate and maintain strategy use, believe that the strategy will be effective, and that they can be successful using it. Fourth, strategies are situation specific. This means that the students' goals, the task requirements, the context, and other factors all interact to help determine which strategy may be best. The students must understand under what circumstances a given strategy is or is not appropriate.

Action learning. 'Learning to learn' is related to action learning, which seeks to facilitate skill development based on the integration of knowledge gained from experience and knowledge gained by formal learning, underlined by critical reflection (Kelliher, 2014). Action learning is a process of insightful questioning and reflective listening, focusing on the learning and the action. Theoretically, this does not require the extension of new knowledge. In action learning, the students select some issues, analyse them, take some action, and reflect on that action (Marquardt, 2004). The action learning approach provides a combination of theory and experience; it creates positive change in motivating participants to actively participate in the learning process and acquires more effective 'learning to learn' skills (Bourner, Frost, 1996). 'Learning to learn' through action learning is a continuous group-based process of engagement, learning, and reflection, where a group of students meet regularly in a classroom under the guidance of a teacher over an extended time period. Thus, lessons in the classroom with students can be seen as action learning groups, to which students raise and bring issues for discussion with the aim of generating innovative and creative ways of dealing with complex issues within the context of a specific teaching–learning subject in a classroom (Kember,

2000). Teachers facilitate students' learning through the development of practical solutions that are implemented with planned intent and are related to specific teaching–learning goals (Ashton, 2006). In lessons, students discuss their problems through a question-and-answer process that elicits critical thinking and dialogue and encourages the generation of ideas and clarification of assumptions (Michel et al., 2009). The process of action learning in a classroom encourages students to reflect on and learn from their own and their fellow students' experiences (Kelliher, 2014). Action learning provides a sustainable way of building the capacity of teachers to improve teaching and learning practices. Some of the advantages of action learning include flexibility, respect for the knowledge and experience of participants, involvement, collegiality, empowerment, and ownership. The challenge for teachers is to engage students in the activity and the development of 'learning to learn' skills necessary to function today (Dolapcioglu, 2020).

Constructivist teaching. Constructivism's central idea is that human learning is constructed, and students build new knowledge upon the foundation of previous learning. It is 'an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the student' (Elliott et al., 2000: 256). Constructivism believes in the personal construction of meaning by the student through experience and that meaning is influenced by the interaction between prior knowledge and new events (Arends, 1998). Thus, prior knowledge influences what new or modified knowledge an individual will construct from new learning experiences (Phillips, 1995). Learning is a social activity, which means acting or interacting together (Dewey, 1938). Learning based on constructivism is an active process in which students construct meaning through active engagement with the world. Here, students' understanding must come from making meaningful connections between prior knowledge, new knowledge, and the processes involved in learning (Ernest, 1994). Each individual student has a distinctive point of view, based on their existing knowledge and values. This means that the same lesson, teaching, or activity may result in different learning by each student, as their subjective interpretations differ (Brooks, Brooks, 1993). This principle appears to contradict the view that knowledge is socially constructed. Students have their own personal history of learning; nevertheless, they can share knowledge. However, teaching and learning are interrelated social processes influenced by cultural factors. Cultures and their knowledge bases are in a constant process of change, as are the knowledge stored by students and teachers, and knowledge is not a rigid copy of some socially constructed template. In learning a culture, each student changes that culture, and this process is a basic concept in the implementation of 'learning to learn' in the classroom (Fox, 2001). Thus, students try to develop their own individual mental models of the real world from their perceptions of that world. As they perceive each new experience, students continually update their own mental models to reflect the new information and construct their own authentic interpretation of reality (Driscoll, 2000). Constructivist teaching and learning is student-centred. The primary responsibility of the teacher here is to create a collaborative problem-solving environment where students become active participants in their own learning. Thus, the teacher acts as a facilitator of learning rather than an instructor. The teacher seeks to understand the students' pre-existing conceptions and to guide the activity to address these ideas and then build on students' learning in the classroom (Oliver, 2000). Constructivist learning environments must be considered when implementing constructivist teaching strategies so that 'learning to learn' skills can be developed by students in the classroom: knowledge is shared between teachers and students; teachers and students share authority; teachers facilitate or guide students' learning in the classroom; and learning groups consist of small numbers of heterogeneous students in the classroom (Honebein, 1996; Tam, 2000).

Experiential learning. Experiential learning is the process of learning by doing. By engaging students in hands-on experiences and reflection, they are better able to connect theories and knowledge learned in the classroom to real-world situations. In his experiential learning theory, Kolb (1984) described two different ways of grasping experience (concrete experience and abstract conceptualisation) and identified two ways of transforming experience (reflective observation and active or reflective experimentation). According to Kolb, concrete experience provides information that serves as a basis for reflection. From reflection, students assimilate the information they have gathered through a concrete experience and develop new theories about the world, which they then actively or reflectively experiment with. Experiential learning techniques include a rich variety of practices whereby the participants have opportunities

to learn from their own and each other's experiences, being actively and personally engaged in the learning process (Kohonen, 2001). Students learn from immediate experiences and are engaged in the learning process as whole persons, both intellectually and emotionally. Experiential learning involves observing the phenomenon and doing something meaningful with the observations through active participation. It emphasises learning in which the student is directly in touch with the phenomenon being studied, rather than simply watching, reading, hearing, or thinking about it (Kolb, 1984). When students participate in experiential learning, they gain a better understanding of the subject material; a broader view of the world and an appreciation of the learning community in the classroom; insight into their own skills, interests, passions, and values; opportunities to collaborate with diverse organizations and people; positive professional practices and skill sets; the gratification of assisting in meeting community needs; and self-confidence, leadership, and 'learning to learn' skills (Tanaka et al., 2016; RameshBabu et al., 2019).

Active learning. Active learning is a process that has student learning at its centre. Active learning focuses on how students learn, not only on what they learn. Students are encouraged to 'think hard,' rather than passively receive information from the teacher (Prince, 2004). Teachers must make sure that they challenge their students' thinking (Meyers, Jones, 1993). With active learning, students play an important part in their own learning process. They build knowledge and understanding in response to opportunities provided by their teachers. Because active learning encourages students to take a central role in their own learning, it stipulates their 'learning to learn' skills and prepares them better for education at school (Haak et al., 2011). Analytical skills also help students to improve their problem-solving skills and the application of their knowledge (Ambrose et al., 2010). Active learning is based on a theory called constructivism (Meyers, Jones, 1993), which emphasises the fact that students construct or build their own understandings. Constructivists argue that learning is a process of 'making meaning.' Students develop their existing knowledge and understanding to achieve deeper levels of understanding. This means that students are more able to analyse, evaluate, and synthesise ideas (Phillips, 1995). Skilled teachers make these deeper levels of understanding possible by providing the learning environments, opportunities, interactions, tasks, and instruction necessary to foster the deep learning of the students in the classroom (Elliott et al., 2000). Thus, learning should be relevant and within a meaningful context. This means that students learn best when they can see the usefulness of what they are learning and connect it to the real world (Fox, 2001). The benefits of active learning are as follows (Harmin, Toth, 2006; Lumpkin et al., 2015): active learning helps students to become 'lifelong learners'; in an active learning approach, learning is not only about the content, but is also about the process; active learning develops students' autonomy and their ability to learn; active learning provides students with opportunities for greater involvement and control over their learning; active learning is engaging and intellectually exciting; and an active learning approach encourages all students to stay focused on their learning, which often gives them greater enthusiasm for their learning. Furthermore, teachers often find that they enjoy the level of academic discussion with their students that an active learning approach encourages.

Integrative learning. Integration in education can be defined as the coordination of different learning activities to ensure the harmonious functioning of the educational process (Kanwar et al., 2017). Integrated teaching refers to a way of connecting skills and knowledge from multiple sources and experiences or applying skills and practice in various settings. It simply means bridging the connection between academic knowledge and practice (Vashe et al., 2019). Integrated teaching is believed to develop critical thinking, self-learning ability, deep learning, and problem-solving skills (Quintero et al., 2016). There are four major components in integrated teaching (Kanwar et al., 2017): integration of experience, social integration, integration of knowledge, and integration as curriculum design. Integrative learning is an approach where the student brings together prior knowledge and experiences to support new knowledge and experiences. By doing this, students draw on their skills and apply them to new experiences on a more complex level. The concept behind integrative learning is that students take ownership of their own learning, developing critical inquiries and making meaningful connections between different disciplines, as well as utilising critical thinking to address real-life problems (Mansilla, 2008). Integrative learning is a learning theory describing a movement towards integrated lessons helping students make connections across curricula (Harr et al., 2015). Integrative learning comes

in many varieties: connecting skills and knowledge from multiple sources and experiences; applying skills and practices in various settings; utilizing diverse and even contradictory points of view; understanding issues and positions contextually; and making connections within a major, between fields, between curriculum, co-curriculum, or between academic knowledge and practice (Huber et al., 2009).

Learning co-creation. Co-creation is a new educational idea that emphasises student empowerment through teaching and learning in the classroom. Attitudes such as ‘students as partners’ are basic principles of co-created learning and teaching implementation in the classroom (Cook-Sather, 2018). The essence of learning and teaching co-creation is student engagement, which refers to a broad range of learning and teaching activities that teachers employ to motivate and interest students, as well as the time and efforts students dedicate to meaningful learning in the classroom (Bovill, 2020). ‘Students as partners’ refers to a deeper level of student involvement and a teacher’s professional agency, which is implemented through teaching (Bovill et al., 2015). The learning and teaching partnership is a cooperative and reciprocal educational interaction-based process between a teacher and students through which they can contribute equally to curricular and educational conceptualization, decision-making, implementation, investigation, and analysis in a variety of ways (Bovill, 2015). Collaborating with students is an effective way to develop curricula, classroom activities, and sometimes, assessments. While many are familiar with the concept of co-creation, fewer are confident in how, on a practical level, to effectively work with students to shape their learning. Here, we pull together advice from academics who are successfully using co-creation in their teaching and seeing positive learning outcomes as a result (Bovill et al., 2015). Participatory design plays a core role in learning and teaching co-creation and refers to the collaboration of a group of teachers and students in the design and development of initiatives, which can include curricula (Bergmark, Westman, 2016).

3. Methodology

Sample

The study participants were selected using a targeted convenience sampling technique. In a survey conducted March-June 2021, 336 respondents from three major Lithuanian cities and regions participated. The sample of the study is dominated by women, accounting for 89.1 %. Most teachers surveyed are middle-aged (41-45 years old – 14.2 %, 46-50 years old – 18.3 %) and older (51-55 years old – 21.3 %, 56-60 years old – 15.8 % and 61-65 years old – 12.6 %) (their mean age was 49.23, SD = 9.96). According to the data, more than half (57 %) of teachers’ sample had acquired pedagogic education, and 40.9 % of them – finished university level studies in different areas other than pedagogy and have obtained additionally a pedagogical qualification. Almost half of the respondents of the survey work in gymnasiums (48.9 %). Most respondents have pedagogical experience, having worked in an educational institution for 21-25 years. – 15.8 %, 26-30 years – 19.9 %, 31-35 years – 14.6 %, and even 17 % (average 24.73 years, SD = 10.97). The educators who participated in the study have more than 36 years of pedagogical experience. According to the pedagogical category, almost half (46.7 %) of pedagogues have a pedagogical category of a teacher-methodologist, a third (32.8 %) have a senior teacher qualification category. The sample of the study is dominated by teachers of the Lithuanian language and literature (22.4 %), natural sciences – 21.3 %, arts and technology education – 21 %, mathematics – 18.6 %, moral education – 17.5 %.

Measures

A closed-ended original questionnaire on learning to learn within the teacher-student interaction in a classroom was used for data collection.

The instrument consisted of two parts – demographic and learning to learn dimensions. The construction of the learning to learn dimensions’ part of the questionnaire was based on the concepts of learning strategies (Hattie, Donoghue, 2016), action learning (Kember, 2000), constructivist teaching (Kim, 2005; Tobias, Duffy, 2009), experiential learning (Kolb, 1984), active learning (Meyers, Jones, 1993), learning how to learn (Blacka et al., 2006; James et al., 2006; Peculea, Bocos, 2015; Letina, 2020), integrative learning (Wrenn, Wrenn, 2009), learning co-creation (Bovill, 2020), self-assessment in a classroom (Brown, Harris, 2014), teacher self-assessment (Ross, Bruce, 2007), creation of educational environment in a classroom (Bucholz, Sheffler, 2009; Villa, Baptiste, 2014; Prameswari, Budiyo, 2017).

Table 1. Demographic characteristics of respondents

| | | Frequencies | Percent | Total | Mean | SD |
|------------------------------------|--|--------------------|----------------|--------------|-------------|-----------|
| Gender | Man | 40 | 10.9 | 366 | - | - |
| | Woman | 326 | 89.1 | | | |
| Age | 20-25 years old | 7 | 1.9 | 366 | 49.23 | 9.96 |
| | 26-30 years old | 10 | 2.7 | | | |
| | 31-35 years old | 17 | 4.6 | | | |
| | 36-40 years old | 27 | 7.4 | | | |
| | 41-45 years old | 52 | 14.2 | | | |
| | 46-50 years old | 67 | 18.3 | | | |
| | 51-55 years old | 78 | 21.3 | | | |
| | 56-60 years old | 58 | 15.8 | | | |
| | 61-65 years old | 46 | 12.6 | | | |
| | over 66 years old | 4 | 1.1 | | | |
| Education | University level, pedagogical | 209 | 57.1 | 366 | - | - |
| | University level, non-pedagogical with additionally acquired pedagogical qualification | 157 | 42.9 | | | |
| School (in the teacher works) type | Pre-school | 22 | 6.0 | 366 | - | - |
| | Pre-primary | 6 | 1.6 | | | |
| | Primary | 38 | 10.4 | | | |
| | General | 41 | 11.2 | | | |
| | Secondary | 11 | 3.0 | | | |
| | Pro-gymnasium | 39 | 10.7 | | | |
| | Gymnasium | 179 | 48.9 | | | |
| | Multifunctional centre | 10 | 2.7 | | | |

| | | | | | | |
|------------------------|--|-----|------|-----|-------|-------|
| | Professional/vocational school | 20 | 5.5 | | | |
| Pedagogical experience | 0-5 years | 23 | 6.7 | 342 | 24.73 | 10.97 |
| | 6-10 years | 24 | 7.0 | | | |
| | 11-15 years | 26 | 7.6 | | | |
| | 16-20 years | 39 | 11.4 | | | |
| | 21-25 years | 54 | 15.8 | | | |
| | 26-30 years | 68 | 19.9 | | | |
| | 31-35 years | 50 | 14.6 | | | |
| | Over 36 years | 58 | 17.0 | | | |
| Pedagogic category | Teacher | 54 | 14.8 | 366 | - | - |
| | Senior teacher | 120 | 32.8 | | | |
| | Teacher methodologist | 171 | 46.7 | | | |
| | Teacher expert | 21 | 5.7 | | | |
| Teaching subject | Moral education | 64 | 17.5 | 366 | - | - |
| | Lithuanian literature and language | 82 | 22.4 | | | |
| | Foreign language | 39 | 10.7 | | | |
| | Social sciences (history, geography) | 54 | 14.8 | | | |
| | Mathematics | 68 | 18.6 | | | |
| | Natural sciences (biology, physics, chemistry, integral course for natural sciences) | 78 | 21.3 | | | |
| | Physical culture | 55 | 15.0 | | | |
| | Art or technological education (arts, music) | 77 | 21.0 | | | |
| | Drawing/graphic design | 3 | 0.8 | | | |
| | Economics and entrepreneurship | 12 | 3.3 | | | |
| | Information Technology | 24 | 6.6 | | | |

| | | | | | | |
|--|-----------------------|----|-----|--|--|--|
| | Basics of citizenship | 17 | 4.6 | | | |
| | Human safety | 24 | 6.6 | | | |

The demographic part consisted of seven questions, which cover gender, age, level of education, school type, pedagogical work experience at school, pedagogical category, and teaching subject(s). All these demographic characteristics covered 48 items in total. All questions were multiple choice, where respondents were asked to choose one response from the list provided.

The 'learning to learn' part consisted of eight themes (diagnostic blocks) and every theme included the particular amount of items: i) teacher's self-assessment of learning to learn skills (18 items); ii) teacher's principles for implementing learning to learn (13 items); iii) learning to learn skills developed in lessons (10 items); iv) learning to learn: student involvement (6 items); v) learning to learn: teacher and student learning co-creation (13 items); vi) learning to learn: creating educational environments according to differences in student learning (10 items), vii) learning to learn: opportunities for students to control their learning (7 items); viii) learning to learn strategies (23 items). In total this part incorporated 109 items.

In total the questionnaire included 157 items.

The questionnaire parts were formed from closed-ended statements and each part was presented in a matrix-type question which was expanded by separate items. Items were assessed on different scales, such as "strongly disagree", "disagree", "neither agree nor disagree", "agree", "strongly agree"; "very often", "often", "do not know", "seldom", "very seldom"; "definitely yes", "yes", "do not know", "no", "definitely no"; "no skills", "minimum skills", "average skills", "good skills", "great skills".

Based on the results of our study sample, internal consistency reliability (Cronbach's α) coefficients for items of the separate diagnostic blocks of the questionnaire were calculated. All the diagnostic blocks 'Cronbach's alpha coefficient estimates range from .788 to .929, what proves that coefficients of every diagnostic block are more than 0.5 and it means that they are acceptable and, according to methodological requirements, it should be at least in between .65 and .8. Cronbach's alpha coefficient of all the questionnaire is .966. Therefore, it can be stated that the data were reliable, and it was not necessary to exclude any diagnostic block estimates from further analysis.

Table 2. Cronbach's alpha coefficient estimates

| No. | Themes (diagnostic blocks) | Cronbach's Alpha |
|-----|---|------------------|
| 1. | Self-assessment of teacher's learning to learn skills | 0.919 |
| 2. | Teacher's principles for implementing learning | 0.796 |
| 3. | Learning to learn skills developed in lessons | 0.811 |
| 4. | Learning to learn: student involvement | 0.788 |
| 5. | Learning to learn: teacher and student learning co-creation | 0.846 |
| 6. | Learning to learn: creating educational environments according to differences in student learning | 0.875 |
| 7. | Learning to learn: opportunities for students to control their learning | 0.815 |
| 8. | Learning to learn strategies | 0.929 |

Data analysis

The software package SPSS 27.0 was used for statistical analysis.

Cronbach's alpha as a measure was used to assess the reliability, or internal consistency, of a set of questionnaire or items. In other words, the reliability of the given measurement refers to the extent to which it is a consistent measure of a concept, and Cronbach's alpha is one way of measuring the strength of that consistency.

The Pearson correlation coefficient was used to determine the statistical relationships, the values of which can range from -1 to +1. The closer the result is to 1 (-1), the stronger the correlation. Statistical significance was applied when p-value: ** $p < .01$ and * $p < .05$.

The Mann-Whitney U test is a nonparametric alternative independent sample t test that is used to compare two sample means obtained from the same population and is used to check whether the means of the two samples are the same or not. Nonparametric Mann Whitney (between two independent groups) was used to search for possible relationships between demographic variables. Differences in study results were considered statistically significant at $p \leq .05$. The Mann and Whitney U test is the best known and most widely used of the two independent nonparametric comparison test of samples. The essence of this test can be briefly explained as follows: the combined data from both samples obtained by testing the same test are ranked. The ranks of each sample are then summed separately. If the null hypothesis is correct, i.e., the distributions of the variables are the same, the ranks will be distributed among the groups at random. The statistics of the Mann and Whitney criterion U are calculated based on the sum of the ranks of each sample, based on which the statistical hypothesis is decided: H_0 : the distributions of the variables are the same; H_1 : the distributions of the variables are not the same.

The Wilcoxon signed-rank test (also called the Wilcoxon signed rank sum test) is a non-parametric test to compare data. When the word "non-parametric" is used in statistics, it does not quite mean that researchers know nothing about the population. It usually means that researchers know the population data does not have a normal distribution. The Wilcoxon signed rank test was used in the study because the differences between pairs of data were non-normally distributed.

Z-score indicates how much a given value differs from the standard deviation. The Z-score, or standard score, is the number of standard deviations a given data point lies above or below mean. Standard deviation is essentially a reflection of the amount of variability within a given data set. A Z-score (also called a standard score) gave researchers an idea of how far from the mean a data point is; if a Z-score is 0, it indicates that the data point's score is identical to the mean score. In the case of our study, all calculated Z-score values were greater than zero. According to the Percentile to Z-Score Calculator, the z-score that corresponds to the 90th percentile is 1.2816. In our research all the estimates of Z-score are greater than 1.2816 and it would be considered a "good" z-score.

Ethics

Ethical principles and validity of the research were evaluated and an ethical permission to conduct the questioning survey-based study was received from the Research Board of Vytautas Magnus University (26-01-2020, Protocol No. 1). The questionnaire was anonymously completed online with no risk of revealing personal or institutional identity of research participants.

Limitations

The sample of the study was not selected on a random basis, so the empirical results have limited applicability to the entire teacher population nationwide.

The main methodological limitation of the study was related to the composition of the sample by gender: the sub-sample of women is eight times larger than sub-sample of men, so the results of the study regarding the teachers' gender, should be treated with extreme caution.

5. Results

Learning to learn

Self-assessment of teacher's learning to learn skills. A moderate correlation was found between leadership and mentoring ($r = .608$, $p = .000$, $N = 366$) and team building ($r = .576$, $p = .000$, $N = 366$). A strong correlation was found between the improvement of curriculum in

collaboration with teachers and the consultation with other teachers on the improvement of school plans ($r = .758, p = .000, N = 366$) and the evaluation of school plans based on data analysis ($r = .605, p = .000, N = 366$). Consultation with teachers on the improvement of school plans correlates with the collective implementation of school plans ($r = .678, p = .000, N = 366$), the evaluation of school plans based on data analysis ($r = .666, p = .000, N = 366$) and professional development at school in collaboration with teachers ($r = .509, p = .000, N = 366$). A moderate correlation was obtained between the statements “Collective implementation of school plans” and “Evaluation of school plans based on data analysis” ($r = .688, p = .000, N = 366$). This means that the development and improvement of the teacher's individual education plans in collaboration with their colleagues and having a vision for the future development of these plans are directly related not only to each other but also to the evaluation of school education plans.

A moderate correlation was found between the use of research results for the improvement of teaching and the analysis and systematization of scientific sources ($r = .664, p = .000, N = 366$). Consequently, the more a teacher reads, analyses, and systematises scientific sources, the more often he/she uses research results to improve teaching/learning. A moderate correlation was found between sharing information on best practice with teachers and contributing to various school initiatives ($r = .566, p = .000, N = 366$) and sharing information read with peers about different educational sources ($r = .605, p = .000, N = 366$). It can be said that the dissemination of the teacher's good practice, active cooperation of the teacher and involvement in the school's community activities are interrelated.

The statement “I contribute to various initiatives at school” correlates with the statement “I contribute to various initiatives outside school” ($r = .618, p = .000, N = 366$). A moderate correlation was also found between contributing to various initiatives outside the school and sharing information about different educational sources with fellow teachers ($r = .509, p = .000, N = 366$). It can be said that an active involvement of the teacher in the activities organized in the school enables the teacher to share his/her good experience and competencies with other teachers or members of the educational community outside the school.

Table 3. Correlations: self-assessment of teacher’s learning to learn skills

| Statements | Mentorship | Team building | Consultation with teachers on improving school plans | Collective implementation of school plans | Evaluation of school plans based on data analysis | Implementation of professional development at school in | I make a positive impact on student learning | I analyse and systematise scientific sources | I contribute to various initiatives at school | I contribute to various initiatives outside of school | I share with my fellow teachers the information I have read about |
|---|------------|---------------|--|---|---|---|--|--|---|---|---|
| Leadership | .608** | .576* | | | | | | | | | |
| Improving curriculum in collaboration with teachers | | | .758* | | .605* | | | | | | |

| | | | | | | | | | | | |
|--|--|--|--|--------|-------|--------|-------|-------|-------|--|-------|
| Consultation with teachers on improving school plans | | | | .678** | .666* | .509** | | | | | |
| Collective implementation of school plans | | | | | .688* | | | | | | |
| I make a positive impact on teaching | | | | | | | .727* | | | | |
| I use research results to improve teaching | | | | | | | | .664* | | | |
| I share information with teachers about best practices in their practice | | | | | | | | | .566* | | .605* |
| I contribute to various initiatives at school | | | | | | | | | .618* | | |
| I contribute to various initiatives outside of school | | | | | | | | | | | .509* |

Analyzing the characteristics of the self-assessment of teacher’s learning to learn skills diagnostic block, it was found that women are better able to assess their skills of team building ($p = 0.026$) and improvement of educational plans in cooperation with teachers ($p = 0.012$) compared to men.

Table 4. Mann – Whitney criterion and comparing the responses by gender: self-assessment of learning to learn skills

| Statement | Teacher’s gender | N | Mean rank | Mann-Whitney | Wilcoxon W | Z | Asym p. Sig. |
|---------------|------------------|-----|-----------|--------------|------------|--------|--------------|
| Team building | Man | 40 | 151.66 | 5246,500 | 6066,500 | -2.229 | .026 |
| | Woman | 326 | 187.41 | | | | |

| | | | | | | | |
|---|-------|-----|--------|----------|----------|--------|------|
| Improving curriculum in collaboration with teachers | Man | 40 | 147.28 | 5071,000 | 5891,000 | -2.506 | .012 |
| | Woman | 326 | 187.94 | | | | |

Teacher principles for implementing learning to learn. Analyzing the teacher’s principles in the implementation in learning to learn, moderate correlations were obtained between the statements “every student can learn” and “every student can learn” ($r = .531, p = .000, N = 366$) and “every student can learn to learn” ($r = .531, p = .000, N = 366$). This means that the educator’s attitude that a student can learn is related to the teacher’s attitude that each student can achieve positive outcomes. A moderately strong correlation was also found between the statements “important expectations and reflections on students’ abilities in teaching” and “important student achievements as part of their personal and school life” ($r = .503, p = .000, N = 366$). Consequently, the attitude of the teacher about the students’ expectations, which is related to the reflection on the available abilities, determines the students’ achievements in personal and socio-educational life.

Table 5. Correlations: teacher’s principles for implementing learning to learn

| Statements | Every student can learn | Every student can learn to learn | The achievements of students as part of their personal and school life are important to me |
|---|-------------------------|----------------------------------|--|
| Every student can learn | .531** | .531** | |
| Students’ expectations and reflections on their abilities are important to me in teaching | | | .503** |

Analyzing the teacher’s principles in implementing the characteristics of learning to learn diagnostic block, it was found that women better appreciate “teaching creates supportive and responsible environments that encourage students to become active” ($p = .003$), “I provide students with a variety of situations, examples they would make their own choices, solve problem situations and make decisions” ($p = .011$), “I use various illustrations, tools, art artifacts, practical verbal examples, etc. during teaching. t. to create interesting learning environments for students” ($p = .006$), “I teach students that fact is not an objective argument but is a fact in a specific context” ($p = .001$), “I pay attention to students’ expectations in teaching” ($p = .012$), “Students’ expectations and reflections on their abilities are important in teaching” ($p = .022$) compared to men.

Table 6. Mann-Whitney criterion and comparing the responses by gender: teacher’s principles in implementing characteristics of learning to learn

| Statements | Teacher’s gender | N | Mean rank | Mann-Whitney | Wilcoxon W | Z | Asym p. Sig. |
|--|------------------|-----|-----------|--------------|------------|--------|--------------|
| In teaching, I create support and responsibility-based educational environments that encourage students to become active | Man | 40 | 143.63 | 4925.000 | 5745.000 | -2.995 | .003 |
| | Woman | 326 | 188.39 | | | | |
| During teaching, I provide | Man | 40 | 149.91 | 5176.500 | 5996.50 | -2.547 | .011 |

| | | | | | | | |
|--|-------|-----|--------|----------|----------|--------|------|
| students with a variety of situations, examples, contexts to make their own choices, solve problematic situations, and make decisions. | Woman | 326 | 187.62 | | 0 | | |
| I use a variety of illustrations, tools, art artifacts, practical verbal examples, and so on. t. to create exciting learning environments for students | Man | 40 | 145.36 | 4994.500 | 5814.500 | -2.726 | .006 |
| | Woman | 326 | 188.18 | | | | |
| I teach students the notion that a fact is not an objective argument but is a fact in a specific context | Man | 40 | 134.81 | 4572,500 | 5392.500 | -3.457 | .001 |
| | Woman | 326 | 189.47 | | | | |
| In teaching, I pay attention to students' expectations | Man | 40 | 149.03 | 5141,000 | 5961.000 | -2.509 | .012 |
| | Woman | 326 | 187.73 | | | | |
| Students' expectations and reflections on their abilities are important to me in teaching | Man | 40 | 152.15 | 5266,000 | 6086.000 | -2.286 | .022 |
| | Woman | 326 | 187.35 | | | | |

Learning to learn skills developed in lessons. A moderate correlation ($r = .660$, $p = .000$, $N = 366$) was found between communication and collaboration. Consequently, communication skills strengthen students' collaboration skills in the classroom.

Table 7. Correlations: learning to learn skills development in lessons

| | |
|---------------|---------------|
| Statements | Collaboration |
| Communication | .660** |

Analyzing the learning to learn skills developed in the lessons, it was found that women value creativity ($p = .020$), problem solving ($p = .019$), critical thinking ($p = .034$), leadership ($p = .003$), communication ($p = .000$), cooperation ($p = .000$), adaptability ($p = .002$), interest ($p = .018$), reflection ($p = .021$) compared to men.

Table 8. Mann-Whitney criterion and comparing the responses by gender: learning to learn skills developed in lessons

| Statement | Teacher's gender | N | Mean rank | Mann-Whitney | Wilcoxon W | Z | Asym p. Sig. |
|-----------------|------------------|-----|-----------|--------------|------------|-------|--------------|
| Creativity | Man | 40 | 152.01 | 5260.500 | 6080.500 | -2324 | 20 |
| | Woman | 326 | 187.36 | | | | |
| Problem solving | Man | 40 | 151.19 | 5227.500 | 6047.500 | -2355 | 19 |
| | Woman | 326 | 187.46 | | | | |

| | | | | | | | |
|-------------------|-------|-----|--------|----------|----------|-------|----|
| Critical thinking | Man | 40 | 154.00 | 5340.000 | 6160.000 | -2119 | 34 |
| | Woman | 326 | 187.12 | | | | |
| Leadership | Man | 40 | 141.39 | 4835.500 | 5655.500 | -2952 | 3 |
| | Woman | 326 | 188.67 | | | | |
| Communication | Man | 40 | 116.93 | 3857.000 | 4677.000 | -4996 | 0 |
| | Woman | 326 | 191.67 | | | | |
| Cooperation | Man | 40 | 135.74 | 4609.500 | 5429.500 | -3595 | 0 |
| | Woman | 326 | 189.36 | | | | |
| Adaptability | Man | 40 | 140.73 | 4809.000 | 5629.000 | -3073 | 2 |
| | Woman | 326 | 188.75 | | | | |
| Curiosity | Man | 40 | 151.24 | 5229.500 | 6049.500 | -2374 | 18 |
| | Woman | 326 | 187.46 | | | | |
| Reflecting | Man | 40 | 151.23 | 5229.000 | 6049.000 | -2308 | 21 |
| | Woman | 326 | 187.46 | | | | |

Learning to learn: student involvement. The moderate correlation was found between students' attentiveness to positive emotions and positive emotions to achieve their intended learning goals ($r = .583$, $p = .000$, $N = 366$), which means that positive emotions are particularly important for students to achieve their learning goals.

Table 9. Correlations: learning to learn through students' involvement

| | |
|--|---|
| Statements | Students are attentive because they experience positive emotions while learning |
| Experiencing positive emotions in pursuit of intended learning goals | .583** |

Statistical analysis using the Mann-Whitney criterion and comparing the responses by gender showed that here are no statistically significant differences between genders.

Learning to learn: learning co-creation between the teacher and students. Analyzing the results of the correlation analysis of teacher-student learning co-creation, a moderate correlation was obtained between the provision of teacher feedback to students and the provision of student feedback to the teacher ($r = .519$, $p = .000$, $N = 366$), which means that feedback is obtained in the learning process is important from both teachers and students.

Table 10. Correlations: learning to learn through co-creation between the teacher and students

| | |
|--|--|
| Statements | In each lesson, I provide students with generalized feedback |
| In each lesson, I provide to students the generalized feedback | .519** |

Analyzing teacher-student learning co-creation, it was found that women value the statements “ I pay attention to their emotions and motivation when working with students” (p = .002), “My experience suggests that students' positive expectations for personal learning are the basis for their learning achievements and self-confidence” (p = 0.011) more as compared to men.

Table 11. Mann-Whitney criterion and comparing the responses by gender: teacher-student learning co-creation within the learning to learn implementation

| Statement | Teacher's gender | N | Mean rank | Mann-Whitney | Wilcoxon W | Z | Asymp. Sig. |
|---|------------------|----|-----------|--------------|------------|--------|-------------|
| When working with students, I pay attention to their emotions and motivation | Man | 40 | 141.10 | 4824.000 | 5644.000 | -3.085 | .002 |
| | Woman | 32 | 188.70 | | | | |
| My experience suggests that students' positive expectations for personal learning are the basis for their learning achievement and self-confidence. | Man | 40 | 148.68 | 5127.000 | 5947.000 | -2.542 | .011 |
| | Woman | 32 | 187.77 | | | | |
| When working with students, I clearly communicate my expectations, describing their learning activities, arguing why they will be done in the lesson. | Man | 40 | 144.20 | 4948.000 | 5768.000 | -2.857 | .004 |
| | Woman | 32 | 188.32 | | | | |

Learning to learn: creating educational environments according to students' learning differences. Analyzing the developed educational environments according to the differences in students' learning, a strong correlation was obtained between the available knowledge and abilities / skills (r = .739, p = .000, N = 366). Moderate correlations were found between learning styles and expectations (r = .529, p = .000, N = 366), interests and motivation (r = .565, p = .000, N = 366), interests and expectations (r = .530, p = .000, N = 366), differences in cultural and linguistic learning (r = .567, p = .000, N = 366), differences in cultural and social learning (r = .580, p = .000, N = 366), differences in linguistic and social learning. differences (r = .511, p = .000, N = 366). This means that the teacher must consider the individual differences of the students in creating learning environments that motivate and enable the student to learn.

Table 12. Correlations: learning to learn through creating educational environments according to students' learning differences

| Statements | Abilities /skills | Motivation | Expectations | Linguistic learning | Social learning |
|---------------------|-------------------|------------|--------------|---------------------|-----------------|
| Available knowledge | .739** | | | | |
| Learning styles | | | .529** | | |

| | | | | | |
|---------------------|--|--------|--------|--------|--------|
| Interests | | .565** | .530** | | |
| Motivation | | | .582** | | |
| Cultural learning | | | | .567** | .580** |
| Linguistic learning | | | | | .511** |

Analyzing the created environments according to the differences in students' learning, it was found that women value emotions higher ($p = .005$) than men.

Table 13. Mann-Whitney criterion and comparing the responses by gender: the learning to learn through creating educational environments according to students' learning differences

| Statement | Teacher's gender | N | Mean rank | Mann-Whitney | Wilcoxon W | Z | Asymp. Sig. |
|-----------|------------------|-----|-----------|--------------|------------|--------|-------------|
| Emotions | Man | 40 | 144.39 | 4955.500 | 5775.500 | -2.794 | .005 |
| | Woman | 326 | 188.30 | | | | |

Learning to learn: opportunities for students to control their learning. A moderate correlation was found between the statements “when working with students, I provide them with the opportunity to form their own learning goals and link them to learning outcomes” and “plan learning opportunities that support students' learning goals” ($r = .570$, $p = .000$, $N = 366$). This means that the planning learning opportunities that support students' learning goals is linked to the provision of opportunities to them form their own learning goals in relation to their learning outcomes.

Statistical analysis using the Mann-Whitney criterion and comparing the responses by gender show that there are statistically significant differences in some of the statements “I plan learning opportunities that support students' learning goals” ($p = .012$); “I encourage the development of students' language and metacognitive abilities by enabling them to discuss and reflect on personal learning” ($p = .004$); “Feedback is effective for students if it gives them time to understand and change the actions based on it” ($p = .004$). All other statements do not differ statistically significantly between genders.

Table 14. Correlations: learning to learn through opportunities for students to control their learning

| Statement | I plan learning opportunities that support students' learning goals |
|---|---|
| Working with students ensures that they can shape their learning goals and relate them to learning outcomes | .570** |

Table 15. Mann-Whitney criterion and comparing the responses by gender: learning to learn through opportunities for students to control their learning

| Statement | Teacher's gender | N | Mean rank | Mann-Whitney | Wilcoxon W | Z | Asymp. Sig. |
|---|------------------|----|-----------|--------------|------------|--------|-------------|
| I plan learning opportunities that support students' learning goals | Man | 40 | 150.80 | 5212.000 | 6032.000 | -2.523 | .012 |
| | Woman | 32 | 187.51 | | | | |
| I encourage the development of students' language and metacognitive skills by giving them opportunities to discuss and reflect on personal learning | Man | 40 | 142.88 | 4895.000 | 5715.000 | -2.872 | .004 |
| | Woman | 32 | 188.48 | | | | |
| Feedback is effective for students if it gives them time to understand it and change the behaviour based on it. | Man | 40 | 144.20 | 4948.000 | 5768.000 | -2.851 | .004 |
| | Woman | 32 | 188.32 | | | | |

Learning strategies

Learning strategies: application. A moderate correlation is identified among the statements “I encourage students to test theories, models by discussing and/or working in groups” and “I create learning situations in which students have to make decisions relevant to specific learning contexts” ($r = .536, p = .000, N = 366$) connection. This means that the more often learning situations are created for students in specific learning contexts, the more often students apply the methods in practice by discussing or working in groups and / or teams. A moderate correlation was also found between the statements “I create learning situations in which students have to make decisions relevant to specific learning contexts” and “develop students' ability to reflect on their experiences on a specific issue and find applicability” ($r = .596, p = .000, N = 366$). Consequently, the more often learning situations are created for students, making specific decisions, and overcoming various problems, the easier it is for students to discover adaptability.

Table 16. Correlations: learning strategies – application

| Statements | I create learning situations in which students must make decisions that are relevant to specific learning contexts | I develop students' ability to reflect on their experiences on a specific issue and find opportunities for applicability in them |
|--|--|--|
| I encourage students to test theories and models by discussing and/or working in groups | .536** | |
| I create learning situations in which students must make decisions that are relevant to specific learning contexts | | .596** |

Learning strategies: acting. A moderate correlation was found between the opportunities for students to act and take responsibility for solving assigned learning tasks and the opportunities for students to initiate creative solutions to problems ($r = .550$, $p = .000$, $N = 366$). Therefore, it can be argued that the more opportunities there are for initiating creative problem-solving approaches, the more often students take responsibility for assigned learning tasks.

Table 17. Correlations: learning strategies – acting

| Statements | I enable students to take actions and take responsibility for their own tasks |
|--|---|
| I provide opportunities for students to initiate creative solutions to problems relevant to learning instead of what I suggest | .550** |

Learning strategies: reflecting. Based on the results of the study, it can be stated that encouraging students to rethink their learning strengths and weaknesses and predict learning goals is moderately correlated with encouraging students to rethink what they learned in the lesson ($r = .510$, $p = .000$, $N = 366$). The moderate correlation is evident between the opportunity for students to communicate their reflections in writing and to share with other students, and the opportunity for students to reflect on the quality of learning and present their reflections to the audience ($r = .572$, $p = .000$, $N = 366$). This means that the teacher is focused on students' reflection, which is directly related to the students' motivation for successful learning activities. Also, the more often students are encouraged to self-assess and reflect on their learning strengths and weaknesses, the easier it is to control learning outcomes and the quality of learning.

Learning strategies: abstracting/working with information. The moderate correlation was found between assigning target tasks that require working with various information and encouraging them to choose information sources to perform learning tasks or solve problems ($r = .583$, $p = .000$, $N = 366$). A strong correlation was found between teaching to systematise information related to a learning task or situation and teaching to summarize information related to a learning task or situation. ($r = .767$, $p = .000$, $N = 366$). This means that the teacher encourages the students to independently search for answers to the questions, systematise, summarize, and use various sources of information, plan their activities, and encourage the student to choose the sources of information.

Table 18. Correlations: learning strategies – reflecting

| Statements | I encourage students to rethink what they learned in the lesson by accurately naming the learning outcomes | I encourage students reflect on the quality of their learning in writing and/or orally and present their reflections to the audience |
|--|--|--|
| I encourage students to rethink their learning strengths and weaknesses and set learning goals based on that | .510** | |
| I provide opportunities for students to communicate reflections in writing and share them with other students through oral work in groups or teams | | .572** |

Table 19. Correlations: learning strategies – abstracting/working with information

| Statements | I encourage students to choose their own sources of information to complete learning tasks or solve learning problems | I teach students to systemize information related to a learning task or learning situation |
|--|---|--|
| I assign targeted tasks to students that require working with a variety of information | .505** | |
| I teach students how to systematise information related to a learning task or learning situation | | .767** |

Statistical analysis using the Mann-Whitney criterion and comparing the answers by gender show that there is a statistically significant difference in the statements that women rate better than men:

- *Acting*. “I give students opportunities to know their talents and abilities by working in groups or teams” (p = .008); “I provide opportunities for students to negotiate, persuade and influence working in groups or teams” (p = .022); “I provide opportunities for students to initiate creative solutions to problems relevant to learning instead of the ones I suggest” (p = .016). All other statements do not differ statistically significantly between genders.

- *Applying*. “I enable students to make presentations of creative projects” (p = .003); “I create learning situations in which students have to make decisions that are relevant to specific learning contexts” (p = .017). All other statements do not differ statistically significantly between genders.

- *Reflecting*. “I encourage students to rethink what they learned in the lesson by accurately naming the learning outcomes” (p = .003). All other statements do not differ statistically significantly between genders.

- *Abstracting/working with information*. “I focus on teaching students how to select information related to a learning task or learning situation” (p = .015); “I teach students how to systematise information related to a learning task or learning situation” (p = .017); “I teach students to summarize information related to a learning task or learning situation” (p = .021); “I teach students to present structured information orally” (p = .006). All other statements do not differ statistically significantly between genders.

Table 20. Mann-Whitney criterion and comparing the responses by gender: learning strategies – acting, applying, reflecting, abstracting/working with information

| ACTING | | | | | | | |
|---|------------------|-----|-----------|--------------|------------|--------|-------------|
| Statement | Teacher's gender | N | Mean rank | Mann-Whitney | Wilcoxon W | Z | Asymp. Sig. |
| I provide opportunities for students to learn about their talents and abilities by working in groups or teams | Man | 40 | 146.21 | 5028.500 | 5848.500 | -2.662 | .008 |
| | Woman | 326 | 188.08 | | | | |
| I provide opportunities for students to negotiate, persuade, and influence working in groups or teams | Man | 40 | 150.89 | 5215.500 | 6035.500 | -2.292 | .022 |
| | Woman | 326 | 187.50 | | | | |

| | | | | | | | |
|--|-------|-----|--------|----------|----------|--------|------|
| I provide opportunities for students to initiate creative solutions to problems relevant to learning instead of what I suggest | Man | 40 | 149.09 | 5143.500 | 5963.500 | -2.399 | .016 |
| | Woman | 326 | 187.72 | | | | |
| APPLYING | | | | | | | |
| I provide opportunities for students to make presentations of creative projects | Man | 40 | 141.13 | 4825.000 | 5645.000 | -2,985 | .003 |
| | Woman | 326 | 188.70 | | | | |
| I create learning situations in which students must make decisions that are relevant to specific learning contexts | Man | 40 | 149.88 | 5175.000 | 5995.000 | -2,381 | .017 |
| | Woman | 326 | 187.63 | | | | |
| REFLECTING | | | | | | | |
| I encourage students to rethink what they learned in the lesson by accurately naming the learning outcomes | Man | 40 | 143.40 | 4916.000 | 5736.000 | -3.006 | .003 |
| | Woman | 326 | 188.42 | | | | |
| Abstracting / working with information | | | | | | | |
| I focus on teaching students how to select information related to a learning task or learning situation | Man | 40 | 151.40 | 5236.000 | 6056.000 | -2.427 | .015 |
| | Woman | 326 | 187.44 | | | | |
| I teach students how to systematise information related to a learning task or learning situation | Man | 40 | 151.63 | 5245.000 | 6065.000 | -2.396 | .017 |
| | Woman | 326 | 187.41 | | | | |
| I teach students to summarize information related to a learning task or learning situation | Man | 40 | 153.11 | 5304.500 | 6124.500 | -2.311 | .021 |
| | Woman | 326 | 187.23 | | | | |
| I teach students to present structured information orally | Man | 40 | 146.10 | 5024.000 | 5844.000 | -2.735 | .006 |
| | Woman | 326 | 188.09 | | | | |

6. Discussion

Research results answer the research question: “How are the components of the characteristics of ‘learning to learn’ concept interrelated in the context of teacher-students’ educational interactions in the classroom?”

The research results showed that ‘learning to learn’ components in the context of teacher-students’ educational interactions in the classroom are the following:

Self-assessment of teacher’s learning to learn skills. Teachers are capable to assess their skills when they connect their leadership and mentorship within the educational interactions with students. Shillingstad et al. (2014) argue that teachers as mentors need to grow into leadership and these two roles through teacher’s practices in a classroom is a processual experimentation and this incorporates school cultures, various instructional practices, and formative assessment. Also, teachers’ capability to self-assess their skills is related to their collaboration with fellow teachers by working on school plans, improvement of curriculum which stimulates the collective cooperation

processes in teachers' community (e.g., collective implementation of school plans). This empirical fact from our research coincides with results of Voogt et al. (2016) findings that teachers collaboration influences their knowledge and practice, impacts implementation of curriculum change and develops collaborative community of practice. Our research findings prove that improvement of teaching is related to individual efforts of the teacher to use scientific resources in teaching, but this requires from the teacher self-empowerment to choose, analyse, and systematise the scientific sources. This process is a part of teacher's efforts to improve teaching and learning in a classroom. This means that acquiring this sophisticated knowledge and developing a practice that is different from what teachers themselves experienced as students requires learning opportunities for teachers that are more powerful than simply reading and talking about new pedagogical ideas (Cohen et al., 2003).

Teacher principles for implementing learning to learn. Results of our research showed that teacher's positive attitudes toward students and students' positive academic achievements/outcomes are interrelated. Thus, teacher's positive attitudes are associated with students' personalities, their personal and academic development, and students' academic success as well as teacher's positive attitudes positively influence students' personality as well as their life performances (Uluga et al., 2011).

Learning to learn skills developed in lessons. Our research findings proved that teacher's communication and collaboration skills strengthen students' collaboration skills in the classroom. This could be explained that collaborative learning is useful in developing students' ability to learn to work as a team while getting them engaged in the learning activities and students then believe that they really gain know knowledge and new skills (Sulaiman, Shahrill, 2015).

Student involvement. Our study allows to assume that students' own positive emotions are particularly important for achievements of their learning goals. However, the empirical fact we have obtained does not explain the details of the "how" and "why" questions - these are the answers that can be investigated in the future. This statement is also communicated by Izard et al. (2008) who has neglected, that research can explain when and why emotion is associated with students' academic success, even though emotions contain useful information that can guide cognition and action.

Teacher-student learning co-creation. Results of our study highlighted the fact that teachers pay attention to students' emotions and motivations when working with them in a classroom. Méndez-Aguado et al. (2020) agree that positive emotion positively influences academic motivation of students in a classroom. Also, academic motivation is positively related to students' academic performance and their adaptive behaviours and habits related to the learning. This shows that in the educational relationship between teacher and students, the teacher is observing, listening to, and constructing a teaching process through learning co-creation in which the student is not only accepting knowledge in one direction from the teacher, but that the student is an emotional being whose emotions are relevant (Bovill, 2020).

Creating educational environments according to students' learning differences. Our research findings revealed that the teacher must consider the individual differences of the students in creating learning environments that motivate and enable the student to learn. Because in teaching-learning processes here are interrelated learning styles and expectations, interests and motivation, differences in cultural and social learning. So individual differences are important for determining the learning styles of students. In order teachers would be able to design the learning-teaching process appropriate to the individual differences of students, the students should make active participation in the lesson and the individual differences of their learning not to be ignored (Kubat, 2018).

Opportunities for students to control their learning. From our study is clear that teachers understand that when they work with students in a classroom it is important to provide them with the opportunity to form their own learning goals and link them to learning outcomes. Goal setting is a form of student-involved data use (Jimerson, Reames, 2015). It gets students involved in reviewing their learning processes. This allows students to collaborate with teachers and to set goals for their learning improvement and directing their learning to towards the targeted learning goals. When implemented well, these goal-setting practices have a significant positive influence on student learning outcomes (Leithwood, Sun, 2018).

Learning strategies: applying. Research findings allow to make statement that if the learning situations are created for students in specific learning contexts, then students are tended to

apply the methods in practice by discussing or working in groups and/or teams. This means that the value of students' cooperation and working in groups/teams is evident in teaching practice in the classroom. The ways teachers help students to set their learning goals are related to students' collaboration in a classroom and teacher's instruction (Janssen, Wubbels, 2018). Also, research findings showed that learning situations that are created for students, making specific decisions, and overcoming various problems, then the students easier adapt to learning contexts and situations. Collie, Martin (2016) argue that effective instruction requires adaptation of instructional content and lesson pacing to be responsive to students' differentiated learning needs, changes in the levels of learning support provided to students as they develop expertise in the content.

Learning strategies: acting. Our findings revealed that here are relationships between the opportunities for students to act and take responsibility for solving assigned learning tasks and the opportunities for them to initiate creative solutions to problems through their learning. Designing activities that foster student independence is essential because they invite students to engage more thoughtfully with the content (Sulaiman, Shahrill, 2015). Student choice makes students active participants in their own learning. Such autonomy is associated with greater personal satisfaction in educational environments in a classroom. When students oversee their own learning, they feel a sense of belonging—the classroom becomes a space defined by them (Kubat, 2018).

Learning strategies: reflecting. Based on the results of the study, it can be stated that encouraging students to rethink their learning is related with encouraging them to rethink what they learned in the lesson. Reflection helps students remember lessons learned and gives them a sense of accomplishment. When they consider their challenges and experiences deeply, they can identify gratifying experiences and things that they can aspire to do differently going forward. reflection builds confidence and fosters pride in new skills (Veine et al., 2020).

Learning strategies: abstracting/working with information. The research results revealed the important of teacher's encouragement of students to independently search for answers to the questions, systematise, summarize, and use various sources of information, plan their activities, and encourage the student to choose the sources of information. These results clearly support the student autonomous learning in the classroom. Student autonomy is necessary for her/his encouragement, the opportunity of learning the subject and skills, and student's responsibility of her/his learning achievements (Jora, 2020). The student's autonomy should be gradually implemented through teaching and learning processes in a classroom (Almusharraf, 2020).

7. Conclusion

Learning to learn characteristics include self-assessment of teacher's learning to learn skills, teacher's principles for implementing learning to learn, learning to learn skills developed in a lesson, student involvement, teacher-student learning co-creation, creating educational environments according to students' learning differences, opportunities for students to control their learning, and learning strategies – applying, acting, reflecting, abstracting/working with information.

The content of each learning to learn characteristic is related to teacher-student educational interactions in the classroom with a focus on teacher's particular abilities: ability to cooperate and collaborate with fellow teachers at school, mentorship and leadership, and capability to use scientific sources to teaching; considering positive attitudes toward student's personalities and their learning; having communication and collaboration skills for creating the atmosphere of collaborative learning in a classroom; maintaining students' positive attitudes toward their learning in the classroom; implementing learning co-creation in the classroom; not ignoring students' emotions in the learning process and being adaptive through teaching to students' learning; take into account the individual differences of students in creating learning environments that motivate and enable the students to learn; providing students with the opportunities to form their own learning goals and link them to learning outcomes; creating learning situations for students in specific learning contexts; providing opportunities for students to take actions and responsibilities for solving learning tasks and initiate creative problem solving through learning; designing students' independence and autonomy in their learning; encouraging students to reflect on their learning; encouraging students to search for answers through working with variety of information, which could be not provided in advance by the teacher.

Learning to learn requires teaching and learning that are interrelated processes, which include many variables. These variables interact as students learn toward their learning goals and incorporate new knowledge, behaviours, and skills that add to their range of learning experiences. Both teaching and learning processes are navigated by the teacher through educational interactions with students in a classroom. Teacher's understanding about relevance of learning to learn for students's learning and implementing it within the educational interactions with students in a classroom effects the students 'learning through their reciprocal teacher-student communication, collaboration, cooperation, co-creation. Learning to learn is particularly important when teachers are no longer a main source of information and knowledge. The findings show how the gap can be addressed between current and future teaching-learning performances in a classroom.

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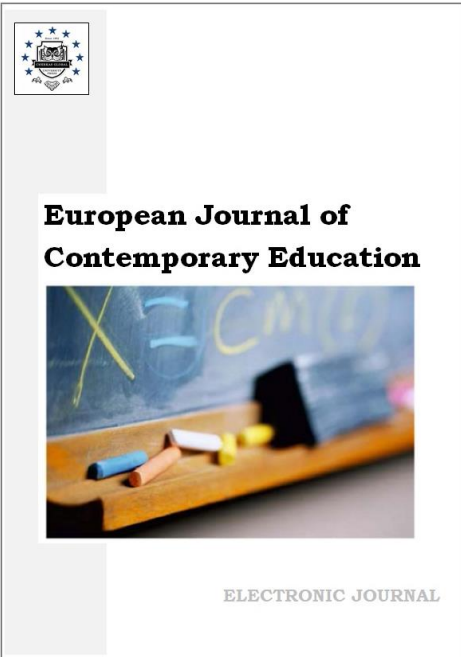
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Development of the Personalized Model of Teaching Mathematics by Means of Interactive Short Stories to Improve the Quality of Educational Results of Schoolchildren

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Abstract

The problem which is solved by this research is due to the need to resolve the contradiction between the requirements of the modern economy for the quality of mathematics training of future specialists and an insufficiently developed methodological base for training graduates that meets these requirements.

The aim of the study is to theoretically substantiate and experimentally test the effectiveness of the personalized model of teaching mathematics by means of interactive short stories to improve the quality of educational results of schoolchildren.

The research methodology is the analysis and generalization of literature on the problems of improving the quality of mathematics education, the use of digital technologies to personalize learning. The following empirical methods were used: observation, analysis of the results of work in the AXMA Story Maker application (choice of answer, number of attempts to find a solution, read publications, etc.). In the experiment the Fisher criterion was used to process the results.

Research results. The work clarifies the essence of the concepts “personalized learning model”, “visual short story” and highlights the didactic functions of interactive short stories in relation to mathematics education. The authors described directions of activities at mathematic, in which the personalized educational model is a condition for the successful implementation of

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personal trajectories.

The conclusion summarizes the features that should be taken into account when designing the personalized learning model: correlating the didactic purpose and the result of work in the nonlinear environment, choosing a plot for a short story, personalized trajectory of cognition, etc.

Keywords: mathematics education, digital technologies, interactive environment, visual short story, personalization of learning, AXMA Story Maker.

1. Introduction

1.1. The relevance of the problem

The relevance of the presented study is due to the following factors:

1. The educational policy of the modern digital school is aimed at improving the quality of education. In particular, the provisions of the federal law “On Education in the Russian Federation” establish that distant technologies and e-learning can be used in the implementation of educational programs, including mathematics (Karakozov, Ryzhova, 2019). In the context of introduction of the state standard of basic general education, which takes into account the principles of the system-activity approach, the use of interactive technologies acquires particular relevance (Aleksandrov et al., 2017).

2. Mathematics education is an integral part of general education. Mathematics, which is reasonably proved by A. S. Kotyurgina et al. (Kotyurgina et al., 2020), is one of the basic subjects at school, it supports the study of other disciplines (physics and mathematics, humanitarian, etc.). In modern conditions a certain amount of fundamental mathematics knowledge, knowledge of mathematics methods are becoming compulsory elements of the culture of the nation. In addition, learning mathematics performs developmental functions: intellectual skills, which are necessary for any person, regardless of what field of the activity the person will be engaged in the future, are formed.

3. In the theory and methodology of teaching mathematics, according to E.A. Perminov, D.D. Gadzhiev, M.M. Abdurazakov (Perminov et al., 2019), much attention is paid to the search and implementation of new methods and means for high-quality training of graduates of secondary schools to consciously use mathematics knowledge and skills necessary for their future professional activities, and the formation of holistic ideas about this science as part of the common human culture.

4. Modern education analysts at the Higher School of Economics under the leadership of L. L. Lyubimov are developing the author's Concept for the Modernization of Education and believe that the new society needs people who can independently make decisions, ... predict their possible consequences” (Lyubimov, 2020). The inclusion of interactive digital means in the educational, cognitive, mathematics activities of students should contribute not only to increasing academic performance in mathematics, but also to contribute to the holistic development of the personality, the realization of creative abilities and cognitive interests of each student (Galimova et al., 2019).

In other words, innovative pedagogical technologies and modern digital resources should be the basis of the information educational environment that takes into account individual personality traits. N.I. Isupova, T.N. Suvorova argue that in the modern personified educational space, digital resources should complement and expand the range of educational and cognitive influences, enrich cognitive practice, and promote the mastery of the culture of thinking (Isupova, Suvorova, 2018).

Such thinking, according to M. Novitasari et al., is most in demand in the modern society (science, industry and economics), since the corresponding intellectual activity supports decision-making in an uncertain future (Novitasari et al., 2020). The visual component of interactive media affects visual and emotional memory (Olefirenko et al., 2019).

Thus, there is a practical need for the use of interactive digital tools to improve the quality of teaching mathematics in the personified educational space.

1.2. Research purposes and objectives

The purpose of the study is determined from the need to study the features of the development of a personalized model of teaching mathematics by means of interactive short stories to improve the quality of mathematics education.

The following were identified as the main objectives:

– to clarify the essence of the concepts: “personalization of learning”, “personalized learning model”, “visual interactive short story” in the context of the requirements of the digital school;

- to describe the didactic potential of AXMA Story Maker as a visual interactive short story development tool;
- to design a personalized environment for teaching mathematics based on interactive short stories, focused on improving the quality of educational results of schoolchildren;
- to describe the directions of the cognitive activity of schoolchildren in the AXMA Story Maker environment;
- to present the system of the teacher's work on the structure of the visual interactive short story, its text (task) component;
- to experimentally test the effectiveness of the developed teaching methodology by means of interactive short stories to improve the quality of mathematics education of specialists of the future.

2. Relevance

2.1. Literature review

The analysis of Russian and foreign scientific works on the research problem is carried out in three directions:

- 1) search for new methods and means in teaching mathematics to improve the quality of mathematics education;
- 2) identifying the didactic potential of digital technologies to support the personalization of teaching mathematics;
- 3) generalization of the experience of using modern interactive methods and tools when teaching mathematics.

2.1.1. Analysis of Russian scientific and pedagogical literature

The inclusion of interactive short stories and educational quests in the cognitive activity of students are current directions for the development of the didactic system (Karavaev, Soboleva, 2017). E.A. Perminov, D.D. Gadzhiev, M.M. Abdurazakov also conclude that in the general system of knowledge there is an increase in the importance of mathematics, the penetration of mathematics models and methods into various spheres of human life (Perminov et al., 2019). In these conditions in the theory and methodology of teaching mathematics it is necessary to pay more attention to preparing graduates of a general education school for the use of mathematics knowledge and skills which are necessary for their future professional activities and the formation of ideas about this science as part of a common human culture.

N.A. Urvanova notes that high-quality teaching mathematics in the digital school presupposes the active inclusion of interactive digital means in educational and cognitive activities of students (Urvanova, 2018). Their choice and application should contribute to increasing academic performance in mathematics, the realization of the creative abilities and cognitive interests of each student.

It is the mentor of the digital school who can and should choose personalized learning technologies that maximally work to form the type of thinking and way of action that is in demand in the digital society. Other authors complement these ideas and argue that distant technologies, e-learning, interactive tools and activity methods should be used when teaching mathematics (Galimova et al., 2019). N.A. Urvanova also formulates the condition that innovative pedagogical technologies and modern digital resources should be the basis of the educational environment, adjusted to individual personality traits (Urvanova, 2018). Moreover, N.A. Urvanova notes that in such a specially designed educational model the student receives maximum conditions for the development of “the ability to learn”. Researches on the study of the issues of personalization of learning and the use of digital technologies to design a personalized learning model were also analyzed.

For example, N.V. Chernyaeva reasonably argues that an important direction in the educational policy is the transition from “mass” education to the personalized one (Chernyaeva, 2020). According to the author, the main aim of personalized learning is to provide conditions for self-realization of students. N.V. Savina notes that in the personalized educational model the student receives maximum conditions for the development of “the ability to learn” (Savina, 2020). Appropriate conditions must be supported by the personal educational route, a trajectory of cognition, curriculum, and information environment.

The most comprehensive methodological approach to developing the personalized model of teaching mathematics based on digital technologies is presented in the study of E.G. Sabirova, T.V. Fedorova, N.N. Sandalova (Sabirova et al., 2019). The authors conclude that the number of digital educational resources for personalization of learning is constantly increasing. However, in order to purposefully and methodologically effectively include the appropriate services in the educational process the mentor needs to know principles and conditions of personalization of education. In addition, it is the teacher who should understand the range of educational tasks that can be solved with the help of electronic resources; determine methodological functions, types of educational activities that digital technologies support and initiate. The purpose of their research is to identify the effectiveness of the interactive educational platform Uchi.ru for personalized teaching of mathematics in primary school.

So, there is an objective need to analyze and generalize the experience of using modern interactive methods and tools when teaching mathematics.

O.I. Vaganova et al. examine the general methodological aspects of organizing the learning process using modern interactive didactic tools. In the research the concept of "interactivity" refers to the interaction between objects (Vaganova et al., 2020). The authors formulate the following requirements for interactive teaching aids: support of motivation (the appearance of an incentive for students to study the subject); management and regulation (directing the attention of students to the study of objects, phenomena). Z.I. Isaeva notes the following didactic properties of interactive teaching tools: multimedia, instrumentality, adaptability, information content, motivation (Isaeva, 2019). E.V. Soboleva, M.S. Perevozchikova prove that designing interactive quest rooms as organizational forms of cognition and educational technology is not one of the options for gamification of the digital educational space, but also contributes to the formation of intellectual competence of the individual (Soboleva, Perevozchikova, 2019).

E.N. Nikolaeva, I.P. Egorova prove that with the help of interactive methods it is possible to increase academic performance in the subject, the involvement of students activities, thereby contributing to the personalization of learning (Nikolaeva, Egorova, 2020). Including interactive techniques has a beneficial effect on creative, critical and creative thinking.

E.A. Levchenko, A.V. Mantorova describe the concept of a visual interactive short story "Getting Through" as a variant of the development of creative thinking, imagination and formation of foundations of the scientific worldview. However, such interactive tools have been developed only for classes in history, literature, and English (Levchenko, Mantorova, 2020).

Thus, Russian modern researchers convincingly prove that the inclusion of interactive services for visual short stories and quests in educational and cognitive activities not only meet the goals and challenges of the education system, but also allows to prepare demanded and competitive professionals of the future for the country's economy.

2.1.2. Analysis of foreign studies

Analytical work in this part of the study was also carried out in three directions.

As part of the first direction, it should be noted that foreign scientists are unanimous in the opinion that it is educational achievements in mathematics that are the basis of quality education in general (Gault, 2019; del Río, Sanz, Búcarí, 2019). In particular, J. Park et al. reasonably argue that mathematics knowledge acquired in primary school determines the success of further education, readiness of adolescents to think independently, and to the reasoned activity (Park et al., 2016). Researchers identify five conditions for personalized learning: formation of subject-oriented skills; development of thinking (critical, analytical); support of students by the teacher; use of various didactic methods, forms and means of teaching (for example, electronic educational resources, simulators, educational and interactive quests); use of information technologies when teaching.

According to S.K. Bawa, R. Kaushal, J.K. Dhillon, development of personalized learning is one of the priorities of modern mathematics education. The authors conclude that the use of information technologies can improve the quality of teaching mathematics (Bawa et al., 2020). A. L. Alfaro-Arce, M. Alpízar-Vargas study the didactic potential of multimedia programs (combining text, sound and music, graphics, animation and still images) in teaching elementary mathematics (Alfaro-Arce, Alpízar-Vargas, 2019). Based on statistical data they substantiate the effectiveness of such multimedia applications for the development of mathematics skills.

D. Hillmayr et al. also conclude that the use of digital technologies can improve the quality of teaching mathematics (Hillmayr et al., 2020). At the same time, scientists carry out the experiment which confirms that the use of intelligent learning systems, modeling and work with dynamic mathematical tools is much more effective than the usual multimedia course support.

K. Bovermann and T. J. Bastiaens conclude that the use of interactive tools and applications in the mathematics classroom provides variability in the presentation of tasks, uniqueness of exercises, quick assessment, and necessary trajectory correction, changes in the difficulty of the level, competitiveness and the game approach to learning. To create such applications tools that are part of the integrated Microsoft Office suite and other applications that do not require programming skills are used (Bovermann, Bastiaens, 2020).

In turn, an increase in literacy, formation of the critical worldview is the basis for the preparation of future generations (Radović et al., 2019). According to the provisions of J.F. Harding et al. personalization is the creation of the learning environment which matches unique abilities and needs of the student in order to achieve the potential of students (qualities, talents) (Harding et al., 2019). Personalization is a process during which the subject acquires individual properties and qualities that allow him/her to fulfill a certain social role, to build relationships with other people (Catarino et al., 2019).

The concept of “personalized learning” is used to refer to a process that consists of a set of educational programs, methods and teaching techniques, which is aimed at identifying and taking into account educational needs, interests and individual characteristics of the student (Radović et al., 2019).

According to E.M. Ghazali, D.S. Mutum, M.Y. Woon, education in school should take into account cognitive interests and professional aspirations of the student (Ghazali et al., 2019). In the work of O.C. Yung, S.N. Junaini, A.A. Kamal, L.F. Md Ibharm, based on the analysis and generalization of the didactic capabilities of QR codes for teaching, priorities for the development of web technologies, interactive short story services, the authors reasonably highlight a promising direction in the new educational realities – the use of game mechanics to support the cognitive activity of students in the mathematics course. The use of means of interactive short stories and quests in the mathematics activity, the construction of a mathematical model in a playful form helps to activate knowledge, increase the interest and curiosity of the teenager of generation Z (Yung et al., 2020). The authors note that with the help of such visual objects it is possible to increase mathematics academic progress, involvement of students activities, thereby contributing to the personalization of learning.

Using interactive techniques stimulates creative, critical and creative thinking (Mora-Luis et al., 2020). Improving the quality of mathematics education in the context of personalization presupposes the innovative approach to teaching, the use of non-standard tools and technologies (Catarino et al., 2019). Moreover, if applied correctly, this approach can qualitatively increase the effectiveness mastering the educational material and activate the cognitive activity of schoolchildren, and promote professional self-determination (Helmlinger et al., 2020).

However, as the analysis of the literature has shown the practical implementation of interactive visual short stories and quests in teaching mathematics, the use of software applications that take into account the principles of didactics and contribute to improving the quality of mathematics education cause certain difficulties (More, 2018). It should be noted that there is a need to allocate additional time and labor resources, work with the educational mathematical content of the application, knowledge of the basics of didactics and their use in practice, the choice of software, etc. (Bocconi et al., 2018).

Thus, new challenges of the time determine modernization of mathematics school education: a transition to personalized learning takes place (Bawa et al., 2020), interactive methods and means are actively used to present facts, tasks and exercises, to support modeling (Harding et al., 2019).

At the same time, in other school subjects (literature, history, English), interactive technologies also support formation of the scientific picture of the world, development of mental processes, and creativity. In particular, game applications and visual interactive short stories are being developed. Therefore, to improve the quality of teaching mathematics it seems appropriate to use such interactive short stories as the basis of the personalized educational environment.

3. Materials and methods

3.1. Theoretical and empirical methods

The following methods were used in the study: theoretical analysis and generalization of scientific literature on the problems of improving the quality of mathematics education; using digital technologies to personalize learning; didactic potential of visual interactive literature as a kind of computer games.

The main methodological principle of the study is determined by the key condition for personalized learning and presupposes the freedom to choose the educational path. This principle of choice is realized in the space of the interactive short story. The interactive short story is both a learning tool and a play space. Interaction with the user in the visual interactive environment is implemented mainly with the help of textual information. The text can be accompanied by video, images, sounds.

The use of interactive short stories in teaching mathematics is supported by the following system of didactic principles: accessibility, consistency, connection between theory and practice, conscious activity, individual approach, cooperation. On the other hand, teaching mathematics (the study of rigorous scientific facts, mathematical calculations, etc.) is supported by the artistry of the text, ideas in the imagination of the user-player, plot, and interaction of characters.

To obtain up-to-date information on qualitative changes in the educational achievements of students in mathematics the following empirical methods were used: observation, analysis of work results in the AXMA Story Maker application (choice of answer, number of attempts to find the right solution, study of theoretical material in publications, use of audio background, etc.).

The use of tools for designing visual interactive short stories was carried out as part of the course "Entertaining mathematics". This course is included in extracurricular activities of personality development in secondary school № 11 in Kirov.

Control tests, as a research method, given an opportunity to assess the level of mathematical training of the subjects research with the help of specially selected exercises. An input control was organized to form the experimental and control group, the control included five tasks (do logical inferences, calculate a value from a ready-made mathematical expression, work with a problem formulation, draw up a mathematical formula, use information technologies to automate mathematical calculations). 121 students of grade 7 were involved in work with interactive short stories. The average age of the respondents was 13 (51 % girls and 49 % boys).

Despite the fact that for the implementation of interactive short stories there are many software tools (Twine, Quest, Apero, Kvestor, AXMA Story Maker, etc.), the research uses the AXMA Story Maker application as a software tool. Its main advantages include the fact that using the application does not require programming skills, simplicity and convenience of the user interface, availability of ready-made templates for publications, support for various languages (Russian, English), the application provides a wide range of functionalities for designing visual travel games, interactive short stories.

Statistical processing of the research results was performed using the Fisher test.

3.2. The base of research

The use of design tools for visual interactive short stories was carried out as part of course "Entertaining mathematics". This course is included in extracurricular activities of personality development in secondary school № 11 in Kirov. 121 students of grade 7 were involved in work with interactive short stories. The average age of the respondents was 13 (51 % girls and 49 % boys).

The sample was not random. An input control was organized to form the experimental and control group, the control included five tasks. The tasks were designed according to the principles of didactics. The content of the tasks meets the requirements of the standards of International and Russian education. To ensure conditions for group homogeneity, the same teacher conducted classes on the basics of mathematics for all students.

This teacher also formulated systems of educational tasks, directed information interaction in the process of solving problems by schoolchildren in the AXMA Story Maker environment. Work with interactive applications was performed in the same classrooms, on the same hardware and software. The materials for the test were developed by the authors in accordance with the current standard of basic general education.

3.3. Stages of research

The research was carried out in three stages.

At the preparatory stage of the experiment software that support the implementation of interactive visual short stories was studied and analyzed: Twine, Quest, Apero, Kvester, AXMA Story Maker, etc. After comparing the software for the implementation of interactive short stories according to the selected criteria, the application AXMA Story Maker was reasonably chosen. Next, the didactic potential of its tools for personalizing mathematics learning was explored. To assess the input conditions materials from a specially organized control event (5 tasks) were used.

For the correct solution of control tasks the student could receive the maximum of 12 points. The work was considered completed (mark “credit”) if the student scored more than 7 points.

Thus, it was possible to collect data on 121 schoolchildren of whom the experimental (60 students) and control (61 students) groups were formed. The sample was not random. The average age of the respondents was 13. In the experimental group there were 51 % of girls and 49 % of boys.

The second stage of the study was to correlate the topics of the course “Entertaining mathematics” (elements of logic, formulas, equations, inequalities, motion problems, percentage problems, etc.) with the capabilities of the software for creating interactive short stories. In particular, the system of classes was determined.

Proposed titles were formulated, plots for interactive short stories, focused on the rational use of AXMA Story Maker tools for personalizing teaching mathematics, were designed: “Eastern Horoscope”, “Systems of Notation”, “Seven Wonders of the World”, “Professions of the Future”, etc.

The third stage of the research is experimental teaching, the inclusion of a mathematics elective for purposeful work with the means of interactive short stories in the curriculum.

4. Results

4.1. Clarification of the essence of basic concepts

Personalized education in the presented study is considered as an educational approach using individual educational trajectories. It is the approach, according to the results of which the level of individual motivation increases, cognitive interests are satisfied, and the professional self-determination of each student is supported.

The author's understanding of the meaning of “personalized learning” assumes that the student gets the opportunity to choose: the content (from the proposed); the speed, and in some cases the place of training, and the format of the assignments; the method of designing and implementing the educational process; the self-realization mechanism; the form of organization of the learning process.

An interactive short story is a story, the artistic image and content of which are realized with the help of a computer program. The Interactive short story is both a learning tool and an interactive game genre. It tells a story that appears on the screen in the form of text, video, sometimes with background music.

Visual interactive short story is an interactive learning tool. It is a story. The artistic image and content of the short story may vary depending on the student's actions. The use of software services for the implementation of interactive short stories creates additional conditions in order to form in students the style of thinking that is in demand in society. This style of thinking involves the search for various ways to achieve the goal and understanding the laws of chance. The effectiveness of the organization of the corresponding mathematical activity is determined by the capabilities and skills of the mentor in the digital school.

The use of the developed learning model in the experimental group was aimed at forming a set of educational results in mathematics:

- subject (arithmetic and logical operations, rounding and use of alphabetic symbols, construction of graphs of functions and tables, use of scientific mathematical terminology, etc.);

- metasubject (universal principles and patterns, tools for modeling phenomena and processes; understanding the areas of application of mathematical knowledge and skills in the digital society; simple and complex conditions; working with a problem formulation; search, presentation and storage of information; inductive and deductive ways of reasoning; algorithmic nature of activities in the interactive environment, etc.);

– personal (formation of the sense of responsibility to other users for reliability of information; development of critical thinking and creative abilities of students when analyzing and making generalizations of information in the course of solving problems; support for independent choice in the interactive environment; use of digital resources for the implementation of educational and cognitive goals and self-development, etc.).

So, to achieve the aim of the research, the personalized model of teaching mathematics was developed, the components of which are: the interactive short story (plot for presenting a sequence of mathematical facts), the software tool (AXMA Story Maker application); game elements (levels, process visualization tools, characters), didactic principles of teaching mathematics (individualization, accessibility, consistency, etc.).

The personalized model of teaching mathematics by means of interactive short story is divided into the following levels:

Level 1. “Personalization for learners”. By means of interactive short stories in the experimental group the teacher creates conditions and opportunities for acquiring new mathematical knowledge and skills. In the designed conditions and in the process of interactive interaction with the software environment students make their own choice, observe the reaction of the environment, receive either confirmation of their hypothesis or return to the previous fragment of the short story.

Level 2. “Personalization by efforts of the student”. In the interactive visual environment when studying mathematical patterns, ideas and approaches, a member of the experimental group receives new tools, algorithms, methods in order to personalize own subsequent learning.

It should be noted that in the developed personalized model of teaching mathematics, the rate of presentation of a new fragment of the short story is also designed taking into account the individual characteristics and capabilities of the experimental group participants.

Another important circumstance is that for the experimental group work with fragments of the visual short story in the interactive environment presupposes obtaining fundamental theoretical knowledge while playing. By including game elements, not only the presentation of the educational material is changed, but when solving mathematical problems positive emotional background is maintained and stress factors are minimized.

The author's conclusions of the presented work confirm the previously obtained information by E.V. Soboleva et al. on the effectiveness of the use of interactive technologies when teaching mathematics (Soboleva et al., 2018).

The advantages of the AXMA Story Maker software include the following:

- free version allows to create game applications, tests, interactive short stories, quests;
- structure of links between paragraphs is displayed on the main screen. The user can adjust the workspace to suit own characteristics of information perception;
- official website has a guide for authors, a blog and other teaching materials to help the developer;
- finished resource can be saved and used as an html file;
- no specialized programming skills are required;
- possibility to work without Internet access.

The AXMA Story Maker application integrates the capabilities of the JavaScript language. Figure 1 shows the workspace and tools for making a publication. When adding text, one can work with color, font and format; there are tags for designing paragraphs and links; there is a possibility to add buttons and audio files; there are functions for copying, scaling, etc. Thus, when developing and filling a short story, the mentor of the digital school is required to have basic skills and information literacy.

Thus, the use of AXMA Story Maker made it possible to use text information, graphics, and sound when designing interactive visual short stories.

All of the above, firstly, corresponds to the age and psychological characteristics of the thinking of modern adolescents; secondly, it organically complements the rigor of mathematical theories.

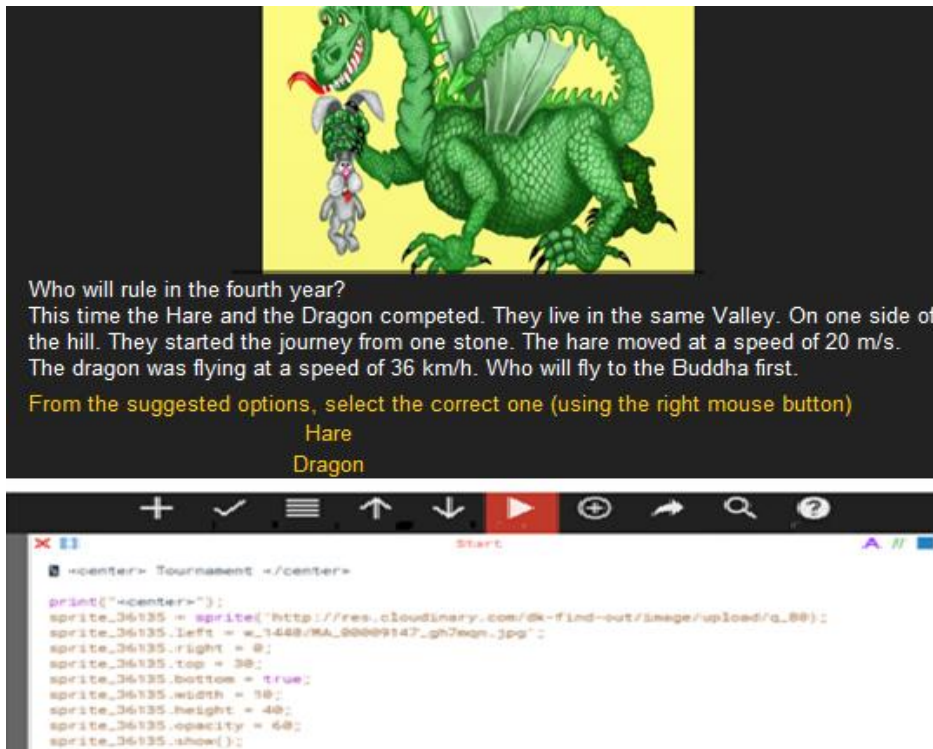


Fig. 1. Work with the content of the publication

4.2. Educational and cognitive activity of students in the visual interactive short story environment

Visual short stories include two main elements: visual (static pictures) and literary (the text of the story itself).

With the help of interactive short stories the personalized learning model was designed and implemented, it is focused on a qualitative change in the level of academic achievements of schoolchildren. The entire story is divided into publications – images of the working field, which combine various forms of information presentation (text, graphics, sound). Each publication is a separate element of the learning model. Movement through the plot of the story, movement of the character through publications is determined by the choice of the student. The content of the publications is mathematical theory, practice-oriented tasks and exercises.

The meaningful elements in the developed educational model in mathematics for students of the experimental group are: the concept of the formula, the arithmetic expression, the equation/inequality, the roots of the equation, etc. It should be noted that the study of each topic in the experimental group is designed for several classes (mastering new material, developing mathematical skills when working with publications of the visual novel, doing control tasks in the interactive environment).

In the experimental group the primary focus was precisely on the acquisition of new theoretical knowledge, its meaningful application when solving mathematical problems. To involve students in complex intellectual activities (due to the need to memorize, formulate, generalize, check, etc.), rigorous mathematical calculations, the means of interactive stories were used. Introduction to the independence, cognitive activity, argumentation and responsibility for decision-making took place through the nonlinear space of the game world. The means of interactive short stories were used to involve students in complex intellectual activities (due to the need to memorize, formulate, generalize, check, etc.) and rigorous mathematical calculations.

As an example let us consider one of the interactive visual short stories in AXMA Story Maker, which supports mathematics learning in the personalized model for the experimental group.

Once the Lord of the country X decided to choose his successor among all the wise men, scientists of the kingdom of Oz. He invited them to his place under the pretext of participating in the tournament "What? Where? When?" It was winter time and there were severe frosts. To get to

the site of the tournament travelers had to go through a forest, a valley, a ravine, unfriendly giants, a lake, a swamp, and abandoned villages. Let us describe some of the features of the presentation of mathematical material in publications of the interactive short story.

All guests independently chose their paths and means of transportation. So, one of the publications of the short story contained the following task as an alternative: from two cities, the distance between which is 140 km, two wise men began to move towards each other. At first, the expert Cube came out on foot and an hour later his friend Compass left by carriage. The speed of Cube is 5 km/h and it is 2 times less than the speed of Compass who goes by carriage.

The essence of math activity: make an equation and determine the time before friends' meeting. Working with the interactive environment assumes that from the proposed options the student must choose the answer that he/she considers correct. Then the student clicks on this answer with the left mouse button and goes to the next publication.

[[*10 hours| Cube and Compass]]

[[15 hours | error Cube's way]]

[[1 hours | error Compass's way]]

The choice of "Error Cube's way" assumed the execution of an additional task for drawing up an equation, expression of one variable through another, etc.

For example, it involved the following task: "To find which way the expert traveled one should find the product of speed and time spent during travel. It is known that the carriage moved at a speed of 10 km/h and the whole journey took 5 hours. Accordingly, Cube overcame "...." km "? From the proposed options, one needs to choose the correct answer and click on this answer with the left mouse button:

[[*50 km| Cube and Compass]]

[[50 km/h| error Cube's way]]

[[2 km| error Compass's way]]

At the same time, the choice "Cube and Compass" corresponded to the continuation of the short story. For example, go to the next publication: "On the way Cube met his old friend Compass, who was crossing the valley alone. Cube invited him to his carriage, since it would be more fun for the two of them to get there. Compass agreed, and they went to the Lord of the country X together".

Thus, the students in the experimental group received in each subsequent publication either a refinement of the mathematical theory or new mathematical tasks. Next publication is a free choice of each student.

During the implementation factors corresponding to the specifics of mathematics education, didactic principles, mechanics of interactive short stories and quests were taken into account:

- information presented in each of the paragraphs is concise and structured;
- base on interdisciplinary and intradisciplinary relationships;
- tasks and questions for the short story are designed in accordance with the current educational standards and curricula;
- text component is checked for the presence/absence of errors;
- only generally accepted mathematical terms and notations are used.

The students in the control group worked at the elective using the educational-methodological complex of Yu. N. Makarychev et al. This teaching material is focused on updating knowledge, as well as preparing for the study of courses in geometry, physics, chemistry and geography in subsequent classes. The complex is included in the federal list of textbooks. The educational-methodological complex uses a differentiated decoration for various sections: theoretical information, tasks for working in pairs and for revising, entertaining facts on the history of the development of mathematics, etc.

Also, at the elective the participants of the control group used workbooks and training programs, they participated in mathematical dictations. The classes in the control group were organized according to the principle "from theory to practice".

When developing the interactive short story with mathematical content, additional opportunities were also created for the development of teamwork skills, cross-industry communication, and the propaedeutics of working with technical documentation was carried out.

There is on fact that is of particular importance for solving future professional tasks when implementing innovations, the fact is that the concretization of the content of each educational game space with mathematical content does not occur at the initiative of the mentor, which is

typical to the traditional system of teaching mathematics. The direction for mathematical research is determined by the students themselves.

4.3. Experimental evaluation

4.3.1. The ascertaining stage of the experiment

At the first stage of the experiment, materials of specially organized testing were used to assess the input conditions, the test took into account the priorities of the digital society, the competence of the atlas of new professions. All questions and tasks were developed by the authors in accordance with the requirements of state federal educational standards. Students were asked to solve 5 tasks.

The solution to the first problem is associated with the development of logical thinking. For example, students are given cards with a sequence of numbers in a specific order. They need to continue the pattern and determine the number that should be on the blank card.

The solution to the second problem involves calculating the value of a mathematical expression. For example, it is to determine the value of the expression $F = m \cdot a$ if the mass and acceleration are known.

For the correct solution of each of these problems, the student received 1 point.

When solving the third task, the student had to choose from the proposed formulations of problems the one which conditions correspond to a certain mathematical equation. For example, $33 / (x + 6.5) + 4 / (x - 6.5) = 1$. For the correct solution of the problem of this level, the student received 2 points. Examples of tasks:

1. The yacht "Pobeda" sailed 4 km upstream of the river, and then another 33 km downstream. Captain Wrangel calculated that they spent one hour on the whole journey. Find the speed of the yacht if the river speed is 6.5 km/h.

2. From the diaries of a young traveler "Today we examined the atolls of the islands. At the same time, our expedition covered 4 km on foot, 33 km we sailed on the ship "Victoria" along the equator forward and 6.5 km when returning back". Help determine the speed of travelers.

To solve the fourth problem, the student had to compose an equation on his/her own. For example, a cruise ship covered 108 km downstream and 84 km upstream, spending 8 hours for the entire journey. It is known that the speed of the river is 3 km/h. Find own speed of the cruise ship. Having designated the own speed of the cruise ship as x km/h, write an equation that corresponds to the condition of the problem.

For the correct solution of the problem of this level, the student received 3 points.

The fifth task involved the use of software and information technology. For the correct solution 5 points were given.

For example, Hermione decided to organize a picnic for her friends. To do this, she compiled a "memo", where she wrote down all the purchases necessary for a good rest (food, dishes, their quantity, etc.). Hermione, like a real researcher, approached the task in a complex way: the girl studied all the prices in magic stores and shops. For structuring she compiled a spreadsheet with a price range for each item. Determine in which shop Hermione's costs will be minimal.

For example, Hermione decided to organize a picnic for her friends. To do this, she compiled a "memo", where she wrote down all the purchases necessary for a good rest (food, dishes, their quantity, etc.). Hermione, like a real researcher, approached the task in a complex way: the girl studied all the prices in magic stores and shops. For structuring she compiled a spreadsheet with a price range for each item. Determine in which shop Hermione's spend will be minimal.

So, for the correct solution of the control tasks, the student could receive the maximum of 12 points. The work was considered completed (mark "credit") if the student scored more than 7 points.

Thus, it was possible to collect data on 121 schoolchildren, of whom the experimental (60 students) and control (61 students) groups were formed. The sample was not random. The average age of the respondents was 13. In the experimental group there were 51 % of girls and 49 % of boys.

4.3.2. Forming stage of the experiment

At the forming stage of the experiment the teacher analyzed the requirements of the digital economy to the quality and level of mathematical training of graduates. The provisions of the

current state federal educational standards determine that as part of mathematics education the student must acquire a certain amount of fundamental mathematical knowledge, master the mathematical methods of cognition and the general culture of the nation. In addition, teaching mathematics should perform developmental functions: to form intellectual skills necessary for any person regardless of what field of activity he/she will be engaged in in the future.

Classes for students in the control group were conducted according to the traditional method of teaching mathematics, without special organization of activities in the environment of interactive short stories and quests. They were active and independent in research, which was organized in the form of practical work on solving mathematical story problems, performing exercises on specific topics. Schoolchildren from the experimental group were taught according to the described way.

The second stage of the study was devoted to correlating the topics of the course "Entertaining mathematics" (elements of logic, formulas, equations, inequalities, motion problems, percentage problems, etc.) with the capabilities of the software tool for creating interactive short stories. In particular, the sequence of classes was determined.

1. Acquaintance with AXMA Story Maker, basic commands and user interface icons.

2. Work with forms and text windows, moving through the branches and levels of the interactive short story. At this stage, the students wrote scripts to implement the short stories algorithm (in Figure 1), determined the sizes and positions of the visual objects necessary for the work.

3. Execution of a demo version of the interactive short story to study or consolidate theoretical material.

4. Passing the test version of the interactive short story.

Approximate titles were formulated, plots for interactive short stories, focused on the rational use of AXMA Story Maker tools for personalizing teaching mathematics, were designed: "Eastern Horoscope", "Systems of Notation", "Seven Wonders of the World", "Professions of the Future", etc.

4.3.3. Control stage of the experiment

At the fixing stage of the experiment, control testing was also carried out. The types of tasks and principles of assessment corresponded to the tasks and the procedure of the entry test. Information about the measurement results before and after the experiment is presented in Table 1.

Table 1. The results of the test

| | Before the experiment | | After the experiment | |
|--|-------------------------------------|--------------------------------|-------------------------------------|--------------------------------|
| | Experimental group (60 students) | Control group (61 students) | Experimental group (60 students) | Control group (61 students) |
| Percentage of students who received the mark "no credit" | 56,7 % (34) | 55,7 % (34) | 15 % (15) | 50,8 % (31) |
| Percentage of students who received the mark "credit" | 43,3 % (26) | 44,3 % (27) | 75 % (45) | 49,2 % (30) |

The reliability of the obtained results was checked using the Fisher's angular transformation (Fisher's criterion) using the online calculator (<https://www.psychol-ok.ru/statistics/fisher/>). The critical value of Fisher's criterion for the significance level of 0.05 (φ_{crit}) is 1.64.

The hypotheses were accepted:

H_0 – the level of educational results in mathematics in the experimental group is statistically equal to the level of the control group;

H1 – the level of educational results in mathematics in the experimental group is higher than the level of the control group.

The empirical value of Fisher's criterion before the start of the experiment is 0.115 ($\varphi_{\text{emp}} = 0.115 < \varphi_{\text{crit}} = 1.64$). Therefore, before the start of the experiment, the hypothesis H₀ is accepted. The value of the Fisher criterion after the experiment is 2.964 ($\varphi_{\text{crit}} = 1.64 < \varphi_{\text{emp}} = 2.964$), therefore the hypothesis H₀ is rejected and H₁ is accepted.

Thus, the shift towards improving the quality of educational results in mathematics of students of the experimental group can be considered not accidental.

5. Limitations

The sample of students was not probabilistic, therefore, experimental data cannot be generalized for the entire students population. For diagnostics, the results of the input control testing were taken into account. Throughout the experiment, creative activity in the interactive environment was carried out by the same teacher, on the same software equipment in special classrooms.

6. Discussion

Doing the quantitative analysis of the obtained results, we conclude that 75 % of the students in the experimental group successfully coped with the control tasks. According to the results of input measurements, this value was equal to 43.3 %. The number of students who did not complete the task decreased from 56.7 % to 15 %. The dynamics of the results in the control group is not so significant. 49.2 % of schoolchildren received the mark "credit". Initially, this figure was 44.3 %. The number of students who could not complete the final test was 50.8 % (compared to 55.7 % after the entry test).

In general, the pedagogical experiment allows to conclude that teaching mathematics according to the designed personalized model based on visual short stories contributes to improving the quality of education. The level of academic results in mathematics in the experimental group became significantly higher due to the fact that the information environment for studying the topics of the course "Entertaining mathematics", supported by interactive means, made it possible to create and provide conditions for: taking into account the individual, age and psychological and physical characteristics of students; studying universal methods, approaches that are the basis of research, educational and cognitive and further professional activities of schoolchildren; developing the skills of independence in decision-making, responsibility for one's choice and its consequences; self-education; creating situations of success; organization of creative activity.

The quality of teaching mathematics also increased due to the fact that both auditory and visual channels of information perception were involved. In the proposed recommendations, we consider it necessary to note the sanitary and hygienic aspect of the use of interactive stories and quests in teaching. So the duration of using the resource in a basic school lesson should not exceed 30 minutes.

When studying the topics of the course "Entertaining Mathematics" in the AXMA Story Maker environment, students learn mathematical facts, theories, methods more consciously, they actively apply them to solve practice-oriented problems; a stable favorable emotional background is created; thought processes (memory, imagination, attention) develop more intensively. The choice of this particular software product made it possible to design the personalized environment that supports the study of basic mathematical concepts, forms demanded mathematical skills, demonstrates the capabilities of new interactive tools and game applications, and provides an experience of independent choice in decision-making.

The results of the study are consistent with the conclusions of J. Jorge, R. Paredes about the didactic potential of interactive tools with functionality for designing a nonlinear trajectory of cognition (Jorge, Paredes, 2018). Moreover, they fully correspond to the data of S. Radović, M. Marić, D. Passey, that visual technology activates cognition, stimulates intellectual work (Radović et al., 2019).

The implementation of the formulated recommendations will allow the teacher of the digital school to create additional conditions for personalization of teaching mathematics. Using AXMA Story Maker to develop the interactive short stories with math content aligns with digital

priorities and convincingly demonstrates the didactic potential of technology to improve the quality of maths education.

7. Conclusion

The study presents a solution to the problem caused by the need to resolve the contradiction between the requirements of the modern economy for the quality of mathematics training of future specialists and an insufficiently developed methodological base for training graduates that meets these requirements. It was assumed and experimentally proved that acquiring high-quality mathematics education by graduates of the modern school is facilitated by work in the specially designed personalized learning environment based on interactive technologies.

The following features of the development of the personalized learning model by means of interactive short stories were noted, they maximally contribute to improving the quality of educational results in mathematics:

1. Correlation of the educational goal (in this case) and the results of educational and search activities in the environment of the interactive short story. First of all, before using a game application that supports interactivity of interaction and the nonlinear personal trajectory of cognition, it is necessary to determine the goals and intended results (personal, subject, metasubject): learners must remember mathematical facts, get logical conclusions, choose a reasoned answer, build their personal educational route from "ignorance to knowledge". The goal will determine not only the content of the visual short story, but also the number of required publications, plot, and levels of material presentation.

2. Understanding and taking into account the individual, age and psychological and physical characteristics of students.

3. Determination of the place and significance of the interactive short story for the main course in mathematics: where and when the resource will be used, the duration of the work.

4. Designing the plot of the interactive short story. The plot for the space of the game (as in the described option) can go beyond the limits of the studied discipline. The plot of the short story can be based on a literary work, film events, historical or geographical discovery.

5. The choice of the text component, i.e. features of drawing up the system of tasks and questions. We advise to adhere to the following recommendations: order tasks and questions by level of difficulty; the first problem (the starting point of the short story) is the simplest, containing only known mathematical facts and firmly mastered formulas; the wording should be understandable for students, consistent with their cognitive interests and level of academic achievement.

6. Development of the personalized educational trajectory. When solving each of the problems, the student must be offered a choice of one of several answer options. To do this, the teacher needs to think over the following in the interactive short story:

- what will happen if the student answers the question correctly, and to which publication he/she will move;

- what will happen if the student makes a mistake, and what mathematical theory (volume, degree of detail) will allow him/her to understand and correct it.

The personalized model of teaching mathematics, developed by means of interactive short stories, contributes not only to improving the quality of the obtained subject and educational knowledge, but also contributes to the development of thinking. In the course of educational and cognitive activities in AXMA Story Maker, in the process of making a decision and making an independent choice, soft skills that are in demand by the digital society are formed: planning, search, critical assessment and processing information, the ability to work in an uncertain future, responsibility.

Thus, the use of interactive short stories as the basis for the personalized model of teaching mathematics contributes to an increase in the level of academic achievements of schoolchildren. Research materials can be used to develop ideas for personalizing learning in the digital school.

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The History of Education

Employees within the Public Education Sector in the Russian Empire in the first half of the 19th century: Their Place within the Bureaucratic Apparatus and Some Characteristics of Their Service

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Abstract

This paper is focused on employees within the system of public education in the Russian Empire in the first half of the 19th century. An attempt was made to determine the place of this category of functionaries within the state's bureaucratic system.

Reference was made to relevant statutory enactments from the period under review, published documents, and archival materials. To refer to said category of public officers, use in the work was made of the synonymous terms 'functionaries within the public education sector', 'educational functionaries', 'pedagogical functionaries', and 'school functionaries'.

Here is an outline of the main insights drawn from this study. The legal status of employees within the education sphere, which had begun to take shape as early as the late 18th century, was formalized in the early 19th century. Insight was gained into the nature of their service, including their official functions and duties, their service conditions, and the attitude of their own and that of the public to this type of service. The service of pedagogical functionaries had a distinctive nature. Officers in this category were the most educated group within the nation's bureaucracy. Their functions were not purely bureaucratic and often were directed at educating and nurturing future functionaries.

Keywords: education, education policy, bureaucracy, public officers, functionaries, teachers, educational district.

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1. Introduction

Over the past few decades, the issue of whether or not pedagogical employees could be considered public officers has been brought up in the post-Soviet space more than once. The debate continues to this day. The issue dates back to the late 18th century, when it was first raised by the government of the Russian Empire. At that time, employees within the education sector were granted public service rights, becoming part of a social occupational group such as public officers. Exploring this historical experience in detail can provide valuable insight as to how to go about the place of pedagogical employees (teaching staff and auxiliary personnel in schools) in the fabric of social relations and their role in the complex process of state building.

2. Materials and methods

The present paper explores the characteristics of pedagogical service in the Russian Empire in the first half of the 19th century, more specifically some of the key characteristics of the service of functionaries within the public education sector.

Use was made of relevant writings by 19th and 20th century researchers and contemporary authors. As the work's primary source base, use was made of a set of documents published in *Zhurnal Ministerstva Narodnogo Prosveshcheniya* and relevant archival materials from the State Archive of Kharkov Oblast ([GAKhO](#)).

The research reported in this work was conducted with a reliance on the principles of historicism, objectivity, and historical anthropologism. Via the use of the principle of historicism in exploring the evolution of the status of employees within the public education sector, account was taken of the era's concrete historical circumstances. The principle of objectivity helped explore the making of service within the public education sector in the period from the late 18th to the first half of the 19th centuries taking into account the key objective laws that governed the state development process in the Russian Empire at that time. The focus was on using real facts and staying committed to not manipulating them in any way. The use of the principle of historical anthropologism (anthropocentrism) helped foreground the humanistic essence of the study, which is centered around a specific group of people with clearly defined professional roles – employees within the public education sector in the Russian Empire.

3. Discussion

There has been a lack of dedicated research into the service of pedagogical functionaries in the Russian Empire. The few researchers who have explored the issue under examination most notably include Yu.A. Disson, V.V. Morozova, O.V. Serdyutskaya, V.E. Slotin, and N.V. Firsova ([Disson, 2008](#); [Morozova, 2007](#); [Serdyutskaya, 2008](#); [Slotin, 2010](#); [Firsova, 2007](#)). Most of this research is focused on issues of statutory support for pedagogical service and the social status of functionaries within the public education sector. Researcher O.V. Serdyutskaya has also explored issues such as the everyday routine of pedagogical functionaries, their relationships with the administration and with their fellow staff members, and the corporate psychology of instructors ([Serdyutskaya, 2008: 102](#)). The authors of the present work have previously explored the characteristics of the service of honorary supervisors within the public education system in the Russian Empire ([Degtyarev, Polyakova, 2020](#); [Degtyarev et al., 2020](#)). Issues related to the Russian Empire's 19th century professoriate have been researched by A.E. Lebid, N.A. Shevchenko, and a few other scholars ([Lebid et al., 2020](#); [Lebid, Shevchenko, 2021a](#); [Lebid, Shevchenko, 2021b](#)).

Some information useful for exploring the subject under examination is available from some works devoted to the education sector in the Russian Empire as a whole and some devoted to the history of particular educational institutions. Those from the pre-Soviet period most notably include works by A.S. Voronov, P.V. Znamensky, D.K. Vishnevsky, E.A. Kivlitskiy, and V.V. Serebryanikov ([Vishnevskiy, 1903](#); [Voronov, 1849](#); [Kivlitskiy, 1899](#); [Znamenskiy, 1881](#); [Serebrennikov, 1897](#)). Worthy of a separate mention is a substantial work by M.F. Vladimirskiy-Budanov devoted to the government's policy on public education in the Russian Empire in the 18th century. The scholar explored the issue in the context of building a system of vocational education ([Vladimirskiy-Budanov, 1874](#)). The research on the issue conducted over the past few decades most notably includes works by L.A. Bulgakova, O.I. Travkina, V.L. Masliychuk, L.Yu. Posokhova, and L.N. Korablina ([Bulgakova, 1978](#); [Bulgakova, 1980](#); [Korablina, 2002](#); [Masliichuk, 2009](#); [Posokhova, 2009](#); [Travkina, 2003](#); [Degtyarev et al., 2018](#)).

4. Results

In exploring the service of functionaries within the public education sector in the Russian Empire, it may be particularly worth focusing on aspects such as the place of this category of functionaries within the country's bureaucratic apparatus, their official functions and duties, their service conditions, and the attitude of their own and that of the public to this type of service.

While performing their professional duties, employees within the public education sector performed virtually no bureaucratic functions. With that said, all of them were in public service, so the same remuneration system was used in respect of them as of functionaries in other sectors. Even in the Governing Senate, employees within the public education sector were referred to as functionaries in educational service. The focus of the present paper is on employees within this particular sector.

In addition to the terms 'functionaries within the public education sector' and 'educational functionaries', use herein will also be made of 'pedagogical functionaries' and 'school functionaries'. The term 'pedagogical functionaries' is broader, as it encompasses all employees in all types of educational institution, as well as home instructors. At the same time, the term 'school functionaries' denotes public officers in mid- and lower-level educational institutions (gymnasiums; uyezd and parish schools). The primary focus in the present paper is on school functionaries.

Functionaries within the public education sector formed a distinct social occupational group in the Russian Empire, and it was quite diverse in social background and education level.

Russian researcher O.V. Serdyutskaya has validly suggested that in the period under review teaching service had come closer in length of service to the rest of the types of public service in the Russian Empire (Serdyutskaya, 2008: 102).

The development of the distinct occupational group of teachers in the Russian Empire was in large part facilitated by the reforms undertaken by Catherine II (Morozova, 2007: 58), some of which were based on Austrian legislation. Almost at once, there emerged a need to determine the legal status of teachers. However, the Austrian regulatory framework did not contain any specific provisions relating to this. Consequently, the School Statute of 1786 did not clearly define the official status of employees in educational institutions. With that said, they were recognized as being in public service.

The status of pedagogical employees was clearly defined at the legislative level in the early 19th century, with members of this group able to enjoy all benefits of public service. Service within the public education sector was wholly subordinate to the will of the state and its bureaucratic needs. All educational institutions and their employees were to nurture students to become citizens loyal to the monarchy and train future functionaries (Slotin, 2010: 64-65). Pedagogy historian P.F. Kapterev viewed educational functionaries in the Russian Empire as a distinct social group, which he referred to as "the teacher estate". The scholar saw the group as "a special variety of functionaries, who, too, are obligated to observe state discipline and espouse existing state principles in word and action" (Kapterev, 1915: 226). Pedagogical functionaries enjoyed remuneration in the form of salaries, ranks, and orders.

Thus, along with civil servants, the nation's workforce in public service included employees within the science and education sectors as well, with members of this group working in a fairly broad spectrum of positions – from members of the Academy of Sciences to lab technicians and from professors to home instructors (Kvasov, 2005: 16-17).

A serious problem was providing educational institutions with the required number of functionaries. By nature, pedagogical service was not very popular (at least not among members of the Russian nobility). Besides, working as a pedagogical employee required a higher education level. These and a few other reasons could be conducive to a high staff turnover rate in educational institutions (except for universities, working in which was more prestigious and materially rewarding). As a result, it often was the case that one person taught several totally different disciplines, which negatively impacted on the quality of education provided.

The number of functionaries working in educational institutions in the Russian Empire grew continually in the period between the 18th and mid-19th centuries. This was associated with the development of the education system, an increase in the number of educational institutions of all types, and the growing need of the state for a highly skilled workforce to be employed in public administration, with special knowledge and skills increasingly required to work in this area.

Requirements for functionaries had changed significantly compared to the 18th century, when all that was required of members of this group was moral rectitude and some clerky skill.

The first half of the 19th century witnessed the beginning in the Russian Empire of the process of the vocational component being set apart into a separate component in the nation's education system. The state needed employees with special training in particular areas. This process began earlier with pedagogical functionaries than with those in other public service sectors. The state undertook to establish special pedagogical educational institutions and departments for this group. The number of teachers working in gymnasiums was regulated. The School Statute of 1804 limited the number of teachers in gymnasiums to 8, and the School Statute of 1828 – to 16, dividing the group into senior and junior teachers. The status of senior teachers was held by those concerned with teaching history, mathematics, ancient languages, and Russian language arts. These were Class 9 positions. The status of junior teachers was held by those concerned with teaching Russian grammar, geography, and foreign languages. These were Class 10 positions. A separate category was teachers of drawing and penmanship. These were Class 12 positions. In 1849, the Trustee of the Moscow Educational District, D.P. Golokhvastov, raised the need for training instructors of legal disciplines. The Governor-General of the Baltic Provinces, A.A. Suvorov, stated in his 1849 and 1853 reports to the Emperor that there was a shortage of lawyers, gymnasium teachers, and home instructors (Ryabikova, 1974: 61).

In February 1850, the government directed that it be allowed for state-funded students in the Law Institute of Saint Vladimir University in Kiev to be appointed to teach jurisprudence in gymnasiums, with it being mandatory for them to serve in that post for no less than 6 years (ZHMNP, 1850: 5).

When admitting a new employee to service, a school's principal was to coordinate the candidacy with its administration. More specifically, the principals of gymnasiums were to receive the go-ahead from the University's School Committee. For instance, on April 23, 1813, the principal of Chernigov Gymnasium lodged a formal request with the School Committee of Kharkov University to permit him to hire to the position of Chief Clerk a collegiate registrar named N.P. Filonovich, who had previously worked in the Chernigov Gubernia Administration. Enclosed with the request were the job candidate's discharge certificate and service record (GAKhO. F. 667. Op. 283. D. 136: 1).

When firing educational functionaries, principals were to coordinate the issue with the administration as well. It was mandatory to state the reason. If it lay in one's inability to perform one's duties due to health reasons, a relevant certificate was to be provided confirming that. A typical doctor's note contained a brief health report proving the impossibility of one performing one's official duties at the time. For instance, a physician at Chernigov Military Hospital described the physical condition of a teacher of German at Chernigov Gymnasium named K.F. von Flegen as follows: "... has long been suffering from the following medical conditions: chest pain and nervous prostration; I administered some treatment, but a quick recovery is not likely; for these reasons, Mr. von Flegen is unable to perform his job duties properly at this time" (GAKhO. F.667. Op. 283. D. 153: 3).

Sometimes, the authorities had no control over the processes of admitting to service, dismissing, and transferring school functionaries. This was quite rare and mainly was the case in Rightbank Ukraine, which had become part of the Russian Empire following the partition of Rzeczpospolita. Some of the educational institutions in that area were maintained by monasteries. In 1827, the Trustee of the Kharkov Educational District, which the above region was part of, received a complaint that the schools "operated by the Basilians and other ecclesiastical estates" admitted teachers and transferred them to other educational institutions at the sole discretion of an abbot. Personnel changes of this kind were not something that the School Committee of Kharkov University was normally readily informed of. This complicated the staffing of such educational institutions with specialists with the education and skills required to hold teaching positions, something that needed to be confirmed by certificates from the gymnasiums and universities they had attended (GAKhO. F. 667. Op. 287. D. 98: 10).

Contemporary researcher V.E. Slotin relies on the School Statute of 1804 to single out the following four major groups of school functionaries:

- 1) gubernia public school principals (gymnasium principals);
- 2) staff superintendents (or supervisors);

3) senior and junior teachers;

4) teachers of drawing, uyezd school teachers, and parish teachers (the last group typically being Class 14 teachers; this required not being a person of ecclesiastical status) (Slotin, 2010: 61-62).

The scholar did not include in any of these groups honored trustees and auxiliary personnel in educational institutions.

Arguably, it is fair to suggest that there was a fifth group, which included clerks, accountants, medical personnel, and a few other types of functionary in an educational institution – with or without a rank (but entitled to have one). While being considered public officers within the public education sector, those in this group were subsumed by V.E. Slotin under auxiliary personnel.

The principal of the local gymnasium was the highest school officer in a governorate at the time. The same person was in charge of public schools in a given area. In fact, it had been decreed by the Statute of 1804 that such a functionary was to be in charge of not only the local gymnasium but of all educational institutions in a given governorate. When considering a candidate for said position, account would be taken of one's social background (no members of the taxed estates could be admitted), age (one needed to be no younger than 16), and education level (one needed to be a graduate of an educational institution). This type of functionary belonged to Class 7. Essentially, apart from having an official duty to select personnel for the schools under their charge, each principal had to be an all-rounder, i.e. have a confident command of teaching methodology and be able to fill in for any teacher in the gymnasium if necessary.

Schools directors were to inspect each educational institution under their charge once every year. Furthermore, staff superintendents were responsible for the overall supervision and administration of the affairs of uyezd and parish schools all year round. While such functionaries were to belong to Class 9, it was not uncommon for them to have a lower rank, a consequence of shortages of staff superintendents in uyezd educational institutions. As of 1826, they were even legislatively allowed to have a rank lower than Class 9. The position of Staff Superintendent was typically held by pedagogues from the same educational institutions.

The School Statute of 1828 introduced the position of Gymnasium Inspector. Inspectors monitored teaching and the moral component in educational institutions (Yeroshkin, 1957: 59). Such functionaries were well-versed in a variety of issues related to the operation of such institutions. Consequently, they often ran the office when the principals of schools or gymnasiums were away. For instance, in August 1854, the post of Principal of Rovno Gymnasium was filled by court councilor A.D. Tumanov, formerly its inspector, in place of state councilor I.V. Roskovshenko, who left due to health issues (ZHMNP, 1854: 6-7).

A distinct category of school functionaries was teachers of religion. Members of this group belonged to the clergy and could not be awarded a rank in the Table of Ranks. Nevertheless, they were recognized by the government as being in public service. Some researchers are of the view that they were higher in status than ordinary civil school functionaries – based on the fact that their signature on a school-leaving certificate would come before that of other teachers (Slotin, 2010: 157). This appears to be debatable. Arguably, they simply commanded respect based on moral grounds, for Orthodox Christianity played a pivotal role in the life of Russian society at the time.

Apart from school functionaries, there were also home instructors. Male home instructors were considered public officer. They had an official service record maintained for them and could be awarded a rank. In the first half of the 19th century, many foreigners in Russia wished to work as a home instructor. For instance, in 1832, among the candidates for this title in Volyn Lyceum were a Frenchwoman named E. Delille (in September) and a Venetian named L. d'Artusi (in October). All such individuals pledged allegiance to the Russian state (GAKhO. F. 667. Op. 287. D. 194). In 1850, Volyn Governorate had 5 home instructors, with 4 of these being foreigners and just 1 being a local nobleman. All had a rank – between Class 14 and Class 9. At the same time, Poltava Governorate had just 2 such functionaries, with both being local residents. One of them, who came from the *odnodvortsy* social group, had the rank of collegiate secretary, and the other, who came from the children of company officers social group, did not have a rank.

To obtain a private home instructor's permit, one needed to pass exams in many different subjects. As many as 4 individuals sat for exams (2 males and 2 females) in Volyn Lyceum in September 1832. A former student of this lyceum named P. Leonchitsky sat for exams in arithmetic, algebra, geometry, Russian, Polish, French, Latin, and German. A former teacher of Liubar Uyezd School named M. Parsheim had to sit for exams in French and German (although his

professional competence was not to be doubted, as he had taught these very two languages at the above school earlier). Female graduates of Kremenets Boarding School named A. Navrotskaya and E. Delille sat for exams in divinity, Polish, French, German, arithmetic, and geography. Besides, A. Navrotskaya also demonstrated her knowledge and skills in penmanship, music, and dance (GAKhO. F. 667. Op. 287. D. 194: 1). Aside from taking exams, all four candidates for the title of home instructor also had to provide certified documents proving their noble descent. In addition, the School Committee of Kharkov University requested that P. Leonchitsky and M. Parsheim provide proof of “not being affiliated with the rebels” (GAKhO. F. 667. Op. 287. D. 194: 12). This was required in the light of the then-recent events of the November Uprising (1830-1831), with the authorities needing assurances about the political integrity and loyalty of such job candidates.

The ability of pedagogical functionaries to move up through the ranks was governed by the following criteria: education level (e.g., having an academic degree); pedagogical proficiency; length of service in education; previous track record (experience working in other institutions); having the backing of prominent scholars and other functionaries (Shpak, 2008: 129).

The period between the late 18th and the first quarter of the 19th centuries witnessed considerable interest in pedagogical service among persons of the clergy, Cossacks, and petit bourgeois across the Russian Empire. Many members of the underprivileged estates saw working in education as, above all, a way to raise their social status. It was easier for properly educated members of these estates to engage in pedagogical service than in any other type of public service. Besides, considering that there were fewer barriers to acquiring a class rank at that time, one could build a career this way relatively quickly back then.

In this context, worthy of particular note is the career of M.V. Anishchenkov, who held the rank of titular councilor (Class 9) and taught at Nogai Parish School within Taurida Governorate in 1830. He began service in 1809, when he was 18 and possessed a secondary education (which he upgraded a little later). He was of Cossack background. M.V. Anishchenkov had some experience serving in the Poltava Little-Russian Gubernia Administration, where he worked first as a clerk and then as a gubernia registrar. He later worked as a teacher at Romny Uyezd School within Poltava Governorate. While there, within a period of just 10 years, M.V. Anishchenkov advanced in rank from Class 14 to Class 9 in the Table of Ranks (from collegiate registrar to gubernia secretary, to collegiate registrar, and to titular councilor). Promotion through the ranks helped him attain nobility, raising his social status (GAKhO. F. 667. Op. 285. D. 20: 43-46). M.V. Anishchenkov's was not the only success story at the time.

5. Conclusion

Service within the public education sector was an integral component of the bureaucratic apparatus in the Russian Empire. All official relationships within this sector were regulated by statutory enactments whose force applied to all civil functionaries. At the same time, the service of pedagogical functionaries had a number of distinctive characteristics. Specifically, this category of public officers represented the nation's most educated group. Their job functions were not purely bureaucratic and often were directed at educating and nurturing future functionaries. There are a few other characteristics typical of the period's pedagogical functionaries, but they will be examined through a regional lens as part of a future study.

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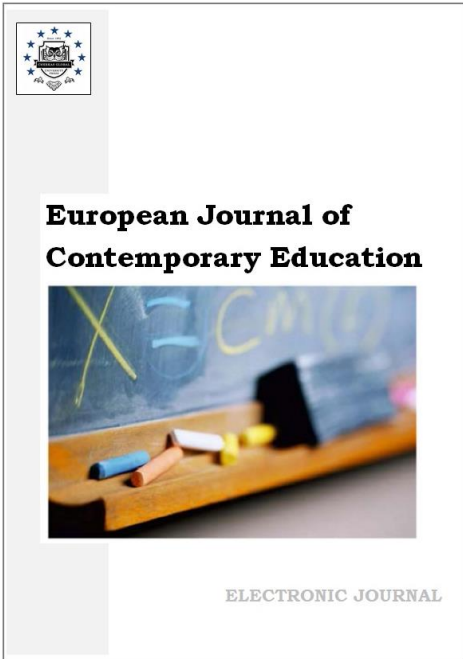
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The Social Composition of Students at Kharkov Imperial University in the Second Half of the 19th century

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Abstract

This paper examines an official document originally entitled ‘The List of Students at Kharkov Imperial University’ to provide an insight into the size, social composition, and religious affiliation of students and auditors at Kharkov Imperial University in the period 1840–1899.

A glimpse is provided of the evolution of the title of this historical source through the period of its publication. An insight is also provided into the substantive and formal characteristics of this historical document, including its structure, format, and the nature of the data contained therein.

A quantitative analysis of the data in the Lists helped determine the total number and composition of students enrolled in Kharkov Imperial University in the period under review.

It was established that, depending on the date of publication, different versions of the List varied in the kind of data available on students and auditors at the University.

The paper provides trend data on the composition of students within different departments and across the University as a whole. It was established that by the late 19th century the estate composition of the student body at Kharkov Imperial University had changed, with similar processes taking place in universities across the Russian Empire. This trend was associated with certain common processes that were taking place across the Russian Empire.

The paper also describes the way education in the Russian Empire transformed from an estate-based vocational education system to an estateless general education system.

Keywords: education, enrollment, learning opportunity, education policy, higher education, Kharkov Imperial University.

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1. Introduction

Gaining a proper insight into the characteristics of the development of the higher education system in the Russian Empire in the 19th century requires access to a source base that will enable a comprehensive analysis of relevant historical events and an integrated assessment thereof. In this context, it is worth conducting an integrated analysis of the following historical source on the history of higher education in the Russian Empire – ‘The List of Students at Kharkov Imperial University’. Originally so entitled, this document provides an insight into the student body of Kharkov Imperial University in the period 1840–1917. An analysis of this historical source will make it possible to explore the various aspects of university development in the Russian Empire through the example of this particular university, as it contains information about the number, social composition, and religious affiliation of students and auditors at it.

It is worth noting that in the education system of the Russian Empire the university had developed not only and not so much as a research center but as a social institution shaping and nurturing the future of the nation’s political and ecclesiastical elites.

It is also worth noting that the social background of the nation’s emergent elite was not exclusively noble. In a sense, the university in the Russian Empire could be regarded as a “social elevator” for poor members of the nobility and the taxed estates, something that could help them improve their social status and integrate into the nation’s system of public service.

As noted by T.N. Zhukovskaya, “in the opening decades of the 19th century, the nation’s student body tended to be replenished not by members of the nobility but by graduates of ecclesiastical seminaries. The latter did not have much choice: wait for years to get a place in a modest rural parish or try their luck elsewhere other than ecclesiastical service. The government gave tacit approval to admitting to universities even members of the taxed estates (petit bourgeois and state and private peasants)”. According to the scholar, “all universities had many of them” (Zhukovskaya, 2011: 99).

The system of internal hierarchy entrenched in Russian imperial universities, grounded in a combination of civil rank, academic degree, and academic post, had an effective impact in terms of urging youth to choose science and education as a career path. For most of them, the university served to destroy estate barriers, offering new opportunities and mechanisms for socialization.

The period’s student body was made up of members of the petit bourgeois, state peasants, Cossacks, serfs, and other strata of society. For instance, a state peasant named Zakhary Serikov attended the Department of Medicine at Kharkov Imperial University (Spiski studentov, 1850–1851: 21), and an emancipated serf named Ivan Borovik attended the Department of Law (Spiski studentov, 1869–1870: 11).

The purpose of the research reported in this paper was to analyze the above document in order to gain an insight into the substantial transformations in the sociopolitical and socioeconomic areas of life in the Russian Empire in the 19th century.

2. Materials and methods

In putting this work together, use was made of ‘The List of Students at Kharkov Imperial University’, a source on the history of higher education in the Russian Empire in the 19th century. The chronological focus was from 1840 to 1899. The document contains official information on students at Kharkov Imperial University, including data on their social background, religious affiliation, the date they were admitted to the University, the institution(s) they previously attended, and the source of funding for their tuition fees (Spiski studentov, 1840–1899).

No analysis was deliberately carried out of the List for the period 1900–1917, as it would be logical to examine them in the context of a new era in the history of the Russian state as a whole and Kharkov Imperial University in particular with a view to conducting a comparative analysis of the subject.

Use was made of methods of data analysis to obtain statistics about the outcomes across the key areas and objectives essential to the educational process in Kharkov Imperial University, as well as the dynamics of change in the size and social estate composition of the student body in this educational institution.

Use was also made of comparative analysis to explore the social estate composition of the University’s student body in each of its four departments. This helped summarize the social composition and size of the student body at Kharkov Imperial University in the 19th century.

The chronological focus was from 1850, i.e. the year the University became a four-department institution (following the splitting of the Department of Philosophy), to 1899.

3. Discussion

The history of Kharkov Imperial University is a bright page in the history of higher education in the Russian Empire. It is one of the oldest higher educational institutions not only in Ukraine but in Eastern Europe as a whole. The history of Kharkov Imperial University is an integral part of the intellectual, cultural, and ecclesiastical history of both Ukraine and the Russian Empire as a whole.

In this regard, the history of Kharkov Imperial University must be considered in the context of the development of higher education and science across the Russian Empire as a whole. Scholarly publications on this subject can help determine some of the key trends in the development of higher education in the Russian Empire and the making of its university space, which was deeply incorporated into the overall urban context. With that said, an important component of this process was the shaping of the values of the university community as a corporation of students and teachers. Hence, the history of Kharkov Imperial University is of considerable scholarly interest. It has been researched in multiple studies.

Of particular note is 'The History of Kharkov University (1804–2006): A Systematic Bibliographical Reference Book' (Istoriia, 2007). The value of this collection lies in that it covers over 8,000 scholarly works on the history of Kharkov University, grouped together based on chronology and subject matter. In the context of the present study, worthy of particular mention are Sections 10 and 11, which contain materials on issues of enrollment in the University (10.4) and rules for students and auditors (10.9), as well as lists of students and auditors at it (11.2).

There are a number of general scholarly works on the history of higher education in the Russian Empire that consider it through the lens of the European and Russian imperial traditions of education and science (Andreev, 2009; Avrus, 2001; Astakhov, 1955; Polyanskaya, 1958).

For instance, S.I. Posokhov examines, through the example of Moscow, Kazan, and Kharkov Imperial Universities, issues of the adaptation of an imperial university into the European sociocultural space. The historian provides an insight into the practices of the above universities in relation to self-representation, examines the mechanisms underlying the development and transformation of university traditions, and discusses the effect of the activity of a university in terms of urban modernization (Posokhov, 2014).

Issues surrounding student life in universities across the Russian Empire have been explored by a number of scholars, including A.G. Voronov, (Voronov, 1913), T.N. Zhukovskaya (Zhukovskaya, Kazakova, 2007; Zhukovskaya, 2011), V.S. Gnilosyrov (Gnilosyrov, 1862), and I.V. Lyubarsky (Lyubarskij, 1891). V.P. Buzeskul provides an insight into the operation of Kharkov Imperial University in the period from the adoption of the University Statute of 1884 to the beginning of the Russian Revolution of 1905 (Buzeskul, 1905). Some of the key characteristics of the organization of the educational process in Kharkov Imperial University have been analyzed by A.E. Lebid and N.A. Shevchenko (Lebid, Shevchenko, 2021).

Of particular interest is research by A.V. Kamosko (Kamosko, 1970) and S.V. Rozhdestvensky (Rozhdestvenskij, 1907) on the estate composition of students in Russian imperial universities and other educational institutions.

In particular, A.V. Kamosko provides some data on changes in the social composition of students in gymnasiums, progymnasiums, and real schools in the period 1836–1888. According to the scholar, "although children of nobles and functionaries led the way in numbers in gymnasiums in post-reform Russia, there was a significant drop in their relative share of the student body. At the same time, there was a significant increase in the number of children of members of the urban and rural estates, above all members of the groups that formed the Russian bourgeoisie, which was closing in on the privileged nobility. The researcher asserts that "the composition of students in secondary and higher schools in Russia in the 1930–80s was changing fully in keeping with the socioeconomic shifts taking place in the country at the time" (Kamosko, 1970: 207).

Furthermore, S.V. Rozhdestvensky provides an insight into the estate composition of students in Russian universities through the lens of a clash of an estate-based vocational education system and an estateless general education system (Rozhdestvenskij, 1907: 83).

The present work is based on a scholarly analysis of data contained in an official document originally entitled 'The List of Students at Kharkov Imperial University' ([Spiski studentov, 1840–1899](#)).

4. Results

As already mentioned earlier, the List contained information on students' religious affiliation, estate background, previous education, etc.

The document had been printed at the University's own publishing house since 1840. That is, it had not been released for three and a half decades since its foundation in 1804. The document was released under different names at different times:

1840–1858: 'The List of Students at Kharkov Imperial University';

1864–1866: 'The List of Students and Individuals Enrolled to Attend Lectures at Kharkov Imperial University';

1868–1885 and 1906–1907: 'The List of Students and Auditors Enrolled to Attend Lectures at Kharkov Imperial University';

1886–1887, 1896–1898, and 1908–1916: 'The List of Students at Kharkov Imperial University';

1898–1902: 'The Alphabetical List of Students and Auditors at Kharkov Imperial University'.

Pursuant to the University Statute of 1835, Kharkov Imperial University had the following three departments organized in it: 1) Department of Philosophy; 2) Department of Law; 3) Department of Medicine. The Department of Philosophy was split into the following two divisions: 1) History and Philology; 2) Physics and Mathematics. In 1850, these two divisions became independent departments. Thus, Kharkov Imperial University had three departments from 1835 to 1850, with one more department established in 1850.

In Kharkov Imperial University, as in other universities in the Russian Empire, each year the Administration drew up a list of students and auditors at the University, which included information for each of its departments ([Spiski studentov, 1840–1899](#)).

Being the official mouthpiece of Kharkov Imperial University, the document was published each year under the authority of the University's Board. It contained information on the University's students and auditors (i.e., individuals allowed to attend lectures and other learning activities without receiving credit) ([Brokgauz, Efron, 1892: 142](#)). According to Article 116 of the University Statute of 1884, "alongside students, permission to attend lectures and other learning activities will be granted to outsiders of a certain social standing or in a certain occupation" ([Ustav, 1911: 41-42](#)).

For instance, among the outsiders admitted to attend lectures in the Department of Medicine in the 1850–1851 school year were "a vet assistant named Osip Jordan, a person in pursuit of a degree in veterinary medicine, and a drugstore owner's assistant named August Bart, a person in pursuit of a degree as a druggist" ([Spiski studentov, 1850–1851: 25](#)). The number of auditors at Kharkov Imperial University increasingly grew with time. Whereas there were 5 auditors at Kharkov Imperial University between 1850 and 1851, the figure was now 65 between 1859 and 1860 ([Spiski studentov, 1859-1860: 28-34](#)), 57 between 1869 and 1870 ([Spiski studentov, 1869–1870: 37-38](#)), and 78 between 1880 and 1881 ([Spiski studentov, 1880–1881: 85-88](#)).

Admission to Kharkov Imperial University was regulated by the following rule: within the period from July 15 to August 15, "young people of at least 17 years of age" were to lodge with the Rector a formal request seeking permission to enroll in the department of their choice. The following documents were to be submitted:

1) All Christian entrants needed to provide their birth and baptism certificates. All entrants of other faiths needed to provide only their birth certificate.

2) All entrants needed to provide their gymnasium diploma or gymnasium transcripts.

3) All entrants of noble descent needed to provide their nobility certificate or a copy of the record in a noble genealogical book.

4) All entrant children of persons with a class rank needed to provide their father's service record.

5) All entrant members of the taxed estates needed to provide a discharge certificate. Those who had reached the age of 20 needed to provide a military service registration certificate as well.

- 6) All home-educated entrants needed to provide a certificate of conduct issued by the police.
 7) All entrant foreigners needed to provide a passport (Pravila, 1878: 3-4).

As already mentioned earlier, the List contained data on the number of students in different years and departments, as well as information on their social background and religious affiliation (Table 1; Table 2; Table 3; Table 4).

Table 1. Number and Social Composition of Students at Kharkov Imperial University in the Period 1850–1851 (Spiski studentov, 1850–1851)

| Department | 1850–1851 | | | | | | | | | |
|-------------------------|---------------|-----------|------------|------------|-----------|-------------------|-----------------|-----------|-----------|-----------|
| | Year of study | | | | | Social background | | | | |
| | I | II | III | IV | V | nobility | petit bourgeois | merchants | clergy | officers |
| History and Philology | 8 | 7 | 13 | 4 | - | 13 | 1 | 2 | 7 | 7 |
| Physics and Mathematics | 19 | 11 | 26 | 19 | - | 42 | 7 | 6 | - | 9 |
| Law | 26 | 15 | 31 | 50 | - | 79 | 5 | 6 | 6 | 18 |
| Medicine | 45 | 33 | 40 | 30 | 12 | 71 | 16 | 12 | 7 | 22 |
| Total | 98 | 66 | 110 | 103 | 12 | 205 | 29 | 26 | 20 | 56 |

Table 2. Number and Social Composition of Students at Kharkov Imperial University in the Period 1859–1860 (Spiski studentov, 1859–1860)

| Department | 1859–1860 | | | | | | | | | |
|-------------------------|---------------|------------|-----------|-----------|-----------|-------------------|-----------------|-----------|-----------|-----------|
| | Year of study | | | | | Social background | | | | |
| | I | II | III | IV | V | nobility | petit bourgeois | merchants | clergy | officers |
| History and Philology | 9 | 3 | 3 | 4 | - | 12 | 2 | 1 | 3 | 3 |
| Physics and Mathematics | 56 | 24 | 11 | 8 | - | 66 | 1 | 9 | 6 | 11 |
| Law | 67 | 42 | 27 | 12 | - | 78 | 11 | 17 | 6 | 17 |
| Medicine | 62 | 39 | 43 | 37 | 34 | 65 | 30 | 20 | 14 | 36 |
| Total | 194 | 108 | 84 | 61 | 34 | 221 | 44 | 47 | 29 | 67 |

Table 3. Number and Social Composition of Students at Kharkov Imperial University in the Period 1869–1870 (Spiski studentov, 1869–1870)

| Department | 1869–1870 | | | | | | | | | |
|-------------------------|---------------|------------|------------|-----------|-----------|-------------------|-----------------|-----------|-----------|------------|
| | Year of study | | | | | Social background | | | | |
| | I | II | III | IV | V | nobility | petit bourgeois | merchants | clergy | officers |
| History and Philology | 13 | 6 | 9 | 6 | - | 10 | 3 | 1 | 7 | 9 |
| Physics and Mathematics | 33 | 21 | 21 | 15 | - | 47 | 4 | 7 | 3 | 21 |
| Law | 82 | 93 | 87 | 23 | - | 133 | 18 | 16 | 16 | 68 |
| Medicine | 44 | 29 | 29 | 9 | 12 | 46 | 16 | 10 | 2 | 31 |
| Total | 172 | 149 | 146 | 53 | 12 | 236 | 41 | 34 | 28 | 129 |

Table 4. Number and Social Composition of Students at Kharkov Imperial University in the Period 1880–1881 ([Spiski studentov, 1880–1881](#))

| Department | 1880–1881 | | | | | | | | | |
|-------------------------|---------------|------------|------------|------------|-----------|-------------------|-----------------|-----------|------------|------------|
| | Year of study | | | | | Social background | | | | |
| | I | II | III | IV | V | nobility | petit bourgeois | merchants | clergy | officers |
| History and Philology | 20 | 15 | 20 | 21 | - | 10 | 2 | - | 39 | 18 |
| Physics and Mathematics | 63 | 49 | 18 | 8 | - | 43 | 6 | 12 | 35 | 29 |
| Law | 40 | 28 | 25 | 21 | - | 53 | 6 | 8 | 27 | 15 |
| Medicine | 120 | 126 | 68 | 66 | 55 | 71 | 62 | 36 | 129 | 58 |
| Total | 243 | 218 | 131 | 116 | 55 | 177 | 76 | 56 | 230 | 120 |

There are a few insights to be gained from the data analysis conducted. First of all, it is possible to name Kharkov Imperial University's most and least successful departments in terms of student enrollment ([Table 5](#)).

Table 5. Total Size of the Student Body at Kharkov Imperial University in the Period 1850–1881

| Department | 1850–1851 | | 1859–1860 | | 1869–1870 | | 1880–1881 | |
|-------------------------|-----------------|----|------------------|----|------------------|----|------------------|----|
| | people | % | people | % | people | % | people | % |
| History and Philology | 32 | 9 | 19 | 4 | 34 | 6 | 76 | 10 |
| Physics and Mathematics | 75 | 19 | 99 | 20 | 90 | 17 | 138 | 18 |
| Law | 122 | 31 | 148 | 31 | 285 | 54 | 114 | 15 |
| Medicine | 160 | 41 | 215 | 45 | 123 | 24 | 435 | 57 |
| Total | 389 (+5) | - | 481 (+65) | - | 532 (+57) | - | 763 (+78) | - |

[Table 5](#) displays the data on the numbers of students and auditors (provided in brackets) in each of the departments at Kharkov Imperial University.

As evidenced in the table above, the Department of History and Philology was the University's least popular department. The most popular were the Department of Medicine and the Department of Law.

It is particularly worth noting the uneven dynamics of admission to the University in the entire period under review. Admission was most stable in the Department of Physics and Mathematics. The process was somewhat nonlinear with the rest of the departments, especially the Department of Law (a sharp increase in the 1869–1870 school year) and the Department of Medicine (a sharp drop in the same school year).

Second of all, the data analysis helped determine the dynamics of change in the estate composition of students within different departments and across the University as a whole ([Table 6](#)).

Table 6. Social Estate Composition of Students at Kharkov Imperial University in the Period 1850–1881

| Social background | Department | 1850–1851 | | 1859–1860 | | 1869–1870 | | 1880–1881 | |
|-------------------|-------------------------|-----------|----|-----------|----|-----------|----|-----------|----|
| | | people | % | people | % | people | % | people | % |
| Nobility | History and Philology | 13 | 6 | 12 | 5 | 10 | 4 | 10 | 6 |
| | Physics and Mathematics | 42 | 20 | 66 | 30 | 47 | 21 | 43 | 24 |

| | | | | | | | | | |
|------------------------|-------------------------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|
| | Law | 79 | 39 | 78 | 35 | 133 | 56 | 53 | 30 |
| | Medicine | 71 | 35 | 65 | 30 | 46 | 19 | 71 | 40 |
| | Total | 205 | 52 | 221 | 46 | 236 | 44 | 177 | 23 |
| Petit bourgeois | History and Philology | 1 | 4 | 2 | 5 | 3 | 7 | 2 | 3 |
| | Physics and Mathematics | 7 | 24 | 1 | 2 | 4 | 10 | 6 | 8 |
| | Law | 5 | 17 | 11 | 25 | 18 | 44 | 6 | 8 |
| | Medicine | 16 | 55 | 30 | 68 | 16 | 39 | 62 | 81 |
| | Total | 29 | 7 | 44 | 8 | 41 | 9 | 76 | 10 |
| Merchants | History and Philology | 2 | 8 | 1 | 2 | 1 | 3 | - | - |
| | Physics and Mathematics | 6 | 23 | 9 | 19 | 7 | 21 | 12 | 22 |
| | Law | 6 | 23 | 17 | 36 | 16 | 47 | 8 | 14 |
| | Medicine | 12 | 46 | 20 | 43 | 10 | 29 | 36 | 64 |
| | Total | 26 | 7 | 47 | 10 | 34 | 6 | 56 | 7 |
| Clergy | History and Philology | 7 | 35 | 3 | 10 | 7 | 25 | 39 | 17 |
| | Physics and Mathematics | - | - | 6 | 20 | 3 | 11 | 35 | 15 |
| | Law | 6 | 30 | 6 | 20 | 16 | 57 | 27 | 12 |
| | Medicine | 7 | 35 | 14 | 50 | 2 | 7 | 129 | 56 |
| | Total | 20 | 5 | 29 | 6 | 28 | 5 | 230 | 30 |
| Officers | History and Philology | 7 | 13 | 3 | 4 | 9 | 7 | 18 | 15 |
| | Physics and Mathematics | 9 | 16 | 11 | 16 | 21 | 16 | 29 | 24 |
| | Law | 18 | 32 | 17 | 26 | 68 | 53 | 15 | 13 |
| | Medicine | 22 | 39 | 36 | 54 | 31 | 24 | 58 | 48 |
| | Total | 56 | 14 | 67 | 14 | 129 | 24 | 120 | 16 |

Based on the above, the following inferences were made:

1) the period under review witnessed an overall decline in the number of students of noble descent at Kharkov Imperial University (from 52% of the total student body in the period 1850–1851 to 23 % in the period 1880–1881);

2) relatively low number of students from the petit bourgeois estate (less than 10 % of the total student body), the largest number of members of this group (relative to total students in the department) being concentrated in the Department of Medicine (over 80 % in the late 19th century);

3) relatively low number of students from the clergy (approximately 6 % of the total student body), the exception being the 1880–1881 school year, when their share was 30 % (relative to the rest of the school years in the period under review) – owing yet again to the Department of Medicine, which at that time had more student members of the clergy than the other three departments combined – 129 versus 101;

4) relatively low number of students from the merchant estate;

5) members of the rest of the social groups accounting for about 7.5 % of the total student body at Kharkov Imperial University.

With regard to the average share of students from each estate within each department at Kharkov Imperial University in the period under review, the figures are as follows:

1) nobility: History and Philology – 5 %; Physics and Mathematics – 24 %; Law – 40 %; Medicine – 31 %;

2) petit bourgeois: History and Philology – 5 %; Physics and Mathematics – 11 %; Law – 23 %; Medicine – 61 %;

3) merchants: History and Philology – 4 %; Physics and Mathematics – 21 %; Law – 30 %; Medicine – 45 %;

4) clergy: History and Philology – 22 %; Physics and Mathematics – 11 %; Law – 30 %; Medicine – 37 %;

5) officers: History and Philology – 10 %; Physics and Mathematics – 18 %; Law – 31 %; Medicine – 41 %.

Thus, the largest enrollment of members of the nobility was in the Department of Law, members of the petit bourgeois – the Department of Medicine, members of the merchant estate – the Department of Medicine, members of the clergy – the Department of Medicine, and members of the military estate – yet again the Department of Medicine. In part, this was due to the Department of Medicine being most popular with entrants. More specifically, in the period 1850–1881 the Department of Medicine had an enrollment of 933 students, the Department of Law – 669, the Department of Physics and Mathematics – 402, and the Department of History and Philology – 161 students.

5. Conclusion

As demonstrated by the case of Kharkov Imperial University, increasingly by the late 19th century the higher education system in the Russian Empire was witnessing liberalization processes, which was reflected in changes in the social estate composition of students within different departments and across the university as a whole. An analysis revealed that the drop in the number of members of the nobility among students at Kharkov Imperial University was associated with an increase in the number of individuals of non-noble descent among them.

A structural analysis of the Lists revealed that in the period under review the student body at Kharkov Imperial University mainly comprised members of the following five estates: nobility, petit bourgeois, merchants, clergy, and children of company officers. In addition, the University's student body included the offspring of state peasants, *odnodvortsy*, clerks, emancipated serfs, settlers, and Cossacks, as well as foreigners and Jews, with the share of members of these social groups in the total number of students at Kharkov Imperial University being very small.

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The System of Public Education in Penza Governorate in the second half of the 19th and early 20th centuries. Part 1

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Abstract

This set of articles explores the development of the education system in Penza Governorate, a region in the Russian Empire, in the second half of the 19th and early 20th centuries (through to 1917).

The present paper examines the prerevolutionary, Soviet, and contemporary historiography and relevant sources for the study of the topic. It employs a set of traditional and nontraditional historical and general research methods. It provides an outline of the region's economic, social, political, and geographical characteristics. It provides a quantitative and qualitative insight into the state of the system of public education in the region as of 1854.

A conclusion was drawn that the source base on the subject, especially its segment dealing with the first half of the 19th century, is quite scant. A highly valuable source for statistics on the subject is the so-called "memorandum books". There is a lack of fundamental research on the subject too.

The authors' conclusion is that by the mid-1850s Penza Governorate had an underdeveloped education system – even vis-à-vis the then-newly incorporated areas of the Caucasus. The governorate had 28 educational institutions. That is, the region had an average of about 3,000 urban residents per educational institution. The low level of development of the education sector in Penza Governorate at the time must have been associated with the region's relative remoteness and vastness, its complex climatic conditions, and the prevalence there of traditional crafts, which did not require literacy.

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1. Introduction

Penza Governorate was a relatively small administrative territorial unit situated in the heart of the Russian Empire. Primarily focused on arable farming, it had a population of 1.5 million as of 1897. As Penza Governorate the area existed between 1796 and 1797 and later between 1801 and 1928. Its capital was Penza.

This work will examine the development of the system of public education in Penza Governorate, including in comparison with some of the other regions of the Russian Empire.

The present paper, which kicks the series off, analyzes the source base for the study and provides a historiographical review of the topic under review, offers a general insight into the level of socioeconomic development in Penza Governorate, and furnishes statistics on schools and students in the region as of 1854.

2. Materials and methods

The primary source employed in this study is the Memorandum Books for Penza Governorate, which was an annual publication that contained detailed information on the activity of educational institutions in the region (e.g., [Pamyatnaya knizhka, 1854](#)). This particular source will be used throughout the series to analyze the system of public education in Penza Governorate.

The Memorandum Books may have been the first periodical in Penza Governorate. While it certainly did not measure up to *Zhurnal Ministerstva Narodnogo Prosveshcheniya*, it did include fairly detailed information on activity within the region's education sector. More than 20 issues of the Memorandum Books were released, the first in 1854 and the last in 1912.

The Books were uniform in structure. They listed all major gubernia and uyezd public authorities, contained reference information on various business sectors, and provided statistics about most areas of public life, which is what makes this source particularly valuable.

Valuable, if somewhat succinct, information is available from a number of sources of a reference nature, including the copious Brockhaus and Efron Encyclopaedic Dictionary ([Brokgauz–Efron, 1896](#)) and the following regional reference sources: I.F. Kuz'min's 'Penza Governorate (A Geographical Description and Historical Data)' ([Kuz'min, 1895](#)), official directories for Penza Governorate (e.g., [Adres-kalendar', 1865](#)), and reference books of Penza Governorate (e.g., [Spravochnaya kniga, 1893](#)).

Some information is available from reports by Penza functionaries (e.g., 'Report of the Penza Gubernia Administration on the Participation of the Penza Gubernia Zemstvo in the Development of Public Education' ([Doklad gubernskoi upravly, 1900](#))).

The development of education in the governorate has been explored by articles published in a number of Russian journals, including *Zhurnal Ministerstva Narodnogo Prosveshcheniya* (e.g., [ЖМНП, 1843](#)), *Narodnoe Obrazovanie* (e.g., [HO, 1898](#); [HO, 1900](#)), *Narodnaya Shkola* (e.g., [HIII, 1869](#)), *Obrazovanie* (e.g., [Obrazovanie, 1892](#); [Obrazovanie, 1899](#); [Obrazovanie, 1908](#); [Obrazovanie, 1909](#)), *Pedagogichesky Listok* (e.g., [PL, 1873](#); [PL, 1897](#)), and *Pedagogichesky Sbornik* (e.g., [PS, 1872](#); [PS, 1890](#)).

Valuable information is also available from some of the period's newspapers, both those published in Penza Governorate (e.g., [PGV, 1844](#); [PGV, 1869](#); [PGV, 1871](#)) and those published in adjacent governorates (e.g., [NGV, 1865](#)).

Worthy of separate mention are relevant regulations governing the operation of educational institutions in the region, as well as directories of such regulations. This most notably includes the Regulation on Female Schools under the Purview of the Ministry of Public Education ([Polozhenie o zhenskikh uchilishchakh, 1861](#)), 'A Digest of Ordinances of the Penza Gubernia Zemstvo Assembly (1865–1911)' ([Postanovleniya Penzenskogo..., 1911](#)), a set of collections of ordinances by the Ministry of Public Education (e.g., [Postanovleniya MNP, 1865](#); [Postanovleniya MNP, 1876](#); [Postanovleniya MNP, 1877](#)), and 'A Collection of Ordinances and Directives on Gymnasiums and Progymnasiums under the Purview of the Ministry of Public Education' ([Postanovleniya po gimnaziyam, 1874](#)). Another source definitely worthy of mention is 'The Complete Collection of Laws of the Russian Empire' ([PSZRI, 1884](#)).

The study employed a set of traditional and nontraditional historical and general research methods.

The traditional research methods employed in this study include the historical-systemic method (to explore the system of public education in Penza Governorate through the prism of the political, social, demographic, and economic state of affairs in the region), the historical-comparative method (both in terms of the chronological aspect, i.e. to compare the state of the region's education system at the lower and upper chronological boundaries, and in terms of the territorial-geographical aspect, i.e. to compare the region's education system with that of other regions with similar socioeconomic development), the historical-typological method (the region's educational institutions were classified by type), and the historical-genetic method (to determine the correlation between the development of the education system in Penza Governorate and regulatory activity by the government).

The nontraditional method employed in this study is the historical-statistical method (to conduct quantitative analysis of educational institutions in the region and students at them). Wide use was made of the following general research methods: synthetic analysis, analysis of sources and the literature (bibliographical analysis), and systems analysis.

The integrated use of the above methods helped gain an objective and comprehensive insight into the development of the system of public education in Penza Governorate in the period between the 19th and early 20th centuries.

3. Discussion

Overall, there is a paucity of research regarding the development of the education system in Penza Governorate. Considering that the present paper kicks off a series of three articles on the topic, more detailed attention will be given to the historiography thereof.

In terms of the prerevolutionary historiography, of particular interest is the 81-page work 'An Essay on Primary Education in Penza Governorate Based on Data for the 1899–1900 School Year', published by the Penza Gubernia Zemstvo in 1903, which contains detailed and highly valuable statistical data on the activity of primary educational institutions in Penza Governorate at the turn of the century (Ocherk, 1903).

An analysis of statistics on public education in European Russia, which Penza Governorate was part of, was conducted by scholar A.V. Dubrovskii (Dubrovskii, 1879).

Between the first two decades of the 20th century, scholar N.F. Ezerskii explored the characteristics of interaction between the zemstvo and public schools (Ezerskii, 1910), the characteristics of the educational process (Ezerskii, 1912), and didactic content in public schools in the region (Ezerskii, 1913).

Some information is also available from research on the history of particular educational institutions (e.g., 'A Historical Essay on Penza's First Gymnasium (1804–1871)' by P.P. Zelenetskii (Zelenetskii, 1889)).

Issues related to interaction between parochial schools and the local education administration were explored in an article by K.N. Korol'kov published in the journal *Penzenskiiye Eparhial'nye Vedomosti* (Korol'kov, 1898).

The Soviet historiography contains several noteworthy works covering the topic.

Research on the education system in Penza Governorate remains episodic and fragmentary. We shall start with the integrated fundamental works exploring the education system in the Russian Empire as a whole.

A collection of essays by V.Z. Smirnov provides an in-depth analysis of the education system in imperial Russia and explores its breakthrough achievements (Smirnov, 1963). A monograph by I.M. Bogdanov investigates issues related to education and literacy in prerevolutionary Russia (Bogdanov, 1964). A work by E.D. Dneprov explores the Soviet historiography related to the development of pedagogy prior to the 1917 Revolutions (Dneprov, 1979).

Also of note are the following collections of essays on the history and development of pedagogy: 'Essays on the History of the Penza Region (Spanning the Period from the Earliest Times to the Late 19th Century)' (Ocherki, 1973), 'Essays on the History of the Education and Pedagogical Thought in the Nations of the USSR (Spanning the Second Half of the 19th Century)' (Ocherki, 1976), and 'Essays on the History of the Education and Pedagogical Thought in the Nations of the USSR (Spanning the Period from the Late 19th to Early 20th Centuries)' (Ocherki, 1991). These are

summarizing works and can be of interest only in terms of gaining a general idea of the development of the education system in Penza Governorate, so they make no pretense to providing a comprehensive treatment of the subject.

As regards relevant articles in periodicals and nonperiodicals, of particular interest is a paper by A.G. Rashin exploring the key issues with literacy and measures to resolve them within Russia's public education sector in the period between the 19th and early 20th centuries (Rashin, 1951). Scholar V.Z. Smirnov researched the measures to maintain student discipline in gymnasiums and progymnasiums in prerevolutionary Russia (Smirnov, 1956).

The contemporary historiography contains very few fundamental works on the topic.

Of particular note is the fundamental work 'Essays on the History of Public Education in the Penza Region' (Ocherki, 1997). Produced by a team of researchers under the editorship of V.I. Nikulin, it is a profound work that relies on a vast source base, one that overall meets the objective of providing a comprehensive and objective analysis of the system of public education in the Penza region. Yet certain issues, like those related to its state in the prerevolutionary period, could have been explored in that work in more depth.

Some general information on the topic is available from the integrated collective monograph 'The Penza Region in the History and Culture of Russia', produced under the editorship of O.A. Sukhova (Penzenskii krai, 2014). Public education in the region is discussed in the above work in Item 8, 'Public Education in Penza Governorate in the Period between the Second Half of the 19th and Early 20th Centuries', of Section 3, 'Penza Governorate in the Post-Reform Period'. This section comprises just a few pages, so the information provided therein is more of a fact-finding nature.

Likewise, the collection 'A Heritage: The Culture of the Penza Region in Documents of an Era and Letters and Memoirs from Contemporaries' provides a fairly brief and generalized account of the education system in Penza Governorate (Nasledie, 1994).

The number of publications in the literature that examine the topic is relatively small too. However, they can provide an insight into a fairly narrow spectrum of issues, with reliance on a vast source base.

In particular, scholar N.N. Chetvertkova explores the system of public education in Penza Governorate in the period 1900–1905 based on materials from the newspaper The Penza Governorate Gazette to provide an insight into the reasons behind growth in the numbers of educational institutions and students in the region in that period and investigate issues related to material support for educational institutions there. The author also devotes some attention to the handling of staffing issues and the issue of finding a sponsor by the local education administration (Chetvertkova, 2007).

There are several works that examine the development of female education in Penza Governorate. For instance, a work by V.N. Parshina analyzes Russia's female vocational education sector in the period between the second half of the 19th and early 20th centuries. The scholar examines relevant initiatives brought forward by the general public at the time. The work concludes that "the dynamics of this process [the development of female education in Penza Governorate] were dependent directly on the level of socioeconomic development in the country" (Parshina, 2008: 124). The author draws attention to the obvious mismatch between the declared need for vocational female education and the practical activity of educational institutions in the region, which took very little account of the real needs of society (Parshina, 2008). The same scholar also shares the findings from a structural analysis of educational processes in female primary educational institutions in Penza Governorate in the period between the second half of the 19th and early 20th centuries (Parshina, 2010). The above works contain rich archival material gleaned from the State Archive of Penza Oblast.

The issue of female education in Penza Governorate is explored in more depth in a candidate's dissertation by the abovementioned scholar, 'The Making of the System of Female Education in Russia in the Period between the Second Half of the 19th and Early 20th Centuries: The Case of Penza Governorate' (Parshina, 2007).

The issue of the development of female education in Penza Governorate has also been explored in an integrated fashion by scholars O. Makarkina and N.I. Polosin (Makarkina, Polosin, 1998).

A candidate's dissertation by O.V. Dunaeva provides an insight into the development of special education in the second half of the 19th century in Russia's provincial cities through the example of Penza (Dunaeva, 1999a). Of interest in the context of the research reported in the present paper is also an article by the above scholar focused on the ethnic, estate, and religious composition of the student body in the above sector (Dunaeva, 1999b).

Of particular interest are the dissertations by L.D. Goshulyak focused on the history of pedagogy. The scholar's candidate's dissertation explores the development of the "zemstvo concept of public education (through the example of Penza Governorate) in the period between the second half of the 19th and early 20th centuries (Goshulyak, 1995). The scholar's doctoral dissertation investigates the theory and practice of the development of the education system in Penza Governorate in the same period (Goshulyak, 2002).

A useful insight into the region's system of secondary education is provided in a candidate's dissertation by O.A. Kostyukova, 'The Making and Development of Gymnasium Education in Russian Governorates in the 19th and Early 20th Centuries: The Case of Gymnasiums in Penza Governorate', which provides a fairly in-depth analysis of the development of the region's gymnasium education sector from the time of its foundation in the governorate (1804) to the February Revolution of 1917 (Kostyukova, 2006).

For the purposes of comparative historical analysis, use was made of a number of articles on other governorates and regions of the Russian Empire (e.g., Cherkasov, 2011; Magsumov et al., 2018; Mamadaliev et al., 2020a; Mamadaliev et al., 2020b; Mamadaliev et al., 2020c; Mamadaliev et al., 2020d; Molchanova et al., 2019; Molchanova et al., 2019a; Molchanova et al., 2020; Natolochnaya et al., 2016; Shevchenko et al., 2016).

In general, while the analysis of the system of public education in Penza Governorate conducted so far is quite in-depth, there still remain a few areas that need further exploration. The present series of articles aims to fill these gaps.

4. Results

The study's geographical scope is restricted to a region that existed as Penza Governorate between 1796 and 1797 and later from 1801 to 1928.

Information on the region's education system in the late 18th and first half of the 19th centuries is quite fragmentary. A proper source base on the subject began to form only in the 1840s, with the launch of a number of periodicals, including the Memorandum Books.

Therefore, the chronological scope of this work (as a series of articles) is somewhat narrower than the scope of the governorate's existence. It is 1854–1917. The present paper is an introductory one and examines the state of the region's education system as of 1854.

Below is an outline of the economic and social state of affairs in Penza Governorate at the time.

According to the Brockhaus and Efron Encyclopaedic Dictionary, Penza Governorate had "borders with Tambov Governorate to the west, Saratov Governorate to the south, Simbirsk Governorate to the east, and Nizhny Novgorod Governorate to the north. The area has a rolling surface, its landscape shaped by gentle hills and deep river valleys. These valleys get filled with river water in springtime" (Brokgauz-Efron, 1896: 134). The region's economy was grounded in arable farming (cultivation of wheat, rye, barley, oats, buckwheat, potatoes, hemp, and some tobacco; operation of a three-field system, a fairly backward system of field husbandry), horticulture (apples and cherries), and livestock farming (horse breeding, pig farming, sheep farming, and beef cattle farming). A major role in the region's economy was played by its textile industry (mainly linen fabrics). The region produced hemp fabric and manufactured simple agricultural implements and machinery. It had approximately 2,500 factories and plants, with a combined workforce of around 14,000.

The region had a population of around 1.5 million, with the overwhelming majority of its residents (approx. 1.4 million) being Orthodox Christians, followed by a very long margin by Muslims (approx. 70,000). A relatively large group in this respect was constituted by Schismatics (over 22,000), distinguished by the government from Orthodox Christian citizens. In terms of social estate composition, the overwhelming majority of the population were peasants (approx. 1.3 million), followed by a very long margin by members of the "military estates" (approx. 84,000), and then members of the petit bourgeois (over 65,000). The majority of the population lived in

villages. In terms of ethnic composition, the overwhelming majority of the population were ethnic Russians (over 85%), followed by Mordvins (aboriginals) and Tatars ([Perepis'..., 1997](#)).

Below is the characterization of education system in Penza Governorate as of 1896 provided by the Brockhaus and Efron Encyclopaedic Dictionary ([Brokgauz-Efron, 1896: 138-139](#)).

The governorate had 882 educational institutions, with a combined enrollment of 44,500 students. Its secondary education sector was represented by the following:

- 2 male gymnasiums;
- 1 female gymnasium and 2 female progymnasiums;
- 1 diocesan female school;
- 1 ecclesiastical seminary and 3 ecclesiastical schools;
- 1 real school;
- 1 teacher's seminary;
- 1 surveyor's school and 1 gardening school ([Brokgauz-Efron, 1896: 138](#)).

The region's secondary educational institutions had a combined enrollment of 2,235 (1,407 males and 828 females).

Its lower and primary educational institutions included the following:

- special schools (1 technical railroad school, 1 rural midwifery school, 1 feldsher school, 2 agricultural schools, forest science programs at two forest districts, and 1 Tatishchev female trades school);

- monastery schools (6 schools for girls only and 3 schools for both boys and girls, with a combined enrollment of 192);

- parochial schools (223, with a combined enrollment of 8,970 (7,942 males and 1,028 females));

- grammar schools (157, with a combined enrollment of 3,664 (3,301 males and 363 females));

- urban schools (6 (as of 1872));

- uyezd schools (4);

- two-grade parish schools (4);

- parish schools for boys (21);

- parish schools for girls (13);

- parish schools for both boys and girls (3; starting with the urban ones, the above schools had a combined enrollment of 6,612);

- two-grade schools under the purview of the Ministry of Public Education in the countryside (7, with a combined enrollment of 887);

- one-grade schools under the purview of the Ministry of Public Education (11, with a combined enrollment of 729);

- zemstvo schools for boys (5, with a combined enrollment of 332);

- zemstvo schools for girls (5, with a combined enrollment of 332);

- zemstvo schools for both boys and girls (5, with a combined enrollment of 328) ([Brokgauz-Efron, 1896: 138-139](#)).

The region also had mono-ethnic ministerial schools for Mordvins and Tatars. According to the encyclopedia, "some schools have lately had gardens, vegetable patches, and apiaries organized at them. The gubernia zemstvo has provided funding for the running of such apiaries. Craft and handiwork classes are currently offered at a number of schools in the region" ([Brokgauz-Efron, 1896: 139](#)).

Special attention in the Brockhaus and Efron Encyclopaedic Dictionary is given to library services in the region. Based on data from it, as of 1896 the region had "15 libraries, 23 book stores and shops, 7 print shops (one of these incorporating a lithographic shop and a type foundry), 1 lithographic shop, and 3 photographer's studios. Among the region's uyezd cities, the following had libraries in them: Krasnoslobodsk, Mokshan, Nizhny Lomov, and Saransk. There is a book warehouse in Penza, set up by the gubernia zemstvo, and funding has been provided for the operation of reading-halls. The government has provided 5,784 rubles for the female gymnasium, 3,000 rubles for the real school, 2,000 rubles for the male gymnasium, 500 rubles toward the two Count Speransky scholarships, and 1,100 rubles toward the pedagogical program. A special item of expenditure is the funding of the zemstvo scholarships at Kharkov University and Penza's First

Gymnasium. The zemstvo allocated for the schools 180 rubles in 1867, 12,883 rubles in 1869, and 118,392 rubles in 1889” (Brokgauz–Efron, 1896: 139).

The primary source used in this study, the Memorandum Books for Penza Governorate, was published by the Penza Gubernia Statistics Committee in the region’s capital, Penza.

The region’s education system is covered in several sections (each item covered in a separate section), with the following explored in depth: a noble institute, a gubernia gymnasium, an uyezd school, an institute for noble maidens, and a private school. The Memorandum Book lists information on staff at these schools such as their positions, titles, and full names (Pamyatnaya knizhka, 1854: 25-28). Information of this kind is not available on staff at the rest of educational institutions in the region.

A consolidated table at the end of the Memorandum Book provides the number of educational institutions in each city, dividing them into ecclesiastical and secular, and the number of students at them (Pamyatnaya knizhka, 1854: 117). Table 1 displays these data.

Table 1. Numbers of Educational Institutions and Students at Them in the Cities of Penza Governorate (Pamyatnaya knizhka, 1854: 117).

| City | Educational institutions | | Number of students | | |
|----------------|--------------------------|-----------|--|---------------------------------|-----------|
| | Ecclesiastical | Secular | At the region’s ecclesiastical schools | At the region’s secular schools | |
| | | | Males | Males | Females |
| Penza | 1 | 4 | 764 | 607 | 36 |
| Saransk | 0 | 2 | 0 | 71 | 0 |
| Insar | 0 | 1 | 0 | 22 | 3 |
| Krasnoslobodsk | 1 | 2 | 224 | 154 | 0 |
| Narovchat | 0 | 3 | 0 | 91 | 4 |
| Nizhny Lomov | 1 | 2 | 209 | 133 | 11 |
| Kerensk | 0 | 0 | 0 | 0 | 0 |
| Chembar | 0 | 2 | 0 | 84 | 0 |
| Mokshan | 0 | 2 | 0 | 47 | 0 |
| Gorodishche | 0 | 2 | 0 | 62 | 0 |
| Troitsk | 0 | 1 | 0 | 20 | 0 |
| Shishkeyev | 0 | 1 | 0 | 60 | 0 |
| Verkhny Lomov | 0 | 1 | 0 | 105 | 6 |
| Total | 3 | 25 | 1,197 | 1,456 | 60 |

Overall, as of 1854 the governorate had 28 educational institutions, with a combined enrollment of 2,713 students, with the overwhelming majority of these being males (2,653 (97.7%) – versus 60 females (2.3%)). The situation in Penza Governorate was similar to that across the Caucasus, where, as suggested by a number of researchers (e.g., Cherkasov, 2011; Magsumov et al., 2018; Mamadaliev et al., 2020a; Mamadaliev et al., 2020b; Mamadaliev et al., 2020c; Mamadaliev et al., 2020d; Molchanova et al., 2019; Molchanova et al., 2019a; Molchanova et al., 2020; Natolochnaya et al., 2016; Shevchenko et al., 2016), this was due to the belief that women did not need education, as theirs was the role of housewife in the traditional family. As of 1854, the region’s cities had a combined population of 82,206 (Pamyatnaya knizhka, 1854: 117). That is, students accounted for just about 3.4% of the population, with there being 2,936 residents per educational institution, which is a low figure even vis-à-vis the then-newly incorporated areas of the Caucasus (see the above publications). This backwardness must have been associated with the region’s relative remoteness and vastness and its tough climatic conditions, with its population having to depend on physical labor to make a living and thus having no time for a “luxury” like education. It is also worth remembering that it was a period when serfdom was still in place in the Russian Empire, with landowners being hardly interested in peasants being literate.

5. Conclusion

The following conclusions were drawn from the insights gained from this study:

1. There are a relatively low number of sources on the education system in Penza Governorate available to the public at this time, which especially is the case with those covering the first half of the 19th century. Of greatest relevance for the purposes of the present work is the Memorandum Books for Penza Governorate.
2. There are a relatively low number of works of a fundamental nature dealing with the topic under review. The 1997 monograph 'Essays on the History of Public Education in the Penza Region' is the only major work found to provide at least some insight into the subject. By contrast, there are a decent number of articles in various publications that explore a particular segment of the region's education system (e.g., secondary education, female education, and public education).
3. As of 1854, the governorate had 28 educational institutions, including a noble institute, a gubernia gymnasium, an uyezd school, an institute for noble maidens, a private school, and a number of primary schools.
4. The region's educational institutions had a combined enrollment of 2,713 students, with the overwhelming majority of these being boys (97.7 %). This, above all, was due to adherence to the traditional patriarchal family model, which did not view women's literacy as necessary.
5. The region's education system was quite backward. There were an average of 2,936 urban residents per educational institution (all types), a worse figure even vis-à-vis the then-newly incorporated areas of the Caucasus. The low level of development in the region's education sector was associated with the dominance of serfdom there, its relative remoteness and vastness, its tough climatic conditions, and the prevalence there of traditional crafts, which did not require literacy.

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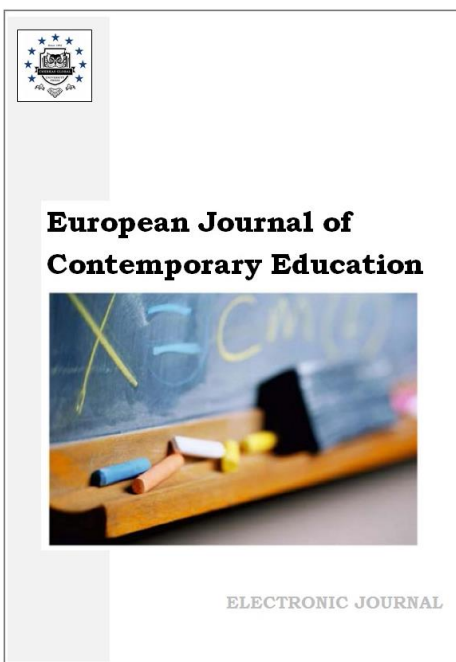
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Interpretation of the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ Report in the Kharkov Educational District

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Abstract

This paper features an analysis of a set of documents produced in the Kharkov Educational District to enable pedagogues to interpret correctly the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ report, more commonly known as “The Kitchen Staff Children Circulaire”. It is shown that the initial version of the document not only did not contain any specific measures to introduce the estate principle into education but also reflected the will of Alexander III, who regarded the introduction of tough estate restrictions for gymnasium students as inopportune and inconvenient. Yet the Trustee of the Kharkov Educational District, N.P. Vorontsov-Vel’yaminov, set a greater store by the mere wishes of the Minister of Public Education, I.D. Delyanov – the hope that administering control over the conditions in which gymnasium students were taught at home would make it possible to gradually free gymnasiums of children from the lower estates. N.P. Vorontsov-Vel’yaminov issued a special document intended to expound, and, in actual fact, to adjust, the ministerial circulaire and directed expressly that enrollment preference be given to gymnasium entrants of noble descent, while no children from the lower estates be admitted unless a special scholarship was available for them. Interestingly, in doing so N.P. Vorontsov-Vel’yaminov claimed that the new ministerial circulaire contained nothing particularly new and based the restrictions not on that document but on an 1870 legislation, which he interpreted in a biased manner. Thus, the estate restrictions introduced under Alexander III in Russian gymnasiums were engendered not so much by the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’

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report but by the administrative zeal of officials who set a greater store by the personal opinion of the Minister expressed in that report than by the formally recommended measures included therein.

Keywords: history of education, “The Kitchen Staff Children Circulaire”, ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ report, Kharkov Educational District, I.D. Delyanov, N.P. Vorontsov-Vel’yaminov.

1. Introduction

‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ is a controversial report produced in the 1880s by I.D. Delyanov, Russia’s then-Minister of Public Education. More commonly known as “The Kitchen Staff Children Circulaire”, it is the most famous document on education in the Russian Empire. The document’s unofficial title has long become a part of Russian culture, being used figuratively in the context of prioritizing exclusive education for members of the higher strata of society. For instance, I.M. Il’yinsky, the current Rector of Moscow State University, who has held a number of posts in Russia’s State Duma, views the circulaire as having been typical for the world’s entire education system up to the 20th century: “Education, essentially, remained a privilege of and a blessing for members of high society. By contrast, the masses, i.e. members of the lower strata, were to acquire skills and abilities through learning crafts. A similar approach to education was practiced in Russia as well. On July 1, 1887, Tsar Alexander III signed into law a notorious document known as “The Kitchen Staff Children Circulaire”. Admission to gymnasiums and progymnasiums would be denied to children of Jews, “coachmen, lackeys, cooks, laundresses, small shopkeepers, and the like, whose children, with the exception of those gifted with ingenious abilities, should not aspire to receive secondary and higher education” (Il’inskii, 2012: 9). One of the sections in an article by Moscow Pedagogical University professors B.F. Slavin and B.A. Slavina, ‘On Relevant Issues in Education Reform’, is entitled ‘We Must Not Forgo Free Education and Replicate the “On Kitchen Staff Children” Law’ (Slavin, Slavina, 2016: 39). Note that the article makes no mention of the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums’ report whatsoever, while the phrase ‘kitchen staff children’ is used in it to describe Russia’s contemporary education reform in the following context: “Replacing publicly-funded, free education with paid education, not accessible to most “kitchen staff children”, wholly contradicts the principles of democracy and is something that ever since the times of Alexander III has been condemned by most representatives of progressive social thought in Russia” (Slavin, Slavina, 2016: 40). Finally, O.N. Smolin, a member of the State Duma’s Education and Science Committee, notes the following on the matter in one of his articles: “Issuing new decrees on “kitchen staff children” in the early 21st century is a sign of having fallen behind the rest of the civilized world by at least a hundred years” (Smolin, 2002: 42). As we can see, the term ‘kitchen staff children’ is used in the article without mentioning not only the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums’ report but any historical context.

“The Kitchen Staff Children Circulaire” remains a realm of collective memory for more than one social group in Russia. The phrase ‘kitchen staff children’ has turned into a fixed expression that can be used in relation to events from a whole different era. In this respect, of particular interest is an article by G.A. Ivanova, ‘Sociocultural Semantic “Expansions” of Precedent Linguistic Phenomena in Internet Discourse: The Case of the ‘Kitchen Staff Children’ Idiom’. This work suggests that the phrase ‘kitchen staff children’ (which, by the way, was not used in the original circulaire) has gradually expanded its meaning and continues to do so to this day (Ivanova, 2011: 97-103). In this regard, there is another consideration worth looking into. The semantic difference between the titles ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ and “The Kitchen Staff Children Circulaire” is obvious: the former is of an official-businesslike nature and is neutral in terms of judgment, while the latter, which outwardly seems to be modeled on officialese, contains a strain of hidden irony and criticism. However, even in textbooks they tend to use the second, unofficial, title almost exclusively. For instance, a History of Russia textbook for ninth-graders (part of an instructional suite under the editorship of Academician A.V. Torkunov) from Prosveshchenie, a major Russian publishing house, refers to said document as follows: “An infamous document known as “The Kitchen Staff Children Circulaire”” (Arsent’ev i dr., 2016: 7). While this wording is formally correct, it is clear that the document has a different title officially and this is its unofficial title,

which is widely used in culture. With no caveats the textbook thereafter refers to it as “The Kitchen Staff Children Circulaire” (Arsent’ev i dr.,, 2016: 9).

Arguably, making a certain event part of collective memory does not necessarily facilitate the objective perception and scholarly study thereof. According to French historian P. Nora, collective memory is even in opposition to history, as it “nourishes recollections that may be out of focus or telescopic, global or detached, particular or symbolic-responsive to each avenue of conveyance or phenomenal screen, to every censorship or projection” (Nora, 1999: 20). The aforementioned examples of contemporary authors invoking “The Kitchen Staff Children Circulaire” seem to align perfectly with this description by the French historian. I.M. Il’yinsky, B.F. Slavin, B.A. Slavina, and O.N. Smolin do not describe the historical report ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ in the context of an era. Instead, in analyzing issues in contemporary education they appeal to the very concept of “kitchen staff children”, as a socially vulnerable group of people, those subject to segregation within the educational environment.

Thus, while the idiom ‘kitchen staff children’ is regularly used in both the literature and opinion writing, the amount of historical and pedagogical research devoted to the actual report ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums’ is relatively limited, while issues related to its use in actual practice are brought up even more rarely. In this regard, of particular interest is an article by R.R. Shakirov, ‘Systematic Totalitarianism in School Management: The ‘On Reducing Gymnasium Education’ Report (1887)’, which talks about a mechanism for legitimizing in scientific research opinions that are commonly accepted in collective memory (Shakirov, 2013: 65-71). The article states that the Ministry of Public Education “issued a well-known circulaire, ‘On Kitchen Staff Children’” (Shakirov, 2013: 67). It is clear that this is not a deliberate error but the use of a commonly accepted unofficial title. Yet it consequently acquires in the narrative the features of an official title, one given by the Ministry. Without comparing the document with other documents produced in that era, R.R. Shakirov draws the following conclusion: “The Ministry of Public Education created a unique document that was incompatible with the rule of law. The instruction, characterized by the use of examples rather than precise formulations, must have been made vague for no other reason than to ensure the arbitrary use of power by a local executive authority, which was expected via the circulaire to act not in accordance with the letter of the law but in harmony with the spirit of departmental direction” (Shakirov, 2013: 67). While such an assessment is acceptable, it must be remembered that Russia’s 19th century education system was characterized by high levels of autonomy at local level, with broad rights exercised by local executives. In 1861, the Kharkov Educational District even published in its official circulaires a report by famous pedagogue N.A. Lavrovsky, a Kharkov University professor, addressing the issue in question (Tsirkulyar, 1861b: 13-19). N.A. Lavrovsky criticized the then-existing state of affairs regarding legal support for the educational process for tendencies to use “general expressions” and “give full scope to arbitrary rule” instead of using clear-cut criteria for assessing the quality of education (Tsirkulyar, 1861b: 14). Therefore, in analyzing the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums’ report in the context of an era, it seems reasonable to base one’s judgment not on general notions of what education-related legislation must be like but on specific mechanisms for applying it in practice. Otherwise, too great is the risk of just illustrating the opinion entrenched in collective memory that restricting access to education for members of the lower estates under Alexander III was a mistake both pedagogical and historical. It can be argued that, from a scholarly standpoint, it is a lot more important to get an idea of what estate restrictions in gymnasiums looked like in practice at that time, how severe the arbitrary use of power by local executive authorities was, and to what degree that power was abused to implement social stratification specifically.

An attempt to analyze the document under examination in the context of an era specifically was undertaken by T.A. Magsumov in an article entitled ‘The ‘On Reducing Gymnasium Education’ Report (1887)’ (Magsumov, 2013: 488-489). The paper points out that the actual author of the circulaire, Minister of Public Education I.D. Delyanov, was at once subjected to criticism from both the left and the right. For instance, V.P. Meshchersky and A.A. Kireev, who backed the report, regarded it as composed in an inept manner, and even suggested that it should be classified altogether (Magsumov, 2013: 488). With that said, while formally the report *was* published as secret, it became public knowledge due to negligence at local level. For instance, in the Odessa Educational District a public ordinance for gymnasium principals was drawn up based on it, while in the Moscow

Educational District children from the lower estates willing to enter a gymnasium were directly told to try a different educational institution, one with a more suitable curriculum (Magsumov, 2013: 488). The article also mentions an apology issued by I.D. Delyanov, who reasoned that he was seeking to prevent access to gymnasiums not for children from the lower estates but for children who could not pursue education in an appropriate manner due to family circumstances (Magsumov, 2013: 488). Finally, the historian argues that the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums’ report was a tactical mistake by I.D. Delyanov, who discredited ideas of his own that by and large had the backing of Russian conservatives.

In the light of the aforesaid, of particular interest is the question of in what manner, from the standpoint of the local pedagogical authorities, the Delyanov report was to be applied in practice, considering that the Ministry of Public Education and educational district trustees had expounded its gist to gymnasium principals and teachers, as well as engaged in working out a set of principles underlying the legal enforcement of the new ordinance. It is worth remembering that the actual text of the circulaire contained a caveat that children from the lower estates who were “gifted with ingenious abilities” *could* be admitted to gymnasiums. Given the aforementioned autonomy of local education in the Russian Empire, this provided local pedagogues with the freedom to both deny “kitchen staff children” access to gymnasiums and let some bright children from the lower estates enter them.

The present work examines official circulaires for the Kharkov Educational District in order to establish which way it went on the issue. It will not focus on any other narratives related to the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ circulaire (e.g., reducing the size of the Jewish student body in gymnasiums). These narratives warrant a separate study, as they were regulated by whole different documents in the Kharkov Educational District.

2. Materials and methods

The main source employed in conducting the research reported in the present work is ‘Circulaires for the Kharkov Educational District’. Essentially, these circulaires were a periodical. As of 1887, they were published once a month and were in the public domain. A subscription cost 6 rubles per year, with it being mandatory for educational institutions within the District to get a subscription to it (Tsirkulyar, 1887b: 71-72). Thus, regardless of the degree of secrecy around the initial text of the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ report, all the information associated with the document and brought to the notice of pedagogues through ‘Circulaires for the Kharkov Educational District’ would inevitably become public knowledge. The Circulaires had quite a complex structure. For the purposes of the present study, only two sections from the publication will be explored herein. Information obtained from the Ministry of Public Education would be communicated to pedagogues via the ‘Ministerial Ordinances’ section. However, as a rule, ordinances received from Saint Petersburg would not be published. Instead, a brief retelling thereof would be provided. Specifically, the ‘Ministerial Ordinances’ section of the August issue for 1887 contained 11 texts, with just two of them (scholarship provisions) reproducing governmental documents word for word, and nine of them being a brief retelling of recommendations and orders from the central authorities (Tsirkulyar, 1887a: 8-21). This provided the District’s Trustee with a certain amount of latitude – it was up to him to decide in what form and with an emphasis on what to bring to pedagogues’ notice orders from the higher-ups. Besides, some of the Circulaires had a section entitled ‘Directives of the District’s Administration’, in which the Trustee addressed pedagogues personally, including, as it will be shown below, in an effort to explain to them how to interpret ministerial ordinances. Thus, the actual mechanism underlying ‘Circulaires for the Kharkov Educational District’, as a tool for informing pedagogues of changes in education, made them highly subordinate to the District’s, as opposed to the Ministry’s, Administration. Even without issuing express directives, the Trustee could make it clear to teachers what he expected of them. In this context, it is worth mentioning once more the report by N.A. Lavrovsky published in ‘Circulaires for the Kharkov Educational District’ in 1861. At that time, the views of this esteemed pedagogue had been presented on the pages of the Circulaires more than once, with them tending to have the nature not of official directives but of a sort of a guidepost for provincial teachers that had not been captured in law (Tsirkulyar, 1861a: 7). What is more, the District’s Administration

would publish the results of checks in gymnasiums and schools in an effort to let the public know of the methodological causes behind both their successes and failures (Tsirkulyar, 1861c: 85-87).

Note, however, that by 1887 'Circulaires for the Kharkov Educational District' had taken on a much more formal nature, with some of the issues even carrying no directives from the District's Administration and unofficial reports, and with checks results increasingly ceasing to be published altogether. This, of course, was also associated with the overall state of affairs in the Empire. Yet it appears to make sense to take into consideration the characteristics of the character of a particular trustee. In the early 1860s, the Kharkov Educational District was headed by General D.S. Levshin, whom a famous scholar named A.V. Nikitenko called "the best trustee", stressing particularly that, while this not-the-most-competent military person did not mind taking advice from others, he would do so "without becoming a slave to them" (Nikitenko, 1955: 429-430). In 1887, the District was headed by N.P. Vorontsov-Vel'yaminov, of whose activity as a trustee nothing has been found in writings by his contemporaries. He was a former military person with no university education (a graduate of an artillery school). However, he had served for many years (since 1870) within the system of the Ministry of Public Education (Vorontsov-Vel'yaminov, 1901: 373-374). It is in the context of the 'On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof' report that the experienced official deemed it necessary to provide detailed explanations as to how to interpret directives from the Ministry of Public Education.

The authors have in their possession the original text of the 'On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof' report, a retelling of this text in 'Circulaires for the Kharkov Educational District' (which differs from the original significantly), and a set of detailed guidelines from N.P. Vorontsov-Vel'yaminov on how to implement such directives in practice. Juxtaposing these texts using the historical-comparative method could help establish how much they match the image of "The Kitchen Staff Children Circulaire" entrenched in collective memory, and, most importantly, who in actual fact was behind the attempts to install in the Kharkov Educational District an education system based exclusively on social stratification.

3. Results

For a start, here is a brief reminder of the key facts about the controversial report 'On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof'. Arguably, as is typically the case with realms of memory, there are a few large gray areas about how this document has been interpreted in the public consciousness. I.D. Delyanov did, indeed, propose that one should admit "to gymnasiums and progymnasiums children from only some of the estates – those not lower than merchants of the 2nd guild" (Sbornik postanovlenii..., 1894: 880). However, Alexander III turned this proposition down as "inopportune and inconvenient". Instead, he set the Minister the objective of "deflecting the influx into gymnasiums and progymnasiums of children of persons whose family circumstances are such that they do not comport with expectations in the area of secondary education" (Sbornik postanovlenii..., 1894: 880-881). Thus, it was I.D. Delyanov who advocated rigorous compliance with the principle of social stratification in education. However challengeable it may seem, Alexander III's position on the matter was broader – denying admission to gymnasiums only to children whose family circumstances did not permit them to pursue a course of study in an appropriate manner. In his report, I.D. Delyanov mentioned the Emperor's criticism of the idea of implementing rigorous social stratification in education, spoke of the objective set by the emperor, and then recommended two specific measures to achieve it: (1) increasing tuition fees and (2) "advising those in charge of gymnasiums and progymnasiums to only admit children who are in the custody of persons who can provide sufficient assurance that there is proper family oversight and that all the necessary comfort is provided to ensure proper schooling for the child" (Sbornik postanovlenii..., 1894: 881). However, later on I.D. Delyanov did take the liberty to insult members of the lower estates in a gross manner. He expressed the hope that, following the implementation of the measures recommended by him, "gymnasiums and progymnasiums will be free from the need to admit to them children of coachmen, lackeys, cooks, laundresses, small shopkeepers, and the like, whose children, with the exception of those gifted with ingenious abilities, should not aspire to receive secondary and higher education" (Sbornik postanovlenii..., 1894: 881). Nevertheless, this odious phrase was merely I.D. Delyanov's wish for the future, something with no

statutory force. Thus, the notion entrenched in collective memory that the Delyanov report expressly barred “kitchen staff children” from entering gymnasiums is not true – legally, it denied admission to gymnasiums only to those whose parents, regardless of estate background, could not ensure appropriate conditions for their education.

However, on June 5, 1887 (hereinafter all dates given are Old Style), Alexander III stamped “Imperially Approved” on the complete text of the Delyanov report ([Sbornik postanovlenii..., 1894: 880](#)). This created a specific situation, one arguably typical for the late Russian Empire – while the new statute did not introduce social stratification in gymnasium education directly, there was clear and unequivocal indication that the Minister of Public Education was a proponent of doing so. With that said, as mentioned earlier based on a work by T.A. Magsumov, the actual document was secret – yet it was necessary to bring its gist to the knowledge of gymnasium principals and teachers.

Consequently, the ‘Ministerial Ordinances’ section of the August issue of ‘Circulaires for the Kharkov Educational District’ carried a text entitled ‘On the Measures to Enhance the Composition of the Student Body in Gymnasiums and Progymnasiums and on the Increase in the Cost of Tuition at Such Educational Institutions’ ([Tsirkulyar, 1887a: 14-16](#)). Note that the text has a title that is different from that of the scandalous Delyanov report, which may indicate that the Ministry of Public Education was seeking to enhance the quality of, not reduce, the student body in gymnasiums. And that is no coincidence. The Kharkov Educational District Trustee’s retelling did not mention Alexander III’s stance about the inopportuneness of implementing social stratification in education. Nor did it mention the objective, set by him, of reducing the number of students in gymnasiums at the expense of children who were unable to pursue a program of study in them in a quality manner. Instead, it stated that I.D. Delyanov was personally preoccupied with the issue of “enhancing the composition of the student body in gymnasiums and progymnasiums” ([Tsirkulyar, 1887a: 14](#)). While the subsequent text reproduced the ministerial report almost word for word, it did so in a whole different context – for the purpose of “enhancing the composition of the student body”, it was directed that gymnasiums and progymnasiums should admit only “children who are in the custody of persons who can provide sufficient assurance that there is proper family oversight and that all the necessary comfort is provided to ensure proper schooling for the child”, followed by the expression of the proverbial hope that “gymnasiums and progymnasiums will be free from the need to admit to them children of coachmen, lackeys, cooks, laundresses, small shopkeepers, and the like, whose children, with the exception of those gifted with ingenious abilities, should not aspire to receive secondary and higher education” ([Tsirkulyar, 1887a: 14](#)). What is more, there appeared a substantiation regarding what kind of harm children from the lower estates were causing, something not present in the text signed by the Emperor. It was stated that such children “should by no means leave the environment that they belong to – lest that, as indicated by the many years’ experience in the field, should lead to disregard for the will of one’s parents, discontent with one’s daily life, and frustration with existing – naturally inevitable – inequality in material circumstances” ([Tsirkulyar, 1887a: 14](#)).

While no assertion will be ventured herein as to which institution was behind the changes, the Ministry of Public Education or the Kharkov Educational District, it is obvious that between the initial text of the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ report and its local interpretation in the ‘On the Measures to Enhance the Composition of the Student Body in Gymnasiums and Progymnasiums and on the Increase in the Cost of Tuition at Such Educational Institutions’ ordinance there was a major difference, despite a literal overlap in text between some of the key provisions. It can be clearly seen from the report signed by Alexander III that the stance of the Emperor (and, accordingly, of the Russian Empire as a whole) on social stratification in education was different from I.D. Delyanov’s and no objective of preventing children from the lower estates completely from pursuing gymnasium education had been expressly set at imperial level. Note that they did not express in the circulaire for the Kharkov Educational District the Emperor’s position, but did express I.D. Delyanov’s as the only one to follow (and, accordingly, the official position of the Russian Empire). Thus, it appears that the new measures were being introduced specifically in order to provide a formal pretext for refusing to admit to gymnasiums children from the lower estates (the objective being that of “enhancing the composition of the student body in gymnasiums”, as opposed to “deflecting the influx into gymnasiums and progymnasiums of children of persons whose family circumstances are such that they do not comport with

expectations in the area of secondary education”). And the next thing they did was to bring into play the nonpublicness of the Emperor-signed report – the interpretation of the unpublished document in the Kharkov Educational District was a lot more hardline and discriminatory than the original, but those who had no access to the initial text had no idea of that!

What is especially noteworthy is that the Ministry of Public Education demonstrated a striking bureaucratic resourcefulness in getting the Delyanov report implemented in practice. It follows from the ‘On the Measures to Enhance the Composition of the Student Body in Gymnasiums and Progymnasiums and on the Increase in the Cost of Tuition at Such Educational Institutions’ ordinance that the Ministry “left to the discretion of the District’s Trustee the matter of providing relevant guidance in this respect [implementing the circulaire] to those in charge of gymnasiums and progymnasiums” (Tsirkulyar, 1887a: 14). Thus, it was up to local executives to devise how to ensure that gymnasiums were attended only by “children who are in the custody of persons who can provide sufficient assurance that there is proper family oversight and that all the necessary comfort is provided to ensure proper schooling for the child”. The Ministry of Public Education recommended to the Administration of Kharkov Educational District only some measures, none of which dealt with social stratification. For instance, I.D. Delyanov personally recommended (“would personally deem it useful”) that, upon receipt of requests for children to be allowed to take an entrance exam, gymnasium and progymnasium principals should “ask the requester directly and try to make relevant inquiries about their material and family circumstances, about the way they have brought up their offspring up to that point, and so on; and, if the person’s family circumstances do not match the aforesaid conditions, their requests are to be resolutely turned down, followed by a recommendation that they should try other educational institutions, those with a less lengthy program of study and one that matches their circumstances better” (Tsirkulyar, 1887a: 14-15). Thus, the main measure proposed by I.D. Delyanov, one he was responsible for personally, was well in line with the objective set by the Emperor – the one of “deflecting the influx into gymnasiums and progymnasiums of children of persons whose family circumstances are such that they do not comport with expectations in the area of secondary education”. Pursuant to this objective, gymnasium principals were to gain an integrated insight into the characteristics of the way children were being brought up in their families, study the morals of their parents, and, on that basis, weed out only those proved certain not to have the ability to complete a program of study in a gymnasium due to family or financial circumstances – but by no means every single member of the lower estates. That said, measures aligned with I.D. Delyanov’s personal beliefs regarding a need for rigorous social stratification in education and contravening Alexander III’s stance on the issue were invented at local level, with the Minister’s scandalous statement that “children of coachmen, lackeys, cooks, laundresses, small shopkeepers, and the like” should not be admitted to gymnasiums being positioned to pedagogues not as an assumption about a possible repercussion of the planned reform but as a primary objective for it.

All this created the preconditions for ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’, a much more controversial report, to be implemented – at least within the Kharkov Educational District – specifically as “The Kitchen Staff Children Circulaire”, as it exists in collective memory, i.e. with a focus on barring children from the lower estates from entering gymnasiums. Considering all of the above facts, one could arguably doubt even the assumption by T.A. Magsumov that the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums’ report was a tactical mistake by I.D. Delyanov. A whole different picture emerges: the Minister, whose proposition with regard to implementing an education system based purely on social stratification had been turned down, deliberately rendered his idea in an ambiguous fashion, in hopes that the general measures proposed by him would lead to rigorous social stratification in education. Technically, the Ministry of Public Education seems to have subsequently fulfilled the will of the Emperor in a strict manner, with the measures it recommended in relation to the report he had signed into law not being focused on enforcing social stratification in education. Yet the same Ministry created the conditions for local officials to use their own initiative in implementing the report, with the latter being misled with regard to the primary objective for it – they were being told that the report was a step in the direction of implementing rigorous social stratification in education. Clearing up the details of this situation may require conducting an archive search – it is not quite clear if it was I.D. Delyanov himself who perverted the Emperor’s will before the Trustee

of the Kharkov Educational District or if it was the District's Administration that opted to "see" in the ambiguous report 'On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums' the opinion of their immediate superior, the Minister of Public Education, exclusively. However, it can be argued that a blunder by I.D. Delyanov is out of the question here – to "err" that way, one would have had to have a good understanding of how the functionary apparatus in the Russian Empire worked. The experienced bureaucrat managed to take advantage of officials' tendency to be obsequious toward their immediate superiors, arranging things in such a way that they would be implementing his own ideas at local level, despite the Emperor's disapproval of the actual approach. With that said, the Minister would naturally come under harsh criticism from the public. Had he fulfilled the will of Alexander III properly, "The Kitchen Staff Children Circulaire" would have never made its way into collective memory; the authorities would have toughened the rules on admission to gymnasiums with a focus on prospective students' living standard, dependability, and social status – rather than just their estate background. While it is quite likely that such a law would have increased the share of members of the higher estates among the country's students, the idea of completely barring children from the lower estates from attending gymnasiums would have fallen off the radar, and the 'On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof' report would have become just another conservative statute produced in the era of Alexander III.

Working out specific measures to bar unsuitable persons from entering gymnasiums and progymnasiums was up to the Trustee of the Kharkov Educational District, N.P. Vorontsov-Vel'yaminov, personally. Indeed, the September issue of 'Circulaires for the Kharkov Educational District' carried 'A Copy of Proposition of the Trustee of the Kharkov Educational District to Gymnasium and Progymnasium Principals No. 4387 of August 12, 1887' (Tsirkulyar, 1887b: 22-28). This document is very important for understanding the real mechanism behind the implementation of the 'On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof' circulaire. Formally, it was of a recommendatory nature (the term 'proposition' being present in the very title thereof). But there is more to it. It appears that N.P. Vorontsov-Vel'yaminov realized the complexity of the situation he was in; so, following in the footsteps of I.D. Delyanov, he simply resolved not to directly order that his subordinates stop admitting children from the lower estates to gymnasiums but have them refuse such children admission without a formal order.

Of particular interest is the preamble to the document in question. One learns from it that, while N.P. Vorontsov-Vel'yaminov did mail out to gymnasium and progymnasium principals the ministerial circulaire of June 18, 1887 (i.e. I.D. Delyanov's version of the 'On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof' report), he had found it necessary to attach to it some guidelines of his own – "to ensure the circulaire will be applied as correctly as possible" (Tsirkulyar, 1887b: 22). Thus, technically, the will of the Emperor *was* brought to the knowledge of the immediate executives – the principals of gymnasiums and progymnasiums. However, almost simultaneously they received another two texts – 'On the Measures to Enhance the Composition of the Student Body in Gymnasiums and Progymnasiums and on the Increase in the Cost of Tuition at Such Educational Institutions' and 'Proposition of the Trustee of the Kharkov Educational District to Gymnasium and Progymnasium Principals No. 4387 of August 12, 1887', which adjusted the practical application of the ministerial circulaire substantially. Apparently, that was sufficient for experienced education officials to figure out what it was that their immediate superiors expected of them.

So, what is it that N.P. Vorontsov-Vel'yaminov personally recommended to his subordinates? He took a roundabout approach to it, reasoning that "in the new proposition by Mr. Minister there is nothing that is not based directly on the substance of the current statute and all the rules already in place for gymnasiums" (Tsirkulyar, 1887b: 23). Thus, it turns out that, although the new circulaire by I.D. Delyanov contained only recommendations, not orders, gymnasium principals were hardly in a position to refuse to implement it, as those recommendations were, as asserted by the Trustee, based directly on the gymnasium statute and rules in place at the time.

Indeed, N.P. Vorontsov-Vel'yaminov next proceeded to blast the then-existing practices dealing with the running of gymnasiums. He unequivocally argued that gymnasiums were filled with "scores of students with neither the aptitude to pursue higher academic education nor the financial means to engage in school learning continuously and over a number of years" (Tsirkulyar,

1887b: 23). This suggestion was supported by the fact that, as established by an educational district official who was present at an entrance exam, in some gymnasiums only “less than half of all applicants deserved to be granted a matriculation certificate” (Tsirkulyar, 1887b: 23). In the view of N.P. Vorontsov-Vel’yaminov, it was “more than likely” that the presence of an educational district official would have exposed the same problem in many other gymnasiums (Tsirkulyar, 1887b: 23). The Trustee further suggested that individuals with failed matriculation exams or with matriculation certificates received as a result of the examiner being soft on them were not only of no use but also could grow up to be a menace to society: “The danger with such individuals is that their shortcomings resulting from undereducation, such as being light-minded and overly superficial in reasoning, coupled with being pretentious and overly conceited, may become the source or agent of harmful aspirations in society” (Tsirkulyar, 1887b: 24). The Trustee stressed that a gymnasium indulging undiligent students was “bastardizing and being grossly unmindful of” their direct purpose as “an educational institution intended to prepare one for university” (Tsirkulyar, 1887b: 23). Indeed, there was evidence to back up the claims made by N.P. Vorontsov-Vel’yaminov. As an example illustrating the fact that his predecessors had been soft on undiligent students, Novocherkassk Gymnasium, a school within the Kharkov Educational District, had in the early 1880s “an original way of promoting students to the next grade: promotion would be granted to students with overall grades of 2 ½ and 2 ¼ in one or two core subjects, and even to straight 2 students” (Artinskii, 1907: 286).

The Trustee’s next move is a particularly interesting one. He suggested that, among other things, the problem stemmed from many gymnasium executives not paying enough attention to the fact that, pursuant to ‘The Rules on Examinations for Gymnasium and Progymnasium Students’, in placing their child in a gymnasium parents were entering in written form into a *commitment* [italicized in the original] (Tsirkulyar, 1887b: 24). Indeed, ‘The Rules on Examinations for Gymnasium and Progymnasium Students’, signed into law on December 8, 1872, captured the following obligations to be assumed by one’s parents or guardians: 1) Purchase the student the required school uniform and textbooks and effect payment for their tuition; 2) “Make every effort” to ensure the student will comply with all directives from the Administration; 3) Notify the Gymnasium of a change in the student’s place of residence (Pravila..., 1873: 67). Hence, as quite logically argued by N.P. Vorontsov-Vel’yaminov, gymnasium and progymnasium principals who *knowingly* [italicized in the original] admitted children whose parents were unable to fulfill said obligations, could be regarded as acting in violation of the law. A practice of this kind could in the long run lead to schools being filled with children unable to learn in an adequate manner (Tsirkulyar, 1887b: 24).

Arguably, the aforementioned arguments by N.P. Vorontsov-Vel’yaminov are quite cogent, and they were well in line with the expressly stated wish of Alexander III, i.e. the objective of “deflecting the influx into gymnasiums and progymnasiums of children of persons whose family circumstances are such that they do not comport with expectations in the area of secondary education”. However, the Trustee went on to make some even more controversial statements. N.P. Vorontsov-Vel’yaminov endeavored to make it look like an obvious fact that only children from the higher estates could meet those rules, which had been established for gymnasium students long before the proverbial circulaire came out: “The gymnasium student rules (e.g., “on the lifestyle of students; on observing the regulations and proprieties of the educational institution; on observing the dress code; on student apartments”; etc.) expressly imply most of the students being from families that are in decent material circumstances and have members who have a decent standing in society or the job market by virtue of their education level and subsequent activity” (Tsirkulyar, 1887b: 24-25). This also provided the grounds for justifying I.D. Delyanov’s odious grouping in terms of who should never be admitted to a gymnasium (“children of coachmen, lackeys, cooks, laundresses, small shopkeepers, and the like”). This grouping took on the form of an express directive: “The circulaire from Mr. Minister expressly mentions a category of such persons, i.e. individuals whose material and family circumstances and intellectual development are such that no assurance can be provided that there is proper family oversight of them and proper effort is made to facilitate their successful learning” (Tsirkulyar, 1887b: 24).

Let us now consider the Trustee’s most revealing arguments on the matter. As noted earlier, neither the circulaire ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ nor the ordinance ‘On the Measures to Enhance the

Composition of the Student Body in Gymnasiums and Progymnasiums and on the Increase in the Cost of Tuition at Such Educational Institutions' contained specific measures to expressly restrict admission to gymnasiums for children from the lower estates. The Emperor's directive envisaged "advising those in charge of gymnasiums and progymnasiums to only admit children who are in the custody of persons who can provide sufficient assurance that there is proper family oversight and that all the necessary comfort is provided to ensure proper schooling for the child", while the Minister's recommendation required that they "ask the requester directly and try to make relevant inquiries about their material and family circumstances, about the way they have brought up their offspring up to that point, and so on". From the Trustee's viewpoint, there was a need to come up with a statutory basis for both the actual principle of social stratification in education and the specific measures via which this principle was to be implemented, for the new circulaire allegedly merely reminded gymnasium and progymnasium principals of their duties, with such measures already being in place statutorily but failing to be implemented. So N.P. Vorontsov-Vel'yaminov invoked 'The Rules on Examinations for Gymnasium and Progymnasium Students' once more. He argued that Article 8 thereof required that, along with their gymnasium enrollment application, parents submit documentation about their "material and social circumstances" (Tsirkulyar, 1887b: 25). In actuality, this article of 'The Rules on Examinations for Gymnasium and Progymnasium Students' required that parents and guardians only submit the following two documents, neither expressly having to do with "material and social circumstances": (1) an "age certificate" (a birth certificate or a certified copy of the birth registration) and (2) a "rank certificate" (e.g., a deputy assembly certificate, a nobility conferral certificate, a father's service record, or an identity card) (Pravila..., 1873: 38). N.P. Vorontsov-Vel'yaminov recommended that gymnasium principals base their decision about whether or not to allow a child to take an entrance exam on these documents specifically, not on conversations with parents and special inquiries made for the purpose, as proposed by I.D. Delyanov (Tsirkulyar, 1887b: 25-26).

The Trustee did not have the brass face to state directly that children from the lower estates would never be provided with appropriate conditions for learning in school, and their parents would not help them with their school work. In fact, he conceded that one should not disregard "the family's central part in the religious and moral education of their offspring, regardless of financial circumstances", and even admitted openly that parents' social status was more important than which estate they represented (Tsirkulyar, 1887b: 26). Still, this portion of N.P. Vorontsov-Vel'yaminov's reasonings does contain a conclusion that a child from a higher estate was more amenable to gymnasium education: "Yet it is a more natural and frequent phenomenon that the aforementioned positive conditions tend to be provided in families with a generations-long tradition of providing good education for their members, as tends to be the case with those belonging to the estate of nobility" (Tsirkulyar, 1887b: 26).

Thus, it was the Trustee of the Kharkov Educational District, not the Minister of Public Education or the Emperor, who expressly directed that preference in enrolling in gymnasiums within the District be given to children of nobles. Note once more that in doing so he invoked not the 'On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof' report and the Ministry's recommendations on it but some much earlier statutes, most importantly 'The Rules on Examinations for Gymnasium and Progymnasium Students', suggesting that those requirements could de facto be met only by children from families of high social standing or belonging to the estate of nobility. According to N.P. Vorontsov-Vel'yaminov, the mechanism permitting the weeding out of children from unsuitable families, which had been prescribed back in 1872, was not being implemented by gymnasium administrations at all. This mechanism, which the Trustee reduced to the formal checking of the applicant estate background documentation submitted to the gymnasium administration, was in open contravention of the new recommendations by I.D. Delyanov, which did prescribe that conversations be conducted with parents and inquiries be made about their circumstances, regardless of which estate they represented, in order to establish the suitability of their child for gymnasium education.

N.P. Vorontsov-Vel'yaminov next proceeded to directives as to how to go about talented children from the lower estates. He again undertook to invoke 'The Rules on Examinations for Gymnasium and Progymnasium Students', this time appealing to Article 12 and claiming that, pursuant to it, entrance exams were to be conducted under the personal direction of principals and done so "in a most circumstantial manner" (Tsirkulyar, 1887b: 26). Here the Trustee engaged in outright imposture, as the article read as follows in the source: "Each entrance examination must

be conducted by a teacher of relevant subjects in the course of study that an examinee is willing to enroll in and under the supervision of a principal, an inspector, or a supervising instructor” (Tsirkulyar,..., 1873: 39). Apparently, N.P. Vorontsov-Vel’yaminov wished that in his educational district responsibility for each child from a lower estate admitted to a gymnasium be taken by the school’s principal, who would be required to attend the exam personally. The Trustee disguised his main idea behind beautiful phrases about the importance of talented children from the lower estates (e.g., “Such children will always be the object of special care on the part of a gymnasium’s Administration, so that their intellectual development can benefit, not harm, them” (Tsirkulyar, 1887b: 27)). However, he subsequently argued that one should not delude oneself over strong entrance exam performances: “A person’s extraordinarily rapid, yet often shallow, intellectual development at a very young age is by no means a guarantee that their development will be as progressive in later years” (Tsirkulyar, 1887b: 27). The Trustee even went on to suggest that some of them being of outstanding intellect should not serve as the basis for believing that children from the lower estates should be admitted to a gymnasium: “It is to be considered in relation to individuals in tight financial circumstances that successfully completing a long journey of attending a gymnasium and later a university requires not just intellectual ability but also character and willpower, which are as significant” (Tsirkulyar, 1887b: 27). Therefore, in the end N.P. Vorontsov-Vel’yaminov unequivocally recommended that gymnasium principals (who, as noted earlier, were seen as personally responsible for the admission of children to their school) should not admit children from the lower estates, regardless of their talent, unless an all-expenses-paid scholarship was available for them: “It would help to admit children in said category only to gymnasiums that can steadily provide scholarships that are sufficient to cover all student expenses” (Tsirkulyar, 1887b: 27).

Thus, while formally ‘Proposition of the Trustee of the Kharkov Educational District to Gymnasium and Progymnasium Principals No. 4387 of August 12, 1887’ contained only recommendations, as opposed to direct orders, in actual fact the will of N.P. Vorontsov-Vel’yaminov was brought to the notice of the subordinates via this document in quite an unequivocal way – preference, in admitting children to a gymnasium, was to be given to children of nobles, while children from the lower estates were to be admitted only if there was a scholarship available for them there. An interesting situation, one arguably typical for the Russian Empire, emerged – in expounding to his subordinates the governmental circulaire, the Trustee of the Kharkov Educational District was guided not by the will of the Emperor and not by a set of existing measures but the opinion of his immediate superior, Minister of Public Education I.D. Delyanov, voiced in it. Powerless to direct, based on the circulaire, that only children from the higher estates be admitted to gymnasiums, N.P. Vorontsov-Vel’yaminov interpreted certain long-existing statutes in such a way as though they de facto already barred children from the lower estates from enrolling in gymnasiums and the Minister only reminded one of that through his circulaire. An unusual conclusion can be drawn here – what in the Kharkov Educational District became “The Kitchen Staff Children Circulaire”, i.e. a document introducing rigorous social stratification in education, was not the famous report ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ but the additions to it issued by the local Administration so as to ensure that gymnasium principals would interpret the governmental text “correctly” upon coming in it across the specific idea that Alexander III had unequivocally opposed. Even I.D. Delyanov offered a caveat that children from the lower estates “gifted with ingenious abilities” were not to be barred from pursuing gymnasium education. But N.P. Vorontsov-Vel’yaminov took it further and claimed that even bright members of the lower classes should not attend gymnasiums, as they may lack “the character and willpower” to succeed.

4. Conclusion

According to German politician and historian F. Mehring, there are “two types of historical legend, which are different from each other as much as plaster is from marble. The former are created artificially, and the latter – naturally. Those of the first type are a meaningless lie, and those of the second are an unconscious truth. The former are represented by false play under a scholarly disguise; the latter – by authentic knowledge that just needs clear expounding. The former are easy to break; yet they are also easy to mold back in place; the latter are knowledge broken with a heavy hammer once and for all – something that can never be restored; but its fragments continue to shine like gemstones” (Mering, 1941: 91-92). As demonstrated earlier,

“The Kitchen Staff Children Circulaire” could be subsumed under the second type of historical legend. What is more, one could regard as felicitous the actual difference in title between ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’, as a real report, and “The Kitchen Staff Children Circulaire”, as what has been preserved in public memory.

As demonstrated earlier, the report’s initial text, signed by the Emperor personally, not only did not envisage implementing social stratification in Russian education but also mentioned that the proposition by I.D. Delyanov to restrict admission to gymnasiums for children from estates “lower than merchants of the 2nd guild” had been turned down. The specific measures provided in the circulaire did not specifically deal with social stratification either – it was recommended that children should be denied admission to a gymnasium not based on their estate background but based on whether or not their family could provide the proper conditions for their education. The famed phrase “gymnasiums and progymnasiums will be free from the need to admit to them children of coachmen, lackeys, cooks, laundresses, small shopkeepers, and the like, whose children, with the exception of those gifted with ingenious abilities, should not aspire to receive secondary and higher education” did not occupy a central place in the text – in the initial context, it just reflected the hopes of I.D. Delyanov.

Accordingly, as such ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ does not deserve the ill fame that has been attached to it. Officials in the Kharkov Educational District ended up fulfilling not the will of the Emperor expressly specified in that report but the wish of the Minister voiced therein. The District’s Trustee, N.P. Vorontsov-Vel’yaminov, personally accompanied the mail-out of the ministerial circulaire with a special document that unequivocally implied that in admitting children to gymnasiums preference should be given to children of nobles, while children from the lower estates should be denied all access to gymnasiums unless a special scholarship was available for them. What is particularly paradoxical about the whole situation is that in trying to substantiate this idea the Trustee invoked not the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums’ report (which simply contained no direct grounds for that) but some much earlier statutes, including those created back in the Great Reforms era, interpreting them in the sense that as of 1872 parents placing their child in a gymnasium statutorily entered into a commitment, and only nobles or people of high social status had the means to live up to those commitments. Ergo, by enrolling a child from a lower estate a principal would knowingly be acting in violation of a law that had been in place since as early as 1872!

Therefore, it appears to be logical to draw a line between the ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ report and “The Kitchen Staff Children Circulaire” – the latter being not some specific government document but a collection of acts intended to explain to those in charge of a gymnasium how to interpret the above report correctly. Within the Kharkov Educational District, such acts were created at local level by officials willing to please I.D. Delyanov. Yet, in actual fact, they reduced his position to an absurdity. Whereas the Minister at least recommended that conclusions be drawn as to a child’s suitability for attending a gymnasium based on communication with their parents and making relevant inquiries about their family, N.P. Vorontsov-Vel’yaminov, essentially, reduced things to formally checking their estate background.

Of course, as a report ‘On Reducing the Size of the Student Body in Gymnasiums and Progymnasiums and Changing the Composition Thereof’ is far from being perfect, and “children of coachmen, lackeys, cooks, laundresses, small shopkeepers, and the like” is a passage that is unacceptable both aesthetically and ethically. However, the history of interpretation of this report in the Kharkov Educational District arguably indicates that the real problem was not the direct purport of directives from above but the administrative zeal of local officials who were willing to violate those directives in order to please their superiors. In a healthier environment, they would have fulfilled the part of the report that prescribed specific measures of quite an adequate nature. Alas – N.P. Vorontsov-Vel’yaminov opted to satisfy the wish of the Minister expressed in the document but not supported in it with specific measures – that gymnasiums be free from children from the lower estates. He even thought up for it a substantiation using some laws he interpreted in a biased manner.

Be it in substance rather than title, “The Kitchen Staff Children Circulaire” did circulate in certain educational districts in the Russian Empire. But the causes of that lay not so much in

I.D. Delyanov's imperfect legislative activity but in the cadre policy practiced by the Ministry of Public Education at the time – local education officials letting their loyalty to the higher-ups and willingness to please them prevail over pedagogical principles – and even over the law itself.

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The System of Public Education in Elisabethpol Governorate in the Period 1868–1917. Part 2

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Abstract

This work explores the system of public education in Elisabethpol Governorate in the period 1868–1917. The present part of the work examines the timeframe from 1885 to 1900.

A key source used in putting this work together is a set of reports from the Trustee of the Caucasus Educational District for the period 1884–1914. These reports provide a valuable statistical insight into the development of the system of public education in Elisabethpol Governorate in the prerevolutionary period. They contain data such as the number of educational institutions in the region, their library holdings, and the size and ethnic composition of the student body at them.

The authors' conclusion is that by 1900 the process of building a network of educational institutions in Elisabethpol Governorate had been effectively completed. The governorate had educational institutions of all levels (secondary, lower, and primary), with both boys and girls having access to all this education. Despite relatively minor growth in the numbers of secondary and lower educational institutions in the region, there was a sharp increase in library stock in these sectors. The period 1885–1900 was a time marked by brisk development in the region's primary education sector, witnessing a threefold increase in the number of primary schools and a fivefold increase in the number of students attending primary school in the region. With that said, the period witnessed not only growth in the number of primary schools in the region but growth in per school enrollment in this sector as well. In terms of ethnic composition, the way was led by

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Armenians (66 % of the total student body), followed by Tatars (19%), and then ethnic Russians (7.1 %).

Keywords: Elisabethpol Governorate, Caucasus Educational District, period 1868–1917, history of pedagogy.

1. Introduction

Elisabethpol Governorate was formed on February 19, 1868, from several uyezds in the Tiflis and Baku governorates. Its capital was Elisabethpol. By 1884, despite the availability in the region of all three major education levels (secondary, lower, and primary) girls could access only the primary level. The region's student body had a motley ethnic composition: Armenians (57 %), Tatars (23 %), Europeans (13.8 %), and ethnic Russians (less than 5 %) (Magsumov et al., 2021: 1046). This part of the work is focused on the timeframe 1885–1900.

2. Materials and methods

A key source used in putting this work together is a set of reports from the Trustee of the Caucasus Educational District for the period 1884–1914. These reports provide a valuable statistical insight into the development of the system of public education in Elisabethpol Governorate in the prerevolutionary period. They contain data such as the number of educational institutions in the region, their library holdings, and the size and ethnic composition of the student body at them.

The use of analysis, summarization, the chronological method, and the statistical method helped gain a comprehensive insight into the development of public education in Elisabethpol Governorate in the period 1885–1900. More specifically, it helped summarize and systematize the available material on the region's educational institutions and student body. An insight was also gained into the region's academic library holdings.

3. Discussion

In the present part, it is worth focusing on the historiography related to the development of the system of public education in the Caucasus in the period 1885–1900. A valuable insight into the organization of the educational process in the Caucasus in the late 19th century can be gained from existing research on public education in the following regions: Kars Oblast (Magsumov et al., 2020), Tiflis Governorate (Mamadaliyev et al., 2020; Mamadaliyev et al., 2020a), Kuban Oblast (Molchanova et al., 2019), and Stavropol Governorate (Natolochnaya et al., 2020). Some research has also been conducted on private education in the Russian Empire-era Caucasus, with the period 1885–1900 explored as well (Taran et al., 2021).

Among the areas in other parts of the Russian Empire whose public education system of said period has been researched in depth most notably are the Kharkov Educational District (Degtyarev, Polyakova, 2020) and Vologda Governorate (Cherkasov et al., 2019; Cherkasov et al., 2019a).

4. Results

As across the Russian Empire as a whole, the network of educational institutions in the Caucasus was divided into the systems of secondary, lower, and primary education.

Secondary education

The first male progymnasium in Elisabethpol Governorate was established in 1870 as a result of the reorganization of Elisabethpol Uyezd School. On March 31, 1881, it was reorganized into Elisabethpol Male Gymnasium (Otchet, 1885: tables), which became the region's first secondary educational institution. On September 20, 1881, the city of Shusha became home to a real school. Essentially, these two male schools represented the region's entire secondary education sector by 1885. This state of affairs (the absence of female educational institutions) persisted in the region up until the late 19th century. On April 2, 1899, Elisabethpol became home to the region's first female secondary educational institution – Elisabethpol Female Progymnasium (Otchet, 1900: 166).

Table 1 displays the numbers of secondary educational institutions and students at them in Elisabethpol Governorate at the time.

Table 1. Numbers of Secondary Educational Institutions and Students at Them in Elisabethpol Governorate in the Period 1885–1900 (Otchet, 1886: applications; Otchet, 1887: 4, applications, 106; Otchet, 1890: № 1, 28, 51, 77; Otchet, 1891: № 1, 28, 51, 77; Otchet, 1892: № 1, 25, 51, 77; Otchet, 1894: № 1, 25, 51, 77, 106, 127; Otchet, 1895: № 1, 25, 51, 77, 106, 127; Otchet, 1896: 1, 28, 51, 77; Otchet, 1897: 6, 54, 109, 135; Otchet, 1899: 6, 60, 109, 135; Otchet, 1900: 6, 54, 109, 138, 166, 208; Otchet, 1901: 6, 54, 109, 135, 166, 208)

| Year | Gymnasiums | | Progymnasiums | | Real schools | Total | Number of students | | |
|------|------------|--------|---------------|--------|--------------|-------|--------------------|-------|-------|
| | Male | Female | Male | Female | | | Boys | Girls | Total |
| | | | | | | | | | |
| 1886 | 1 | - | - | - | 1 | 2 | 492 | - | 492 |
| 1889 | 1 | - | - | - | 1 | 2 | 486 | - | 486 |
| 1890 | 1 | - | - | - | 1 | 2 | 464 | - | 464 |
| 1891 | 1 | - | - | - | 1 | 2 | 466 | - | 466 |
| 1892 | 1 | - | - | - | 1 | 2 | 472 | - | 472 |
| 1893 | 1 | - | - | - | 1 | 2 | 480 | - | 480 |
| 1894 | 1 | - | - | - | 1 | 2 | 500 | - | 500 |
| 1895 | 1 | - | - | - | 1 | 2 | 521 | - | 521 |
| 1896 | 1 | - | - | - | 1 | 2 | 453 | - | 453 |
| 1898 | 1 | - | - | - | 1 | 2 | 653 | - | 653 |
| 1899 | 1 | - | - | 1 | 1 | 3 | 699 | 182 | 881 |
| 1900 | 1 | - | - | 1 | 1 | 3 | 694 | 232 | 926 |

As evidenced in [Table 1](#), the region's male secondary education sector did not have a large student body virtually throughout the period under review, with interest in secondary education starting to increase only in 1898, when the number of students there began to grow. A key achievement in the area of secondary education in the region at the time was the opening of its first female progymnasium, i.e. its first female secondary educational institution. Despite slow growth in the number of secondary educational institutions in the governorate, by 1900 secondary education was accessible there to both genders.

In terms of academic library holdings, in 1885 the two secondary educational institutions in Elisabethpol Governorate had a combined library stock of 8,537 items ([Otchet, 1886: applications](#)).

By 1900, Elisabethpol Male Gymnasium had a library stock of 19,761 items, Shusha Real School – 6,651 items, and Elisabethpol Female Progymnasium – 628 items ([Otchet, 1901: 111, 171](#)). Thus, the three secondary schools had a combined library stock of 27,030 items, an increase of 3.1 times.

Lower education

The first lower educational institution in Elisabethpol Governorate, Shusha Urban School, was opened on June 1, 1875. Subsequently, the region became home to lower schools in Nukha and Elisabethpol. Up until 1894, the region's system of lower education remained unchanged. On July 1, Shusha became home to a Mariinsky female school ([Otchet, 1895: № 287](#)). This school was the region's first lower educational institution for girls.

[Table 2](#) displays the numbers of lower educational institutions and students at them in the region at the time.

Table 2. Numbers of Lower Educational Institutions and Students at Them in Elisabethpol Governorate in the Period 1885–1900 (Otchet, 1886: applications; Otchet, 1887: 198, 218, 232, 254; Otchet, 1890: № 185, 200, 241, 256; Otchet, 1891: № 184, 202, 240, 258; Otchet, 1892: № 184, 199, 240, 258; Otchet, 1893: № 184, 199, 240, 258; Otchet, 1894: № 184, 199, 240, 258; Otchet, 1895: № 184, 199, 240, 258, 284, 300; Otchet, 1896: 184, 197, 258, 287, 300; Otchet, 1897: 295, 321, 381, 394, 426, 456; Otchet, 1899: 295, 323, 381, 394, 406, 436; Otchet, 1900: 296, 350, 431, 444, 456, 486; Otchet, 1901: 296, 350, 431, 456, 486)

| Year | Urban schools | Tradesman's specialized schools | Mariinsky female schools | Tradesman's schools | Total | Number of students | | |
|------|---------------|---------------------------------|--------------------------|---------------------|-------|--------------------|-------|-------|
| | | | | | | Boys | Girls | Total |
| 1885 | 3 | 1 | - | - | 4 | 804 | - | 804 |
| 1886 | 3 | 1 | - | - | 4 | 726 | - | 726 |
| 1889 | 3 | 1 | - | - | 4 | 661 | - | 661 |
| 1890 | 3 | 1 | - | - | 4 | 727 | - | 727 |
| 1891 | 3 | 1 | - | - | 4 | 754 | - | 754 |
| 1892 | 3 | 1 | - | - | 4 | 668 | - | 668 |
| 1893 | 3 | 1 | - | - | 4 | 640 | - | 640 |
| 1894 | 3 | 1 | 1 | - | 5 | 682 | 120 | 802 |
| 1895 | 3 | 1 | 1 | - | 5 | 673 | 120 | 793 |
| 1896 | 3 | 1 | 1 | - | 5 | 688 | 156 | 844 |
| 1898 | 3 | 1 | 1 | - | 5 | 810 | 260 | 1,070 |
| 1899 | 3 | 1 | 1 | - | 5 | 975 | 286 | 1,261 |
| 1900 | 3 | 1 | 1 | - | 5 | 1,242 | 260 | 1,502 |

While the number of urban schools in the region remained unchanged throughout the period under review, in 1899 Elisabethpol Urban School began to be overfilled. Specifically, whereas in 1899 it was attended by 450 students, in 1900 the figure was now 638. It is obvious there was a surge in interest in lower education in the capital.

Similar to the situation in the secondary education sector, the number of lower educational institutions in the region rose insignificantly – from 4 to 5. However, of importance were the establishment of the region's first educational institution for girls and sharp growth in demand for lower education in the governorate. In the period under review, the number of students at lower educational institutions in the region increased nearly twofold – from 804 to 1,502.

In terms of academic library holdings, in 1885 the region's lower primary schools had a combined library stock of 4,741 items, with 4,539 of these being in its urban schools and 202 being in Elisabethpol Tradesman's School (Otchet, 1886: applications).

In 1900, the three urban schools had a combined library stock of 10,449 items, Shusha Mariinsky Female School had a library stock of 1,618 items, and Elisabethpol Tradesman's Specialized School had a library stock of 2,653 items (Otchet, 1901: 301, 432, 459). This brings it to a total of 14,720 items, an increase of 3.1 times.

Primary education

In 1885, the region had 33 primary educational institutions under the purview of the Ministry of Public Education (Otchet, 1886: applications). As at 1895, their largest number was 39. The situation began to change drastically only in 1896.

Table 3 displays the numbers of educational institutions under the purview of the Ministry of Public Education and students at them in the region at the time.

Table 3. Numbers of Primary Schools under the Purview of the Ministry of Public Education and Students at Them in Elisabethpol Governorate in the Period 1885–1900 (Otchet, 1886: applications; Otchet, 1887: 272, 296; Otchet, 1890: № 296, 311; Otchet, 1891: № 315, 330; Otchet, 1892: № 317, 333; Otchet, 1894: № 318, 333; Otchet, 1895: № 318, 333; Otchet, 1896: 318, 333; Otchet, 1897: 506, 536; Otchet, 1899: 486, 516; Otchet, 1900: 536, 566; Otchet, 1901: 536, 566)

| Year | Number of schools | Number of students | | |
|------|-------------------|--------------------|-------|-------|
| | | Boys | Girls | Total |
| 1885 | 33 | 915 | 247 | 1,162 |
| 1886 | 35 | 1,197 | 303 | 1,500 |
| 1888 | 35 | 1,419 | 324 | 1,748 |
| 1889 | 32 | 1,534 | 207 | 1,741 |
| 1890 | 36 | 1,793 | 257 | 2,050 |
| 1891 | 36 | 1,833 | 221 | 2,054 |
| 1892 | 38 | 1,854 | 257 | 2,111 |
| 1893 | 38 | 1,870 | 271 | 2,141 |
| 1894 | 39 | 1,827 | 291 | 2,118 |
| 1895 | 39 | 1,941 | 322 | 2,263 |
| 1896 | 41 | 2,406 | 336 | 2,742 |
| 1897 | 47 | 2,819 | 324 | 3,148 |
| 1898 | 61 | 3,373 | 436 | 3,809 |
| 1899 | 82 | 4,761 | 892 | 5,653 |
| 1900 | 91 | 5,152 | 1,152 | 6,303 |

As evidenced in Table 3, the number of primary educational institutions in the region increased nearly 3 times (from 33 to 91 schools). The number of students at them rose 5.4 times, with the number of boys at them growing 5.6 times and the number of girls increasing 4.6 times. Concurrently, there was growth in per school enrollment as well. Whereas in 1885 the figure was 35.2 students per school, in 1900 it was now 69.2. In other words, per school enrollment in the region’s primary education sector had increased nearly twofold, a testimony to the growing demand in the region for primary education too.

Private educational institutions

The private education sector in the Caucasus Educational District, which Elisabethpol Governorate was part of, was characterized by instability and a tendency to respond to changes in demand, with the figure fluctuating significantly – in a range between 9 and 15. In the period under review, the region’s private education system was represented by lower and primary schools. Table 4 displays the numbers of private educational institutions and students at them in the region at the time.

Table 4. Numbers of Private Educational Institutions and Students at Them in Elisabethpol Governorate in the Period 1885–1900 (Otchet, 1886: applications; Otchet, 1887: 305, 307; Otchet, 1890: № 288; Otchet, 1891: № 307, 311; Otchet, 1892: № 310, 314; Otchet, 1894: № 310, 314; Otchet, 1895: № 310, 314; Otchet, 1896: 310, 314; Otchet, 1897: 488, 496; Otchet, 1899: 468, 476; Otchet, 1900: 518, 526; Otchet, 1901: 518, 526)

| Year | Number of schools | | | | Number of students | | |
|------|-------------------|----------------|-----------------|-------|--------------------|-------|-------|
| | Secondary | Lower | Primary | Total | Boys | Girls | Total |
| 1885 | - | - | 14 ¹ | 14 | 521 | 62 | 583 |
| 1886 | - | - | 12 | 12 | 488 | 30 | 518 |
| 1889 | - | 2 ² | 11 | 13 | 426 | 151 | 577 |
| 1890 | - | 2 | 12 | 14 | 502 | 130 | 632 |

¹ Of the 14 private schools, 12 were male, 1 was female, and 1 was mixed.

² Both of the lower educational institutions were female.

| | | | | | | | |
|------|---|----------------|----|----------------|-----|-----|-------|
| 1891 | - | 2 | 10 | 12 | 528 | 151 | 679 |
| 1892 | - | 2 | 8 | 10 | 482 | 157 | 639 |
| 1893 | - | 2 | 8 | 10 | 463 | 168 | 631 |
| 1894 | - | 2 ¹ | 8 | 10 | 495 | 81 | 576 |
| 1895 | - | 1 | 8 | 9 ² | 456 | 95 | 551 |
| 1896 | - | 1 ³ | 14 | 15 | 688 | 200 | 888 |
| 1898 | - | 1 | 13 | 14 | 741 | 377 | 1,118 |
| 1899 | - | - | 10 | 10 | 523 | 237 | 760 |
| 1900 | - | - | 9 | 9 | 373 | 221 | 594 |

Private lower educational institutions played a very important social role in the region – they provided education to girls. In the period from 1889 to 1898, when there still were private lower schools in the region, there was just one private lower male school there (in 1894; it closed down that same year due to tough competition). Whereas there were no private lower schools in the region prior to the above period simply because they did not exist yet, subsequent to it none were simply left there. The latter was due to the opening of two female state schools there – the female progymnasium in Elisabethpol and the Mariinsky female school in Shusha. With demand for female education in these cities met, the private lower schools had to close down. As regards the region’s private primary schools, by the late 19th century their number declined too – due to the opening of a large number of state primary schools there.

The size of the student body in the region’s private education sector remained virtually unchanged at the time – 594 students in 1900 versus 583 students in 1885. In terms of gender composition, whereas in 1885 girls accounted just for 10.6 % of the total student body, in 1900 the figure was now 37.4 %.

Table 5 displays the data on the ethnic composition of the region’s student body as at 1900.

Table 5. Ethnic Composition of the Student Body in Elisabethpol Governorate as at 1900 (Otchet, 1901)

| School | Ethnic Russians | Georgians | Armenians | Tatars | Mountaineers | Jews | Other |
|--------------------------------|-----------------|-----------|-----------|--------|--------------|------|-------|
| Secondary education | | | | | | | |
| Male gymnasium | 73 | 36 | 156 | 47 | - | 15 | 18 |
| Real school | 18 | 5 | 316 | 63 | - | - | 4 |
| Female progymnasium | 45 | 14 | 143 | 1 | - | 2 | 8 |
| Total | 136 | 55 | 615 | 111 | - | 17 | 30 |
| Lower education | | | | | | | |
| Elisabethpol Urban School | 25 | 6 | 527 | 78 | 1 | - | 3 |
| Shusha Urban School | 3 | - | 173 | 44 | - | - | - |
| Nukha Urban School | 5 | 2 | 159 | 51 | - | - | - |
| Mariinsky female school | 14 | 1 | 285 | 5 | - | - | - |
| Tradesman’s specialized school | 5 | 9 | 55 | 51 | - | - | 3 |
| Total | 52 | 18 | 1,199 | 229 | 1 | - | 6 |

¹ Starting in 1894, the governorate had 1 male and 1 female lower educational institutions.

² Starting in 1895, the governorate had 1 female lower and 8 male primary educational institutions.

³ Starting in 1896, the governorate had 1 female lower educational institution.

| Private education | | | | | | | |
|-------------------|-------|----|-------|-------|----|----|-----|
| Private school | 7 | 2 | 560 | 25 | - | - | - |
| Primary education | | | | | | | |
| Primary school | 472 | 16 | 3,789 | 1,407 | 58 | 5 | 556 |
| Total | 667 | 91 | 6,163 | 1,772 | 59 | 22 | 592 |
| Combined total | 9,366 | | | | | | |

As evidenced in Table 5, compared with 1885, the share of Armenians in the region's educational institutions increased in 1900 from 57 % to 66 %. Tatars, just as before, were ranked second in this period, but there was a decline in their number – from 23 % to 19 %. In 1900, ethnic Russians moved to third place – 7.1 % (their number was less than 5% before). Ranked fourth were members of other ethnicities, including Europeans – 6.3 %.

5. Conclusion

By 1900, the process of building a network of educational institutions in Elisabethpol Governorate had been effectively completed. The governorate had educational institutions of all levels (secondary, lower, and primary), with both boys and girls having access to all this education. Despite relatively minor growth in the numbers of secondary and lower educational institutions in the region, there was a sharp increase in library stock in these sectors. The period 1885–1900 was a time marked by brisk development in the region's primary education sector, witnessing a threefold increase in the number of primary schools and a fivefold increase in the number of students attending primary school in the region. With that said, the period witnessed not only growth in the number of primary schools in the region but growth in per school enrollment in this sector as well. In terms of ethnic composition, the way was led by Armenians (66 % of the total student body), followed by Tatars (19 %), and then ethnic Russians (7.1 %).

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The System of Public Education in Volyn Governorate in the Period 1796–1917. Part 3

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Abstract

This work explores the system of public education in Volyn Governorate in the period 1796–1917. This part of the work examines the timeframe 1900–1917.

Use was made of the Memorandum Books for Volyn Governorate for the period 1901–1915. During the period under review, this source carried reports on the state of the system of public education in the region. While mainly focused on educational institutions under the purview of the Ministry of Public Education and parochial Orthodox Christian schools, it also carried data on schools of other faiths (e.g., Jewish and German schools) in the region. Use was also made of relevant documents from the Russian State Historical Archive (Saint Petersburg, Russian Federation).

The authors' conclusion is that in the period 1900–1917 the development of the system of public education in Volyn Governorate was mostly governed by regional factors. The system of public education in this region of the Russian Empire was also influenced by the Russian Revolution of 1905 and later World War I, as well as the religious composition of the population. Overall, the region's system of public education developed in an evolutionary and dynamic manner. In the period under review, the size of the region's network of secondary educational institutions increased 3 times. Throughout the period, the region witnessed growth in the number of female students at its secondary educational institutions. By 1913, the number of girls at secondary educational institutions in the region had surpassed the number of boys at them. The number of girls at the region's lower educational institutions increased 4 times, with the overall number of students at them increasing more than 3 times. A unique phenomenon was primary education in the region. With the number of primary educational institutions in the region remaining virtually

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unchanged, growth in the number of students at them was just about 20 %. This growth was almost entirely associated with growth in the number of girls attending primary school in the region.

Keywords: Volyn Governorate, Russian Empire, system of public education, parochial schools, period 1796–1917.

1. Introduction

Volyn Governorate was established in 1796 following the third partition of Rzeczpospolita. By 1900, the region had built an extensive network of educational institutions, which included a number of secondary educational institutions, nearly 40 lower schools, and a large number of primary schools (most of which were parochial).

This part of the work is focused on the timeframe 1900–1915.

2. Materials and methods

Use was made of the Memorandum Books for Volyn Governorate for the period 1901–1915. During the period under review, this source carried reports on the state of the system of public education in the region. While mainly focused on educational institutions under the purview of the Ministry of Public Education and parochial Orthodox Christian schools, it also carried data on schools of other faiths (e.g., Jewish and German schools) in the region. Use was also made of relevant documents from the Russian State Historical Archive (Saint Petersburg, Russian Federation).

As in most of the similar works, use was made here of the chronological and statistical methods. The use of the chronological method made it possible to explore the characteristics of secondary, lower, and primary education in Volyn Governorate. The statistical method was employed to analyze a large body of statistical information and gain an insight into aspects such as the types of educational institutions and the size and gender composition of the student body across the region.

3. Discussion

The previous part of the work examined the limited historiography of the subject under review accumulated in the prerevolutionary and Soviet periods ([Cherkasov et al., 2021a: 1049-1050](#)).

Public education in the Russian Empire has been the subject of more extensive research in the contemporary period, with historical statistical research being conducted on various educational districts across the Russian Empire. These studies have examined the various aspects of the system of public education in the early 20th century Russian Empire, including the number and quality of educational institutions and the number and gender composition of students at them. For instance, research has been conducted on public education in the following areas: Kuban Oblast ([Molchanova et al., 2019a](#); [Molchanova et al., 2020](#)), Stavropol Governorate ([Natolochnaya et al., 2020a](#); [Natolochnaya et al., 2020b](#)), Orenburg Governorate ([Magsumov et al., 2020b](#)), and the Kharkov Educational District ([Degtyarev et al., 2020](#)).

4. Results

As already noted in the work's previous part, by 1900 the region had built a network of educational institutions, which included secular, ecclesiastical, private, and national educational institutions ([Cherkasov et al., 2021: 795](#)) across the secondary, lower, and primary education sectors.

Secondary educational institutions

As of 1900, Volyn Governorate had 9 secondary educational institutions under the purview of the Ministry of Public Education (5 gymnasiums (3 male and 2 female), 1 male progymnasium, 1 real school, 1 first-rate female educational institution (modeled after the gymnasium), and 1 teacher's seminary). Three of these were in Zhitomir, the region's capital, 5 – in its uyezd cities, and 1 – in one of its uyezds ([Pamyatnaya knizhka, 1901: 86-89](#)).

The period 1900–1917 was the heyday of secondary education in Volyn Governorate. It witnessed brisk development in both the private and public secondary education sectors. In addition, there emerged nontraditional forms of secondary education (e.g., pedagogical

programs). Table 1 displays the numbers of secondary educational institutions and students at them in the region at the time.

Table 1. Numbers of Secondary Educational Institutions in Volyn Governorate and Students at Them in the Period 1900–1915 (Pamyatnaya knizhka, 1901: 86-89; Pamyatnaya knizhka, 1902: 94-97; Pamyatnaya knizhka, 1903: 90-93; Pamyatnaya knizhka, 1904: 48-49; Pamyatnaya knizhka, 1905: 40-43; Pamyatnaya knizhka, 1906: 30-32; Pamyatnaya knizhka, 1907: 33-35; Pamyatnaya knizhka, 1908: 42-44; Pamyatnaya knizhka, 1909: 45-47; Pamyatnaya knizhka, 1910: 45-47; Pamyatnaya knizhka, 1911: 46-48; Pamyatnaya knizhka, 1912: 90-91; Pamyatnaya knizhka, 1913: 90-91; Pamyatnaya knizhka, 1915: 90-91; Pamyatnaya knizhka, 1916: 63-64)

| Year | Number of educational institutions | | | | | | | | Number of students | | |
|------|------------------------------------|--------|---------------|--------|--------------|----------------------------|---|-------|--------------------|-------|---------------------|
| | Gymnasiums | | Progymnasiums | | Real schools | First-rate private schools | Teacher's seminaries (pedagogical programs) | Total | Boys | Girls | Total |
| | Male | Female | Male | Female | | | | | | | |
| 1900 | 3 | 2 | 1 | - | 1 | 1 | 1 | 9 | 1,936 | 798 | 2,734 |
| 1901 | 3 | 2 | 1 | - | 1 | 1 | 1 | 9 | 1,967 | 782 | 2,749 ¹ |
| 1902 | 3 | 2 | 1 | - | 1 | 2 | 1 | 10 | 2,156 | 848 | 3,004 |
| 1903 | 3 | 2 | 1 | - | 1 | 2 ² | 1 | 10 | 2,184 | 1,302 | 3,486 |
| 1904 | 3 | 2 | 1 | - | 1 | 3 ³ | 1 | 11 | 2,194 | 1,589 | 3,783 |
| 1905 | 3 | 2 | 1 | - | 1 | 3 ⁴ | 1 | 11 | 2,356 | 1,475 | 3,831 |
| 1906 | 3 | 2 | 1 | - | 1 | 3 ⁵ | 1 | 11 | 2,495 | 1,842 | 4,337 |
| 1907 | 3 | 2 | 1 | - | 1 | 3 ⁶ | 1 | 11 | 2,267 | 1,880 | 4,147 |
| 1908 | 4 | 2 | - | - | 1 | 10 ⁷ | 1 | 18 | 2,786 | 2,393 | 5,179 |
| 1909 | 4 | 2 | - | - | 1 | 10 ⁸ | 1 | 18 | 2,926 | 2,278 | 5,204 |
| 1910 | 4 | 2 | - | - | 1 | 12 ⁹ | 1 | 20 | 2,993 | 2,502 | 5,495 |
| 1911 | 4 | 2 | - | - | 1 | 12 ¹⁰ | 1 | 20 | 2,846 | 2,821 | 5,667 |
| 1912 | 4 | 2 | - | - | 1 | 13 ¹¹ | 1 | 21 | 2,954 | 3,030 | 5,984 |
| 1913 | 9 | 13 | - | - | 1 | - | 2 | 25 | 3,296 | 3,659 | 6,955 ¹² |
| 1915 | 10 | 15 | - | - | 1 | - | 3 | 29 | 2,671 | 1,928 | 4,599 |

As evidenced in Table 1, the period under review witnessed a threefold increase in the number of secondary educational institutions in the region – from 9 to 29. Worthy of particular note is the fact that starting in 1903 demand for secondary education in the region increased. A major role in this was played by private educational institutions. In an attempt to meet demand, a third private

¹ Data not available on the number of female students attending first-rate private education in the region

² The governorate had 2 first-rate female schools (gymnasiums).

³ The governorate had 2 first-rate female schools (gymnasiums) and 1 female progymnasium.

⁴ The governorate had 3 first-rate female schools (gymnasiums).

⁵ The governorate had 3 first-rate female schools (gymnasiums).

⁶ The governorate had 3 first-rate female schools (gymnasiums).

⁷ The governorate had 2 male and 4 first-rate female schools (gymnasiums), as well as 4 private female progymnasiums.

⁸ The governorate had 3 male and 4 first-rate female schools (gymnasiums), as well as 3 private female progymnasiums.

⁹ The governorate had 4 male and 8 first-rate female schools (gymnasiums).

¹⁰ The governorate had 3 male and 9 first-rate female schools (gymnasiums).

¹¹ The governorate had 4 male and 9 first-rate female schools (gymnasiums).

¹² There may have been one more first-rate private female school, but it is not possible to determine the number of students at it due to lack of statistics.

gymnasium was set up in 1904, and in 1908, i.e. right after the Russian Revolution of 1905, the region witnessed a sharp rise in the number of secondary educational institutions (an increase of 7). The region's system of public education entirely owed this increase to private educational institutions. Whereas in 1907 there were just 3 private female gymnasiums, in 1908 the region additionally became home to 2 male and 1 female gymnasiums, as well as 4 female progymnasiums. This indicates that female secondary education was especially in demand in the region at the time. The number of private educational institutions in the region rose up until 1912, when their combined number reached 13 to account for over 60% of the total number of secondary educational institutions in the region. However, as early as 1913, in conjunction with the opening of state (5 male and 11 female) gymnasiums, all private educational institutions in the region ceased operation.

As regards the number of students at secondary educational institutions in the region, it rose briskly up until World War I. More specifically, in the period from 1900 to 1913 it rose from 2,734 to 6,955, a more than twofold increase. Of particular note is the gender composition of students at the region's secondary schools at the time. Whereas in 1900 girls constituted less than a third of the total student body, in 1912 and 1913 they accounted for over half thereof.

Lower educational institutions

By 1900, Volyn Governorate had 51 lower educational institutions, including 6 ecclesiastical, 1 Jewish, and several sectoral educational institutions (e.g., a school for police officers). In the period 1900–1917, the system of lower education in the governorate, similar to its system of secondary education, experienced brisk development. In this regard, of particular interest is information relating to the region's educational institutions run by the Ministry of Public Education and two-grade parochial schools under the purview of the Holy Synod. In addition, the sample includes the region's feldsher, lower tradesman's, and lower agricultural schools. Table 2 displays the data on the region's lower educational institutions in the period 1900–1915.

Table 2. Numbers of Lower Educational Institutions in Volyn Governorate and Students at Them in the Period 1900–1915 (Pamyatnaya knizhka, 1901: 86-89; Pamyatnaya knizhka, 1902: 94-97; Pamyatnaya knizhka, 1903: 90-93; Pamyatnaya knizhka, 1904: 48-49; Pamyatnaya knizhka, 1905: 40-43; Pamyatnaya knizhka, 1906: 30-32; Pamyatnaya knizhka, 1908: 42-44; Pamyatnaya knizhka, 1909: 45-47; Pamyatnaya knizhka, 1910: 45-47; Pamyatnaya knizhka, 1911: 46-48; Pamyatnaya knizhka, 1912: 90-91; Pamyatnaya knizhka, 1913: 90-91; Pamyatnaya knizhka, 1915: 90-91; Pamyatnaya knizhka, 1916: 63-64)

| Year | Number of educational institutions | | | | | | Number of students | | | |
|------|------------------------------------|-------|------------------------|-----------------------------|--|------------------|--------------------|--------|-------|--------|
| | Two-grade schools | | Higher primary schools | Parochial two-grade schools | Lower tradesman's and agricultural schools | Feldsher schools | Total | Boys | Girls | Total |
| | Urban | Rural | | | | | | | | |
| 1900 | 16 | 22 | - | 2 | - | 1 | 41 | 5,533 | 2,457 | 7,990 |
| 1901 | 13 | 25 | - | 3 | - | 1 | 42 | 6,029 | 2,627 | 8,656 |
| 1902 | 14 | 45 | - | 5 | - | 1 | 65 | 8,440 | 2,963 | 11,403 |
| 1903 | 24 | 48 | - | 5 | 5 | 1 | 83 | 9,746 | 3,446 | 13,192 |
| 1904 | 26 | 51 | - | 6 | 4 | 1 | 88 | 10,045 | 3,847 | 13,892 |
| 1905 | 28 | 55 | - | 11 | 4 | 1 | 99 | 12,104 | 4,552 | 16,656 |
| 1906 | 28 | 58 | - | 12 | 4 | 1 | 103 | 12,612 | 5,193 | 17,805 |
| 1907 | 28 | 60 | - | 12 | 4 | 1 | 105 | 12,610 | 5,250 | 17,860 |
| 1908 | 28 | 72 | - | 14 | 4 | 1 | 119 | 12,687 | 5,531 | 18,218 |
| 1909 | 29 | 81 | - | 14 | 4 | 1 | 129 | 14,261 | 6,027 | 20,288 |
| 1910 | 30 | 83 | - | 14 | 4 | 1 | 132 | 15,981 | 4,730 | 20,711 |

| | | | | | | | | | | |
|------|----|-----|----|----|---|---|-----|--------|-------|--------|
| 1911 | 31 | 92 | - | 16 | 5 | 1 | 145 | 17,989 | 7,372 | 25,361 |
| 1912 | 31 | 96 | - | 17 | 7 | 1 | 152 | 19,004 | 7,738 | 26,742 |
| 1913 | 2 | 103 | 29 | 17 | 7 | 1 | 159 | 18,454 | 7,387 | 25,841 |
| 1915 | - | 113 | 34 | 17 | 7 | 1 | 172 | 15,483 | 7,389 | 22,872 |

As evidenced in [Table 2](#), the period under review witnessed brisk development in the region's lower primary education sector, both quantitatively and qualitatively. Specifically, the number of educational institutions in this sector rose 4.2 times. In terms of quality, near the end of the period under review the region witnessed an upsurge in the establishment of higher primary (six-year) schools (note that in 1900 the length of the program of study was 4 years (urban and rural schools)). In addition, there was brisk development in the parochial two-grade schools sector as well, with the number of such schools growing from 2 to 17, an increase of 8.5 times. A novelty was the establishment of lower tradesman's and agricultural schools.

The number of students increased 3.3 times – from 7,990 students (1900) to 25,841 (1913). As with the region's secondary educational institutions, the number of students in this sector dropped sharply in 1915 in conjunction with World War I. As regards the gender balance in this sector, in 1900 girls accounted for a third of the total student body. As early as 1902, their share started to decline. In 1913, it hit its lowest level – 28%.

Primary educational institutions

In the early 20th century, Volyn Governorate witnessed brisk development in its primary education sector as well. To add some more value to public education in regions on the periphery of the nation, with Volyn Governorate being one such region, the authorities also reported on national schools (German and Jewish) in the region. In 1900, their number reached 1,012. However, these schools did not have a curriculum, with the educational process in them often confined mainly to the study of ecclesiastical literature. In this regard, in calculating the number of primary schools in the region in the prerevolutionary period, the authors limited their research to schools under the purview of Ministry of Public Education and one-grade parochial schools. Note that, as in the late 19th century, a major role in the development of primary public education in Volyn Governorate was played by parochial schools, as the region had a large number of small populated areas. Opening ministerial schools in them was not seen as cost effective. [Table 3](#) displays the number of primary educational institutions in the region and students at them at the time.

Table 3. Number of Primary Educational Institutions in Volyn Governorate and Students at Them in the Period 1900–1915 ([Pamyatnaya knizhka, 1901: 86-89](#); [Pamyatnaya knizhka, 1903: 90-93](#); [Pamyatnaya knizhka, 1904: 48-49](#); [Pamyatnaya knizhka, 1905: 40-43](#); [Pamyatnaya knizhka, 1906: 30-32](#); [Pamyatnaya knizhka, 1907: 33-35](#); [Pamyatnaya knizhka, 1908: 42-44](#); [Pamyatnaya knizhka, 1909: 45-47](#); [Pamyatnaya knizhka, 1910: 45-47](#); [Pamyatnaya knizhka, 1911: 46-48](#); [Pamyatnaya knizhka, 1912: 90-91](#); [Pamyatnaya knizhka, 1913: 90-91](#); [Pamyatnaya knizhka, 1915: 90-91](#); [Pamyatnaya knizhka, 1916: 63-64](#))

| Year | Number of educational institutions | | | | Number of students | | |
|------|------------------------------------|---------------|-------------------|-------|--------------------|--------|--------|
| | Public one-grade schools | Rural schools | Parochial schools | Total | Boys | Girls | Total |
| 1900 | 291 | 169 | 1,482 | 1,942 | 71,848 | 13,902 | 85,750 |
| 1901 | 314 | | 1,480 | 1,794 | 69,071 | 13,160 | 82,231 |
| 1902 | 313 | | 1,493 | 1,806 | 68,963 | 13,032 | 81,995 |
| 1903 | 332 | | 1,506 | 1,838 | 68,735 | 13,304 | 82,039 |
| 1904 | 335 | | 1,603 | 1,938 | 74,827 | 17,125 | 91,952 |

| | | | | | | |
|------|-----|-------|-------|--------|--------|---------|
| 1905 | 357 | 1,502 | 1,859 | 75,785 | 17,546 | 93,331 |
| 1906 | 364 | 1,457 | 1,821 | 80,004 | 18,588 | 98,592 |
| 1907 | 362 | 1,388 | 1,750 | 79,486 | 19,034 | 98,520 |
| 1908 | 374 | 1,401 | 1,775 | 79,073 | 18,841 | 97,914 |
| 1909 | 410 | 1,408 | 1,818 | 83,002 | 21,708 | 104,710 |
| 1910 | 437 | 1,413 | 1,850 | 83,877 | 22,216 | 106,093 |
| 1911 | 448 | 1,465 | 1,913 | 84,153 | 22,503 | 106,656 |
| 1912 | 70 | 441 | 1,448 | 84,731 | 22,858 | 107,589 |
| 1913 | 266 | 430 | 1,368 | 2,064 | 85,686 | 26,909 |
| 1915 | 281 | 428 | 1,401 | 2,110 | 77,530 | 27,535 |

As evidenced in [Table 3](#), the influence of parochial education in Volyn Governorate cannot be underestimated. In 1900, 51,219 out of the 71,848 boys (71%) attending primary school in the region were students of parochial schools. The figure was even higher with girls – 10,160 out of the total 13,902 (73%). In 1904, the number of parochial schools in the region reached its maximum (1,603). The figure started to drop during the Russian Revolution of 1905. This decline may have been associated with the process of schools in the region getting larger. Specifically, whereas in 1901 there were 41.8 students per parochial school, in 1906 the figure was 50.8, in 1910 – 56, and in 1913 – 54.4 students.

The number of students increased just slightly – from 85,000 to 105,000. Whereas the number of boys remained virtually unchanged, the number of girls rose 2 times – from 13,900 (1900) to 27,500 (1915). This may have been associated with the fact that as early as 1900 parochial education had reached the majority of boys in Volyn Governorate.

A study conducted by the Russian authorities on January 1, 1915, to determine how many school-age children (ages 8–11) in the governorate were attending school at the time revealed that out of the region's 375,303 children just 150,805 were going to school (RGIA. F. 733. Op. 207. D. 39. L. 1), i.e. just around 40 %. The region's children not attending school at the time included around 50,000 Orthodox Christian girls, as well members of other faiths.

5. Conclusion

In the period 1900–1917, the development of the system of public education in Volyn Governorate was mostly governed by regional factors. The system of public education in this region of the Russian Empire was also influenced by the Russian Revolution of 1905 and later World War I, as well as the religious composition of the population. Overall, the region's system of public education developed in an evolutionary and dynamic manner. By 1915, public education had become equally available and accessible throughout the governorate, i.e. in all its urban and rural areas.

In the period under review, the size of the region's network of secondary educational institutions increased 3 times. Throughout the period, the region witnessed growth in the number of female students at its secondary educational institutions. By 1913, the number of girls at secondary educational institutions in the region had surpassed the number of boys at them. The number of girls at the region's lower educational institutions increased 4 times, with the overall number of students at them increasing more than 3 times. A unique phenomenon was primary education in the region. With the number of primary educational institutions in the region remaining virtually unchanged, growth in the number of students at them was just about 20 %. This growth was almost entirely associated with growth in the number of girls attending primary school in the region.

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Muslim Educational Institutions in Kazakhstan under the Anti-Religious Policy of the Soviet State in the 1920s

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Abstract

The given article presents the results of studying the system of Muslim education in Kazakhstan in the context of the anti-religious policy of the Soviet state and the struggle against ethno-confessional educational institutions in 1920s. The authors explore the features of state policy in the field of Muslim education, its impact on the quantitative growth of Muslim schools in the first half of the 1920s and their almost complete elimination by the end of the decade applying the methods of discursive analysis of previously unused archival sources and regulatory documents. The article considers the main methods of counteraction of the Soviet party and state bodies to the creation and expansion of the network of Muslim educational institutions, the teaching of the Muslim faith in Soviet schools.

Based on the results of the study, it was possible to establish that the loyal policy of the Soviet state in relation to Islamic education in 1917–1926 was due to the political tasks of strengthening the power of the Bolsheviks in the region. Its consequence was the growth of the Muslim movement in the republic, and the network of ethno-confessional educational institutions that had been formed before October 1917 not only grew in number, but also successfully competed with Soviet schools both in material and organizational terms. With the strengthening of the power of the Soviets and with the beginning of the formation of a totalitarian system in the country in the late 1920s, the struggle of the Soviet state with Islamic religious institutions acquired a tough and uncompromising character. Mass liquidation of Muslim religious worship objects began in the republic, mektebs and madrasahs were closed. Such a policy caused the natural resistance of Muslims, suppressed by the authorities with administrative and repressive measures.

Keywords: confessions, Muslim education, Soviet power, religious educational institutions, doctrine, mektebs.

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1. Introduction

Until October 1917, in the education system of the Kazakh Territory, in addition to government (ministerial) educational institutions of various types, there was an extensive network of ethno-confessional educational institutions: parish schools at churches and mosques, madrasas, religious schools, Orthodox missionary schools. The Muslim schools made up the vast majority, which had the character of religious educational institutions and these schools were referred to "native schools" in official documents. They were divided into two types: lower schools – mektebs, higher – madrasahs.

Mektebs functioned in almost every settlement; they were located in mosques and were popular among settled Kazakhs. The nomadic Kazakhs had mobile schools that wandered along with the aul, and temporary schools worked in the winter camps for 3-4 months a year. Children were taught in mektebs by mugallims – teachers from among the Kazakhs or Orenburg Tatars. The education was based on the Tatar literacy; the main subjects were the Koran, history and geography. With the advent of the Sarts, inhabitants of Central Asia, in the Kazakh steppes, the Arabic language and Arabic writing began to penetrate into schools. At the beginning of the 20th century, Muslim schools were widely spread in the south of Kazakhstan and in Central Asia. Therefore, in Syr-Darya region in 1911, 804 mektebs were registered, madrasas – 31, a total number of schools made up 835 (Bobrovnikov, 1913: 41). There were 2437 mektebs and 169 madrasahs in Ferghana region (GAZhO. F. 48. Op. 1. D. 72. L. 13).

Ishans, the preachers who studied in the madrasas of Bukhara, Tashkent, Samarkand, played an important role in the spread of Muslim education in South Kazakhstan. In the steppe part of Kazakhstan, the Tatars contributed to the development of Muslim education. Among the nomadic Kazakhs, the institution of wandering Mugallims became widespread. Hundreds of Mugallims from Orenburg, Troitsk and Kazan traveled across the Kazakh and Turkestan steppes, settled in wealthy families and taught literacy to Muslim children and the Tatar language as home teachers for a relatively small fee (Aziatskaya Rossiya, 1914: 257). "Registration of such schools has always presented great difficulties," wrote imperial officials (Obzor Semirechenskoi oblasti, 1913: 108).

Higher schools madrasahs, by the nature of the sciences taught in them, were exclusively spiritual and legal educational institutions, where mudarrises delivered the lectures, i.e. professors. Their number was insignificant and they were concentrated in the south of Kazakhstan. For example, in Syrdarya region, real madrasahs existed only in Tashkent and Khujand. Both the mektebs and the madrasahs were maintained exclusively at private expense.

A noticeable feature of Muslim education in the Kazakh region at the beginning of the 20th century was the emergence of new-method Jadid schools, which used new teaching methods in their educational practice. At these schools, in addition to subjects of spiritual content, general educational disciplines were taught like arithmetic, geography, pedagogy, literature. Mugallims who studied abroad were the main initiators and adherents of such schools. "The Mugallims who were educated abroad are the authors of the new method of teaching," officials wrote (Bobrovnikov, 1914: 58). The new system of education in Kazakhstan was not widespread, and the new method madrasah was opened in 1912 only in one city – Kostanai.

With the victory of the October Revolution of 1917 in Kazakhstan, as well as in the country as a whole, cardinal changes began in all spheres of public life, including the education system. It was during these years that the pre-revolutionary education system was liquidated and a new Soviet model was formed, which was based on ideological principles. First, confessional educational institutions were closed, Soviet schools, the so-called "schools of a new type", were created throughout the country. Despite the fight against religion declared by the Soviet authorities and the closure of confessional schools, Muslim educational institutions functioned in Kazakhstan until the end of the 1920s. In this context the task of our research is to study the features of state policy in the field of Muslim education, to identify and understand the reasons for its transformation – from a loyal attitude towards Muslim schools in the first half of 1920s to the application of strict legislative and administrative measures to them, prohibiting their activities, up to the liquidation in the late 1920s.

2. Materials and methods

As the main sources, mainly archival documents from the funds of the Central State Archive of the Republic of Kazakhstan, the Archive of the President of the Republic of Kazakhstan, as well

as regional archives of Kazakhstan were used. The regulatory documents of the state on issues of religion and education were studied: the resolutions of the All-Russian Central Executive Committee and the Council of People's Commissars of the RSFSR, the Central Executive Committee and the Council of People's Commissars of Turkestan Autonomous Soviet Socialist Republic (TASSR) and the Kazakh ASSR (KASSR). The paperwork materials of the central (union and republican) and local (provincial and district) educational bodies were analyzed: protocols of the meetings, correspondence with higher management structures on religious issues, reviews of officials on the state of religiosity and dogma in provinces and districts. The materials of current statistics were used as sources, characterizing the dynamics of the number of ethno-confessional educational institutions in the early and late 1920s. The difficulty of using this type of sources is that official statistics are practically absent, and current statistics are not always objective and reliable. To achieve the truth, the authors studied the entire range of statistical materials of management structures at various levels.

The study was carried out based on the theory of modernization used by researchers in the study of the history of state-confessional relations. This paradigm allows us to comprehend the problems of cultural transformation in the context of the modernization processes in society, which had a direct impact on the educational policy of the state. The modernization of the spiritual life of society initiated by the authorities and carried out by administrative, violent methods, caused desperate resistance from the religious part of society, which fought to preserve the objects of worship and confessional schools.

The application of the principles of objectivity, determinism, consistency and historicism made it possible to carry out a critical analysis of the studied processes in dynamics. While working with sources and texts, general scientific research methods were used: analysis and synthesis, generalization, a systematic approach that allows us to consider the studied phenomena in integrity and in interconnection. Special historical methods were applied: historical-systemic and problem-chronological. They made it possible to formulate the author's view on the processes of evolution of state policy towards Muslim educational institutions in Kazakhstan in 1920s. The comparative-historical method was used to compare the general and the specific in the anti-religious educational policy of the Soviet state in the national outskirts.

3. Discussion

The scientific problems of the activities of Muslim educational institutions in Kazakhstan in the first decade of Soviet power are relevant both from the point of view of the needs of an objective assessment of the Soviet state policy regarding ethno-confessional schools, and in the context of the importance of studying archival sources that were not previously used by researchers. Meanwhile, it was not the subject of independent study. Most of the research on the activities of Muslim educational institutions in Kazakhstan is devoted to the pre-revolutionary period. The scientific interests of the authors are focused on the study of the policy of the imperial authorities in relation to Muslim education. In the proceedings of Lysenko Yu.A. debatable issues about the departmental affiliation of Muslim schools in Turkestan, a region that at the beginning of the 20th century included the regions of Southern Kazakhstan are discussed ([Lysenko, 2018: 759-767](#)). In P.P. Litvinov's works, the problem of confessional educational institutions in the context of the general trends in the religious policy of the autocracy in Turkestan region is considered ([Litvinov, 1998: 319](#)). The history of Muslim education in Northern Kazakhstan in the second half of the 19th – early 20th centuries were revealed in the work of Zh.E. Nurbaev ([Nurbaev, 2016](#)). An analysis of the content of curricula in Muslim schools in Kazakhstan and the provision of their educational literature is presented in the works of Razdykova G.M. ([Razdykova, 2018](#)).

The scope of research devoted directly to the study of the activities of Muslim educational institutions in Kazakhstan in the first decades of the victory of Soviet power is practically absent. However, it should be noted the works in which the issues of Muslim education are partially studied in the context of the general problems of the anti-Islamic policy of the Soviet government in the designated period. Z.T. Sadvokasova considers the history of the development of Muslim education in Kazakhstan in the 20th century through the prism of the colonization policy of both autocracy and the Soviet government, and characterizes their attitude towards Muslim schools as sharply negative and hostile. According to the author, despite the change in ideology after October 1917, russification policy was continued in the field of education under the protection of the

internationalist slogans (Sadvokasova, 2000: 76-81). Mustafaeva A.A. substantiates the point of view that the translation of the Kazakh alphabet from the Arabic script into the Latin alphabet was caused by the tasks of “destroying the influence of Islam” and Islamic education (Mustafaeva, 2012: 31-35). According to the authors S.M. Tumenova and B.A. Chakenova the problems of Soviet school construction in 1920s and significant differences in the number of Soviet schools in the southern and northern regions of Kazakhstan are explained by the high religiosity of the population of the south of the republic (Tumenova, Chakenova, 2014: 135-138).

4. Results

The beginning of changes in the system of Muslim education was laid by the Decree of the Council of People's Commissars of the RSFSR of January 20, 1918 "On the separation of the church from the state and the school from the church." The articles of the Decree said: “The school is excommunicated. The teaching of religious beliefs in all state, public and private educational institutions where general education subjects are taught is not allowed. Citizens can teach and learn religion in private” (TGA RK. F. 15. Op.1. D. 394. L. 7-8). With the publication of the Decree, the struggle for the ideological re-education of the people began, which determined the policy of the Soviet state in relation to confessional education. All religious groups and communities were subject to registration, and the clergy were registered in order to control their activities. For each clergyman, a questionnaire was drawn up, in which, in addition to general information, the attitude to the Decree and Soviet power was necessarily indicated. At the end of the questionnaire there was a postscript “For incorrect answers you will answer before the court of the Revtribunal” (GAPO. F. 17. Op.1. D. 2. L. 50).

The Decree was followed by several resolutions of the Soviet government agencies regarding the activities of theological educational institutions. The Decree of the State Commission for Education of February 18, 1918 "On the Soviet School" prohibited the teaching of religious beliefs in all state, public and private educational institutions run by the People's Commissariat for Education (PCE) for individuals under 18 years of age. A ban on the performance of religious rites in schools was introduced (Preodolevaya religioznoe..., 1990: 21). By the decree of the same commission of August 24, 1918, “On Theological Educational Institutions,” all theological educational institutions were to be closed, no matter whose funds they were maintained, and the students of these schools could continue their education in Soviet general education schools (GAZhO. F. 48. Op. 1. D. 72. L. 88). The buildings of the former theological educational institutions with their equipment, libraries and inventory became the property of the state; they were under the jurisdiction of local government bodies and were used for educational purposes. For individuals over 18 years of age, special theological courses for the training of clergy were allowed, but on condition that the course programs would be significantly limited. Referring to the articles of the Constitution of the RSFSR of 1918, the authorities not only banned the teaching of all confessions in schools, but also, by a special circular order of the regional departments of public education, stopped paying salaries to teachers of the theology (TGA RK. F. 1398. Op.1. D. 216. L. 69). In the localities, the county governments massively dismissed ministers of religious cults from teaching positions and heads of educational institutions (Preodolevaya, 1990: 24).

On April 23, 1921, the NCE issued a resolution “On the Teaching of the Law of God to Children under 18”, according to which the teaching of religious beliefs was prohibited. The resolution obliged the provincial departments of public education (PDPE) to take local measures of control and detection of violations of the provisions of the Decree of the Council of People's Commissars of the RSFSR of January 20, 1918 (GAZhO. F. 48. Op. 1. D. 72. L. 89). However, the provisions of the decree did not apply to the indigenous population of the TASSR, which included the southern regions of Kazakhstan – Syr-Darya and Semirechensk. Moreover, the People's Commissariat of the RSFSR, taking into account the local national living conditions and the high degree of Muslim religiosity of the population, allowed the teaching of the faith in Soviet schools of indigenous peoples, including Kazakhs. The authorities explained their decision by the tasks of strengthening Soviet schools and involving the population of the national outskirts in these schools. “It is extremely important that the population get used to Soviet schools. The Soviet school will gradually take root in local life. In all Soviet schools of the indigenous peoples of Turkestan, additional classes in religion are allowed at the request of the population of the given region” (GAZhO. F. 48. Op. 1. D. 72. L. 13). The fourth hour of daily lessons was allotted

for doctrinal studies. A mullah or a teacher of this school, who was paid for these hours, taught the religion lesson. According to officials, this was supposed to inspire the confidence of the Muslim population in the Soviet school.

Other circumstances forced the authorities to make concessions to the Muslim population of the southern regions of Kazakhstan. As early as at the beginning of the 1920s, it became completely clear that the Soviet schools opened in the TASSR could not compete with confessional ones, both in terms of material and ideological ones. Right after the October Revolution of 1917, confessional schools lost their material base – waqfs, lands bequeathed or donated by the nobility and merchants for religious purposes. Waqfs were the main source of existence for the clergy and Muslim educational institutions. However, during the years of the New Economic Policy (NEP), the material base of confessional schools was strengthened thanks to the government's policy of supporting waqfs. By a decree of the Council of People's Commissars of the TASSR of March 17, 1923, the waqfs were considered as "having economic, cultural and educational significance" by the Soviet authorities (TGA RK. F. 30. Op. 1. D. 126. L. 69). Soviet schools, on the other hand, experienced financial difficulties, despite the fact that the NCP, local party and Soviet bodies dealt with the issues of their organizational strengthening. The material insecurity of Soviet schools and teachers undermined its authority and status.

Soviet schools were not popular among Kazakhs, especially in the Islamized southern regions of the republic, and the historical experience of past years affected here. Even pre-revolutionary officials wrote about the attitude of the Kazakhs towards government schools: "Muslims are accustomed to seeing missionary and Russification goals in almost all government activities, and especially in the educational part" (Bobrovnikov, 1913: 67). The Muslim clergy carried out intense agitation against Soviet schools. The main figure in the confessional school was an influential mullah, whose personality was associated with the traditions of the population. The basis of the Soviet school consisted of teachers who had undergone a short-term 2-6 month training, which was clearly not enough for them to obtain high qualifications. It took 4-5 years to train a qualified teacher, and in the conditions of the post-war economic devastation, the state did not have enough material resources, so they temporarily limited themselves to short-term teacher training (GAZhO. F. 48. Op. 1. D. 72. L. 13). Under these conditions, it was decided to introduce the teaching of the religion in Soviet schools and thereby strengthen it organizationally and economically as a measure to strengthen Soviet schools.

During the years of the New Economic Policy in the TASSR, the activities of mektebs and madrasahs were officially allowed. On February 21, 1923, the People's Commissariat of Internal Affairs (PCIA) of the TASSR, which clarified the issues of teaching Islam (GAZhO. F. 50. Op. 1. D. 316. L. 13). The developers of the resolution referred to the fact that the Decree of the Council of People's Commissars of January 20, 1918 "On the separation of church from state and school from church" and the instruction of the People's Commissariat of Justice (PCJ) of August 24, 1918 on this issue in the regions of the TASSR were interpreted by Muslims in different ways. In some regions, mullahs were repressed for teaching Islam in mosques. In others, on the contrary, the mullahs were given permission to teach Islam in their own schools. The decree noted that the activities of theological schools, which are supported by voluntary donations, are prohibited, and they must be closed. At the same time, it was especially emphasized that madrasahs and mektebs do not belong to theological schools. Therefore, repressions against mullahs teaching the dogma of Islam in mosques, at home or in private schools are unacceptable. Any attempts by the Soviet government to ban the teaching of the Muslim faith ended in a concession to the population. In April 1922, the collegium of the People's Commissariat of the KASSR banned the teaching of the Muslim faith in schools in the northern and central regions of Kazakhstan with a special circular. The circular noted the facts of violation of the articles of the Decree of the Council of People's Commissars of the RSFSR of January 20, 1918 by school workers who, under pressure from the local population, taught religious subjects in Soviet schools. The circular allowed local authorities to bring such teachers to the court of the Revolutionary Tribunal and remove them from their positions "as not standing on the platform of socialist construction" (Preodolevaya religioznoe..., 1990: 53).

The decision of the board caused discontent among the Muslim population. In an attempt to prove their right to own school buildings, Muslims filed petitions and complaints with various authorities, demanding the release and return to believers of the previously confiscated buildings of the mektebs for teaching the religion. They referred to the decision of the Commissariat for

Nationalities of August 21, 1920, which stated, “the premises of individual Muslim schools can be returned if it is established that they really are only theological schools and were built exclusively at the expense of the Muslims themselves. ...” (AP RK. F. 140. Op. 1. D. 30. L. 5). The mufti of the Orenburg Mohammedan Spiritual Assembly supported the claims of the believers, which was in charge of the Muslims of Kazakhstan. The emerging situation was not in favor of the state, since Soviet schools were already located in the buildings of former confessional schools. For example, out of 104 Soviet schools in the Pavlodar district, only 10 were located in state-owned premises, and the buildings of 94 schools belonged to local Muslim communities (TGA RK. F. 81. Op. 1. D. 785. L. 83). The authorities were forced to give in, and allowed the population to engage in dogma for an hour every day in the premises of Soviet schools after they had completed classes in general education disciplines. At the same time, teachers of the Soviet labor schools, as well as other educational workers, could not be teachers of the religion.

The issue of teaching the religion was one of the main points, on which the clergy focused, giving it maximum attention. Imperial officials tried to explain it at one time: “To understand the significance of educational institutions among Muslims of foreigners, it is enough to remember that according to the Muslim dogma, “every Muslim must study during his life, as Allah ordered to study.” Therefore, Muslims in every country and every village should have mektebs and madrasahs in which Muslims could study religion and science” (*Asiatskaya Rossiya, 1914: 257*). That is why the struggle against the Muslim faith formed the basis of all the anti-Islamic measures of the Soviet government.

The Decree of the Presidium of the All-Russian Central Executive Committee dated June 9, 1924 “On the Muslim Faith” became the legislative basis for the revival and expansion of the teaching of the Muslim faith in Kazakhstan. It constantly stated the inadmissibility of teaching the religion in state and private educational institutions of the country. Meanwhile taking into account the peculiarities of the life of the Turkic peoples, the All-Russian Central Executive Committee allowed the teaching of the Muslim religion in mosques to the individuals who had completed the full course of the first stage of the unified labor school, and to the people who had reached the age of 14. Before that, it was allowed to teach the religion to the individuals who had reached 18 years of age. Following the decree, the Instruction of the Central Executive Committee of the KASSR dated January 29, 1925 “On the teaching of the Muslim faith in the republic”, which determined the procedure for teaching in Muslim mosques on the territory of the KASSR was issued. The above-mentioned instruction included several points: 1. Teaching exclusively in the mosques, in which Muslim believers concluded the agreements with the Soviet authorities and observed their implementation; 2. Teaching only during those hours when classes and excursions are not conducted in labor schools of the first and second levels of the given locality; 3. Teaching other subjects are not allowed except the religion only; 4. Attending these classes was voluntary, the attender had the right to leave the course at any time; 5. Compliance with sanitary requirements; 6. Teaching only at the expense of voluntary donations; 7. People who were blameless in court and elected by the religious community could teach there (TGA RK. F. 81. OP. 4. D. 2. L. 83-84). To organize teaching, special permission from the provincial administrative department or the district police department was required. In case of violation of the instructions, the provincial authorities could not only warn, but also raise the issue of removing the teacher and terminating the contract, up to the initiation of a criminal case.

With the release of the decree of the All-Russian Central Executive Committee, the Central Spiritual Administration (CSA) of Muslims sent out instructions to all muhtasibats (muhtasibats are spiritual administrative associations of Muslims) on the procedure for teaching the religion and dozens of circulars on opening schools at each mosque. The process of Islamization of the education system covered almost the entire republic. In Kazakh auls and villages, according to reports from local officials, Muslim schools were established en masse. Wherein, the points of the resolution of the All-Russian Central Executive Committee of June 9, 1924 were often violated and ignored: “The doctrine of faith proceeds spontaneously, taking on a threatening character. In some areas, the religious schools are far superior in quantity and quality to the Soviet schools” (AP RK. F. 141. Op. 1. D. 1541. L. 29).

The Muslim clergy made efforts to popularize schools of faith: the mullahs campaigned to discredit Soviet schools, accepted children from the poor strata of the population to schools free, formed public contempt for people who send their children to Soviet schools, tried to subordinate

Soviet schools to their influence by combining faith with secular education. There were transfers of teachers from Soviet schools to religious ones due to material insecurity. Due to the lack of advanced Soviet schools in the republic, the graduates of the first grade Soviet schools were enrolled to study with the mullah.

According to the data of All-Union School Census, in these years girls were more actively attracted to Muslim schools of faith, which was not typical for traditional Muslim schools, where boys predominated. So, in the city of Aulie-Ata (now Taraz city), out of 514 students, there were 323 girls (Preodolevaya religioznoe..., 1990: 155). Involving girls in religious schools, the clergy strove for greater influence on a woman, as the guardian of family, domestic and spiritual values, as a future educator.

According to the officials, one of the reasons for the desire of the clergy to expand the network of schools of faith, in addition to the desire to preserve and strengthen the religiosity of the masses, was economic interest. In the 1920s, the income of the clergy was significantly reduced because they were removed from the performance of acts of civil status and did not participate in the work of the judiciary. The teaching of the religion became almost the only source of income. The reports of officials give the following figures: in the schools of the Turkestan district, the payment in cash and in kind for teaching the religion was 5 rubles per month. On average, the school had 20-25 students. Consequently, the mullah – religious teacher received 100 rubles a month and 499-450 rubles for the academic season. There were 177 schools in the county, their content, respectively, was 70-90 thousand rubles (Preodolevaya religioznoe..., 1990: 155).

In 1923–1926, there was a noticeable growth of the Muslim movement and Muslim educational institutions in Kazakhstan. Therefore, in the Semirechensk province in 1925, there were 458 parish Muslim councils and 210 religious communities (Kazakh, Taranchin, Uzbek, Dungan, and Tatar) were registered, 28 Kazakh and 28 Taranchin Muslim schools were officially opened (Preodolevaya religioznoe..., 1990: 110-111). The information report of the Regional Committee of the Communist Party of Kazakhstan for the first quarter of 1925, gives the following characterization of the religious movement among the Kazakh population: “In the Ural, Bukhara, partly Turgai and Aktobe provinces, there are tens of thousands of murids, hundreds of Muslim schools. Local authorities, with the help of the population, built premises for religious schools, houses of mullahs and new mosques in a number of nomadic regions, such as Adayevsky, Turgaysky and others, throughout 1924” (AP RK. F 139. Op. 1. D. 1229. L. 230).

Meanwhile, Muslim schools were active in the northern regions, where the number of Muslims was not dominant. Regional officials in their reports noted the strong influence of the Kazakh and Tatar clergy in the northern provinces of Kazakhstan. Therefore, in Akmola province there were three officially operated Muslim schools in 1926: 1 – in Akmolinsk, 2 – in Petropavlovsk. Totally, they trained 121 people. The imams of Akmola province considered this number insufficient and filed a petition to open seven more schools: five in Petropavlovsk, one school each in Akmolinsk and Kokshetau. They also repeatedly applied for the opening of a madrasah. One of the imams in Akmolinsk city taught at his parish 20 Muslims according to the madrasah program (Preodolevaya religioznoe..., 1990: 121). In the city of Petropavlovsk, there were eight mosques and Muslim schools functioned at each mosque, 320 people studied in them (GASKO. F. 2376. Op. 1. D. 1. L. 16).

According to the official review of the activities of the Muslim clergy in 1927, the growth of Muslim education was due to several reasons. One of them was that the organizational formation of the Muslims of Kazakhstan took place. Until 1917, the Kazakh clergy did not belong to the CSA, and parishes in the steppe existed spontaneously, without any signs of organizational building. The organizational formation of the Kazakh clergy begins after the II All-Russian Congress of the Muslim clergy in Ufa in 1923, at which two members of the CSA were elected from the Kazakhs and the Kazakh branch was created under it. In 1925, there were 55 officially registered muhtasibats in the republic (AP RK. F. 141. Op. 1. D. 1541. L. 28-39).

In the period preceding the III All-Russian Congress of Muslims, held in October 1926 in Ufa, the Islamic movement in Kazakhstan was growing. Intensive preparations were underway for the congress, at regional and district congresses of Muslims the issues included in the instructions of the delegates to the congress were discussed. The main point of the mandates of the Kazakh Muslims was the requirement for the authorities to expand the scope of the religious study and provide the clergy with unlimited rights regarding the age of students and the place of study (AP RK. F. 141. Op. 1. D. 1541. L. 28). One hundred and thirty five delegates from Kazakhstan with

a decisive vote participated in the congress; it was the largest representation in comparison with other regions of the USSR.

Table 1. Muhtasibats in Kazakhstan in 1925

| No | Name of administrative entities | Number of muhtasibats |
|----|---------------------------------|-----------------------|
| 1 | Aktobe province | 11 |
| 2 | Ural province | 10 |
| 3 | Semipalatinsk province | 8 |
| 4 | Syr-Darya province | 5 |
| 5 | Semirechensk province | 5 |
| 6 | Akmolinsk province | 5 |
| 7 | Kustanai district | 6 |
| 8 | Kara-Kalpak region | 4 |
| 9 | Adayevsky district | 1 |
| | Total | 55 |

Note: The table is compiled based on data: Archive of the President of the Republic of Kazakhstan. F. 141. Op. 1. D. 1541. L. 38-39.

Meanwhile, the result of a loyal policy towards Islamic education was the growth of illegal Muslim schools. In a review of the state of the religious movement in Kazakhstan for 1927–1928 years the following figures are given. The Soviet authorities recorded 276 illegal religious schools in Syr-Darya province with a total number of students 5155 people aged from seven to forty-five in 1928: 160 Uzbek, 115 Kazakh and one Tatar schools. It is noteworthy that 80 % of the schools in this province opened in the post-revolutionary period, and only 20 % in the pre-revolutionary period (Preodolevaya religioznoe..., 1990: 154). In Semirechensk province, 20 illegal schools were liquidated, in which children from 8 to 15 years old studied. On average, each school had from 15 to 75 students (Preodolevaya religioznoe..., 1990: 111). Even after the official closure, three schools continued to teach children. There were 18 schools in Ural province, each of which taught from 20 to 50 people. In Akmola province, 11 schools functioned illegally, where 109 people studied (Preodolevaya religioznoe..., 1990). In other provinces and districts of the republic, 20 schools were identified, where 1946 students studied (Preodolevaya religioznoe..., 1990: 154).

Schools of faith also worked in separated villages, as reported by the information reports of the authorized representatives of the Department of State and Political Administration (DSPA) for the KASSR: "In village No. 4 of the Dombarovskiy volost, a mullah teaches religious doctrine to students" (OGASPI. F. 1. Op. 1. D. 441. L. 81). Mullahs of 8 and 10 auls of Bukhtarma district of Semipalatinsk province in their sermons urged believers to collect funds for the benefit of the mosque and open Muslim schools (AP RK. F. 718. Op. 1. D. 434. L. 37).

Naturally, in conditions of increased religiosity of the population, it was not easy to resist religious education. In the texts of officials' reports, there is a lot of information that "the struggle of administrative, judicial and educational bodies with illegal beliefs in Kazakhstan took place with great difficulties" (AP RK. F. 141. Op. 1. D. 1541. L. 32). Aul councils and volost executive committees often supplied the clergy with all sorts of fictitious documents about the age of students. The facts of violations of the law by the clergy that fell into the bodies of inquiry and investigation did not receive proper movement and registration, and in most cases were reduced to nothing.

The activity of the "Islamic factor" aroused serious fears in the authorities, who seemed to be losing their ideological influence among the masses. In 1926, "Theses on anti-religious propaganda among the Muslims of the KASSR" were published, in which the growth of Islam and the Muslim clergy was noted (AP RK. F. 141. Op. 1. D. 980. L. 103). For the first time, the thesis about the "anti-Soviet nature" of Islam appears in official documents. Accordingly, it was instructed to act appropriately to suppress religious activity – "to expose Islam as an instrument of class enslavement. "The decisive role in carrying out ideological work and instilling an atheistic worldview among the population was assigned to Soviet schools, in which anti-religious events were held, communities of atheists were founded (GAPO. F. 17. Op. 1. D. 2. L. 119). The anti-

religious campaign in the education system was carried out by the Bolsheviks with harsh methods, offering communist ideology with its own deities as an alternative to religion and proclaiming the goal of anti-religious education to be “replacing faith in God with faith in science and machine” (Pipes, 2005: 221).

By the end of the 1920s, government policy towards Islam is tightened. It is no longer so much about “anti-religious agitation and propaganda”, but about “measures to combat Islam” (TGA RK. F. 81. Op. 4. D. 15. L. 102). It becomes obvious that the Soviet government aimed to bring society to a single worldview – an atheistic one, and the Muslim education system was an obstacle on this path. The first document that marked the beginning of the fight against Islamic education was the decision of the bureau of the Kazakh Regional Committee of the All-Union Communist Party of Bolsheviks “On measures to combat the Muslim religious movement” of June 8, 1927. The above-mentioned decree forbade the Muslim clergy to create religious schools of the reformist Soviet type in mosques, in which, in addition to religious ones, general subjects were also taught. Soviet teachers and employees of state institutions were forbidden to teach the religious subjects. The procedure for obtaining permission for mullahs to teach the religion was complicated; provincial governments with the obligatory sanction of the presidium of the provincial executive committee could only carry out permission (TGA RK. F. 81. Op. 4. D. 3. L. 277-284).

The decisive step in the fight against Muslim schools was the decision of the Presidium of the All-Russian Central Executive Committee of the USSR of June 18, 1928 on the abolition of all previously adopted resolutions that allowed the teaching of the Muslim religion: "On the Muslim religion" of June 9, 1924, "On the permission to teach the Muslim religion to the Turkic peoples origin" dated July 24, 1924, "On the approval of the instructions of the people's commissariat of internal affairs PCIA and the people's committee of education PCE on the teaching of the Muslim religion among the Eastern peoples confessing the Muslim religion" dated July 27, 1925 (TGA RK. F. 81. Op. 4. D. 8. L. 317). Based on the decision of the All-Russian Central Executive Committee, on May 11, 1929, the Central Executive Committee of the KASSR adopted a resolution “On the termination of teaching of the Muslim religion in all mosques and schools” (TGA RK. F. 81, Op. 4. D. 15. L. 102).

Several administrative structures were involved in the implementation of the resolution on the places. From July 1, 1929, the public education authorities banned the teaching of faith, religious schools were closed, and the vacated buildings were used for cultural purposes (GAPO. F. 22. Op. 1. D. 25. L. 49). District executive committees stopped issuing permits for the opening of theological schools and controlled that the clergy did not reopen them under the guise of Soviet-type general education schools (GAPO. F. 844. Op. 1. D. 2. L. 34). The bodies of the PCIA of the KASSR were also involved in the control of the educational activities of the Muslim clergy. Through organizations subordinate to the PCE, they collected information about the mood of the population, about the facts of illegal teaching of faith, the quantitative and ethnic composition of students, and training programs (TGA. F. 81. Op. 2. D. 8. L. 181). George Orwell was right when he wrote, “a totalitarian state necessarily tries to control the thoughts and feelings of its nationals, at least as effectively as it controls their actions...” (Orwell, 1989: 245). All information regarding spiritual education was submitted under the heading "secret". Both the republican and district presidiums, which considered the issue of Muslim education, were held behind closed doors. In the materials of the secret correspondence of the PCIA and the PCE of the KASSR, in the reports of the administrative departments of the district police for 1929-1930 there is information about bringing clerics to criminal responsibility for teaching the doctrine of faith (GAPO. F. 22. Op. 1. D. 25. L. 16). In the late 1920s local officials in the messages to the republican ministries reported on the mass liquidation of mosques and Muslim schools. Here is an excerpt from the report of the officials of Aulie Ata city dated January 20, 1930: “We inform you that there are no functioning mosques and religious schools in Mirzoyan city (Auliye-Ata)” (GAZhO. F. 7. Op. 1. D. 87. L. 3). In one of the districts of the South-Kazakhstan region, all 30 mosques of the district and the mektebs and madrasahs functioning with them were closed (TGA RK. F. 789. Op. 1. D. 29. L. 52). In the first quarter of 1928I in Dzhambeitinsky district of the Bukeev province, 9 mosques and 11 mektebs were closed, and the mullahs were put on trial (AP RK. F. 789. Op. 1. D. 13. L. 28). By 1931 in the regions of western Kazakhstan, all religious buildings, including mosques and madrasahs, were liquidated (TGA RK. F. 789. Op. 1. D. 29. L. 53). Such statistics are typical for all regions of Kazakhstan.

5. Conclusion

Thus, the policy of the Soviet government in relation to Muslim education in the 1920s was complex and ambiguous. Moreover, here we should agree with J. Hosking's opinion that "the relationship between Bolshevism and Islam was contradictory. The atheism of the Marxists is incompatible with the strict monotheism of Islam in principle" (Hosking, 1994: 112). In the first half of the 1920s. The Soviet state pursued a loyal policy towards Islam, allowed the activities of Muslim educational institutions and the teaching of the Muslim faith in Soviet schools, referring to the peculiarities of the cultural and historical traditions of the Kazakhs. This "democratic" was due to the political tasks of the Bolsheviks to strengthen their power on the national outskirts of the country. To a certain extent, it contributed to the growth in the number of ethno-confessional schools. In the conditions of the underdevelopment of the educational infrastructure, the lack of school buildings and teachers, the use of intellectual resources and the material base of confessional schools would contribute to the elimination of illiteracy and the development of education. With all the shortcomings of confessional schools (outdated methods of memorizing texts, the use of corporal punishment), one cannot detract from such advantages as closeness to the people, focus on moral issues in educational programs. However, due to ideological reasons, the Bolsheviks launched a struggle against ethno-confessional schools. With the strengthening of Soviet power in the second half of the 1920s, the policy of the state acquired the character of a cruel and uncompromising struggle against religion and the clergy. Due to it, a complete ban on religious education was introduced, and theological schools were closed. In the early 1930s, Muslim educational institutions were almost completely ousted from the educational space of the republic.

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