European Journal of Contemporary Education

Has been issued since 2012.
E-ISSN 2305-6746
2021. 10(1). Issued 4 times a year
MIAR ICDS 2021 – 9,5

Journal is indexed by: **Cross Ref** (USA), **EBSCOhost Electronic Journals Service** (USA), **Electronic scientific library** (Russian Federation), **Global Impact Factor** (Australia), **Index Copernicus** (Poland), **Journal Index** (USA), **Open Academic Journals Index** (USA), **Scopus** (Netherlands), **Web of Science** (USA).

All manuscripts are peer reviewed by experts in the respective field. Authors of the manuscripts bear responsibility for their content, credibility and reliability.

Editorial board doesn't expect the manuscripts' authors to always agree with its opinion.

Postal Address: 1367/4, Stara Vajnorska str., Bratislava – Nove Mesto, Slovak Republic, 831 04

Website: http://aphrsro.net
E-mail: ejce.aphr@gmail.com

Founder and Editor: Academic Publishing House Researcher s.r.o.

Release date 15.03.21
Format 21 × 29,7/4.

Headset Georgia.

Order № 234.

European Journal of Contemporary Education

2021

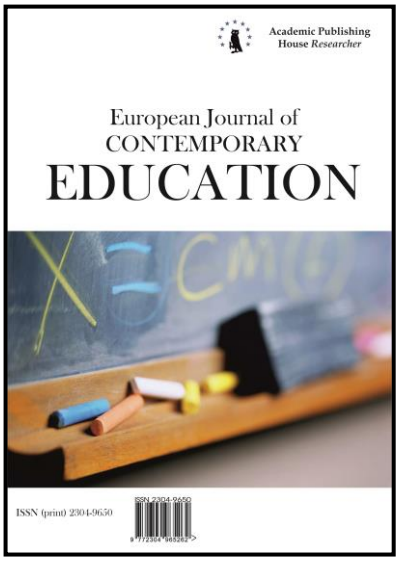
Is. 1

C O N T E N T S

The Problems of Contemporary Education

The History of Education

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 4-17
DOI: 10.13187/ejced.2021.1.4
www.ejournal1.com



The Problems of Contemporary Education

Extent of Use of Social Networks by Faculty Members of Hashemite University

Hytham M. BanyIssa [a], Zohair Hussein AlZoubi [a, *], Rana Mohammad rawashdeh [a]

[a] Hashemite University, Jordan

Abstract

The study aimed to identify the extent to which the faculty members of the Hashemite University use social networks, seen from their point of view, and also aimed to identify if there statistically significant differences in the extent to which the faculty members use social networks, by faculty, country of graduation, academic rank, and years of experience variables. The study's data was collected through a questionnaire distributed to 225 faculty members who were selected in available sample random way in the second semester of the academic year 2019/2020. A tool was developed to measure the faculty members' use, and it consisted of 42 items. The results showed that the degree of social network use among faculty members was high in all disciplines, from the teaching field (highest) to scientific research and the community service field. There were significant differences in social network use due to faculty variable, in favour of science faculty members. And there were significant differences in social network use due to years of experience variable, in favour to the faculty member who has 5-10 years of experience in teaching, but no statistically significant differences in social networks use due to country of graduation and academic position variables. Researchers recommendations to support faculty members and encourage them to evaluate the impact or effects of using different technologies in the educational process.

Keywords: social networks, faculty members, Hashemite University.

1. Introduction

Communication in the field of education is considered an absolute necessity to transfer ideas and information between all parties involved in the educational process through written, oral or modern communication techniques. The latter facilitate the communication process and diversify its channels through technical development, diversity of approaches and electronic programs that

* Corresponding author
E-mail addresses: zohair971@yahoo.com (Z. Hussein AlZoubi)

make communication and information exchange between individuals and institutions very easy (Al-Shyab, 2001).

All means of communication, whether visual, audio or electronic, contribute to the efficient dissemination of information, improvement of the educational process, problem management, clarification of educational situations, transformation of ideas, experiences and professionalism from specialists to the education field. Networking delivers them and makes it possible to achieve better performance (Bomravi, 2001).

The rapid development of technology was a breakthrough from all scientific, cultural and social aspects, and leading to the emergence of social networks which reduce distances, transform the world into a small global village, and are intertwined with all aspects of life, influencing human behaviour and decisions. Traditional forms of communication between the university and its social and administrative surroundings were not immune from these effects, connecting family and university, the two most important educational institutions in society, in order to achieve society's goals of creating good citizens (Ibrahim, 2014).

As a result, social media platforms have become a mainstay of the educational process, making specialists in the field of education consider the importance of distance learning, with its clear impact on the effectiveness of the educational process (Hassan, Salah, 2015). Social media sites, Face book in particular, have contributed to a re-formulation of the relationship between teacher and student, among students themselves, and among teachers themselves, providing a strong motive to learn, and strengthening the relationship between these parties. The impact of social media is such that some researchers have predicted that in the near future it will become a replacement for e-learning programs (Al-Mansour 2012).

Universities are a source of cultural inspiration for any society, with three functions: education, scientific research and community service. These public functions do not change with time or place, and are pivotal to the university's objectives, policies, strategies and action plans (Saleh, 2003). Universities also play an important, distinctive and comprehensive role in all these activities through their faculty members (Al-Zahrani, 2013). The university is one of the most important social institutions influencing and being influenced by the social atmosphere surrounding it. It is a community-based organization on the one hand, and on the other hand it is instrumental in fostering artistic, professional, political and intellectual leadership (Amer, 2007). The university has an important social role, defined in the following functions: preparing human resources, carrying out scientific research, contributing to the process of socialization, the transfer of culture, and dealing with issues and problems of the society and its service and development (Al-Samadouni et al., 2005).

The work of teaching in the university is one of the basic pillars provided by faculty members; it has clear effects on the local community in general and on students in particular. Teaching is an activity practiced by faculty members with the aim of developing the whole educational process, contributing to the development of human resources, and increasing the efficiency and development capacity of many aspects of work (Diab, 2006).

In order for the university professor to fully practice teaching, he should be proficient in his field of specialization, have wide knowledge, be familiar with the latest theories and educational applications, present lesson topics in a clear and logical manner, and take into consideration the individual differences between students (Oda, 2014).

The other major task of a faculty member is scientific research, a measure of the university's scientific and academic level. The university is the first and natural place for research for many reasons, including: the presence of a large number of specialists in the faculty, the presence of a number of research assistants and graduate students, the availability of various research materials such as laboratories, devices and tools to conduct objective and accurate measurements, and the availability of the necessary data collection resources for scientific research (Al-Zamil, 2005). The faculty members need "professional competence as an academic scientist, psychological observer, social leader, ethical educator and technological engineer" (Abu Raya, 2005).

If a faculty member is an active agent in the university's performance, then any imbalance in his preparation process will negatively affect the teaching performance and the quality of education. This requires that the permanent education centre in the university trains faculty members to adopt the required scientific standards in order to achieve total quality in university programs, and to improve their contribution to developing these scientific methods. This is because

the university teacher occupies a central position in any educational system, as one of the active influential elements in achieving the objectives of that system, and is the cornerstone of any reform project (Alzboon, 2018).

The university, whether government or private, is an important part of the local community in which it is established. It undoubtedly contributes to its advancement and progress through the message of education, serious scientific research, interaction with society and work to meet its needs and aspirations. The normal and logical situation is therefore that the university reflects the reality of the community and takes into consideration the circumstances and possibilities of the members of that community, when deciding whether to study at the university or to be employed in the various administrative or academic university jobs. This is in accordance with the philosophy of the university's establishment, embodying justice and equal opportunity principles (Awad, 2014).

The university's service to the community is the actual translation of the university's function to teach individuals to adapt to the rapid changes in the world of science and technology, as well as to the increasing cultural needs that have resulted from the expansion of leisure time and facilities provided by modern means of communication (Al-Shahri, 2012).

Social networks are considered one of the most important technological phenomena of recent years, with the number of users increasing exponentially with the widespread use of laptops and advanced generation phones (Al-Khatib, 2006). Modern fast life has contributed to this spread because everyone is leading a busy life, and exchanging messages, conversations, photos and videos. University professors can use social networks in university teaching by creating a page on any social networking site in which students participate and share their opinions, helping the professor to identify content and formulate objectives (Awad, 2014). Communicating with students through interactive discussions about important topics, teachers can engage students in the implementation of projects related to the promotion of their educational institutions, in order to measure their talents, enrich their abilities and increase their self-confidence (Radi, 2003). The professor can also lecture to a large number of students through distance learning or YouTube. He/she can choose his/her office hours in which students communicate to ask questions, receive answers, and contribute to the transfer of education from the stage of competition to the stage of integration by requiring all learners to participate, have dialogues and gather information (Al-Shahri, 2012).

Given the importance of information obtained from the Internet, an urgent need a rosein educational institutions, including universities, to keep abreast of the technological innovations, including Internet applications to access all aspects of knowledge (Al-Hadi, 2005). The use of Internet technology is continuing to develop and expand, and its introduction into the educational process has become urgent, as it plays a key role in constantly providing renewable scientific information, and teaching the syllabus (Muhammad, 2013). In line with the great changes being witnessed in contemporary global society, in this information age and communications revolution, the programs of all educational institutions , need to be reviewed and developed.

Many studies advise introducing the Internet in education because, unlike many other educational tools, it is modern, constantly updated and provides a wide range of information. Opportunities for teachers or students include online participation in conferences, free learning environments and self-learning programs (Nino, 2013), They also gain positive skills, such as team building, communication, problem solving, and creative and critical thinking (Al-Khatatbeh, 2018).

The Internet facilitates obtaining as much information as possible from around the world, with knowledge of different learning styles such as collaborative learning, self-learning, more than one ways of teaching, and knowledge sources from books, movies and programmers for different educational levels (Al-Najjar, 2001).

There are many obstacles that hinder scientific research in Arab universities and institutions of higher education; to overcome these, it is essential to use modern technologies, especially the Internet, to solve communication problems between the researcher and the outside world, and to make available new and specialized information for researchers (Al-Raaod, 2012).

The successful use of the Internet in scientific research and higher education depends on several factors, the most important of which is easy access to high-quality information sources, which will change the teacher’s role and prompt educational institutions to rebuild their internal units (Hamad, 2018).

Because the modern university's mission is to provide education, scientific research and community service, it is the society's mind and the society's mind is scientific research (Al-Jamal, 2013). Therefore, distinguished researchers, intellectuals and the enlightened are the minds of the community, who are leading its development and progress, and directing its programmers and development plans in all fields (Rabie, 2011). Universities that have not yet recognized the importance of scientific research, thinking their job is only to graduate students without any interest in scientific research or preparation for the present and future, are little more than an extension of primary and secondary education; they are losing sight of the economic importance of scientific research, and the need to develop it (Khadija, 2014).

The use of social networks has been addressed by any number of researchers. For example, Kelly (2002) found that the faculty members in the scientific disciplines at the University of Maryland in America use the Internet more than practitioners of other disciplines, including using the Internet over a longer period of time, and for multiple purposes. A study in African universities (Adeya, Oyeinka, 2002) found that faculty members use the Internet in teaching and research. Al-Mousa's study (2003) also concluded that the Internet should be used in higher education as a means of searching for information, research and studies. A study at the University of Nevada in the United States (Falba, 2003), found that the faculty members believe in the importance of using the Internet in academic areas, whether for teaching or scientific research. Lahibi (2004) found that the spread of Internet technology in Saudi universities encouraged faculty members to use it.

The results of Abu Raya's study (2005) were that the faculty members' purposes for using the Internet are communication, e-mailing, scientific research and teaching. Qitaf study (2006) showed positive trends towards the use of social media and the Internet in scientific research, and that the obstacles to using the Internet in scientific research among faculty members at the University of Annaba in Algeria were the lack of sufficient time and the lack of information in Arabic. Mohammed (2007) found that the percentage of Hashemite University's faculty members using the Internet in scientific research was moderate; the identified statistically significant differences in the percentage of Internet usage by academic position and experience. However, no statistically significant effect was attributed to gender.

Barakat (2008) also showed moderate use of the Internet for scientific research among faculty members in some Palestinian universities. Al-Matrafi (2008) found that although the level of using the Internet by faculty members was moderate, the importance of use was very high, the need for training courses was high, the presence of obstacles was high; the degree of approval for the purposes of employing the Internet was satisfactory, as way approval of proposed ways to activate and develop the use of the Internet.

The results of the study by Hammer (2010) showed a discrepancy in the attitudes of students and faculty towards the use of mobile devices for methodological purposes in lectures. Bute's study (2011) confirmed the attitudes of teachers and students towards the use of the Internet as a source of educational and research information, and the existence of statistically significant differences in teachers' attitudes, by college, gender and degree. Allam (2012) found that males surpassed females in the use of e-learning in university teaching; master's degree holders surpassed PhD holders, and those who had completed several courses surpassed those who had taken only one or none. The results showed statistically significant differences in the attitudes of faculty members at Al-Jouf University towards the use of e-learning in university teaching, attributed to gender (in favour of males), to the qualification (in favour of the master's), in the number of years of higher experience, and to the variability of training courses.

Al-Hazzani (2013) recommended activating social networks in the teaching and learning process, while Ibrahim (2014) concluded that social media should be used by faculty members in the educational process at universities in Upper Egypt. Awad (2014) found that social media sites have a negative impact on the educational attainment of children as the number of hours increased, but a positive impact on the on children when used in the educational setting or under the supervision and guidance of parents. Darboush (2015) found that there is pleasure in using social networks in education at King Saud University, and that the areas of cooperation between colleagues and students increase with the presence of social networking. The study of Hassan and Salah (2015) found technological possibilities for the use of e-learning by faculty members at Hebron University. Al-Zboun (2018) also found that teaching through self-learning and social communication had an effect on the achievement of students at the University of Jordan, with

differences in the social communication scale due according to the method of teaching. The results of Al-Omari's study (2015) showed that one of the obstacles facing faculty members when using the learning system through social media was the weak infrastructure supporting it. Shaaban (2016) found that Face book had both positive and negative significant effects on the social relationships of users, people away from home and those who spent a long times in front of the screen.

Present Study

The world today faces many issues, perhaps the most important being the explosion of knowledge as a result of the fundamental revolution in information and communication technology. This revolution has widened the gap between developed and developing countries. It was accompanied by another explosion, a population explosion, leading to an increase in the number of specialists and the number of those pursuing higher education. This increase requires preparing human and material resources to deliver education to the is ever-growing numbers of learners.

The Internet is one of the most important breakthroughs in information and communication technology, with great benefits in the development of methods of information transfer, modernization of teaching methods, and the development of educational systems, management and scientific research. These are the most important tasks for universities, and a necessity in transformation to an information society.

The role of social networks is no longer confined to identification and communication between users, but goes far beyond that as a familiar educational tool, and an important source of access to learning sources in its various forms, serving universities in achieving the three goals, teaching-scientific research-community service, outlined above.

The present study seeks to answer the following questions:

Question 1: To what degree do the faculty members of the Hashemite University use social networks, in their own opinion?

Question 2: Are there statistically significant differences ($\alpha \leq 0.05$) in the extent to which the faculty members use social networks, by faculty, country of graduation, academic rank, and years of experience variables?

2. Research Methodology

Research Sample

The study's population consisted of all 695 faculty members in the Hashemite University, distributed among 18 faculties, in the second semester of the academic year 2019/2020. A sample of 225 was selected through available random method, representing almost a third of the total population. Table 1 shows their distribution by the study's variables.

Table 1. Sample's members' distribution according to the variables

Variable	Level	Number	Percentage
Faculty	Science	117	52 %
	Humanities	108	48 %
	Total	225	100 %
Graduation country	Arab	90	40 %
	Foreign	135	60 %
	Total	225	100 %
Years of experience	Less than 5 years	65	29 %
	5 – 10 years	83	37 %
	More than 10 years	77	34 %
	Total	225	100 %
Academic rank	Professor	40	18 %
	Associate professor	80	36 %
	Assistant Professor	70	31 %
	Instructor	35	15 %
	Total	225	100 %

Study Instrument

The study used a questionnaire to measure social networking sites' use by the faculty members. It was based on previous research, including the work of Abu Aisha (2014), Al-Raoud (2012), and Al-Mansour (2012).The questionnaire consisted of two parts: the first part includes the variables faculty, country of graduation, years of experience and academic rank. The second part contains 42 items divided into three areas: the field of teaching (15), the field of scientific research (14), and the field of community service (13).

The questionnaire was presented to a committee of ten specialist and expert faculty members from the University of Jordan and Zarqa University, for their opinions and observations on the items' scientific accuracy, wording, meaning, suitability for the field of study and topic. Their opinions were collated, and those items obtaining the agreement of 8 or more referees, (i.e. 80 %) of were adopted, taking into account all their comments. The final version of 42 items were distributed in the four fields, and measured according to a 5-point Likert) scale ranging from 5 =very high to 1 = very low.

In order to ensure the reliability of the research instrument, the internal consistency of the items was evaluated by calculating Cronbach's Alpha: 0.89 for the field of teaching 0.91 for scientific research and 0.88 for community service; the value of the fields combined was 0.89.

Study Procedure

After preparing the study's instrument, verifying its validity and reliability and determining the population and sample, official approval to conduct the study was obtained. The questionnaire was distributed to the sample members over a period of two months during the first semester 2019/2020. The researchers explained the purpose of this study and how to complete the questionnaire. The respondents were assured of the confidentiality of the data and its use for scientific research purposes only, in order to achieve objectivity. After retrieving the questionnaires, the researchers entered the data for analysis. Statistical tests were calculated to ensure that the data were distributed normally.

Data Analysis

Arithmetic averages and standard deviations were used in the statistical analysis, as well as the T-test, one-way analysis of variance, and the LSD test for dimensional comparison.

3. Results

Question one: What is the degree to which Hashemite University's faculty members use social networks from their point of view?

To answer the first research question, the degree to which faculty members use social networks, arithmetic averages and standard deviations were calculated, presented in Table 2.

Table 2. Arithmetic averages and standard deviations

Area Number	Field	Rank	Arithmetic Average	Standard Deviation	Use Degree
1	Teaching	1	4.14	0.89	High
2	Scientific Research	2	3.82	0.95	High
3	Community Service	3	3.39	1.18	Moderate
Total			3.78	0.94	High

This table shows that the level of using social networks by faculty members, in their own opinion, was high overall (average 3.78); the field of teaching ranked highest (4.14) and community service lowest (3.39, or moderate).These results reflect the degree of social network use by faculty members, whose professional duties are laid down by university regulations, locally and internationally, as teaching, scientific research and community service. See Tables 4 to 6 respectively. Overall their use of social networks was high, an indication that the faculty members are keeping pace with scientific developments and responding to modern technologies to support their work and various duties. They also indicate the high ranking of the Hashemite University among Jordanian universities, as one of the

criteria was whether universities keep up with scientific developments. It was pointed out by Diab (2006) that faculty members must use all means to succeed in their prescribed tasks. Al-Mansour (2012) confirmed that they must keep up with scientific and technological developments in order to be an effective element in the performance of the university's tasks. This finding is consistent with the results of several studies including Kelly, (2002), AdeyaandOyeinka (2002), Qitaf (2006), Barakat (2008), Hammer (2010), Ibrahim (2014) and Salah (2015).

Teaching

Table 3. Average and standard deviation for faculty members' use of social networks: teaching

Item Number	Statement	Rank	Arithmetic Average	Standard Deviation	Degree of Use
3	I think that the availability of devices at the university facilitates the social networking process for faculty members.	1	4.47	0.74	High
1	I think the devices used to communicate are modern and save the faculty effort and time.	2	4.46	0.77	High
5	My communication with students through social networks is easy.	3	4.42	0.69	High
2	I work on replying to some of the observations, inquiries and questions from students about the subjects I teach through social networks.	4	4.41	0.77	High
7	I Inform and remind my students of the material examinations in various subjects through social networks.	5	4.40	0.69	High
8	I stress the need for students to adhere to the regulations and instructions laid down by the university through social networks.	6	4.29	0.81	High
9	I remind students of effective ways to study materials through social networks.	7	4.2	0.87	High
4	I urge students to preserve the University's property and buildings through social networks.	8	4.19	0.75	High
6	I advise students to adjust, organize and manage time through social networks.	9	4.13	0.85	High
13	I encourage students to participate in events, activities and celebrations of national and religious events through social networks.	10	4.11	0.83	High
14	I choose some office hours for students through social networks.	11	4.01	1.35	High
15	I urge students to work collaboratively with their peers through social networks.	12	3.99	1.29	High
10	I help my students take experimental exams by posting them on social networks.	13	3.81	0.94	High
11	I communicate with students about emergency updates about lecture time.	14	3.67	1.10	Moderate
12	I answer students' research queries through social networks.	15	3.58	1.28	Moderate
Overall Average			4.14	0.85	High

Table 3 shows that the level of use of social networks for teaching was high, with an average of 4.14, ranging from 4.47 (availability of devices at the university facilitates the social communication) to 3.58 (I answer students' research queries through social networks).Only the two lowest ranking items scored moderate rather than high. The researchers believe that this high level of use of social networks in the teaching field is an indication that the faculty members keep up with all techniques delivering all types of information to students.

This supports the belief of Al-Dahdouh (2012) that in order for a university professor to fully practice teaching, he/she must be proficient in their field of specialization and well-informed.

Scientific research

Table 4. Average and standard deviation for faculty members' use of social networks: scientific research

Item Number	Statement	Rank	Arithmetic Average	Standard Deviation	Degree of Use
16	I offer various academic consultations for graduate students through social networks.	1	4.22	1.16	High
17	I benefit from research, journals, articles, and publications published through social networks.	2	4.11	0.94	High
18	I communicate with my supervised students through social networks.	3	4.03	0.97	High
19	I review, revise, and evaluate masters and doctoral theses through social networks.	4	3.97	0.97	High
20	I communicate with many faculty colleagues to increase collaboration and consultation for scientific research purposes.	5	3.93	1.29	High
21	I think social networks have enabled me to make friends with faculty colleagues around the world.	6	3.88	1.07	High
22	I think social networks have enabled me to learn about diverse cultures through fellow faculty members.	7	3.8	0.94	High
23	I think social networks have enabled me to learn about scientific research in my field.	8	3.71	1.11	High
24	I think the university offers free subscription to many electronic networks for scientific research purposes.	9	3.68	0.98	High
25	I think social network's communication channels between faculty members are available and encouraging.	10	3.67	1.32	Moderate

26	I think the university's administration is working to encourage faculty communication through these networks for academic service purposes.	11	3.61	1.04	Moderate
27	I encourage students to use social networks to invest real time and effort.	12	3.95	1.03	Moderate
28	I believe that social networks enable students to communicate with faculty members from their homes and from different regions for scientific research purposes.	13	3.57	0.99	Moderate
Overall Average			3.82	0.95	High

Table 4 shows that the level of social network use by faculty members for scientific research was high (average 3.82). The highest ranking (average 4.22) was for ("I offer various academic consultations for graduate students through social networks". The four lowest ranked items were moderate rather than high, down to "I believe that social networks enable students to communicate with faculty members from their homes ..." (average 3.57). The researchers consider this high level of use degree for scientific research indicates that the faculty members use all techniques to perform their tasks as professors, whether in theoretical or applied research, and publications in international journals. Social networks enable them to become acquainted with the latest developments at the scientific level, as well as issues related to their areas of specialization.

Community service

Table 5. Average and standard deviation for faculty members' use of social networks: community service

Item Number	Statement	Rank	Arithmetic Average	Standard Deviation	Degree of Use
29	I announce the areas in which I can serve the community through social networks.	1	3.61	1.00	Moderate
30	I offer an appropriate response to the inquiries and observations of the community members through social networks.	2	3.55	1.22	Moderate
31	I communicate with some institutions to provide electronic academic services through social networks.	3	3.54	1.20	Moderate
32	I get invited as a faculty member to many events, seminars and conferences through social networks.	4	3.52	1.08	Moderate
33	I confirm attending many occasions through social networks.	5	3.51	1.29	Moderate
34	I post my CV through social networks on various networks to provide community services.	6	3.41	1.05	Moderate
35	I offer some suggestions and solutions to many social problems through social networks.	7	3.4	0.92	Moderate

36	I communicate with many officials to provide social counseling and services through social networks.	8	3.39	1.21	Moderate
37	I urge students to do community services through social networks.	9	3.38	1.27	Moderate
38	I encourage my colleagues through social networks about social service fields.	10	3.37	1.12	Moderate
39	I make material and moral donations to many parties through social networks.	11	3.34	1.22	Moderate
40	I encourage my colleagues to donate (materially or morally) to the community through social networks.	12	3.33	0.96	Moderate
41	I think the university administration provides incentives for the interaction of faculty members with civil society organizations.	13	3.27	1.24	Moderate
42	The university is keen to encourage faculty interaction with the community through social networks by calculating points for the purposes of promotion.	14	2.88	1.03	Moderate
Overall Average			3.39	1.18	Moderate

Table 5 shows that the level of use of social networking in the field of community service was moderate, with an average of 3.39. The averages ranged from 3.61 for "I announce the areas in which I can serve the community through social networks" to 2.88 for "The university is keen to encourage faculty interaction with the community through social networks by calculating points for the purposes of promotion". The researchers attribute this result to the faculty members' interest in community issues, providing what may be needed by the community such as awareness and guidance services, and conducting various studies of community problems in various areas. The development and progress of a society is a reflection of the level of education, and being interested in serving the society, as faculty members, is considered among their duties.

Question 2: Are there statistically significant differences ($\alpha \leq 0.05$) in the extent to which the faculty members use social networks, by faculty, country of graduation, academic rank or years of experience?

Faculty

The averages, standard deviation and T-test for the degree of use of social networks by the faculty members of the Hashemite University indicate differences by faculty, as shown in Table 6.

Table 6. Average, standard deviation and T-test results for faculty members' use of social networks, by faculty

Variable	Faculty	Sample Number	Arithmetic Averages	Standard Deviations	T	Sig
Faculty	Humanities	108	3.26	0.48	-5.482	*0.000
	Scientific	117	3.61	0.57		

It is clear from Table 6, which includes the T-test results, that there are statistically significant differences in the degree of use of social networks according to the faculty variable, with a higher score for the science faculty (average 3.61 against 3.26).This indicates how much the science faculty member care about scientific issues, technological and medical developments. It makes sense because developments are in the scientific fields.

Country of Graduation

The same analysis was applied to the responses for country of graduation, as shown in Table 7.

Table 7. Average, standard deviation and T-Test results for faculty members' use of social networks, by country of graduation

Variable	Graduation Country	Sample Number	Arithmetic averages	standard deviations	T	Sig
Graduation Country	Arab	90	3.53	0.51	-1.679	0.245
	Foreign	135	3.60	0.61		

The T-test results indicate that there was no statistically significant difference due to country of graduation. This indicates that all faculty members, regardless of the university from which they graduated, whether Arab or foreign, are aware of the use of modern technologies, something of which they must keep abreast in light of global developments and technological and digital acceleration.

Years of experience and academic rank

In addition to average and standard deviations, ANOVA analysis was used to identify differences resulting from experience and rank, as shown in Table 8.

Table 8. Average and standard deviation for faculty members' responses according to years of experience and academic rank

Variable	Variable levels	Number	Arithmetic Averages	Standard Deviations
Years of experience	Less than 5 years	65	3.62	0.67
	5- 10 years	83	3.67	0.56
	More than 10 years	77	3.47	0.51
Academic rank	Professor	40	3.70	1.05
	Associate professor	80	3.54	0.58
	Assistant professor	70	3.60	0.63
	Instructor	35	3.42	0.44

It is noted from Table 8 that there are substantial differences between the averages of the responses of faculty members according to their years of experience and academic position. To verify this, the two-way ANOVA analysis of variance was used, with the results shown in Table 10.

Table 9. Results of two-way analysis of variance for faculty members' responses according to years of experience and academic rank

Variance Source	Squares' Total	Freedom Degrees	Squares' Averages	F Value	Indicative Level
Academic rank	0.539	3.00	0.14	0.42	0.79
Years of experience	2.472	2.00	1.24	3.82	*0.02
Error	109.944	219	0.32		
Total	113.102	224			

The results in Table 9 indicate that there are no statistically significant differences at the ($\alpha \leq 0.05$) level in the responses of faculty members to the degree of their use of social networks according to the academic rank variable, based on the calculated value of F (0.42), and the level of significance (0.797). However, there were statistically significant differences at the ($\alpha \leq 0.05$) level

in their responses according to the variable years of experience, based on the calculated value of F (3.82) and the level of significance(0.02).

In order to find out which of the three levels of experience accounted for the differences, the LSD test was performed for dimensional comparison, as shown in Table 10.

Table 10. LSD test results of the differences in the responses of faculty members according to their years of experience

Variables		Mean	Less than 5 years	5-10 years	More than 10 years
Years of experience	Less than 5 years	3.62			
	5-10 years	3.67			0.20*
	More than 10 years	3.47		-0.20*	

The results indicate most use of social networks by faculty members with 5-10 years of experience, as compared to those with more than 10 years. The researchers attribute this result to faculty members with 5 to 10 years of experience in university teaching looking for all that is new in either teaching, scientific research or community service, in order to keep up with their peers in other universities and other countries. This finding is consistent with those of Muhammad (2007), Allam (2012) and Ibrahim (2014).

Recommendations

Support faculty members and encourage them to evaluate the impact or effects of using different technologies in the educational process. Discuss the phasing out of traditional and rigid teaching methods. Faculty members must be able to perform their duties using social networks. Establish a specialized centre equipped with trained people capable of providing the necessary technical support to faculty members in using information and communication technologies when needed, and on a continuous and direct basis. Help and support the faculties and departments to accelerate the development and updating of the curriculum in ways that correspond to the uses of technology. Spread awareness among faculty members of the importance of using technology in education through brief meetings, educational sessions, and sharing the results of scientific research in this field. Benefit from the results and recommendations from previous studies and scientific research related to the use of technology in education Faculty members should undertake to keep up with change and to acquire the skills to use technology and benefit from it in education.

4. Conclusion

This study aimed to identify the degree do the faculty members of the Hashemite University use social networks, in their own opinion, and also aimed to identify if there statistically significant differences in the extent to which the faculty members use social networks, by faculty, country of graduation, academic rank, and years of experience. The results showed that the degree of social network use among faculty members was high in all disciplines, from the teaching field (highest) to scientific research and the community service field. There were significant differences in networks use due to faculty variable, in favour science faculty members. And there were significant differences in networks use due to years of experience variable, in favour to faculty member who have 5-10 years of experience in teaching, but no statistically significant differences in networks use due to country of graduation and academic position variables. Researchers Recommendations to support faculty members and encourage them to evaluate the impact or effects of using different technologies in the educational process.

References

Abu Aisha, 2014 – *Abu Aisha, S.* (2014). The reality of using social networks by students of the Hashemite University, and its relationship with the value system. Unpublished Master thesis, Hashemite University, Zarqa, Jordan.

Abu Raya, 2005 – *Abu Raya, M.* (2005). The use of the Internet by faculty members in Isra University. *Journal of the Union of Arab Universities*. 45: 133-164.

Adeya, Oyeinka, 2002 – *Adeya, N., Oyeinka, B.* (2002). The internet in African Universities: Case studies from Kenya and Nigeria. [Electronic resource]. URL: www.intech.unu.edu

Al-Hazani, 2013 – *Al-Hazani, N.* (2013). The effectiveness of electronic social networks in the development of teaching and learning process for students of the College of Education at King Saud University. *International Journal of Educational Research*. 11(33): 129-164.

Al-Darboush, 2015 – *Al-Darboush, A.* (2015). The reality of using social networks in education among students of Teachers College, King Saud University. *Journal of the Union of Arab Universities in Higher Education*. 34(2): 91-102.

Al-Hadi, 2005 – *Al-Hadi, M.* (2005). E-learning via the Internet. Cairo: Egyptian-Lebanese House.

Al-Jamal, 2013 – Al-Jamal, R. (2013). The effect of using social media on the ethical values of Saudi youth – a field study. Unpublished Master Thesis, King Abdulaziz University, Saudi Arabia.

Al-Lahibi, 2004 – *Al-Lahibi, M.* (2004). Adoption or use of Internet technology by faculty members in Saudi universities. *Umm Al-Qura University Educational and Psychological Journal*. 16(1): 436-457.

Al-Mansour, 2012 – *Al-Mansour, M.* (2012). Impact of Social Media on Recipients. Unpublished Master Thesis, Arab Open Academy, Denmark.

Al-Omari, 2015 – *Al-Omari, M.* (2015). Reasons for the reluctance of faculty members in the Yarmouk University to use the e-learning system on the university's website from their point of view. *Jordanian Journal of Educational Sciences*. 11(4): 88-102.

Al-Raoud, 2012 – *Al-Raoud, A.* (2012). The Role of Social Networks in political change in Tunisia and Egypt from the perspective of Jordanian journalists. Unpublished Master thesis, Middle East University, Amman, Jordan.

Al-Shayeb, 2001 – *Al-Shayeb, A.* (2001). The reality of using the Internet by faculty members in Jordanian universities and their attitudes towards it. Unpublished Master Thesis, Yarmouk University, Irbid, Jordan.

Al-Shehri, 2012 – *Al-Shehri, H.* (2012). The effect of using social networks on social relations Face book and Twitter as a model, a field study on a sample of students of King Abdul-Aziz University in Jeddah. Unpublished Master Thesis, King Abdul-Aziz University, Saudi Arabia.

Al-Zamil, 2005 – *Al-Zamil, M.* (2005). The reality of Arab universities benefiting from the information services provided via the Internet. *Journal of King Fahd Library*. 11(2): 23-49.

Al-Zboun, 2018 – *Al-Zboun, M.* (2018). The Effect of Teaching Using the Electronic Course System (MODEL) on the Achievement of Computer University Students in Computer Skills and in Developing Self-Learning and Social Communication Skills. Unpublished Doctoral Thesis, University of Jordan, Amman, Jordan.

Amer, 2007 – *Amer, T.* (2007). A Proposal for Developing the Role of the University in Serving the Society in the Light of Modern Scientific Trends. Unpublished Master Thesis, Yarmouk University, Irbid, Jordan.

Awad, 2014 – *Awad, R.* (2014). The effects of using social networks on the educational achievement of children in Tulkarm governorate from the perspective of housewives. Unpublished Master Thesis, Faculty of Community and Family Development, Al-Quds Open University, Tulkarm.

Barakat, 2008 – *Barakat, Z.* (2008). The reality of the use of the Internet by faculty members in Palestinian universities in scientific research. paper presented to the Fourth International Conference of Cairo University, Cairo University, Egypt.

Boomarafi, 2001 – *Boomarafi, B.* (2001). The reality of the use of faculty members at the Sharjah Internet University. *Library Thesis Journal*. 36(1-2): 74-90.

Dahdouh, 2012 – *Dahdouh, A.* (2012). Depicting a proposal to employ Face book social network in the Palestinian universities. Unpublished Master Thesis, the Islamic University of Gaza.

Diab, 2006 – *Diab, S.* (2006). University professor in the light of the challenges of the twenty-first century. the teacher conference in the third millennium, a coming and future vision, Isra University, Amman, Jordan.

Falba, 2003 – *Falba, C.* (2003). Technology use by a college of education faculty and factors influencing of technology in an undergraduates' teacher preparation program'. Dissertation Abstracts International, No. AA19842064, P. 2457.

Hamad, 2018 – *Hamad, L.* (2018). Degree of the use of e-learning tools in teaching in Jordanian universities and their attitudes towards it. Unpublished Master thesis, University of the Middle East, Amman, Jordan.

Hammer et al., 2010 – *Hammer, R., Ronen, M., Sharon, A., Lankry, T., Huberman, Y., Zamtsov, V.* (2010). Mobile culture in college lectures: Instrucotors and students, perspectives. *Interdisciplinary Journal of E-learning and learning Objects*. 6: 293-304.

Hassan, Salah, 2015 – *Hassan, S., Salah, A.* (2015). The reality of using e-learning management system among Hebron University faculty members. *Hebron University Journal for Research*. 10(2): 138-160.

Ibrahim, 2014 – *Ibrahim, A.* (2014). The reality of using social networks in the educational process in Upper Egypt universities. *Journal of Educational Sciences*. 2(3): 413-476.

Kelley, 2002 – *Kelley, K.* (2002). The web of discipline: Biglan's categories, the world wide web, and the relevant of academic. Dissertation Abstracts International, No.AA19836420. P. 1936.

Khadija, 2014 – *Khadija, I.* (2014). The reality of the use of social networks in the educational process in Upper Egypt universities. *Journal of Educational Sciences, Institute of Educational*. 8(3): 265-280.

Khatatba, 2018 – *Khatatba, I.* (2018). The use of e-learning model by the faculty members of Yarmouk University and the obstacles facing them. Unpublished Master thesis, Yarmouk University, Irbid, Jordan.

Khatib, 2006 – *Khatib, N.* (2006). The extent of the awareness of the teaching staff in the Jordanian universities about the concept of e-learning and the reality of their use of it in teaching. Unpublished Doctoral Thesis, University of Jordan, Amman, Jordan.

Mansour, 2004 – *Mansour, T.* (2004). Internet use and its motivations among students of the University of Bahrain: A field study. *Arab Journal of Humanities*. 86: 1-17.

Mohammed, 2013 – *Mohammed, A.* (2013). The role of social networks in the development of the participation of Palestinian youth in social issues. Unpublished Master Thesis, Institute of Arab Research and Studies, Cairo.

Najjar, 2001 – *Najjar, A.* (2001). The reality of the use of the Internet in scientific research among faculty members at King Faisal University. *Journal of the Center for Educational Research*. 10(19): 135-160.

Nino, 2013 – *Nino, M.* (2013). Computer use by faculty members in private Jordanian universities. *Irbid Journal of Research and Studies*. 6(1): 89-111.

Odeh, 2014 – *Odeh, F.* (2014). The role of social networks in educational science, e-learning center. Unpublished Master Thesis, Islamic University, Gaza, Palestine.

Qitaf, 2006 – *Qitaf, N.* (2006). Internet and scientific research in the Algerian University – University of Annaba as a model. *Journal of the Generations Builders*. 15(58): 145-160.

Rabie, 2011 – *Rabie, F.* (2011). The direction of university education professors towards e-learning (field study at the University of Batna). Unpublished Master Thesis, University of Hajj Lakhdar, Algeria.

Radi, 2003 – *Radi, Z.* (2003). The use of social networking sites in the Arab world. *Journal of Education*. 15: 113-129.

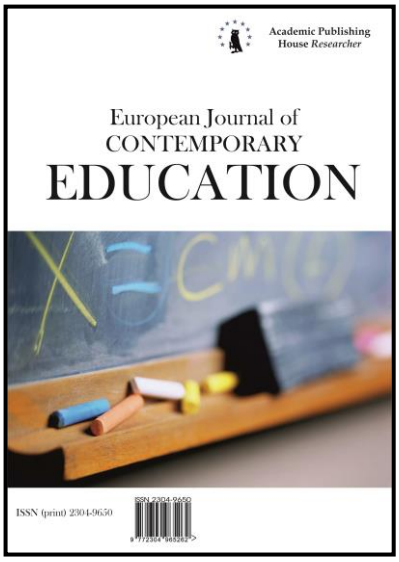
Saleh, 2003 – *Saleh, A.* (2003). Obstacles and Motivations of Scientific Research among Faculty Members in Palestinian Universities. Unpublished Master Thesis, An-Najah National University, Nablus, Palestine.

Samadouni, Ahmed, 2005 – *Samadouni, I., Ahmed Y.* (2005). Activating the role of the faculty member in Egyptian universities in the field of community service. *Journal of Education*. 1: 127-142.

Shaaban, 2016 – *Shaaban, A.* (2016) . The use of the social networking site Face book and its impact on social relations. *Center for Market Research and Consumer Protection*. 49: 325-339.

Zahrani, 2013 – *Zahrani, M.* (2013). The role of social networking sites in solving the problems facing students of practical education and their attitudes towards them. Unpublished Master Thesis, Umm Al-Qura University, Saudi Arabia.

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 18-28
DOI: 10.13187/ejced.2021.1.18
www.ejournal1.com



Reflexive Teacher: Main Difficulties of the Reflexive Activity of Teachers with Various Pedagogical Work Experience

Gulnara F. Biktagirova [a], Roza A. Valeeva [a], Roman S. Nagovitsyn [b, *]

[a] Institute of Psychology and Education, Kazan federal university, Kazan, Russian Federation
[b] Glazov State Pedagogical Institute, Glazov, Russian Federation

Abstract

The relevance of the study is due to the need to identify the position of teachers in their professional activities, the manifestation of its reflective activity. A special attitude of the teacher to his own activity, when the very content of this activity is for the teacher as an object of analysis, reflection and evaluation, characterizes the reflective teacher. It is important that each teacher takes a similar position. In the modern conditions, the modernization of the national education takes on a special significance of the teacher's reflection. Without a reflective view of yourself, your activity and its effectiveness, it is not possible for the teacher to develop personally, to identify and comprehend the reasons for his successes and failures, and hence a successful solution. The purpose of this article is to investigate the difficulties in the reflective activity of teachers with different teaching experience. Research methods: In the process of research, an analysis of the scientific literature, included observation, ascertaining the pedagogical experiment, testing, expert survey, analysis of the results of the experimental work of the empirical study, as well as statistical processing of quantitative research results. Results of the study: Diagnosis of the difficulty level in reflexive activity was carried out with the help of the author's test questionnaire "My reflexive difficulties". The questionnaire includes 6 components of reflexive activity difficulties and reveals the difficulties of the theoretical-methodological, motivational, value-semantic, emotional, process-activity and research character. Relevance of the study: The study showed the need to identify reflexive difficulties and the formation of reflexive skills. Awareness of the need for reflexive activity in practical comprehension is developed by the installation for constant introspection, assessment and self-assessment, as well as analysis of the results obtained. Thus a reflexive teacher is formed. The materials of the article can be useful for teachers, teachers of higher educational institutions, researchers for teaching reflexive activity.

* Corresponding author
E-mail addresses: bikgf@mail.ru (G.F. Biktagirova), valeykin@yandex.ru (R.A. Valeeva), gto18@mail.ru (R.S. Nagovitsyn)

Keywords: reflection, reflective teacher, reflexive difficulties, pedagogical experience, work experience.

1. Introduction

Relevance of the problem. The modern teacher must constantly analyze his professional activities, understand the problems arising in pedagogical practice, choose the right ways to solve them, adequately assess and correct the results (Al-Zoubi et al., 2019). At the same time, observations show that the attitude of the teacher to pedagogical activity does not always coincide completely with the content of his knowledge about this reality, nor with the skills that he creates (Ronda, Saldeeva, 2019). However, as you know, knowledge can become the property of the person only when they are aware of it (Korzhuev et al., 2020). Awareness of knowledge, its inclusion and transformation into its own property is achieved in the process of reflexive activity and necessarily affects the emotional sphere of the individual (Lazard, McAvoy, 2020). But very often it is in reflexive activity that teachers have difficulties (Pogodaeva et al., 2019). Young and even experienced teachers have difficulties in the field of pedagogical analysis and introspection, so necessary for fruitful professional reflexive activity (Biktagirova, Valeeva, 2014).

Status of a problem. The study of the essence of reflection began in ancient times. In the philosophical writings of Antiquity, the purpose of reflection was reduced to the self-knowledge of man (Karpov, 2003). This phenomenon is considered throughout the history of mankind. Since the twentieth century, an in-depth study of the phenomenon of reflection begins (Biktagirova, 2016). The question "What kind of teacher am I?" Can be found in the studies of philosophers, sociologists, psychologists and educators (Kyshtymova, Rozhkova, 2019; Nagovitsyn et al., 2018). Today, reflection is regarded as an important component of professional competence, professional culture of the teacher (Istomina et al., 2020). It is necessary to study the manifestation of the teacher's reflection from the standpoint of his skills, abilities, difficulties, personal abilities, etc. (Almabekova, 2012; Golubeva, 2011).

In the scientific literature today, a study of this problem has been outlined in this direction, but most such studies are most often theoretical in nature or do not disclose methods for studying these phenomena (Nagovitsyn et al., 2019; Rybkin, Grebennikova, 2019).

Analysis of scientific pedagogical literature. The concepts of the teacher's reflection, pedagogical reflection, professional reflection are revealed in the studies (Kozhevnikova, 2017; Robsky, 2015; Shchedrovitsky, 2001). The relationship between the teacher's reflection and other components of professional activity is revealed by teachers and psychologists (Allen et al., 2004; Dudareva, Semenov, 2008; Semenov, 2001). The analysis of the ratio of pedagogical reflection to professional competence, pedagogical skill is revealed in the works (Biktagirova, Valeeva, 2014; Shchedrovitsky, 2001; Slastenin, 2002).

In later works, the authors focus on mastering the skills of pedagogical reflection by teachers and students (Biktagirova, 2016; Robsky, 2015), and also reveal reflexive skills and abilities (Korneenko, 2019). The authors emphasize that they occupy one of the key places in the training and professional growth of the teacher (Nagovitsyn et al., 2019; Rogach et al., 2019).

Today, the authors focus on reflexive education in the system of advanced training, in higher education or specifically subject teachers (Gorokhov, Rusina, 2010; Rybkin, Grebennikova, 2019), and more recently specifically on the reflective teacher and the problems that the teacher may have in this case (Kozhevnikova, 2017; Garcias et al., 2020). It is very important that all authors emphasize the need to teach the reflexive activity of both working teachers and future teachers (Gorohov, Rusina, 2010; Pogodaeva et al., 2019). Also, more and more attention is paid to the difficulties of the modern teacher, which must be taken into account in the training of teachers and in pedagogical practice (Almabekova, 2012; Nagovitsyn et al., 2019).

Most of the current trends in research on reflection and reflexive activity arose in the early 1970s and 1990s, while several meanings of the concepts "reflection" or "reflexion", "reflexive", along with other synonymous terms such as " psychological mindedness "," selfawareness ", etc. (Dudareva, Semenov, 2008; Bigtagirova, 2016). The analysis of psychological and pedagogical research allows us to distinguish the following areas of reflection studies: a tendency to self-analysis (psychological mindedness); intellectual reflection (metacognitions); representations of the psychic of other people (theory of mind); and, processes and activities (consciousness) (Dudareva, Semenov, 2008; Hua et al., 2007). These directions arose as a logical continuation of

the study of regularities and conditions for the effectiveness of psychoanalysis, psychotherapy (Al-Zoubi et al., 2019). During this period, the first methods appear, aimed at diagnosing the propensity to introspection (Golubeva, 2011; Shchedrovitsky, 2001). It is in this sense that the study of reflection can be traced in papers (Allen et al., 2004; Hua et al., 2007).

From the point of view of studying reflexive activity of teachers, modern studies in the field of systems approach are of particular interest (Nagovitsyn et al., 2019; Robsky, 2015). A systematic approach to the problem of the development of professional activity deserves attention, emphasizing the formation of reflexivity (Garcias et al., 2020; Ronda, Saldeva, 2019). They highlight the main forms of professional reflection, depending on the functions that it performs in time (Korneenko, 2019; Kozhevnikova, 2017). The main goal of reflexive practice is a suspension in order to understand reflexive difficulties (Biktagirova, Valeeva, 2014). Practice becomes the source of the professional growth of the teacher only to the extent that it is the object of a structured analysis: the unreflexed practice is useless and eventually leads not to development, but professional stagnation of the teacher (Korzhuev et al., 2020). The need to study the levels of reflexive pedagogical activity, reflexive skills, activity of teachers in professional activity (Pogodaeva et al., 2019).

Today's reflexive practice is given great attention in research, which presents in detail various practical recommendations for researchers, how to implement a reflexive pedagogical process, as well as specific pedagogical tasks (Istomina et al., 2020; Ronda, Saldeva, 2019). Thus, the problems of the teacher's reflexive activity and his difficulties are an object of study by both domestic and foreign scientists, is relevant today in connection with the modernization of teacher education.

Purpose and objectives of the study. The purpose of this article is to investigate the difficulties in the reflective activity of teachers with different teaching experience. The main tasks of our study were as follows:

- to reveal the basic concept of research: "reflexive activity", "reflexive difficulties";
- to provide a methodology for studying the reflexive difficulties of the teacher;
- conduct an experimental study of the reflexive difficulties of young teachers and teachers with work experience of more than 5 years;
- identify the main difficulties for teachers with different levels of teaching experience and make recommendations for their elimination.

2. Materials and methods

Theoretical and empirical methods. To test the hypothesis, a set of various methods complementary to each other was used:

- theoretical – analysis of sociological, philosophical, psychological and pedagogical research on the research problem; analysis of methodological and educational literature;
- empirical – included observation, ascertaining pedagogical experiment, questioning, expert interrogation, analysis of the results of experimental experimental work of empirical research.

Base of research. The study was carried out on the basis of the center of the Privolzhsky Center for Advanced Studies and Professional Retraining of Education Workers of the Kazan Federal University in three stages.

Research stages. At the first stage, the analysis of domestic and foreign psychological and pedagogical literature on this topic was carried out; selection and testing of research methods (January-February 2019). At the second stage, research was carried out on the reflexive difficulties of teachers with different length of service (March 2019 – March 2020). Diagnosis of the level of difficulty in reflexive activity was carried out with the help of the author's test questionnaire "My Reflexive Difficulties" (Biktagirova, 2016), developed and adapted in accordance with the study. The questionnaire includes 6 components of difficulties of reflexive activity and reveals the difficulties of the theoretical-methodological, motivational, value-semantic, emotional, process-activity and research character. At the third stage, a comparative analysis, generalization and systematization of the obtained data were carried out (April – July 2020).

Research participants. 347 teachers of the Republic of Tatarstan, as well as the Volga region participated in the experiment: 122 beginning teachers with less than 5 years of experience and 225 teachers with experience more than 5 years. This sample size was quantitatively substantiated by the respondents who wished to participate in the survey. Due to the fact that a self-isolation

regime was introduced in the Republic of Tatarstan at the end of March 2020, the questionnaire survey of the participants stopped. For the study, the results were taken over 12 months, collected during the implementation of refresher courses. Due to the high professional workload of teachers and the condition of the experiment, according to which the questioning was absolutely on a voluntary basis, only 34 % of all course participants in this organization took part took part in the experiment during this period of time.

For comparison, we chose two samples of study participants with different numbers of teachers in schools: «beginning teachers with less than 5 years» и «teachers with experience more than 5 years». This is due to the fact that there is a shortage of young specialists in educational organizations and a significantly larger number of working teachers of the older generation, as well as those of pre-retirement and retirement age. Nevertheless, when analyzing the questionnaires received, it was revealed that the correctness of filling out the questionnaires and their integrity readiness for all 6 components of the difficulties of the reflective activity of the study in the first sample was 97 %, and in the second sample it was only 59 %. To identify reliable results after the experiment, some of the respondents' questionnaires were not included in the analysis or were included in the study only in certain areas. The analysis of the number of questionnaires for each of the components of the difficulties of reflective activity averaged 119 ± 4 questionnaires for the group "beginning teachers with less than 5 years" and 134 ± 6 questionnaires for "teachers with experience more than 5 years". The number of participants in the questionnaires in each group was converted to a percentage. This allowed to increase the reliability of the comparative results of the study. And ultimately allowed comparison to implement a comparison of the results in groups for each component of the difficulties of reflexive activity and, on its basis, to generalize the results and determine the appropriate recommendations and conclusions.

Research diagnostics. The author's questionnaire assumed certain levels of complexity for each of the components of the difficulties of the teacher's reflective activity. The theoretical and methodological component includes difficulties in the corresponding knowledge and skills in providing reflexive activity: mastering the theoretical foundations of reflexive pedagogical activity: analysis, comparison, synthesis, association, and the ability to apply them; the ability to learn from others.

The motivational component reflects difficulties in the teacher's need for reflexive activity, providing a comprehensive, system-integral process of reflection. The value-semantic component implies difficulties in the teacher's comprehension of values: his personality as a person and a professional; their professional activities; critical reflection on their activities and colleagues. Emotionally-sensual includes difficulties in the emotional attitude and evaluation of the teacher's own characteristics.

The process-activity component reflects the teacher's difficulties in carrying out a variably reflective activity. They include difficulties in identifying contradictions; systematization of the problem situation, designing its self-development for the future. The research component includes: difficulties in the creative solution of research problems in the pedagogical situation; predicting possible difficulties for students; application of the knowledge gained in practice.

The level of reflexive difficulties is an individual or group index-rating. It is determined through self-evaluation of various aspects of the difficulties of reflexive activity. Quantitatively, this is the reciprocal of the degree of difficulty. For example, if the level of difficulty was 1.2 points, then the level of reflective activity 3.0 – 1.2 = 1.8 points. We distinguish the following levels of reflexive activity:

- very low (spontaneously empirical) – below 0.5 points;
- low (reproductive) – 1,5 - 0,5 points;
- average (system-activity) – 2.5-1.5 points;
- high (creative) level, above 2.5 points.

The first level (spontaneously empirical) is an empirical knowledge of the meaning of reflexive skills, but at the same time the lack of a steady motivation for self-analysis and self-development, a lack of understanding of their difficulties. The second level (reproductive) is the teacher's motivation for self-realization based on self-analysis, self-correction and self-development. But at the same time, the lack of own experience of reflexive activity, mainly, the use of the experience of other educators. The third level (system-activity) is characterized by a steady desire to master the theoretical and methodological foundations of reflexive activity, a deep and systematic understanding of their difficulties. Reflexive activity become spersonally significant for

the teacher. The fourth level (creative) is a reflexive activity for the teacher, a steady personal and professional phenomenon. It is distinguished by the manifestation of the creative approach, the search for the construction of this activity, the solution of the difficulties in its activity creatively, with the help of original solutions.

Statistical analysis: Processing the results of the study was carried out using the statistical program SPSS Statistics 20. The significance of differences in the results was determined using Chi-square ($\chi 2$) at $p < 0.01$ и $p < 0.05$. Mathematical and statistical processing was carried out between the indicators of young and experienced teachers for each indicator proposed in the study. Application of the criterion is possible when the results of focus groups according to the state of the indicator being studied are distributed into more than two categories, in our case (high, medium, low, very low).

3. Results

During the diagnostic experiment, the reflexive difficulties of the modern teacher were analyzed in the framework of this approach for each component of reflexive activity.

Reflective activity of the teacher is manifested:

- in the choice of the professional position of the teacher;
- in the peculiarities of the teacher's thinking;
- in the ability to self-observation, self-analysis, self-correction and sense-making.

We consider reflexive difficulties – as teachers' difficulties in reflecting professional activity of the theoretical-methodological, motivational, value-semantic, emotional, process-activity and research character. In order to determine the indicator of the possession of the theoretical foundations of reflexive pedagogical activity, teachers were asked during the interview to determine their difficulties in mastering the theoretical foundations of pedagogical activity (analysis, comparison of synthesis, association, etc.) and the ability to apply them, as well as learn from the experience of others. The summarized results are presented in Table 1:

Table 1. Difficulties in mastering the theoretical foundations of the reflexive pedagogical activity of young teachers

The difficulties of young teachers	High,%	Medium, %	Low, %	Very low,%
Difficulties in mastering the theoretical foundations of pedagogical activity (analysis, comparison of synthesis, association, etc.) and the ability to apply them	26.8	23.7	38.8	10.7
Difficulties in adopting the experience of other teachers.	33.9	31.7	24.4	10

As can be seen from the given Tables 1 and 2, more than a third of experienced teachers have difficulties in mastering system theoretical and methodological knowledge. At the same time, the majority of the teachers interviewed expressed a positive attitude toward the need to master systemic knowledge. At the same time, they are familiar with them, but this allowed us to infer the inability to accept them, being the result of the teacher's not developed positive reflective position. Young teachers have good skills in analysis, comparison, etc., they are better at using them, but they have more difficulties in adopting the experience of colleagues.

Table 2. Difficulties in the theoretical foundations of the reflexive pedagogical activity of experienced teachers

The difficulties of experienced teachers	High,%	Medium, %	Low, %	Very low,%
Difficulties in mastering the theoretical foundations of pedagogical activity (analysis, comparison of synthesis, association, etc.) and	36.4	32.5	16.5	14.6

the ability to apply them				
Difficulties in adopting the experience of other teachers.	17.2	23.1	39.8	19.9

Mathematical and statistical processing of the results showed a significant difference in the difficulties of mastering the theoretical foundations of reflexive pedagogical activity between young and adult teachers at $p < 0.01$ ($\chi2 = 12.430$). In turn, the statistical comparative analysis of difficulties in adopting the experience of other teachers showed a level of $p < 0.01$ ($\chi2 = 13.779$).

The need for reflexive activity shows about one third of teachers, while the figures are approximately the same as for a teacher with work experience, and for young teachers ($\chi2 = 0.395$, $p > 0.05$). Most often they do not think about it when specifically unmotivated (Table 3). When they think about it, the majority (two-thirds of teachers) are positive about this and understand the need for reflexive activity.

Table 3. Difficulties in the teacher's need for reflexive activity

Difficulties	High,%	Medium,%	Low, %	Very low,%	χ2
Difficulties of experienced teachers	29.4	30.8	22.2	17.6	0.395, p > 0.05
Difficulties of young teachers	31.2	26.8	23.1	18.9	

Therefore, the value-semantic difficulties in the teacher's comprehension of his pedagogical activity play a special role. If the teacher begins to critically reflect on his personal activities, professional activities and the activities of his colleagues, he more clearly identifies these difficulties. Mathematical and statistical processing of the results shows that the difference in difficulty in the reflexive activity of teachers is not reliable when comparing two samples: young and adult teachers at $p > 0.05$ ($\chi2 = 0.395$). In turn, the teacher's recognition of the value of his professional work are different for teachers with different work experience (Table 4):

Table 4. Indicators of the value-semantic difficulties of teachers with different work experience

Difficulties	High, %	Medium,%	Low, %	Very low,%	χ2
Difficulties experienced teachers in the recognition of the teacher the value of their professional activities	19.5	20.2	30	30.3	11.574, p < 0.01
Difficulties of young teachers in understanding the teacher the value of their professional activities	28.8	34.8	18.2	18.2	
Difficulties experienced teachers in the critical reflection of their activities and colleagues	22.1	23	22.3	32.6	0.811, p > 0.05
Difficulties of young teachers in critical reflection on their activities and colleagues	22.3	20.1	19.5	38.1	

Experienced teachers have the least difficulty in understanding the value of their professional activities by the teacher (Table 4). Here the indicators of the difficulties experienced teachers are lower than those of the young at a confidence level $p < 0.01$ ($\chi2 = 11.574$). This is directly related to the fact that the process of understanding the value of pedagogical activity significantly affects professionalism, the results of activity depend on it. If we analyze professional qualities along with the results, then each teacher gets some perspective, determining in what direction he should move further in order to develop his activities and colleagues' activities. But experienced teachers still note that they also have difficulties in some critical comprehension of their activities, believing that they are more competent in it if they do not perform reflexive activities and do not go for innovations. At the same time, the teachers' difficulties in critically comprehending young and experienced teachers are approximately the same at a confidence level $p>0.05$ ($\chi2 = 0.811$),

but experienced teachers are less critical to their activities, while for young teachers the criticism is more constructive, they have difficulties in critically understanding their activities and colleagues.

Of particular importance in the development of pedagogical reflection are the constructive critical reflection of pedagogical activity, the unexpected pedagogical situation, the ability to see the contradictions in the simulated and real professional activity. More than a third of teachers are very critical of their pedagogical activities, but not always this criticism is constructive. Difficulties in emotionally assessing and assessing the characteristics of the teacher by the teacher were shown by experienced teachers and teachers with less than 5 years of experience, while difficulties arose a little more in the interaction with experienced teachers (Table 5).

Table 5. Difficulties in the emotional attitude and evaluation of the teacher's own characteristics

Difficulties	High,%	Medium, %	Low, %	Very low,%	χ2
Difficulties of experienced teachers	31.2	27	23.2	18.6	0.246, p > 0.05
Difficulties of young teachers	28.3	26.9	24.9	19.9	

The teacher showed the greatest difficulties with the last two components. Thus, the teacher's difficulties in carrying out variatively practice-oriented reflexive activities cause difficulties for both categories of teachers at a confidence level $p > 0.05$ ($\chi2 = 0.246$). And this indicator is very important for the teacher's mobility, because he often has to make decisions and implement them.

Table 6. Indicators of the process-activity difficulties of teachers with different work experience

Difficulties	High,%	Medium, %	Low, %	Very low,%	χ2
Difficulties experienced by teachers in identifying the contradictions	39.5	30.2	14.9	15.4	1.165, p > 0.05
Difficulties of young teachers in identifying contradictions	41.8	31.8	16.1	10.3	
Difficulties experienced teachers in the systematization of the problem situation	36.8	28.1	22.3	12.8	1.213, p > 0.05
Difficulties of young teachers in systematization of a problem situation	42.3	29.1	19.5	9.1	
Difficulties of experienced teachers in designing their self-development for the future.	43.7	33.6	10.8	11.9	0.565, p > 0.05
Difficulties for young teachers to design their self-development for the future.	47.3	33.8	9.8	9.1	

Unfortunately, a high level of difficulties prevails over all indicators of this component. Mathematical and statistical processing of the results showed that the difference between the data of adults and young teachers was not significant for all the studied criteria at a confidence level of $p > 0.05$. At the same time, the greatest difficulty is to design your self-development for the perspective of both experienced and young teachers. And difficulties in systematization of problem situations are higher for teachers with less than 5 years of experience (Table 6).

Also, a high level of difficulties also occurs in the research component: it includes: difficulties in the creative solution of research problems in the pedagogical situation; predicting possible difficulties for students; application of the knowledge gained in practice (Table 7).

Table 7. Indicators of research difficulties for teachers with different work experience

Difficulties	High, %	Medium, %	Low, %	Very low,%	χ2
Difficulties experienced teachers in the creative solution of research problems in the pedagogical situation	33.5	28.2	22.9	15.4	0.543, p > 0.05
Difficulties of young teachers in the creative solution of research problems in the pedagogical situation	36.8	28.8	22.2	12.2	
Difficulties experienced teachers in predicting the possible difficulties of students	33.8	29.2	21.6	15.4	0.401, p > 0.05
Difficulties of young teachers in predicting the possible difficulties of students	37.3	29.5	18.8	14.4	
Difficulties experienced teachers in the application of the knowledge gained in practice.	29.7	30.6	20.9	18.8	0.184, p > 0.05
Difficulties of young teachers in applying the knowledge they received in practice.	32.3	29.5	20.8	17.4	

As shown by the data (Table 7), it is not by chance that even experienced teachers have difficulties in the creative solution of research problems in the pedagogical situation, many have serious difficulties in predicting the possible difficulties of students, especially young teachers. In turn, the statistical analysis revealed the unreliable differences ($p > 0.05$) in the presence of difficulties in creative solutions, in predicting possible difficulties for students and in the application of the knowledge gained in practice among experienced and young teachers.

4. Discussion

The results obtained complement the experimental data on the analysis of teacher's pedagogical reflection (Kozhevnikova, 2017). Difficulties in pedagogical reflection and directions for their systemic overcoming are experimentally proved (Robsky, 2015). Reflexive skills are beginning to be recognized and considered by teachers as an important and permanent component of pedagogical activity (Istomina et al., 2020). At the same time, the understanding of this process is realized in the practical comprehension and need to identify its reflexive difficulties (Korzhuev et al., 2020). As a result, the installation for constant introspection, evaluation and self-assessment, as well as analysis of the results obtained, is developing. Reflexive position of the teacher becomes system-holistic with a conscious approach to his pedagogical activity and its results. It is she who alone gives him the opportunity to see and evaluate his activity in a new way as creative, transformative, creative.

Experimental studies show (Garcias et al., 2020; Ronda, Saldeva, 2019) a reflective position is actively developing in situations when the teacher not only experiences but also realizes the real difficulties in his activity and does not have in his previous experience ways of solving them (Korneenko, 2019). There is a change in professional position and there is a special independent reflective thinking (Allen et al., 2004). This is especially important for teachers with work experience. In general, teachers experience difficulties in specific reflexive activities: in isolating contradictions, systematizing problem situations, designing their self-development for the future, and also in creatively solving research problems in the pedagogical situation and in predicting possible difficulties for students. At the same time, these difficulties can be met both in experienced and young teachers.

For experienced teachers reflexive difficulties are associated with overcoming the innovation barrier (Biktagirova, Valeeva, 2014). They also have difficulty in mastering the theoretical foundations of pedagogical activity and the ability to apply them (Gorokhov, Rusina, 2010). In pedagogical activity, barriers are manifested in the form of restrictions on the activities of teachers (Pogodaeva et al., 2019). The study of reflexive difficulties and the analysis of one's own pedagogical practice make it possible to identify certain strategies that teachers realize in overcoming the difficulties of pedagogical activity. Young teachers have difficulties in the need for reflexive activity. At the same time, they are faster in mastering innovations, but for them the

characteristic difficult situations are: entry into the professional environment, acceptance of norms, values, traditions of the pedagogical collective, and pedagogical activity itself.

The presented study enters into a discussion on the experimental comparison of the reflexive activity of experienced and novice teachers (Al-Zoubi et al., 2019; Rogach et al., 2019). Experts argue that a teacher's professional activity affects overcoming the difficulties of reflexive activity (Golubeva, 2011; Robsky, 2015), in changes in value-semantic orientation (Kyshtymova, Rozhkova, 2019), emotionally and in assessing their own characteristics (Karpov, 2003; Korzhuev et al., 2020). Nevertheless, the differences between young and experienced teachers are insignificant, and they are more related to professional activity, interest in the reflective activity of the teacher. It is in this position that teachers should be put, consistently translating it from the role of an expert in the experience of others to the role of an "expert for themselves", that is, in a position that is actually reflective of the achievements that it has acquired, analyzing and summarizing the experience of other teachers (Kozhevnikova, 2017; Nagovitsyn et al., 2019). Concrete and close to the real pedagogical experience, the material easily induces the teacher to independently comprehend, the arising difficulties and contradictions, the search for ways and ways to resolve them (Korneenko, 2019; Ronda, Saldeva, 2019). The presented experiment proves a significant change with an increase in the length of service of teachers only in recognizing the value of their professional activities and the theoretical features of reflexive pedagogical activity. The choice of the professional position of the teacher determines how much the general attitude of the teacher to his profession is manifested, how much he is interested in his professional growth, the ability to fully realize himself in pedagogical activity.

Limitations. This study is limited to a sample of the Privolzhsky Center for Advanced Studies and Professional Retraining of Education Workers of the Kazan Federal University during 12 months to collect questionnaires during the pre-isolation period. The resulting sample does not make it possible to cover the entire target audience, since the study was conducted only in a voluntary full-time format at the Kazan Federal University. In accordance with this, for further more detailed analysis, it is necessary to carry out a comparative analysis of the centers of additional education for teachers of various universities in Russia in a longer period in the use of distance technologies. A larger sample size will provide more varied information on this issue.

5. Conclusion

Thus, on the basis of the conducted research it can be stated that:

- the attitude of the teacher to the activity is characterized by positive motivation, a sufficiently high degree of awareness of this process. In this case, the more the teacher is involved in reflexive activity, regardless of the length of service, the more this ratio increases;
- the majority of teachers express themselves in the affirmative about the need to identify reflexive difficulties in their own pedagogical activity, but how to do this does not always represent;
- most teachers are aware of their difficulties in teaching activities. At the same time, every third teacher as much as possible assesses his knowledge in the field of the theoretical foundations of pedagogical reflection; at the same time every second experiencing significant difficulties in reflective activity, especially in the design of their self-development for the future.

The analysis of the initial state of the reflexive activity of the teacher in modern conditions and experimental research gives grounds to believe that it is necessary to develop reflexive skills when preparing a teacher at a university, and throughout pedagogical activity. At a stage when revealing reflexive difficulties and working with them becomes a necessary part of all professional activity, a constant attitude to reflection develops, thereby increasing the professional competence of the teacher.

The materials of this article can be useful for teachers of higher educational institutions in the preparation of future teachers, as well as for teachers of schools to realize their reflexive difficulties and implement reflexive activities.

6. Acknowledgments

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University

References

Allen et al., 2004 – *Allen, J.R., Bennett S., Kearns, L.* (2004). Psycho-logicalmindedness: Aneglected developmental line in permissions to think. *Transactional Analysis Journal*. 34(1): 3-9.

Almabekova, 2012 – *Almabekova, O.A.* (2012). Refleksivnaya praktika kak tekhnologiya obucheniya inostrannomu yazyku v professional'nykh tselyakh [Reflexive practice as a technology for teaching a foreign language for professional purposes]. *Filologicheskiye nauki. Voprosy teorii i praktiki*. 2(13): 16-20. [in Russian]

Al-Zoubi et al., 2019 – *Al-Zoubi, Z., Shamroukh, N., Banyyounis, N.A.* (2019). Teachers carrying out their professional roles as view of Zarqa town's teachers. *European Journal of Contemporary Education*. 8(4): 715-725. DOI: 10.13187/ejced.2019.4.715

Biktagirova, Valeeva, 2014 – *Biktagirova, G., Valeeva, R.* (2014). Development of the teachers' pedagogical reflection. *Life Science Journal*, 11(9s): 60-63.

Biktagirova, 2016 – *Biktagirova, G.F.* (2016). Osnovnyye printsipy i usloviya podgotovki refleksivnykh uchiteley v vuze [Basic principles and conditions of training reflective teachers at university]. *Matematicheskoye obrazovaniye*. 11(6): 1927-1933. [in Russian]

Dudareva, Semenov, 2008 – *Dudareva, V.Yu., Semenov, I.N.* (2008). Fenomenologiya refleksii i napravleniya yeye izucheniya v sovremennoy zarubezhnoy psikhologii [Phenomenology of reflection and the direction of its study in contemporary foreign psychology]. *Psikhologiya. Zhurnal Vysshey shkoly ekonomiki*. 5(1): 101-120. [in Russian]

Garcias et al., 2020 – *Garcias, A.P., Tur, G., Mesquida, A.D., Marín, V.I.* (2020). Reflexive skills in teacher education: A tweet a week. *Sustainability (Switzerland)*. 12(8): 3161. DOI: 10.3390/SU12083161

Golubeva, 2011 – *Golubeva, M.V.* (2011). Refleksivnoye obucheniye aktivnomu otnosheniyu k poznaniyu [Reflexive learning is an active relation to cognition]. *Obrazovatel'nyye tekhnologii*. 2: 78-86. [in Russian]

Gorokhov, Rusina, 2010 – *Gorokhov, V.I., Rusina, N.A. (*2010). Refleksivnyy trening v razvitii uchiteley [Reflexive training in the development of teachers]. *Vysshee Obrazovanie v Rossii*. 2: 89-95. [in Russian]

Hua et al., 2007 – *Hua, W., Beitel, M., Schuman, O. Z., Barry, D.* (2007). Psychometric properties of a Chinese version of the Psychological Mindedness Scale. *Journal of the American Psychoanalytic Association*. 55 (1): 300-305.

Istomina et al., 2020 – *Istomina, O.V., Druzhinina, M.V., Fedoseeva, E.A., Donchenko, E.A.* (2020). Digital and Reflexive Technologies as an Innovation in Teachers' Professional Training. *Lecture Notes in Networks and Systems*. 131: 838-847. DOI: 10.1007/978-3-030-47415-7_90

Lazard, McAvoy, 2020 – *Lazard, L., McAvoy, J.* (2020). Doing reflexivity in psychological research: What's the point? What's the practice? *Qualitative Research in Psychology*. 17(2): 159-177. DOI: 10.1080/14780887.2017.1400144

Karpov, 2003 – *Karpov, A.V.* (2003). Refleksivnost' kak psikhicheskoye svoystvo i metodika yego diagnostiki [Reflexivity as a psychic property and a technique for its diagnosis]. *Psikhologicheskiy zhurnal*. 24(5): 45-57. [in Russian]

Korneenko, 2019 – *Korneenko, T.N.* (2019). Refleksivnyye metody poznaniya v uchebnoy deyatel'nosti: Fenomenologicheskaya germenevtika [Reflexive methods of knowledge in educational activities: Phenomenological hermeneutics]. *Obrazovanie i Nauka*. 21(6): 29-45. DOI: 10.17853/1994-5639-2019-6-29-45 [in Russian]

Korzhuev et al., 2020 – *Korzhuev, A.V., Ryazanova, E.L., Ikrennikova, Y.B., Sadyikova, A.R., Shurupova, R.V.* (2020). Methodological reflection as a component of the activity of the undergraduateand the competitor of the academic degree in pedagogy (2020). *Journal of Advanced Research in Dynamical and Control Systems*. 12(SI2): 221-231. DOI: 10.5373/JARDCS/V12SP2/SP20201064

Kozhevnikova, 2017 – *Kozhevnikova, M.N.* (2017). K ponimaniyu pedagogicheskoy refleksii uchitelya: obosnovaniye gumanitarnoy modeli [To the understanding of teacher's pedagogical reflection: the rationale for the humanitarian model]. *Vestnik Novosibirskogo gosudarstvennogo pedagogicheskogo universiteta*. 6: 134-151. [in Russian]

Kyshtymova, Rozhkova, 2019 – *Kyshtymova, I.M., Rozhkova, N.A.* (2019). Public standing of a teacher and its adjustment. *European Journal of Contemporary Education*. 8(2): 294-302. DOI: 10.13187/ejced.2019.2.294

Nagovitsyn et al., 2018 – *Nagovitsyn, R.S., Bartosh, D.K., Ratsimor, A.Y., Maksimov, Y.G.* (2018). Formation of social tolerance among future teachers. *European Journal of Contemporary Education*. 7(4): 754-763. DOI: 10.13187/ejced.2018.4.754

Nagovitsyn et al., 2019 – *Nagovitsyn R.S., Bartosh D.K., Ratsimor A.Y., Neverova N.V.* (2019). Modernization of regional continuing pedagogical education in the «school-college-institute». *European Journal of Contemporary Education*, 8(1): 144-156. DOI: 10.13187/ejced.2019.1.144

Nagovitsyn et al., 2019 – *Nagovitsyn, R.S., Zamolotskikh, E.G., Potashova, I.I., Rybakova, L.V.* (2019). Model of the system of raising the social status of the teacher in the region on the basis of a pedagogical university. *European Journal of Contemporary Education*. 8(2): 315-327. DOI: 10.13187/ejced.2019.2.315

Pogodaeva et al., 2019 – *Pogodaeva, M.V., Mikhailova, E.K., Usheva, T.F.* (2019). The use of Reflexive Approach in Distance Education of Students at Teacher-training Institutions. *ACM International Conference Proceeding Series*. 1-5. DOI: 10.1145/3338147.3338148

Robsky, 2015 – *Robsky, V.V.* (2015). Trudnosti v pedagogicheskoy refleksii [Difficulties in pedagogical reflection]. *Istoricheskaya i sotsial'no-pedagogicheskaya mysl'*. 52: 28-35. [in Russian]

Rogach et al., 2019 – *Rogach, O.V., Frolova, E.V., Ryabova, T.M.* (2019). Trajectories of building a career of a teacher within academic competition. *European Journal of Contemporary Education*. 8(2): 338-347. DOI: 10.13187/ejced.2019.2.338

Ronda, Saldeva, 2019 – *Ronda, V.G., Saldeva, O.V.* (2019). The revival of values and meanings of the teacher education: Reflexive-creative approach. *Cypriot Journal of Educational Sciences*. 14(2): 266-277. DOI: 10.18844/cjes.v14i2.4239

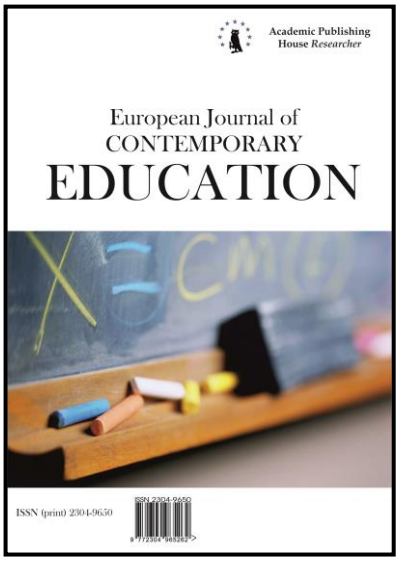
Rybkin, Grebennikova, 2019 – *Rybkin, A.D., Grebennikova, V.M.* (2019). The role of creativity in the process of competitive teacher training subject to Russian professional standard requirements. *European Journal of Contemporary Education*. 8(2): 348-356. DOI: 10.13187/ejced.2019.2.348

Semenov, 2001 – *Semenov, I.N.* (2001). Filosofiya gumanizatsii obrazovaniya i refleksivnosti dialoga [Philosophy of humanization of education and the reflexivity of dialogue]. *Refleksivnyye protsessy i upravleniye*. 1: 113-119. [in Russian]

Shchedrovitsky, 2001 – *Shchedrovitsky, G.P.* (2001). Otrazheniye i yego problemy [Reflection and its problems]. *Refleksivnyye protsessy i upravleniye*. 1: 16-28. [in Russian]

Slastenin, 2002 – *Slastenin, V.A.* (2002). Metodologicheskaya refleksiya v pedagogicheskom issledovanii [Methodological Reflection in the Pedagogical Study]. *Pedagogicheskoye obrazovaniye i nauka*. 4: 28-32. [in Russian]

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 29-34
DOI: 10.13187/ejced.2021.1.29
www.ejournal1.com



Teaching and Learning of Genetics Using Concept Maps: An Experimental Study Among Midwifery Students in Ghana

Reubena Cofie [a], Jacob Owusu Sarfo [b, c, d, *], Patience Fakornam Doe [e]

[a] 37 Military Hospital, Ghana
[b] College of Education Studies, University of Cape Coast, Ghana
[c] Cherkas Global University (International Network Center for Fundamental and Applied Research), Washington, USA
[d] Volgograd State University, Volgograd, Russian Federation
[e] School of Nursing, University of Cape Coast, Ghana

Abstract

Students' understanding of genetics and its associated mechanisms can be a difficult task. Though there are several instructional approaches to enhance the teaching and learning of genetics among medical, nursing, midwifery, and other allied health students in Ghana, little is known about the use of concept mapping as a teaching strategy. This study aimed to investigate the effect of using concept maps to enhance the teaching and learning of genetics among midwifery students in Ghana. We conducted an experimental study using the pre-test/post-test control group design. Fifty-one (51) midwifery students (females) in Ghana were voluntarily recruited and randomly assigned into either experimental or control groups using a 'balloting method.' In the pretest phase, the groups were first administered a Genetics Achievement Test (GAT) to measure their understanding of basic genetic concepts. The experimental and control groups received two (2)-weeks of lessons in genetics using concept mapping and lecture methods respectively during the intervention phase. Following the intervention phase, a posttest (GAT) was administered a week after the intervention to determine whether concept-mapping as a teaching strategy significantly improved the learning and achievement of students. Data analysis was conducted using JASP software (Version 0.14.1). Results showed that there was no significant difference in GAT scores between the groups during the pretest phase, (t = 0.763, df = 45, ρ = 0.194, d = 0.214). However, the experiment group performed better in the GAT than the control group, (t = 9.402, df = 45, ρ < .001, d = 2.634). In conclusion, the concept mapping teaching strategy is recommended

* Corresponding author
E-mail addresses: reubenacofie@gmail.com (R. Cofie), jacob.sarfo@ucc.edu.gh (J.O. Sarfo), patience.doe@ucc.edu.gh (P.F. Doe)

as a useful approach for the teaching and learning of genetics. Teachers can blend this method with the traditional lecture approach to improve learning outcomes among nursing students.

Keywords: concept maps, genetics, Ghana, JASP Software, lecture method, midwifery students, teaching and learning.

1. Introduction

Genetics is fundamental to biological and other applied sciences in the field of health sciences and agriculture (Winchester, 2018). Genetics is complex and its abstract nature can make both teachers and students misconceive it as a difficult scientific concept to teach and learn (Etobro, Banjoko, 2017; Gusmalini, Wulandari, 2020; Kantahan et al., 2020; Osman et al., 2017). For example, Etobro and Banjoko (2017) observed that seventy-five percent (75 %) of pre-service Nigerian biology teachers who participated in their study held several delusions regarding genetics. Among these false beliefs, most participants in the study attributed it to the nonrepresentational methods of teaching genetic concepts. Consequently, it is imperative to find other methods that can enhance the teaching and learning of genetics and its associated mechanisms (Gusmalini, Wulandari, 2020; Etobro, Banjoko, 2017).

Globally, the concept mapping method of teaching is becoming a popular instructional strategy for nursing and midwifery (Jaafarpour et al., 2016). The concept mapping method allows the teacher to organise educational concepts realistically in visual forms. These visual illustrations bring out the relations among concepts in the form of flowcharts, tables, T-charts, and Venn Diagrams (Safdar et al., 2012). Though studies on the practicality of concept mapping for teaching nursing and midwifery students had existed for decades, its mechanism and application had not been fully explored (All et al., 1997; All, Havens, 2003).

In a quasi-experimental study in a university in central Taiwan, it was indicated that concept mapping strategy improved the critical thinking of students who took a semester course in medical-surgical nursing (Lee et al., 2013). The effectiveness of concept mapping as a teaching strategy for students had been attributed to students' ability to think critically about lessons taught in nursing and midwifery (Yue et al., 2017).

Apart from its advantage of enhancing critical thinking among nursing and midwifery students, the effectiveness of concept mapping had been attributed to its ability to aid student nurses to grasp several concepts during lessons (Akinsanya, Williams, 2004). As noted in a study by Akinsanya and Williams (2004), concept mapping offered students the opportunity to engage in meaningful and stimulating learning experiences due to the visual nature of presentations. Notwithstanding the increasing popularity of concept mapping in global nursing and midwifery education, there is a paucity of data within the sub-Saharan Africa context. Evidence from the study by John et al. (2019) involving sixty (60) high school biology students in Nigeria suggested concept mapping as an effective method for teaching genetics. Their experimental study reported that students who were taught using concept mapping performed better on Genetics Achievement Test (GAT) than the group that received lessons using the demonstration method.

Aside from this Nigerian example, the practicality of using concept mapping to teach Ghanaian nursing and midwifery students is yet to be fully investigated experimentally. Therefore, the purpose of this study was to examine the effectiveness of concept mapping as a strategy for teaching and learning genetics among midwifery students in Ghana. This study compared concept mapping to the traditional lecture approach of instruction. The traditional lecture method is known for its practicality in teaching a large number of students, introducing a new topic in which students have little previous knowledge, communicating basic facts, terminologies or promoting initial understanding of the concepts (Chifwa, 2015).

3. Methods

Research Design

A true experimental study was conducted using a pre-test/post-test control group design. The experimental and quasi-experimental designs are known to be useful when measuring the effectiveness of methods of teaching (John et al., 2019) or differences among approaches; for example – the traditional lecture approach of instruction with the flipped classroom among student nurses (Dehghanzadeh, Jafaraghaee, 2018).

Sample and Sampling Procedure

We randomly sampled fifty-one (51) midwifery students in Ghana who were willing to participate in the study. These participants were assigned to the experimental and control groups through a 'balloting method'. The control and experimental groups were made up of 25 and 26 students respectively. Both experimental and control groups were all females class in their second year where they had previously taken courses in genetics, anatomy, and physiology. These student midwives were all having varying intellectual abilities with ages ranging between 18 and 24 years old.

Instrument for Data Collection

A twenty (20) multiple-choice item GAT was adapted from the nursing and midwifery curriculum and other existing studies (John et al., 2019; Yang et al., 2018). Items in this test focused on the significance of chromosomes in heredity, dominant and recessive characteristics, genotypic and phenotypic characteristics, and application of genetics in medicine. Test-retest of the GAT among nursing students in a two (2) week interval gave a reliability coefficient (r) of 0.70.

Procedure

Following all the prescribed ethical procedures required for human studies, official institutional permission and informed consent from participants were obtained before the start of the study.

The experiment consisted of the following phases:

Pretest Phase: All participants in both experimental and control groups were administered the GAT to evaluate their understanding of genetics before the intervention phase.

Intervention phase: Four (4) lessons on selected genetic phenomena were given by the first author using either concept mapping for the experimental group or the traditional lecture method for the control groups respectively for two (2) weeks. The same instructor (first author) was used to teach both groups to ensure that they receive equivalent educational content and instructor quality. Educational content included the genetic terminologies (genotype, phenotype, dominant and recessive traits), mutation, sex determination, conditions associated with genetic transfer: (Klinefelter syndrome, Down syndrome), and genetic counselling. The objectives of the lesson, procedures, and instructional purposes were also explained to the students in each lesson. After each lesson, students in both groups were given assignments and allowed to ask questions.

In the experimental group, educational materials were taught using PowerPoint slides with pictorial drawings of the concepts showing linkages among the concepts. This approach is based on the constructivist view of learning where learners take an active role in learning to ensure meaningful learning (Yue et al., 2017). In addition to the PowerPoint slides, lessons delivered via concept mapping also included constructing linkage diagrams on the board to facilitate the understanding of the concept. Participants were also asked to construct their concept maps using markers on the writing board.

The control group was taught using the traditional lecture method. Educational materials were presented as a lecture to them by the first author during alternate sessions. Educational content was simply presented through PowerPoint slides at each session.

Post-intervention: A week following the intervention, the GAT was again administered as a posttest to both groups. The scores from each group were scored, entered, and screened for data analysis.

Data Analysis

The scores from the pretest and posttest phases were analysed using the JASP software Version 0.14.1 (JASP Team, 2020). Following initial screening for normality (Shapiro-Wilk), outliers, and missing data, the means, standard deviation, frequencies, and percentages of both groups were calculated. The differences between their scores on GAT in the pretest and posttest phases were analysed to Independent t-test statistics at $\rho<0.05$.

4. Results and Discussion

The analysis showed that there was no statistically significant difference between the GAT scores of the experimental and control groups before the intervention, (t = 0.763, df = 45, ρ = 0.194, d = 0.214). As a result, the mean±standard deviation GAT scores during the pretest indicated that the experimental group (11.154 ±0.925) and the control group (10.960±0.889) had a

similar level of knowledge on the concept of genetics before the commencement of the treatment (See Figure 1).

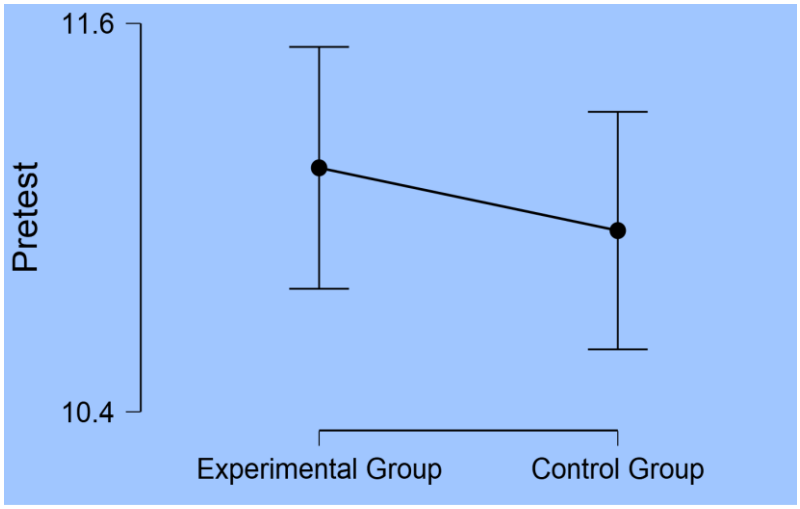


Fig. 1. Pretest Scores on GAT

Furthermore, there was a significant improvement of performance in GAT among the experiment group compared to the control group, (t = 9.402, df = 45, ρ < .001, d = 2.634). As shown in Figure 2, the mean±standard deviation GAT scores during the posttest indicated that the experimental group (16.192±0.849) performed better than the control group (13.120±1.424) after being exposed to the concept mapping method of teaching.

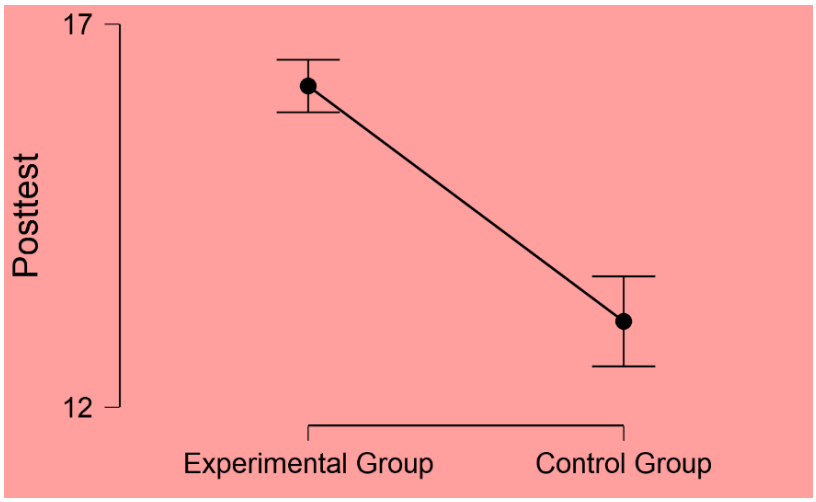


Fig. 2. Posttest Scores on GAT

Results in this present study show that concept mapping is a more effective method in teaching genetic concepts than the traditional lecturer method. The data from this study provided support for the potency of the concept-mapping technique in bringing about the learning of genetics in a meaningful manner. The experimental group who were taught using concept mapping was found to achieve significantly better than their control group counterparts after the intervention. This finding is supported by a study by John et al. (2019) who provided experimental evidence that concept mapping improved the learning of genetics among Nigerian participants. Akeju et al. (2012) attributed an improvement in students' performance due to students' ability to easily store and recall learned materials after being taught via concept mapping. They believed that concept mapping positively affects the learning attitude of students.

It is clear from this present study's results that there was some increase in the mean±standard deviation of the pretest/posttest scores of the lecture method, (10.960±0.889) < (13.120±1.424). The lecture method is one of the commonly used methods of teaching (French, Kennedy, 2017). Its teacher-centered learning focus may promote rote learning in some instances due to students' passive role of failing to form linkages between previous and present knowledge. Petty (2009) reiterated that lecture as a teaching method is useful for the explanation of content by a teacher although it may result in passive assimilation by the students. The performance of the students may be attributed to their inability to connect ideas about genetic concepts and terminologies as rote or passive learning.

Additionally, the lecture method is not suitable for slow learners and pupils who have language problems. It can be boring because the students are not actively involved in the lesson and the concentration span for students is short (Davar, 2012). Studies have shown that blending teaching methods improve learning and achievement rather than the traditional teacher-centered method of teaching (Akeju et al., 2012; Dehghanzadeh, Jafaraghaee, 2018; French, Kennedy, 2017; John et al., 2019). According to Chifwa (2015), the lecture method promotes an initial understanding of concepts and principles. Notwithstanding the limitations of the traditional lecture methods, the lecture method has some value in pedagogical circles although additional creative approaches are needed (French, Kennedy, 2017).

5. Conclusion and Recommendations

The primary focus of this study was to ascertain whether meaningful learning of genetics will be promoted and enhanced by the use of concept mapping. When teachers use concept mapping teaching strategies to teach biological phenomena, students perform significantly better than their counterparts who are taught using the traditional lecture method of teaching. Although the spiral curriculum been practiced in Ghana aims at teaching genetics concepts from basic to complex as learners progress in their education, learners are not able to familiarize themselves with the terms and mechanisms due to the approaches they and the abstract nature of genetics and associated misconceptions. The study recommends that teachers of clinical nursing/midwifery programmes and other health-related schools utilize concept mapping as part of their blended teaching methods to suit enhance meaningful learning of genetic phenomena.

6. Acknowledgements

We would like to thank the authorities of the nursing schools who permitted us to conduct this study. We are also grateful to our participants for their interest and involvement in our study.

7. Conflict of interest

We hereby declare that we have no conflict of interest in the conduct of this study or declaration of results.

References

Akeju et al., 2012 – *Akeju, O.O.S., Rotimi, O.C., Kenni, A.M.* (2012). Teaching with concept mapping instructional strategy in Nigeria secondary schools. *International Journal of Physics & Chemistry Education*. 4(SI): 13-19.

Akinsanya, Williams, 2004 – *Akinsanya, C., Williams, M.* (2004). Concept mapping for meaningful learning. *Nurse Education Today*. 24(1): 41-46.

All et al., 2003 – *All, A.C., Huycke, L.I., Fisher, M.J.* (2003). Instructional tools for nursing education: Concept maps. *Nursing Education Perspectives*. 24(6): 311-317.

All, Havens, 1997 – *All, A.C., Havens, R.L.* (1997). Cognitive/concept mapping: a teaching strategy for nursing. *Journal of Advanced Nursing*. 25(6): 1210-1219.

Chifwa, 2015 – *Chifwa, J.* (2015). Teaching of genetics in selected secondary schools in Kitwe district, Zambia. (Unpublished Master's Dissertation). Zambia.

Davar, 2012 – *Davar, M.* (2012). Teaching of science. New Delhi: PHI Learning Private Limited.

Dehghanzadeh, Jafaraghaee, 2018 – *Dehghanzadeh, S., Jafaraghaee, F.* (2018). Comparing the effects of traditional lecture and flipped classroom on nursing students' critical thinking disposition: A quasi-experimental study. *Nurse Education Today*. 71: 151-156.

Etobro, Banjoko, 2017 – *Etobro, A.B., Banjoko, S.O.* (2017). Misconceptions of genetics concepts among pre-service teachers. *Global Journal of Educational Research*. 16(2): 121-128.

French, Kennedy, 2017 – *French, S., Kennedy, G.* (2017). Reassessing the value of university lectures. *Teaching in Higher Education*. 22(6): 639-654.

Gusmalini, Wulandari, 2020 – *Gusmalini, A., Wulandari, S.* (2020, October). Identification of misconceptions and causes of student misconceptions on genetics concept with CRI method. *Journal of Physics: Conference Series*. IOP Publishing. 1655(1): 012053.

Jaafarpour et al., 2016 – *Jaafarpour, M., Aazami, S., Mozafari, M.* (2016). Does concept mapping enhance learning outcome of nursing students? *Nurse Education Today*. 36: 129-132.

JASP Team, 2020 – JASP Team (2020). JASP (Version 0.14.1) [Computer software]. [Electronic resource]. URL: https://jasp-stats.org/

John et al., 2019 – *John, F., Sani, A. N., Ranccas, B. M., Maskawa, B. U.* (2019). Effects of concept mapping and demonstration method on senior secondary two biology students' achievement in genetics in Jos North, Plateau State. *KIU Journal of Humanities*. 3(4): 177-182.

Kantahan et al., 2020 – *Kantahan, S., Junpeng, P., Punturat, S., Tang, K. N., Gochyyev, P., Wilson, M.* (2020). Designing and verifying a tool for diagnosing scientific misconceptions in genetics topic. *International Journal of Evaluation and Research in Education*. 9(3): 564-571.

Lee et al., 2013 – *Lee, W., Chiang, C. H., Liao, I. C., Lee, M. L., Chen, S. L., Liang, T.* (2013). The longitudinal effect of concept map teaching on critical thinking of nursing students. *Nurse education today*. 33(10): 1219-1223.

Osman et al., 2017 – *Osman, E., BouJaoude, S., Hamdan, H.* (2017). An investigation of Lebanese G7-12 students' misconceptions and difficulties in genetics and their genetics literacy. *International Journal of Science and Mathematics Education*. 15(7): 1257-1280.

Petty, 2009 – *Petty, G.* (2009). Teaching today: A practical guide. *New Delhi Proceedings of the 39th Annual Conference of STA3*, 133-136.

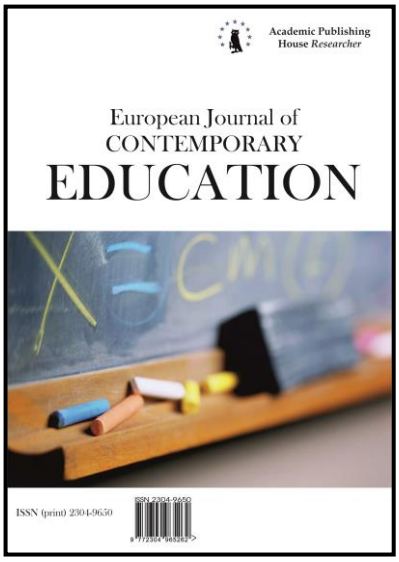
Safdar et al., 2012 – *Safdar, M., Hussain, A., Shah, I., Rifat, Q.* (2012). Concept maps: An instructional tool to facilitate meaningful learning. *European Journal of Educational Research*. 1(1): 55-64.

Winchester, 2018 – *Winchester, A.M.* (2018). Genetics. In Encyclopedia Britannica. [Electronic resource]. URL: https://www.britannica.com/science/genetics

Yang et al., 2018 – *Yang, C., Jen, C.H., Chang, C. Y., Yeh, T.K.* (2018). Comparison of animation and static-picture-based instruction: Effects on performance and cognitive load for learning genetics. *Journal of Educational Technology & Society*. 21(4): 1-11.

Yue et al., 2017 – *Yue, M., Zhang, M., Zhang, C., Jin, C.* (2017). The effectiveness of concept mapping on development of critical thinking in nursing education: A systematic review and meta-analysis. *Nurse Education Today*. 52: 87-94.

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 35-42
DOI: 10.13187/ejced.2021.1.35
www.ejournal1.com



Mathematics: an Academic Discipline that Generate Anxiety in College Students

Milka Elena Escalera-Chávez [a], Josefina Ramos-Hernández [b], Violeta S. Molchanova [c, d], Arturo García-Santillán [b, *]

[a] Unidad Académica Multidisciplinaria Zona Media, UASLP, México
[b] UCC Business School at Universidad Cristobal Colon, México
[c] Cherkas Global University (International Network Center for Fundamental and Applied Research), Washington, USA
[d] Volgograd State University, Volgograd, Russian Federation

Abstract

Mathematics is very important in the workplace. Companies, through mathematical models, can filter and interpret the data obtained from sales reports, customer feedback or web traffic, in order to improve the company's strategy and optimize processes and results. However, a problem arises: for the students who will soon enter the work force, mathematics generates anxiety and so, they try to avoid it. This study aims to examine whether there is a difference in university students regarding math anxiety in terms of gender, career, age and semester, as well as the causes of this anxiety. It is a study that is approached from the hypothetical-deductive and cross-sectional method. The sampling was simple random and it was made up by 343 college students from the majors of the administrative economic area. The instrument used is the scale designed by Auzmendi (1992), of which only the anxiety factor was used. The Kruskal-Wallis test was used to analyze the data. The findings indicate that anxiety towards mathematics is the same in men and women, there are no differences in relation to the age and major of the students, but there is a difference regarding the course that the student attends.

Keywords: mathematics, anxiety, college students.

1. Introduction

As mathematics have become an essential discipline in the work field, Kent et al. (2007) indicate two main reasons for such importance: one is the increase of information technologies in work practices and the second is the response to satisfy the client's demands, since every mathematical procedure at work, no matter how simple, is a part of a wide range of decisions and

* Corresponding author
E-mail addresses: agarcias@ucc.mx (A. García-Santillán)

judgements about processes or products; hence, Vázquez (2017) states that "mathematics is the hidden tread that controls the flow in the new world, real and virtual".

With mathematical models, companies can filter and interpret the data obtained by sales reports, client feedback or web traffic, in order to improve the company's strategy and optimize processes and results. These models correlate the different layers of information regarding the goal of the organization or are useful to take advantage of an opportunity. However, in the work place mathematics is considered a problematic issue and business owners have been informing for some time on their employees' deficit of knowledge and abilities in this subject. Considering the ideas presented before, it can be inferred that mathematics should be considered a relevant matter in a student's life (Cockcroft, 1985).

Some students have understood that mathematics is fundamental in the current world: they are even used to optimize the mixtures of food or chemical products, for instance; additionally, it has been used in marketing to choose advertising media and suitable distribution channels, while some government entities have used it to minimize the costs of managing solid wastes that contaminate air and water (Narro, 1996).

On the other hand, others do not consider the existence of a relationship between mathematics and the work place, such as Soltaní et al (2013) and Jurdak & Shahin (2001), quoted by FitzSimons, 2013, who argue about this discipline only being viewed as a theoretical tool which is often far from reality. In Mexico, Sánchez & Olivares (2016) mentioned that this is precisely the way it is taught and stated "it is because of our educational system, because of how mathematics is presented to students. It is not taught as something attractive and many students see it as something boring" (Sánchez, Olivares, 2016: 1). Because of the former Furner & Berman (2003) consider important for students to realize that mathematics has applications outside the classroom and is necessary in people's daily lives, in the activities they undertake and even at home, to mention a few examples.

Another argument on this matter is the anxiety students manifest towards this subject, as pointed out by international organizations (such as PISA), which has reported that one of the causes of a low level in mathematics is the anxiety present in the student when taking the test (PISA, 2015; 2018). Furner & Berma (2013) indicate that when students feel less anxiety and trust their skills, performance in standardized tests is better and their score improves.

Anxiety, in the educational field has been conceptualized by Hembree (1990) as "*a mood sustained by qualities such as fear and terror. This emotion is unpleasant and has as special characteristics feelings of insecurity and impotence in the face of dangerous situations*" (p. 33). In this regard, Pérez-Tyteca (2012) mentions mathematical anxiety to be manifested through a series of "symptoms", such as: stress, nervousness, concern, restlessness, irritability, confusion, fear and mental block.

Math anxiety can be defined as an "irrational fear to mathematics that interferes with the manipulation of numbers and the solving of mathematical problems in a variety of daily and academic situations" (Buckley, Ribordy, 1982: 1, quoted by Furner, Berma, 2013). The National Council of Teachers of Mathematics (NCTM) recognizes mathematic anxiety as a problem and this issue has been the studied by several researchers, such as Delgado, Espinoza & Fonseca (2017), who investigated the relationship between mathematical anxiety and the variables of gender and academic performance in students from the National University of Costa Rica, revealing that the more math anxiety is present in students, their academic performance is lower; on the other hand, Soneira & Mato, (2020) evaluated anxiety in engineering college students and their results show students to have anxiety towards evaluation and anxiety towards numbers and mathematical operation, being anxiety towards evaluation the one with the highest presence.

Mathematical anxiety is a widely spread phenomenon that has become very normal among college students nowadays and some authors point out to college teachers being aware of the problem starting during childhood (Perry, 2004, quoted by Pérez-Tyteca, 2012). On this matter, García-Santillán, Wurzinger & Tejada (2015) found anxiety towards mathematics being present in elementary school students. Furthermore, the Third International Mathematics and Sciences Study showed mathematics scores to be reduced as the students advance from grades 4 to 12 (Backhoff, Solano, 2003).

Pérez-Tyteca et al. (2008) have highlighted that six out of every ten college students, regardless of their study field, show anxiety symptoms when facing mathematics; likewise, they

mention that there is a difference in relation to the major of the students, as the ones enrolled in the Science Faculty show slightly lower levels of mathematics anxiety than the ones in the Faculty of Arts, Psychology or Sociology.

Regarding the topic of anxiety, a study by García-Santillán, Escalera-Chávez, Moreno-García & Santana-Villegas (2016) proved anxiety to be a factor that prevents students from achieving a good performance during the learning process. Along those lines, a recent study done in a Mexican nautical school by García-Santillán, Moreno-García, Schnell & Ramos-Hernández (2016) showed that mathematical anxiety to daily life situations does not generate a lot of anxiety for the student, in contrast to the anxiety towards the understanding of mathematical problems and anxiety towards the numbers of mathematical operations.

A research by Garcia-Santillan et al. (2017), considering 100 students from the Administrative-Economic in the Veracruz Institute of Technology, evidenced that students suffer from anxiety towards exams, anxiety while solving problems, anxiety before a test, anxiety related to mathematics text books and anxiety to the simple fact of hearing about mathematics. The facts aforementioned contribute in a 66.2 % to the explanation of the phenomenon.

Anxiety towards mathematics has also been examined in relation to gender; some authors (Karimi, Venkatesan 2009; Vitasari et al., 2010, quoted by Pérez-Tyteca et al., 2008), indicate that men suffer less anxiety than women. Cumhur & Tezer (2019) studied the anxiety towards mathematics in 100 college students enrolled in 10 different departments of the Economic and Administrative Faculty of a private college in the academic course 2018–2019. The results reveal the lack of a significative difference in the level of anxiety among students in relation to gender; furthermore, most admitted not to be stressed either before or after mathematics class and thinking about this subject did not cause stress for them. However, other authors have proved there is a significant difference in relation to gender (Goetz et al., 2013, Pourmoslemi et al., 2013, Karimi, Venkatesan, 2009).

One of the goals of any educational system is for students to obtain the best learning and improve their skill levels in every discipline – mathematics is not the exception – which is why college institutions strive for an excellent integral education with constant improvements that encourage the maximum learning goal of the students. Therefore, the results of this research will make a contribution to these institutions by providing evidence on the feeling of anxiety shown by students towards mathematics and with this information, they can implement strategies that promote a better training and talent improvement of the college students.

The role of college education institutions has always been of great significance but in these times, it has become more important in a society where there are settings requiring people to undertake interrelated and interdependent problems from an increasingly complex and including stance (López, 2018). A proper mathematics teaching process will enable students to acquire the knowledge and skill that can be applied in these new scenarios.

Even though there is enough literature on anxiety towards mathematics, there is still a lack of research on the anxiety caused by this discipline in students from social science majors. For said reason, this study poses the following goal: examine if there is a difference related to gender, major, age and course in the level of anxiety towards mathematics among the students from the social sciences majors in the Medium Zone Multi-disciplinary Academic Unit of the Autonomous University of San Luis Potosí (UASLP for its acronym in Spanish), a college in Mexico.

Research hypothesis

Hi_1: The level of anxiety towards mathematics in the students from social sciences majors in the UASLP is different in men and women.

Hi_2: The level of anxiety towards mathematics in the students from social sciences majors in the UASLP is different depending on the major they are enrolled in.

Hi_3: The level of anxiety towards mathematics in the students from social sciences majors in the UASLP is different according to the student's age.

Hi_4: The level of anxiety towards mathematics in the students from social sciences majors in the UASLP is different because of the course (semester) they are studying.

2. Methodology

Research design. This research is approached from a hypothetic deductive-method, since it seeks to corroborate the hypotheses through the obtention of data. The design is non

experimental considering that the independent variables are not manipulated to intentionally modify the effect (Y). It is also transversally cut because the instrument was applied in a single moment in time.

Participants. The key informants for the study are the students from the Medium Zone Multi-disciplinary Academic Unit of the UASLP. The sampling type was simple random and the sample was made up by 343 students, from which 66 % were women and 34 % were men. 43.7 % were in the Business major, 29.4 % in the Public Accountant and Finances major and 26.8 % in the Marketing major.

Instrument. The instrument used in this research was the scale posed by Auzmendi (1992), which is made up by 29 items from five factors: anxiety, liking, motivation, usefulness and trust. The scale is designed with Likert format questions of five points, where 1 is completely disagree and 5 completely agree. Also, for this study, the only considered construct was anxiety. To measure the reliability and internal consistency of the instrument Cronbach's alpha was measured, obtaining a value of 0.5633.

Procedure for data measurement. The gathered data was summited to a statistical analysis of mean difference. In order to this, the *H* test of Kruskal-Wallis was done and the calculations were processed using the software SPSS v.25. Since the purpose is to determine the difference between anxiety towards mathematics and the gender, age, course (semester) and major, this is the technique that allows for the comparison of variances among groups.

3. Results

From the 343 students surveyed in the college, 61.5 % show high anxiety levels and a large percent are women (Table 1). However, this does not prove there is a difference between men and women. In order to see if there are differences in relation to gender, the Kruskal-Wallis H test was used, as well as to check if anxiety was different among the students depending on the major they are studying.

Table 1. Anxiety level

Level	Male	Female	Total
Low	12.5%	26.0%	38.5%
High	20.2%	41.3%	**61.5%**
Total	32.7%	67.3%	100.0%

Source: own

As shown on Table 2, there were no significant differences in anxiety towards mathematics since value p > 0.05 and the difference between the medium range of the gender and major variables is small; consequently, there is evidence to support the null hypothesis, which indicates that the population means for these groups are all the same, meaning there is no difference in relation to gender.

Table 2. Mean range and significance of gender and major

		Mean range	Kruskal-Wallis H	sig.
Gender	Male	154.06	1.777	.183
	Female	168.84		
Mayor			.940	.625
	LA	164.17		
	LM	156.73		
	CP	170.45		

Source: own

Regarding age, the results on Table 3 show the value p > 0.05, hence the null hypothesis is rejected, meaning there are no significant differences between anxiety towards mathematics and the age of the students.

Table 3. Mean range and significance of age

Age	Mean range	Age	Mean range	Kruskal-Wallis H	Sig.
17	150.81	24	134.67		
18	151.87	25	259.13		
19	147.16	26	140.50	16.514	.169
20	168.81	27	74.50		
21	190.21	28	147.50		
22	165.60	33	17.50		
23	180.74				

Source: own

However, there is a significant difference regarding the course (semester) they are studying as the value of p < 0.05. Table 4 shows the mean range of the variable course (semester) and its significance. It is possible to see a higher difference between the first and seventh semesters.

Table 4. Mean range and significance of semester

Semester	Average range	Kruskal-Wallis H	Sig.
1	138.13	14.185	007
3	168.79		
5	166.17		
7	195.55		
9	168.08		

Source: own

Figure 1 clearly shows the difference between means. Likewise, it can be seen in Table 5 that the most significant difference (0.002) is between the first and seventh semester. These significance values have been adjusted with the Bonferroni correction.

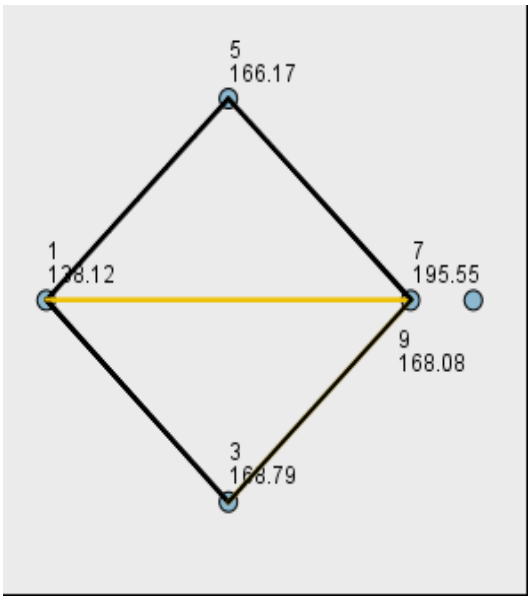


Fig. 1. Comparison between courses (semesters)

Table 5. Constrast statistics among semesters

Sample	Constrast statistic	Error	Statistical deviance of contrast	Sig.	Adjus. Sig.
1-7	-57.426	15.562	-3.690	0.000	0.002
1-3	-30.668	14.146	-2.168	0.030	0.302
1-5	-28.042	14.666	-1.912	0.056	0.559
5-7	-29.384	16.52	-1.779	0.075	0.753
3-7	-26.758	16.059	-1.666	0.096	0.957
1-9	-29.958	24.162	-1.24	0.215	1.000
9-7	27.468	25.33	1.084	0.278	1.000
5-3	2.626	15.193	0.173	0.863	1.000
5-9	-1.917	24.79	-0.077	0.938	1.000
9-3	0.709	24.486	0.029	0.977	1.000

Source: own

With these results, there is statistical evidence to say that the population means for these groups are not all the same, thus it can be concluded that there is a difference in the anxiety towards mathematics experienced by students, according to the course (semester) they are currently enrolled in.

4. Conclusion

In the first place, the results of this research have allowed to obtain evidence about a high percentage of students enrolled in social sciences majors of the UASLP who manifest anxiety towards mathematics and this level of anxiety is present in students from the following three majors: Business, Public Accountant and Marketing.

Another finding was that math anxiety is present in both men and women, since no significant difference was found between them and neither according to their age, although there was a difference in relation to the course (semester) they were studying and this difference is higher between the first and seventh semester. A possible explanation for this could be the subjects taken by the students in the seventh semester, since the contents may include more mathematics.

It is important to highlight that these results are not different from the research done in other college institutions (Garcia-Santillan et al., 2017; García-Santillán et al., 2016) and also match what international organizations have found about anxiety towards mathematics being a relevant problem among students (PISA, 2015, 2018).

The academic authorities of the country could come up with new strategies for the teaching and learning processes of mathematics, so that from their statutes, new regulations can be established on the matter. On their end, academic authorities of public and private institutions offering instruction at all levels of study could reinforce their didactic strategies for such purpose, that is, to redesign the teaching processes used in the learning units and contents taught in mathematics and other related subjects.

References

Alves et al., 2016 – *Alves, M., Rodrigues, C., Rocha, A.M., Coutinho, C.* (2016). Self-efficacy, mathematics' anxiety and perceived importance: an empirical study with Portuguese engineering students. *European Journal of Engineering Education.* 41(1): 105-121. DOI: 10.1080/03043797.2015.109515

Auzmendi Escribano, 1992 – *Auzmendi Escribano, E.* (1992). Las actitudes hacia la matemática-estadística en las enseñanzas media y universitaria. *Características y medición. Ed mensajero. España.*

Backhoff, Solano-Flores, 2003 – *Backhoff, E., Solano-Flores, G.* (2003). Tercer estudio internacional de matemáticas y ciencias naturales (TIMSS): resultados de México en 1995 y 2000. Cuaderno nº4. Instituto Nacional para la Evaluación de la Educación. México, DF.

Cockcroft, 1985 – *Cockcroft, W.H.* (1985). Las matemáticas sí cuentan: informe Cockcroft (Vol. 20). Ministerio de Educación.

Cumhur, Tezer, 2019 – *Cumhur, M., Tezer, M.* (2019). Anxiety about mathematics among university students: A multi-dimensional study in the 21st century. *Cypriot Journal of Educational Science*. 14(2): 222–231.

Cumhur, Tezer, 2019 – *Cumhur, M., Tezer, M.* (2019). Anxiety about mathematics among university students: A multi-dimensional study in the 21st century. *Cypriot Journal of Educational Sciences*. 4(2): 222-23.

De la Peña, 2002 – *De la Peña, J.* (2002). Algunos problemas de la educación en matemáticas en México, México: Siglo XXI.

Delgado et al., 2017 – *Delgado, I., Espinoza, J., Fonseca, J.* (2017). Ansiedad matemática en estudiantes universitarios de Costa Rica y su relación con los rendimientos académico y variables sociodemográficas. *Propósitos y Representaciones*. 5(1): 275-324.

Fitz Simons, 2013 – *Fitz Simons, G.* (2013). Doing Mathematics in the Workplace. A Brief Review of Selected Literature. Adults Learning Mathematics. *An International Journal*. 8(1): 7-19.

Furner, Berman, 2003 – *Furner, J.M., Berman, B.T.* (2003). Review of research: math anxiety: overcoming a major obstacle to the improvement of student math performance. *Childhood education*. 79(3): 170-174.

García-Santillán et al., 2015 – *García-Santillán, A., Wurzinger, A.E., Tejada-Peña, E.* (2015). What Factors Explain the Anxiety Level Towards the Study of Mathematics among Elementary School Students? *Mediterranean Journal of Social Sciences*. 6(4): 564.

García-Santillán et al., 2016 – *García-Santillán, A., Escalera-Chávez, M. E., Moreno-García, E., Santana-Villegas, C.* (2016). Factors that Explains Student Anxiety toward Mathematics. *Eurasia Journal of Mathematics, Science & Technology Education*. 12(2).

García-Santillán et al., 2016 – *García-Santillán, A., Moreno-García, E., Schnell, J., Ramos-Hernández, J.* (2016). Anxiety towards mathematics on undergraduates in a Nautical School (An empirical study in Port Veracruz). *International Electronic Journal of Mathematics Education*. 11(7): 2418-2429.

García-Santillán et al., 2017 – *García-Santillán, A., Rojas-Kramer, C., Moreno-García, E., Ramos-Hernández, J.* (2017). Mathematics test, numerical task and mathematics course as determinants of anxiety toward math on college students. *European Journal of Contemporary Education*. 6(2): 240-253.

Goetz et al., 2013 – *Goetz, T., Bieg, M., Lüdtke, O., Pekrun, R., Hall, N.C.* (2013). Do girls really experience more anxiety in mathematics? *Psychological science*. 24(10): 2079-2087.

Gómez López, 2009 – *Gómez López, J.* (2009). Conocimientos previos de los alumnos de nuevo ingreso a la Facultad de Contaduría y Administración campus Coatzacoalcos, documentos del XII Congreso Internacional sobre Innovaciones en Docencia e Investigación en Ciencias Económico-Administrativas, octubre, Querétaro, México.

Hembree, 1990 – *Hembree, R.* (1990). The nature, effects, and relief of mathematics anxiety. *Journal for research in mathematics education*. 33-46.

Karimi, Venkatesan, 2009 – *Karimi, A., Venkatesan, S.* (2009). Mathematics anxiety, mathematics performance and academic hardiness in high school students. *International Journal of Educational Sciences*. 1(1): 33-37.

Kent et al., 2007 – *Kent, P., Noss, R., Guile, D., Hoyles, C., Bakker, A.* (2007). Characterizing the use of mathematical knowledge in boundary-crossing situations at work. *Mind, Culture, and Activity*. 14(1-2): 64-82.

Lopez, 2018 – *Lopez, Y.* (2018). El papel de la Educación superior en la Sociedad del conocimiento. *COEPES*. 7(20). [Electronic resource]. URL: https://bit.ly/31QRR6Q

Pérez Tyteca et al., 2008 – *Pérez Tyteca, P., Castro, E., Segovia, I. et al.* (2008). Ansiedad matemática de los alumnos que ingresan en la universidad de Granada. Comunicaciones de los grupos de investigación del XI Simposio de la SEIEM. coord. por Matías Camacho Machín, Pablo Flores Martínez, María Pilar Bolea Catalán, pp. 171-180.

Pérez Tyteca, 2012 – *Pérez Tyteca, P.* (2012). La Ansiedad Matemática como centro de un modelo causal predictivo de la elección de carreras. Tesis Doctoral. [Electronic resource]. URL: https://hera.ugr.es/tesisugr/2108144x.pdf

Petriz Mayen et al., 2010 – *Petriz Mayen, M.A., Barona Ríos, C., López Villareal, R.M., Quiroz González, J.* (2010). Niveles de desempeño y actitudes hacia las matemáticas en estudiantes de la licenciatura en administración en una universidad estatal mexicana. *Revista Mexicana de Investigación Educativa*. 15(47): 1223-1249.

Petriz Mayen, 2006 – *Petriz Mayen, M.* (2006). Algunos factores que influyen en el aprendizaje de las matemáticas: el caso de los estudiantes de la Facultad de Contaduría Administración e Informática (FCAeI) de la UAEM, tesis doctoral, México: Centro de Investigación y Docencia en Humanidades.

PISA, 2015, 2018 – PISA (2015, 2018). Programa para la Evaluación Internacional de los Estudiantes. INEE. [Electronic resource]. URL: https://www.inee.edu.mx/evaluaciones/pisa/bases-de-datos-pisa-2015/

Popper et al., 1978 – *Popper, K., Adorno, T., Dahrendorf, R.* (1978). La lógica de las ciencias sociales. México: Grijalbo.

Pourmoslemi et al., 2013 – *Pourmoslemi, A., Erfani, N., Firoozfar, I.* (2013). Mathematics anxiety, mathematics performance and gender differences among undergraduate students. *International Journal of Scientific and Research Publications*. 3(7): 1-6.

Ramírez, 1996 – *Ramírez, A.E.N.* (1996). Aplicación de algunos modelos matemáticos a la toma de decisiones. *Política y Cultura*. (6): 183-198.

Rojas-Kramer et al., 2017 – *Rojas-Kramer, C.A., Escalera-Chávez, M.E., García-Santillán, A.* (2017). Motivación, ansiedad, confianza, agrado y utilidad. Los factores que explican la actitud hacia las matemáticas en los estudiantes de economía. *International Journal of Developmental and Educational Psychology*. 2(1): 527-539.

Salout et al., 2013 – *Salout, S.S., Behzadi, M.H., Shahvarani, A., Manuchehri, M.* (2013). Students' Conception about the Relation of Mathematics to Real-Life. *Mathematics Education Trends and Research*. 2: 2-7.

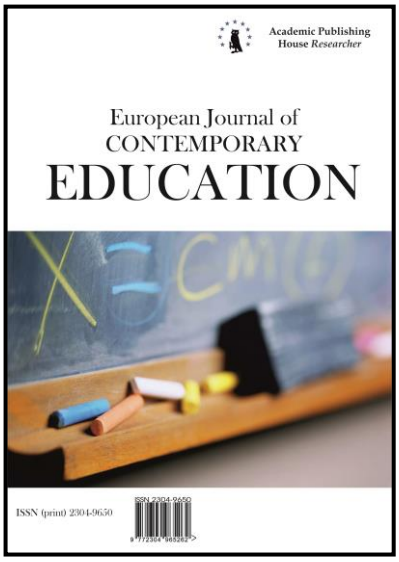
Sánchez, 2016 – *Sánchez, A. y Olivares E* (2016). El problema de las matemáticas en México es cómo se enseñan. [Electronic resource]. URL: https://bit.ly/3h1SUrf

Soneira, Mato, 2020 – *Soneira, C., Mato, D.* (2020). Estructura de un cuestionario para evaluar la ansiedad hacia las matemáticas en estudiantes de ingeniería. *Revista de Estudios e Investigación en Psicología y Educación*. 7(1): 59-70.

Sosa Hernández, 2009 – *Sosa Hernández, E.* (2009). "La resolución de problemas y el uso de software en la enseñanza de las matemáticas", documentos del *XII Congreso Internacional sobre Innovaciones en Docencia e Investigación en Ciencias Económico-Administrativas*, octubre, Querétaro, México.

Vázquez, 2017 – *Vázquez, J.L.* (2017). La poderosa influencia de las matemáticas en el mundo actual. *Aula de Ciencia y Tecnología*. 1. [Electronic resource]. URL: https://bit.ly/3102rJx

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 43-52
DOI: 10.13187/ejced.2021.1.43
www.ejournal1.com



Online Student Education in a Pandemic: New Challenges and Risks

Elena V. Frolova [a, *], Olga V. Rogach [a], Alexander G. Tyurikov [b], Pavel V. Razov [b]

[a] Russian State Social University, Moscow, Russian Federation
[b] Financial University under the Government of the Russian Federation

Abstract

The epidemiological crisis made it necessary to transform the practice of higher education in the conditions of transition to remote mode. Online training has become an alternative to the face-to-face format of classes, which updates the analysis of key risks and problems of the educational process in the context of the pandemic. The leading research method was a questionnaire survey of students with online learning experience (N = 146 people). The survey was conducted in May 2020. For a deeper interpretation of a number of conclusions, the authors conducted a focus group in September 2020 (N = 12 people), which included students of 2-3 years of study at Russian universities. The authors set a goal to study the degree of adaptation of students to new learning conditions, the specifics of their perception of various aspects of learning in an online environment, problems and risks. The results of the study showed that every fourth student when switching to online mode could not successfully adapt to the new format of training. It is concluded that the key risks of online learning are associated with the lack of direct communication channels, the spread of the practice of imitating students' learning activities in the context of reducing the control function of the teacher. The lack of readiness of students to maintain the necessary level of self-organization led to a decrease in students' requirements for themselves as an active participant in the educational process, while increasing requirements for digital competencies and personal qualities of the teacher. In terms of online learning, students demonstrate the need for additional measures to maintain interest in learning: game context, network interaction in the "student-student" system, charismatic presentation of material.

Keywords: higher school, online education, digital technologies, digital literacy, pandemic.

1. Introduction

The global pandemic has significantly transformed all spheres of public life. Modern education is facing new challenges due to the need for an urgent transition to online learning

* Corresponding author
E-mail addresses: efrolova06@mail.ru (E.V. Frolova)

(Favale, 2020). The urgent transition of face-to-face classes to a remote format required the development of an "online methodology" for higher education (Garcia-Penalvo et al., 2020). This online methodology should be considered as a mechanism for transferring knowledge and developing professional competencies of young people without losing the advantages of face-to-face interaction.

The results of a study conducted by Dubreil S. in 2020 illustrate the threat of violation of the integrity of the educational process in the context of widespread forced transition to online learning. Combining pedagogical tools with game design can be considered as a constructive solution for learning in the era of social distancing (Dubreil, 2020). Expanding the boundaries of these conclusions, Timmis S. and Munoz-Chereau emphasize the importance of improvisation and collective activity in the learning environment, and draw attention to students' informal digital practices (Timmis, Munoz-Chereau, 2019). A group of scientists from Brazil made similar conclusions in a study. It is noted that there is a need to review learning scenarios in the period of isolation, to find a balance between the use of pedagogical skills and information and communication technologies. Scientists point out the risks of social injustice due to heterogeneous access to digital technologies. These trends lead to an increase in pre-existing educational asymmetries in the context of digital inequality (Prata-Linhares, 2020).

Most studies show a positive perception of digital technologies in general, and the possibilities of their use in online learning, in particular. M.A. Shchadnaya's work focuses on increasing the flexibility of the education system, which allows all participants to choose a convenient time for classes, take into account individual characteristics and needs of students (Shchadnaya, 2020). According to medium-term forecasts, the use of digital technologies will increase the effectiveness of education by increasing the manageability of the educational process, the prevalence of data control, de-territorialization of the educational space (Selwyn et al., 2019), the formation of individual educational trajectories of students, differentiation of forms and methods of teaching (Frolova et al., 2020).

However, a number of scientists warn against the perception of online learning as a panacea for education (Menashy, Zakharia, 2019). A number of papers conclude that there is an objective need to rethink educational practices in order to minimize the negative impact of modern information and communication technologies on people (Tyurikov, Bolshunov, 2019). Problems of online learning are associated with a decrease in the level of cognitive skills of students (Vinichenko et al., 2018) and insufficient conditions for the formation of communicative competencies (Cladis, 2018). According to experts, it is particularly difficult to conduct an online assessment of students' knowledge and skills in the new environment, compliance with the requirements of transparency, fairness and legal certainty. Research results have shown that the problem that causes the greatest stress for students is the situation of uncertainty when conducting a semester's knowledge assessment (Moawad, 2020). The loss of transparency in the assessment of knowledge creates additional barriers to student motivation. There is a loss of interest in educational activities, a decrease in the level of students' involvement in the educational process, and a violation of communication both within the study group and with the teacher (Frolova et al., 2019). It should be noted that the specifics of remote interaction between teachers and students in the online learning system is a central topic of research on the transformation of the educational process in the context of COVID-19 (Murray, 2020; Kim, 2020). J.R. Bryson and L. Andres distinguish two forms of interaction: surface and deep. The first of them implies a limited practice of conducting a dialogue with students, while the deep form includes a process of joint creativity and educational reflection (Bryson, Andres, 2020). A study led by Ana A. in Indonesia and Malaysia during the COVID-19 outbreak shows the problem of students' psychological resilience to e-learning systems. It is argued that the lack of face-to-face meetings with the teacher should be compensated by an effective learning strategy based on e-learning activities (Ana et al., 2020) and virtual reality technologies (McGovern et al., 2019).

International research materials demonstrate the importance of taking into account the negative aspects and dysfunctions when switching to online training. In particular, according to a group of researchers led by Bataineh K. B., the majority of students at Jordanian universities are dissatisfied with the online learning experience, as they faced the problems such as low Internet speed, insufficient software availability, and unsatisfactory design of online content (Bataineh et al., 2021).

A possible compensator for the problems associated with low interest and lack of motivation of students in online learning is the use of gamified technologies. Scientists pay attention to the fact that modern students are representatives of the digital generation – Net Generation. The specifics of the socio-psychological portrait of a digital generation student require a close interweaving of formal and informal activities in education. For example, digital comics and other visual effects can help generate sustained student interest and increase their enthusiasm and motivation to learn (Craciun, Bunoiu, 2019). Similar results were obtained in the course of conducting focus groups with graduate and undergraduate students. The respondents' preferences in the practice of online learning were identified: visual elements, interactivity, accessibility, and the use of applied scenarios. Of particular importance for modern students is the teacher's ability to switch their attention to different types of work in a virtual learning environment (Groton, Spadola, 2020).

Conclusions drawn from international research demonstrate the special importance of personal and professional qualities of a teacher in the context of digitalization of education. In particular, attention is drawn to the teacher's experience in the online environment, digital skills, and the ability to use information and communication technologies for data analysis. The conclusion is made about the need for continuous improvement of professional knowledge in the field of digitalization, the formation of a teacher's sustainable desire to improve their skills (Kumar et al., 2019).

2. Methods

In modern scientific and practical literature, there are results of research on the possibilities and effectiveness of using distance technologies in certain segments of educational services. However, there is no analysis of the risks of a widespread transition from face-to-face classes to online training. The authors conducted an intelligence study aimed at studying the degree of adaptation of students to new learning conditions, the specifics of their perception of various aspects of learning online, its effectiveness, problems and risks of negative trends. The questionnaire survey was conducted in May 2020 (N = 146 people). The timing of the study was determined by the formation of students' primary experience in online learning. It is of interest to obtain primary data that shows the most significant problems and dysfunctions that students have encountered.

The study used a random sample. The selection was carried out on the principle of voluntariness and availability of inclusion of units of the general population in the sample. The respondents were students of Russian universities. Signs of representation: the status of a student of a higher educational institution in the territory of the Russian Federation, the experience of online training for at least one month. The last requirement was due to the fact that not all universities were able to implement the practice of switching to online mode. The questionnaire was posted on the platform google.com/forms.

The authors used a set of general scientific research methods and analytical procedures: comparative analysis, classification and systematization of data, analysis of documents and scientific literature. In order to verify the data obtained and increase the expertise of the conclusions made, the authors conduct a comparative analysis of the survey results with empirical materials from other research groups.

In order to verify the data obtained, in September 2020, the authors conducted a focus group with 12 full-time students. The students participating in the survey were sent invitations to a focus group study. Out of 32 students who expressed potential readiness to participate, 12 respondents of the 2nd and 3rd years of study with different levels of academic performance were selected. The 1st and 4th year students were excluded due to the lack of sufficient full-time training experience for the first of them and the special expectations of the final year students.

In the course of data processing and interpretation, the authors used statistical analysis methods. In particular, a correlation analysis was carried out, which was carried out by calculating the Pearson correlation coefficient.

3. Results

According to the data obtained, the majority of students have successfully adapted to the transition to online education. Every third respondent chose the answer "excellent" (33.6 %), "good" – 34.9 %. These proportions fully correlate with the assessment of digital competence of

Russians. The results of the VTSIOM survey illustrate the division of Russian citizens by the level of digital competence into four groups, where 30 % have a high level of proficiency and 32 % are above average. Both in study and in professional activities, there is a pattern between a high level of digital literacy and the success of switching to remote mode of work. At the same time, the majority of Russians (60 %) are quite satisfied with their level of digital skills (VTSIOM website).

The current situation in the higher education system has shown that students in general have switched to online education quite easily. However, there are serious concerns about the fact that every fourth University student was not able to adapt to the changes successfully and, in fact, was excluded from the educational process. In the face of a pandemic and a widespread online transition, these students are a prime example of digital asymmetry. This problem should be considered in the long term, since the untimely adaptation of a significant number of students (25 %) to the new format of education initiates a decrease in the professional knowledge of graduates.

Despite the fact that 2/3 of the respondents are quite optimistic when considering their adaptive capabilities, the assessment of the level of complexity of learning in the online format is centered in a lower range. Just under half of the respondents (39.7 %) said that learning is "difficult" and "rather difficult". The key difficulties of the students relate to technical limitations and lack of feedback from the teacher.

Table 1. Distribution of answers to the question: "What difficulties have You experienced in the transition to online learning?" %

Difficulty	%
No personal computer at home	10,3
The lack of access to the Internet	15,1
Inadequate skills to operate the computer	8,2
Lack of feedback from the teacher	18,5
Other	9,5
There are no difficulties	38,4

Only 38.4 % of the respondents did not have trouble with switching to total online training. These results update the search for key dysfunctions and problems in online learning. During the focus group, the issue of the lack of feedback from the teacher was clarified. There were such judgments as "the feeling that we are communicating with the screen, and not with a real teacher", "you can't see the reaction", "in live communication, it is immediately clear whether I answer correctly or say the wrong thing". In the online communication format, many students pointed out the presence of psychological clamps that do not allow them to freely express their opinions. It is noted that many teachers, working with the presentation, do not turn on the camera and do not use a personalized address to students. For many students, this has become an undesirable form of interaction, and they want to work with cameras turned on to create a sense of presence in a virtual classroom.

Additional problems relate to the level of digital literacy of a teacher. During the focus groups, the students were very ironic about those teachers who do not have basic digital skills and have not been able to improve their ability to work in the digital environment. Among the respondents' responses, there were the following statements: *"it feels like some people are using Skype for the first time", "it's been a month, and some still don't know how to turn on presentations"*. We assume that the lack of primary digital skills of the teacher in the eyes of the students was "excusable" only at first, while the lack of positive dynamics in the acquisition of digital skills undermines the professional authority of the teacher.

When answering the question: "What do you think is changing for the worse with online learning compared to full-time?" students noted the following aspects:

Table 2. Distribution of answers to the question: "What do You think is changing for the worse in online training compared to full-time?" %

Criterion	%
Understanding the material	42,1
Interest in learning	38,6
Possibility to exchange opinions with other students	43,4
Feedback from the teacher	31,7
I can't answer	10,3
Other	0,7
Nothing changes	17,9

Of particular concern is the decline in "interest in learning" and "understanding of the material". These trends, in our opinion, are related to the traditional, face-to-face teaching methodology, while the online format requires updating pedagogical methods and using fundamentally new approaches to interaction with students. The absence of such important advantages of the face-to-face format as eye contact, "holding" the audience's attention, visual control, etc., should be compensated by the introduction of innovative digital learning technologies.

According to the students, the effectiveness of online learning is reduced due to such factors as lack of live communication (52.1 %), lack of interactivity (7.5 %), routine (3.4 %), heavy loads (15.9 %). These problems could not but affect the motivation of the students to acquire new knowledge. The research materials showed that only one in five students rated their level of motivation as "excellent". More than a third of the respondents gave negative ratings on this issue (23.3 % – "satisfactory", 15.1 % – "bad").

During the focus group discussion, more than half of the participants indicated that their level of motivation decreased when switching to an online training format. For some students who showed high academic performance, the situation was most stressful.

Table 3. Dependence of students' academic performance and motivation to acquire knowledge online (based on the results of the focus group), N = 12

Has the motivation to learn online decreased	Progress of students			Total
	Good	Average	Bad	
yes	4	3	0	7
no	1	2	2	5
Total	5	5	2	12

The value of the Pearson's chi-square test is 3.771. At a significance level of $p < 0.05$, the critical value of x^2 is 5.991. The relationship between factorial and performance characteristics is not statistically significant, the significance level is $p > 0.05$ ($p = 0.152$). Based on the data obtained, it can be concluded that in general, student performance does not significantly affect the change in the level of motivation of students.

However, according to the results of the focus group study, students with a high level of academic performance report a decrease in the level of satisfaction with the quality of online education. The following opinions were expressed: *"I like to make a presentation in front of an audience, get recognition of my success", "when I make a report on Skype, I'm not sure that people are listening to me, maybe everyone is going about their business, with me in the background"*. Interestingly, when the students were asked whether they listen carefully to their classmates and teachers, many admitted that they combine classes with other forms of activity: *"I text in WhatsApp", "I can read a book", "I log into social networks"*. Based on the responses received, it can be concluded that students reduce their requirements as active participants in the educational process.

Another negative consequence of switching to online education was a drop in interest in studying. Note that the research by K.F. McLay and P.D. Renshaw positions the opinion that an educational institution acts not only as a knowledge constructor, but also as a place of

communication and socialization of students (McLay, Renshaw, 2019). Most of the respondents, having lost the opportunity for informal communication that accompanies the educational process, felt like in a social vacuum.

Table 4. Dependence of students' motivation and feedback quality assessment in the online learning environment, pers

Motivation to gain knowledge in online learning	The quality assessment of feedback between a teacher and a student					Total
	Excellent	Good	Satisfactorily	Badly	I can't answer	
Excellent	12	14	4	0	0	30
Good	12	32	8	1	0	53
Satisfactorily	2	15	12	2	1	32
Badly	0	0	2	2	1	5
I can't answer	8	11	6	0	1	26
Total	**34**	**72**	**32**	**5**	**3**	**146**

The value of the Pearson's chi-square test is 52.635. At a significance level of $p = 0.01$, the critical value of $\chi 2$ is 32. The relationship between factorial and performance characteristics is statistically significant, the significance level is $p < 0.01$.

The data obtained illustrate the relationship between students' motivation to acquire knowledge in online learning and their assessment of the quality of teacher feedback. This relationship allows us to conclude that it is necessary to search for new communication channels that correspond to the format of online work. In the conditions of offline learning, students' communication needs are met within the limits of the time allotted for training sessions. In the online format, when students are limited (psychologically or for technical reasons) in the ability to ask a question or participate in a discussion, feedback should be built on a different principle.

The data obtained correlate with research conducted by the public opinion foundation (POM). To the question "Why do you like studying online less than studying in a normal mode?", a third of the respondents (33 %) chose the answer option: "not enough communication with peers". Every fifth respondent (19 %) noted the lack of communication with the teacher, the lack of his explanation of educational material. In addition, among the disadvantages of online learning, the respondents highlight the inability of students to concentrate on the learning process (44 %), as well as difficulties in mastering the material (37 %) (Distantsionnoe obuchenie shkol'nikov).

During the focus group study, the students noted that despite the use of traditional pedagogical tools by the teacher (lecture presentations, preparation of reports at seminars, case analysis, etc.), the overall level of satisfaction with the quality of training decreased when switching to online mode. The following opinions were expressed: *"I listened to the lecture, the material seems interesting, but I can't bring myself to focus", "the online seminar is almost always boring", "nothing seems to have changed, but it doesn't inspire"*.

Table 5. Distribution of answers to the question: "Do You agree with the following statements?", %.

Statements	YES	NO
Interest in learning online depends on the charisma of the teacher	79,5	20,5
Interest in learning online depends on the teacher's ability to «teach to entertain»	57,5	42,5
Interest in learning online depends on the level of use of digital innovation technologies (networking, gamification, virtual reality technologies)	72,6	27.4
Online education today does not meet the needs and interests of students, and interactive digital technologies are not fully used	53,4	46,6
Teachers are ready to work online and have a high level of digital competence	69,9	30,1

During the study, the students were asked to express their agreement or disagreement with a number of statements. The following statements received the greatest support from students: "interest in learning online depends on the charisma of the teacher" (79.5 %) and "interest in learning online depends on the level of use of digital innovative technologies" (72.6 %). Thus, the unity of personal qualities of a teacher and their digital competencies is a necessary basis for a successful transition to online learning. In the new conditions, students' need for additional drivers to maintain their interest in learning increases. Thus, more than half of the respondents consider it necessary for a teacher to have the skill "to entertain when while teaching". Today, students focus on information and communication technologies that do not so much provide knowledge transfer as allow them to use the game format for completing work tasks: network interaction, gamification, virtual reality technologies, etc.

It is worth noting that the students also highlighted the positive consequences of switching to online education. In particular, the rating is headed by the ability to save time on the road (63 %) and increase the manageability of the educational process (the ability to re-watch the video – 19.9 %, download video materials of the lecture – 6.8 %).

At the same time, these positive consequences become a predictor of the dysfunctions mentioned above. Saving time is accompanied by a combination of educational activities and leisure activities. With a reduced threshold of control (no eye-to-eye contact), many students do not spend time revising the material before class, preparing the workplace, and psychological attitude to work.

4. Discussion

The spread of the COVID-19 epidemic has initiated unprecedented measures for the widespread transition to online learning. The phenomenon of online learning has been the subject of international and Russian interdisciplinary research conducted by both major research centers and individual groups of researchers. The need for self-isolation determined the closure of universities to attend, forcing most students to switch to online education.

The opinions of students and teachers are dominated by polar assessments of the transition to online learning: from very optimistic, associated with saving time and improving the manageability of the learning process, to very pessimistic, due to low adaptive capacity, the complexity of organizing effective communications. The results of the study showed that the essence of this problem lies somewhat deeper and is directly related to digital inequality. According to a number of experts, the availability of financial resources becomes a condition for obtaining digital competencies (Manikovskaya, 2019). This conclusion is supported in the materials of the author research. According to the respondents, the main difficulties in switching to online training are associated with insufficient technical support and poor development of digital skills.

It is worth noting that the growth of requirements for digital skills of participants in the educational process, which has been observed for quite a long time, is a response to the challenges of the new digital reality. However, the epidemiological crisis suddenly put both students and teachers in need of updating these skills. Many of them were not ready for the new realities. Expert assessments illustrate a significant gap in the digital skills of young people related to their socio-economic status (Ma, Vachon, 2019). It can be assumed that the long-term presence of students in online education will contribute to maintaining and exacerbating digital inequality.

Another problem is the lack of adaptation of the full-time format of the teachers work with students to the online mode. The study notes the widespread practice of replicating pedagogical tools and techniques that have shown effectiveness in the face-to-face format of conducting classes. At the same time, when studying online, students have trouble with focusing and motivation to study. The results of the study demonstrate the increased requirements of students to the charisma of the teacher, his ability to "to entertain while teaching", the use of digital innovative technologies. A student and a teacher, faced in a single digital space, showed different levels of digital literacy development. A significant proportion of teachers, according to students, showed a lack of basic skills in working in a digital environment, which showed their vulnerable position on this issue. The results of the focus group illustrated the decline in the authority of those teachers who experienced particular difficulties in organizing their educational process. This problem is typical not only for the Russian higher education system, but also for other developed countries. In particular, there are difficulties in implementing digital technologies in the educational process

due to the insufficient level of training of teachers, their low motivation to develop digital competencies. Measures to solve these problems can include didactic and methodological training of teachers (Zahorec et al., 2019; Chapman et al., 2010); formation of an effective motivation system, and tutor support (Fleisch et al., 2016)

Another problem in online learning is the lack of face-to-face communication practices and the low efficiency of the selected communication channels. Indirect communication with the teacher through the computer screen reduces the students' emotional involvement and the activity of his position in the learning process. The results of the study showed a correlation between students' motivation to study and the assessment of the quality of feedback from the teacher. It is suggested that student-teacher interaction can be developed through face-to-face meetings and/or e-learning activities. This aspect requires further research to find forms of communication that demonstrate the highest degree of effectiveness.

The lack of direct control of the teacher allows students to combine other forms of activity that are not related to their studies. The extreme form of this dysfunction is the imitation of the presence of students in the classroom. Additional research is required to control the involvement of students in the learning process.

Despite a significant body of work devoted to the problems of organizing online education in higher education, there are no assessments of the risks of switching to online education for modern society in the medium term. In particular, the cumulative percentage of students who failed to adapt to the new format of the educational process varies from 20 to 25 % according to various studies. Being "on the sidelines" of the educational process, this social group not only has a low level of competitiveness in the labor market, but also provokes the deprivation of the professional status of certain types of work.

5. Conclusion

In the course of the study, the authors made a number of conclusions that will make us rethink the risks of switching to online training. The optimistic assessments of the use of remote technologies and stereotypical assessments of digital literacy of modern youth that are dominating in the scientific literature today are based on research materials that demonstrate high adaptive capabilities of students. At the same time, the results of the author's research illustrate the need to draw the attention of the scientific and pedagogical community to the "risk zone", namely, a quarter of students who have difficulties and/or have not been able to adapt to the online learning format. This is due to the fact that the question of the advantages and disadvantages of working online should be somewhat broader and take into account the forecasts of this group of students entering the labor market. It can be assumed that the problems that led to unsatisfactory adaptation of some students, according to the pedagogical community, are temporary in nature, and will be resolved when the quarantine restrictions are lifted. However, we believe that today we need to develop a methodology for online learning, which will eliminate the resulting dysfunctions.

The study found that the key problems of online learning are the following: reduced level of students' motivation, in some cases imitation of student" presence at an online class, unsatisfactory feedback, reduced opportunities to control the students' work, etc. The problem of material and technical provision of online training is quite acute. The results of the study showed that students very poorly perceive online education as an adequate substitute for full-time education. In a remote format, many students have lowered their requirements for themselves as participants in the educational process. At the same time, the requirements for the digital competencies of the teacher and their ability to teach using gamification elements are increasing.

6. Limitations

The limitations of this study include the use of spontaneous sampling, which does not fully ensure representative representation of all socio-demographic groups of students. Intelligence research justifies the choice of a spontaneous sample, but further analysis of distance learning problems requires coverage of a wider range of respondents with all the characteristics of representation. Additional limitations are associated with the specific application of qualitative research methods, in particular, focus groups.

References

Ana at al., 2020 – *Ana, A., Minghat, A.D., Purnawarman, P., Saripudin, S., Muktiarni, M., Dwiyanti, V., Mustakim, S.S.* (2020). Students' Perceptions of the Twists and Turns of E-learning in the Midst of the Covid 19 Outbreak. *Revista romaneasca pentru educatie multidimensionala*. 12(1): 15-26. DOI: 10.18662/rrem/12.1sup2/242

Bataineh at al., 2021 – *Bataineh, K.B., Atoum, M.S., Alsmadi, L.A., Shikhali, M*. (2021). A Silver Lining of Coronavirus: Jordanian Universities Turn to Distance Education. *International journal of information and communication technology education*. 17(2): 1-11. DOI: 10.4018/ IJICTE.20210401.oa1

Bryson, Andres, 2020 – *Bryson, J.R., Andres, L.* (2020). Covid-19 and rapid adoption and improvisation of online teaching: curating resources for extensive versus intensive online learning experiences. *Journal of geography in higher education*. DOI: 10.1080/03098265.2020.1807478

Chapman et al., 2010 – *Chapman, L., Masters, J., Pedulla, J.* (2010). Do digital divisions still persist in schools? Access to technology and technical skills of teachers in high needs schools in the United States of America. *Journal of Education for Teaching*. 36(2). DOI: 10.1080/0260747 1003651870

Cladis, 2018 – *Cladis, A.E.* (2018). A shifting paradigm: An evaluation of the pervasive effects of digital technologies on language expression, creativity, critical thinking, political discourse, and interactive processes of human communications. *E-Learning and Digital Media*. DOI: https://doi.org/10.1177/2042753017752583

Craciun, Bunoiu, 2019 – *Craciun, D., Bunoiu, M.* (2019). Digital Comics, a Visual Method for Reinvigorating Romanian Science Education. *Revista romaneasca pentru educatie multidimensionala*. 11(4): 321-341. DOI: 10.18662/rrem/172

Distantsionnoe obuchenie shkol'nikov – Distantsionnoe obuchenie shkol'nikov [Distance learning for schoolchildren]. URL: https://fom.ru/Nauka-i-obrazovanie/14385 [in Russian]

Dubreil, 2020 – *Dubreil, S.* (2020). Using games for language learning in the age of social distancing. *Foreign language annals*. DOI: 10.1111/flan.12465

Favale at al., 2020 – *Favale, T., Soro, F., Trevisan, M., Martino, Drago, I., Mellia, M.* (2020). Campus traffic and e-Learning during COVID-19 pandemic. *Computer networks*. 176 (107290). DOI: 10.1016/j.comnet.2020.107290

Fleisch et al., 2016 – *Fleisch, B., Taylor, S., Schöer, V., Mabogoane, T.* (2016). Failing to catch up in reading in the middle years: The findings of the impact evaluation of the Reading Catch-Up Programme in South Africa. *International Journal of Educational Development*. 53: 36-47. DOI: http://dx.doi.org/10.1016/j.ijedudev.2016.11.008

Frolova et al., 2019 – *Frolova, E.V., Ryabova, T.M., Rogach, O.V.* (2019). Digital technologies in education: problems and prospects for "Moscow electronic school" project implementation. *European Journal of Contemporary Education*. 8(4): 779-789.

Frolova et al., 2020 – *Frolova, E.V., Rogach, O.V., Ryabova, T.M.* (2020). Digitalization of education in modern scientific discourse: new trends and risks analysis. *European Journal of Contemporary Education*. 9(2): 313-336.

Garcia-Penalvo et al., 2020 – *Garcia-Penalvo, FJ., Corell, A., Abella-Garcia, V., Grande, M.* (2020). Online Assessment in Higher Education in the Time of COVID-19. *Education in the knowledge society*. 21(12). DOI: 10.14201/eks.23013

Groton, Spadola, 2020 – *Groton, D.B., Spadola, C.E.* (2020). Variability, visuals, and interaction: online learning recommendations from social work students. *Social work education*. DOI: 10.1080/02615479.2020.1806997

Kim, 2020 – *Kim, J.* (2020). Learning and Teaching Online During Covid-19: Experiences of Student Teachers in an Early Childhood Education Practicum. *International journal of early childhood*. 52(2): 145-158. DOI: 10.1007/s13158-020-00272-6

Kumar et al., 2019 – *Kumar, S., Martin, F., Budhrani, K., Ritzhaupt, A.* (2019). Award-Winning Faculty Online Teaching Practices: Elements of Award-Winning Courses. *Online learning*. 23(4)6: 160-180. DOI: 10.24059/olj.v23i4.2077

Ma et al., 2019 – *Ma, J.K.H., Vachon, T.E., Cheng, S.* (2019). National Income, Political Freedom, and Investments in R&D and Education: A Comparative Analysis of the Second Digital Divide Among 15-Year-Old Students. *SOCIAL INDICATORS RESEARCH*. 144(1): 133-166. DOI: 10.1007/s11205-018-2030-0

Manikovskaya, 2019 – *Manikovskaya, M.A.* (2019). Digitalization of education: challenges to traditional norms and principles of morality. *Vlast' i upravlenie na Vostoke Rossii*. 2(87): 100-106.

McGovern et al., 2019 – *McGovern, E., Moreira, G., Luna-Nevarez, C.* (2019). An application of virtual reality in education: Can this technology enhance the quality of students' learning experience. *Journal of education for business*. DOI: 10.1080/08832323.2019.1703096

McLay, Renshaw, 2019 – *McLay, K.F., Renshaw,P.D.* (2019). Making 'us' visible: Using membership categorisation analysis to explore young people's accomplishment of collective identity-in-interaction in relation to digital technology. *British educational research journal*. DOI: 10.1002/berj.3565

Menashy, Zakharia, 2019 – *Menashy, F., Zakharia, Z.* (2019). Private engagement in refugee education and the promise of digital humanitarianism. *Oxford review of education*. DOI: 10.1080/03054985.2019.1682536

Moawad, 2020 – *Moawad, R.A.* (2020). Online Learning during the COVID-19 Pandemic and Academic Stress in University Students. *Revista romaneasca pentru educatie multidimensionala*. 12(1): 100-107. DOI: 10.18662/rrem/12.1sup2/252

Murray et al., 2020 – *Murray, C., Heinz, M., Munday, I., Keane, E., Flynn, N., Connolly, C., Hall, T., MacRuairc, G.* (2020). Reconceptualising relatedness in education in 'Distanced' Times. *European journal of teacher education*. 43(3): 488-502. DOI: 10.1080/02619768.2020.1806820

Prata-Linhares et al., 2020 – *Prata-Linhares, M.M., Cardoso, T.D.G., Lopes, D.S., Zukowsky-Tavares, C.* (2020). Social distancing effects on the teaching systems and teacher education programmes in Brazil: reinventing without distorting teaching. *Journal of education for teaching*. DOI: 10.1080/02607476.2020.1800406

Selwyn et al., 2019 – *Selwyn, N., Pangrazio, L., Nemorin, S., Perrotta, C.* (2019). What might the school of 2030 be like? An exercise in social science fiction. *Learning media and technology*. DOI: 10.1080/17439884.2020.1694944

Shchadnaya, 2020 – *Shchadnaya, M.A.* (2020). Distance learning in modern reality. *Science, technology and education*. 5 (69): 74-76.

Timmis, Munoz-Chereau, 2019 – *Timmis, S., Munoz-Chereau, B.* (2019). Under-represented students' university trajectories: building alternative identities and forms of capital through digital improvisations. *Teaching in higher education*. DOI: 10.1080/13562517.2019.1696295

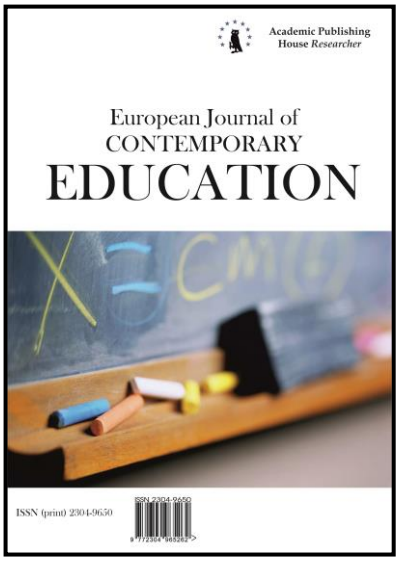
Tyurikov, Bolshunov, 2019 – *Tyurikov, A.G., Bolshunov, A.Ya.* (2019) Information technology as a social challenge of the XXI century *Humanities. Financial University Bulletin*. 9(2(38)): 6-10.

Vinichenko et al., 2019 –*Vinichenko, M.V., Taridi, K. Ridho, Peter, Karacsony, Li, N.P., Gundeea, S. Narrainen, Chulanova, O.L.* (2019). The feasibility and expediency of gamification activities in higher education. *International Journal of Education and Practice*. 7(4): 459-468. DOI: 10.18488/journal.61.2019.74.459.468

VTSIOM website – VTSIOM website [Distance learning for schoolchildren]. [Electronic resource]. URL: https://wciom.ru/index.php?id=236&uid=10280

Zahorec et al., 2019 – *Zahorec, J., Haskova, A., Munk, M.* (2019). Teachers' Professional Digital Literacy Skills and Their Upgrade. *European Journal of Contemporary Education*. 8(2): 378-393. DOI: 10.13187/ejced.2019.2.378

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 53-65
DOI: 10.13187/ejced.2021.1.53
www.ejournal1.com



Usage of Internet by University Students of Hispanic Countries: Analysis Aimed at Digital Literacy Processes in Higher Education

José Gómez-Galán [a, b, *], Jose Ángel Martínez-López [c], Cristina Lázaro-Pérez [c], María del Mar Fernández-Martínez [d]

[a] University of Extremadura, Spain
[b] Ana G. Méndez University, Cupey Campus, Puerto Rico, USA
[c] University of Murcia, Spain
[d] University of Huelva, Spain

Abstract

One of several scientific disciplines' significant objectives is to determine the integration of information and communication technologies (ICTs) in the academic setting. This research studies the use of ICTs, especially the Internet, by university students in Hispanic countries. The methodology used is descriptive and quantitative, based on data mining, through a validated and highly reliable instrument. The sample was composed of students from six countries (N = 1893). The results show that the primary interests in using ICTs and the Internet are primarily for consuming social networks, obtaining information, and leisure, above and beyond their use for academic and university purposes. This indicates that there is still a lack of sufficient training for the optimal use of these technologies by higher education students. It is urgent to carry out digital literacy processes that allow them to develop a critical sense in using ICTs, nowadays configured as powerful means of communication. Furthermore, this study has been determined that the Hispanic common space has solid cultural roots and everyday practices that lead to quite similar general interests.

Keywords: digital literacy, communication and computer systems, university students, educational technology, ICT, higher education.

1. Introduction

Over within the framework of Agenda 2030, the United Nations (UN) has supported the adoption of flexible and valuable skills and competencies by young people throughout their lives in a world that needs greater sustainability and interdependence based on knowledge and information and communication technologies (ICTs) (Gómez-Galán, 2002; Riis, 2017; Acosta,

* Corresponding author
E-mail addresses: jogomez@uagm.edu (J. Gómez-Galán)

Andrés, 2018). Also, educational policies and didactic and pedagogical trends have increased the use of technology in the classroom and outside it, as a support mechanism for teaching and learning, giving rise to new teaching models (Pérez-Parras, Gómez-Galán, 2015; López-Meneses et al., 2015). In this sense, one of the most remarkable characteristics of the current information society is the relevance that ICTs have assumed, being present in practically all personal and social life (Palvia et al., 2018; Nevado et al., 2019).

ICTs have revolutionized work, economics, communication, and training processes (Jorgenson, Vu, 2016). Therefore, incorporating ICTs into university academic activities requires that both students and faculty have mastered and handled software and hardware and the various resources that characterize the changing technological world (UNESCO, 2013). Therefore, digital skills development is currently presented as a critical element for university students' training, who must be competent in the mastery of specific codes, symbolic systems, and ways of interacting with information in digital format and through communication networks (Area, 2014).

Ultimately, information and technology are considered to form a techno-social environment in our current citizenship, which we must analyze and evaluate. And as Aristizabal and Cruz (Aristizabal, Cruz, 2018) argue, digital competence is key to achieving digital citizenship.

Naturally, in these training processes, the bases of communication and computer systems must be known, and their main developments in the areas of telecommunications, computer systems and their applications in wireless, mobile, and satellite communications, neural networks, and artificial intelligence (AI), software and hardware engineering, virtual reality (VR) and augmented reality (AR), telematics and multimedia applications, applications in the economic, social and scientific fields, etc. What should be presented naturally within specific subjects or through tangential contents in all knowledge branches (Concepción et al., 2019).

However, more than a training of technical characteristics, what is needed is a fundamental digital literacy that allows the citizens of the 21st century to develop adequately in society and show critical attitudes to the complex information flows that flood everything today (Leaning, 2019; Gómez-Galán, 2020a). This is a determining factor in university students' training, especially those who will be dedicated to training the new generations (List, 2019).

In this context, we need to know what communication and computer systems are for university students today. What are their interests in using the computer and telematic tools, that is, ICTs in general. For example, access to the Internet, the basis of the digital paradigm, can be done nowadays continuously from any device: smartphones, tablets, laptops, etc. What is the use they make of the network of networks? What are their interests? And on the contrary, what is it they show less interest in the digital environment?

Answering these questions would provide us with valuable information to carry out an adequate integration of ICTs in higher education and promote authentic digital literacy processes based on the knowledge of university students' use of this new environment. We must not forget that these are the digital natives (López-Meneses, Gómez-Galán, 2010). It would be interesting to know if these ICTs skills gained through informal education processes have considerable repercussions for university students throughout their lives. On the contrary, they have been produced in such contexts that they require specific training for their employment in the educational field.

Today the paradigm that has emerged from the emergence of digital technologies is limited to instruments or tools for professional use. On the contrary, we start from the fact that nowadays, ICTs are rich media that have merged -in the process of techno-media convergence- all the instruments, media, channels, and languages of communication. Media that were independent decades ago, such as cinema, radio, television, or the press, are today integrated into the digital medium and have been transformed by it, homogenizing many of their previously distinctive characteristics. In this context, for authentic digital literacy, it is necessary to lean on media literacy principles (Gómez Galán, 2015).

Based on the theoretical frameworks presented at the time by authors such as Mattelart and Mattelart (Mattelart, Mattelart, 1987), Negroponte et al. (Negroponte et al., 1997), Echeverría (Echeverría, 1999) or Bauman (Bauman, 2013), which describe the new society in the framework of the communications revolution and its influence on all dimensions of human activity, it is possible to integrate the basic principles of media education. These have been developed by authors such as Masterman (Masterman, 1990), Piette and Giroux (Piette, Giroux, 1997), Christ and Potter (Christ, Potter, 1998), Buckingham (Buckingham, 2003), Fedorov (Fedorov, 2008; Fedorov, 2015), among others, in addition to ourselves already in the last decade of the 20th century (Gómez Galán, 1999),

which has been growing in interest and scope worldwide (Fedorov, Levitskaya, 2015). In this way, it would be possible to provide citizens with a critical and analytical sense of the information they receive, more necessary than ever in a context currently dominated by disinformation and fake news (Gómez Galán, 2020b).

In this scenario, it is imperative to obtain as much knowledge as possible about the characteristics of the use and consumption that the young generations of ICTs currently make. From children's education to the university world, since media literacy is necessary at all educational stages.

2. Materials and methods

Objectives

This research seeks to provide answers to two questions that seek to achieve the determined objective:

- To determine the main interests that university students in Hispanic countries have today to use the Internet.
- Determine what they are least interested in for the use of the Internet.

In this sense, it should study the topics of most significant interest to students when they use the Internet, which should be understood as the digital society's paradigm. It involves all aspects of software and hardware existing.

Our particular interest is focused on establishing if this use of digital technologies is made mainly for academic activities and education in general. On the contrary, it is intended primarily for leisure or social relations, of such extension in today's society. We cannot forget that we are dealing with university students, therefore a sector of the population that should differ in its use of ICTs from the rest of the citizens. Their university activities would demand a more specialized use of them.

The analyses were carried out comparatively among various Hispanic countries, with the parallel objective of identifying possible patterns in interests or, if necessary, establishing the reasons that could be given for the differences between them.

Instruments

The COBADI® instrument (Digital Basic Competencies 2.0 of University Students) was used for the research, a standardized questionnaire composed of 23 items distributed in three categories: (1) 'Competences in using ICTs for the search and treatment of information'; (2) 'Interpersonal competences in the use of ICT in university settings'; and (3) 'Tools for virtual and social communication in the university'.

The study has focused on this last category, where we find the questions that can give us information about students' significant interests in using ICTs. This instrument is present today in several languages, using the Spanish version (which is also the original) to focus our study on Hispanic countries.

The questionnaire used has been validated and its reliability has been demonstrated in several studies (Gutiérrez-Espalza, Gómez-Zermeño, 2017; López-Gil, Bernal, 2019; Agudo, 2020). For the version used, the reliability of the questionnaire was determined by applying Cronbach's Alpha. The result obtained (Cronbach's $\alpha = 0.90$, $\omega = 0.75$) is a very high score according to the George and Mallery scale (George, Mallery, 2003), which implies high reliability.

The questionnaire was applied telematically, facilitating the link to the COBADI® instrument. Respondents showed their primary interests or those with the most outstanding rejection when using the digital tools, especially using the Internet. To homogenize and guarantee the most significant possible number of respondents and answers and that all students had access to the questionnaire, the collaborating professors dedicated some time to provide the link to the students present in their classroom. The answers were entered into the computing devices in use at the time. Previously, of course, the anonymity of the entire process was guaranteed, and the consent of the participants was got, following the postulates of the Helsinki Declaration.

Sample

The analyses of the university students' responses were carried out comparatively among the six Hispanic countries taking part in the study (Ecuador, Spain, Guatemala, Mexico, Peru, and Venezuela) to determine the interests and rejections for the use of the systems studied. The data collection was completed in 2019, and the analyses were carried out throughout 2020.

In the large sample achieved (N = 1893), a data set was used containing the complete number of observations made by the hundreds of students who responded to the COBADI® instrument in the group of countries. The dataset includes the total responses for both variables in the case of all respondents.

The university ethics committees' requirements were continuously fulfilled both in the application of the questionnaire and in the whole research process. In addition to requesting the participants' consent following the postulates of the Declaration of Helsinki, as indicated, the Codes of Good Practice for Human Research at the universities of the researchers who carried out this research project were also signed. The team recorded it following this protocol.

Methodological Process

A data mining analysis was performed based on the text's answers to the selected questions of the COBADI® instrument as they are of the 'free answer' type. The R software was used to carry out this analysis, which has great possibilities in this type of study and data mining (Williams, 2011; Zhao, Cen, 2013; Daniel, 2019). This programming environment, distributed as a free software package with GNU/GPL license, is highly flexible and versatile, allowing its adaptation to any required statistical analysis.

Within the scope of data mining, a methodological process of text mining was developed to extract as much information as possible from the volume of responses obtained. Text mining is also very effective in searching for knowledge in extensive collections of documents, making it possible to recognize patterns and understand recent information (Bhardwaj, Khosla, 2017; Antons et al., 2020).

The following describes the approach offered for executing the text mining carried out, selecting the terms of interest and the transformations carried out.

In the first instance, the data set containing the complete number of observations (N = 1893) was used. This dataset contained the set of text from the complete responses for both variables of the COBADI® survey. Therefore, data was initially loaded and filtered by selecting the variables of interest and the countries with the most significant sample obtained, and consequently, those set:

```
# Loading and filtering of data
library(readr)
library(dplyr)
library(ggplot2)
library(tidyverse)
library(tidytext)
COFW_data <- read_csv('COBADI_few_variables.csv',
col_types = cols(ICTFormation = col_factor(levels = c('Yes','No')),
Internet.InHome = col_factor(levels = c('Yes','No')),
PC.InHome = col_factor(levels = c('Yes','No')),
Gender = col_factor(levels = c('Woman', 'Man')),
Tablet.InHome = col_factor(levels = c('Yes','No')),
`Interests/ICTUse ` = col_character(),
`Rejection/ICTUse ` = col_character(),
ICTUse.Information = col_factor(levels = c('Nothing', 'Little', 'Much')),
ICTUse.Education = col_factor(levels = c('Nothing', 'Little', 'Much')),
ICTUse. SearchFriends = col_factor(levels = c('Nothing', 'Little', 'Much')),
ICTUse. SocialChat = col_factor(levels = c('Nothing', 'Little', 'Much')),
ICTUse. MultimedDownloads = col_factor(levels = c('Nothing', 'Little', 'Much')),
ICTUse. AcademicWorking = col_factor(levels = c('Nothing', 'Little', 'Much')),
ICTUse.Games = col_factor(levels = c('Nothing', 'Little', 'Much')),
ICTUse.Music= col_factor(levels = c('Nothing', 'Little', 'Much')),
ICTUse.MultimedPublish = col_factor(levels = c('Nothing', 'Little', 'Much')),
ICTUse.TV = col_factor(levels = c('Nothing', 'Little', 'Much'))),
na = 'NA')
# Variables of interest and filtering by country
cobopen <- select(COFW_data, Country, ' Interests/ICTUse ', 'Rejection/ICTUse') %>%
filter(Country %in% c('Venezuela','Ecuador','Spain',
'Guatemala','Mexico','Peru'))
```

The analysis was carried out independently for each of the variables (interest in using ICTs / rejection of the use of ICTs). The tidytext package was used to separate each respondent's responses either by words or by word pairs representing a quantifiable term of interest ('tokenization'). The tokenization was done through several phases:

Phase 1. Respondents' answers were taken and separated into individual words, always identified with the corresponding respondent's country. A filter was applied to eliminate those words that were not interesting for analyzing the information ('stop words'). For example, we talk about connectives, generic terms, etc.

Phase 2. As in the previous phase, a count of 'bigrams', that is, pairs of words, was carried out on this occasion. It should be noted that practically all the dilemmas were not considered of interest for the study, selecting only five that we consider would be appropriate according to our objectives:

bigrams <- c('social media', 'celebrity journalism', 'find partner', 'social issues', 'virtual classroom')

Phase 3. The data tables were merged with the tokens, both by word and by bigram, grouped by country (of course from the six countries studied).

Phase 4. A new filter was made in which the 'stop words' that we considered not to offer relevant data were eliminated. Besides, words that were already part of the determined bigrams were also deleted. For example, 'networks' and 'social' disappeared as separate tokens to constitute the new term (token) 'social media':

nowords <- c('perform', 'theme', 'topics', 'any', 'some', 'celebrities', 'search', 'networking', 'social', 'watch', 'programs', 'online', 'related').

Phase 5. It was determined that some terms could be problematic because they could be regionalisms or variations of expression with different meanings in different countries. Although in all cases the language was Spanish, there were geographical differences. In this way, a 'homogenization' of terms was carried out to reduce them to a single term that would imply a particular concept. In this way, a quantification of the concept referred to by the respondent could be carried out regardless of the specific words used in their answers. For example, this was done with the term 'celebrity journalism', which replaced other terms with the same meaning but used more frequently in specific regions or countries: 'tabloid' 'showbiz', 'gossip', etc. The term chosen in these cases was the most generally used or the most recognized in the context of academic and scientific literature:

 # Code exemplifying the substitutions made. Term to the right of '<-' substitutes those that appear within the parentheses.

term <- as.character(vector())
term[c('pink press','showbiz','gossip')]<- 'celebrity journalism'
term[c('play', 'video game', 'video games', 'games')] <- 'games
term[c('academics', 'academy', 'academics')] <- 'academy
term[c('work', 'jobs')] <- 'work
term[c('university', 'college', 'campus')] <- 'university

Phase 6. After completing the above, the countries were grouped, and each token was counted concerning the number of times the respondents expressed it in each country. This way, the appropriate transformations could be made to show this frequency by country in percentages.

Phase 7. Finally, to determine whether there is dependence in the variation of the frequencies analyzed, that is, the primary uses of ICTs and the Internet about each country, an inferential chi-square analysis (Pearson's $\chi 2$ test) was performed.

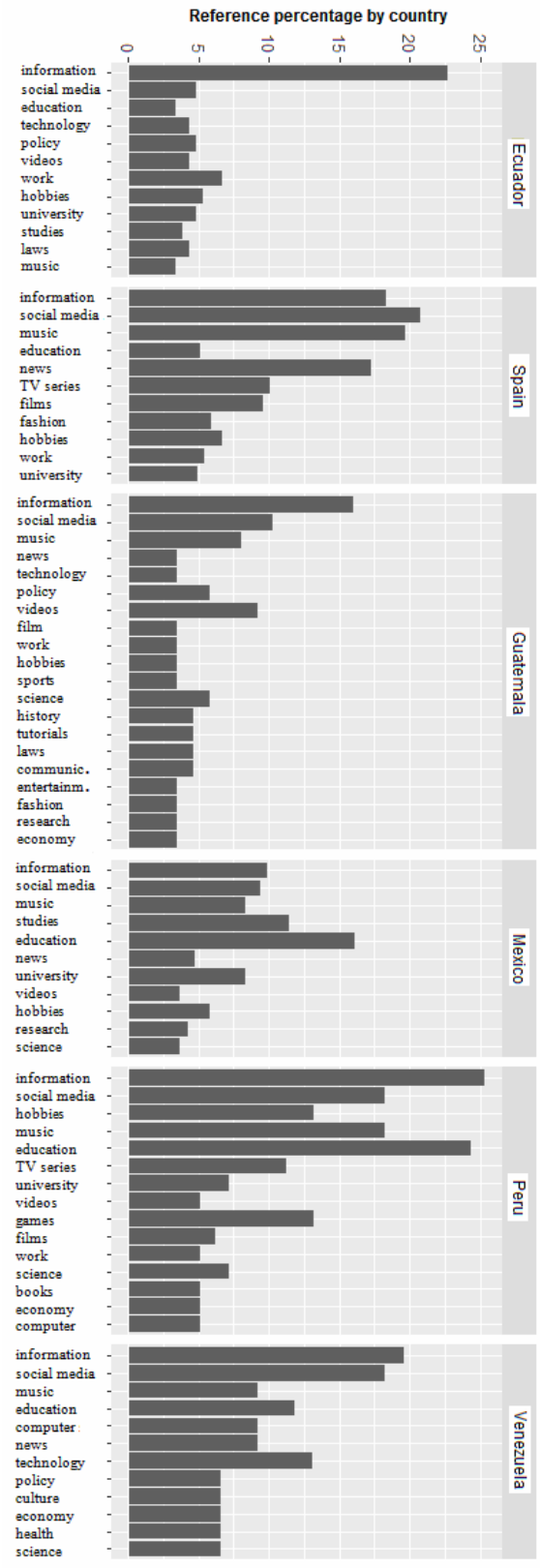
3. Discussion and results

Results

Today's politically, and economically unstable world produces a plethora of information that needs verification. This will help put the situation in perspective and prevent the spread of falsehoods (fakes). Issues related to various aspects of fact-checking techniques are taking center stage in the academic community.

Below are the graphs representing the most common terms expressed in the study countries' survey. The first graph (Figure 1) offers interest activities, while the second graph (Figure 2) represents the activities that respondents reject. We believe that this way, the results obtained can

be compared more effectively, both as a whole and individually for each of the countries. Of the use and interest is presented the percentage obtained in Ecuador, Spain, Guatemala, Mexico, Peru, and Venezuela. Likewise, offering a graph both for and against everything that university students in the Hispanic countries studied use digital technologies for allows a comparison between all of them.



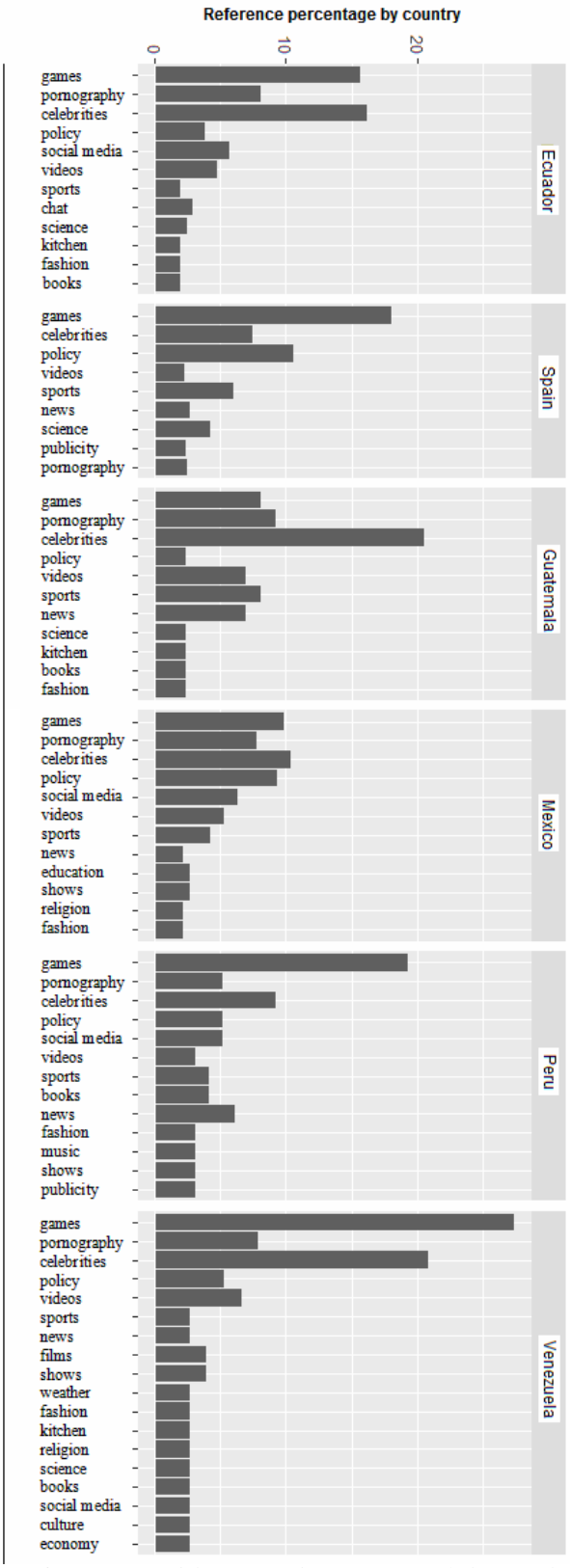


Fig. 1 and Fig. 2. Frequency and percentage of usage and interest by country (Fig. 1, right) and Frequency and percentage for rejection use and lack of interest by country (Fig. 2, left)

It is possible to perceive that, in most of the countries studied, the terms 'information' and 'social media' play a preponderant role in the responses given by the respondents. A selection of the most representative tokens per country gives the following list of terms:

unique(top10bycountry.inter$word)
[1] 'music' 'news' 'information'
[4] 'TV series' 'movies' 'information'
[7] 'fashion' 'work' 'education'
[10] 'university' 'work' 'education'
[13] 'education' 'social' 'videos'
[16] 'sports' 'psychology' 'politics'
[19] 'social' 'technology' 'studies'
[22] 'research' 'law' 'university'
[25] 'computer' 'games' 'social'
[28] 'books' 'video' 'culture'
[31] 'economy' 'health' 'science'
[34] 'history' 'tutorials' 'communication'
[37] 'entertainment' 'news' 'publicity'
[40] 'social'

Suppose we study the patterns by country individually. In that case, we can see that the term 'information' counts for about 22 % of the total terms expressed by the respondents in Ecuador, while the rest of the 10 most common terms in that country remain around 5 %. Spain's primary term is 'social media', followed by 'music' and 'information' respectively. In Guatemala, the three most represented terms are 'information', 'social media', and 'politics'. This last term describes an exception since it is only in Guatemala and Venezuela that it appears among the ten most essential terms of interest. Probably the political situation in both countries can explain this.

In Mexico, the terms most represented by respondents were 'education', 'tasks', and 'news', respectively. It is the only country that does not show terms of interest related to leisure among the first three. In Peru, the three most represented terms are 'information', 'education' and 'social media'/'music', the last two with the exact weighting. Finally, in Venezuela, the first three terms are 'information', 'social media', and 'technology'.

In general, patterns can be found in Hispanic countries of what they consider appropriate for the use of digital technologies. However, there are also differences between countries produced by social, economic, political, distinctive characteristics, etc.

Both in what is of interest and what they show rejection, as perceived in the following figure, they denote a use not too different from what is produced generally in society, as it will be possible to develop later. This is essential information since, with university students, more significant particularities should have been found because of the characteristics of the academic work that they carry out to pursue their careers in the university.

In the case of the terms expressed as rejection (Figure 2), it is perceived that, in a general sense, the most frequent among all the countries are 'games', 'pink press' and 'pornography'. If we make a selection of the most representative tokens per country, we would get the following list of terms:

unique(top10bypais.recha$word)
[1] 'games' 'politics' 'sports' 'hobbies'
[5] 'news' 'sports' 'publicity' 'celebrities'
[9] 'videos' 'pornography' 'chat' 'celebrities'
[13] 'education' 'shows' 'social'
[17] 'pornography' 'books' 'information' 'religion'
[21] 'TV series' 'video' 'science' 'kitchen'
[25] 'fiction' 'fashion' 'education' 'hobbies'
[29] 'shows' 'music' 'news' 'social'
[33] 'movies' 'fashion' 'weather' 'social'

In particular, in Ecuador, the terms 'games', 'celebrities', and 'pornography' are represented as the first three terms. Focusing on Spain, the three most common terms expressed are 'games', 'politics' and 'sports'. Concerning Guatemala, the term 'celebrities' is highly represented as rejection, followed to a lesser extent by 'games' and 'sports'. The three most important terms were 'celebrities',

'games', and 'politics' in Mexico. For Peru and Venezuela cases, the first two terms in importance were 'games' and ' celebrities, followed by 'news' in Peru and 'pornography' in Venezuela.

Finally, as indicated, an inferential analysis was carried out by applying the Chi-Square Test of Independence. This test contrasts the observed results with a set of theoretical results. These are calculated under the assumption that the variables were independent. Thus, the difference between the observed and expected results is summarized by the $\chi 2$ statistic. The simulated p-value is the one that marks whether the hypothesis of independence of the variables is accepted or rejected. It is a statistical test that allows testing whether two study variables are associated or independent of each other.

To evaluate as accurately as possible the relationship between each token, understood as the terms that define the type of use and activities with ICT and the Internet by students, concerning each of the countries, the data from the contingency tables generated for the number of respondents for each country and the frequency of these terms were used, which are summarized in Figures 1 and 2. The $\chi 2$ statistic was applied to these data.

Pearson's Chi-squared test

The simulated p-value was based on the sample size. The test was repeated for each of the main terms defining the use and activities studied. For reasons of space, only one of the most representative examples is given here:

$Music

Pearson's Chi-squared test with simulated p-value

data: table(top10bycountry$Country, top10bycountry$Music)

X-squared = 683.86, df = NA, p-value = 0.0004998

The inferential analysis indicates that there is a relationship between the use of ICTs and the Internet for each of the activities evaluated and the country of the respondents. In other words, it was expected that there would be different behaviors in the use of the Internet for all activities in each of the countries represented by the survey, which is indeed the case. Thus, although the common Hispanic space presents general cultural and social characteristics that lead to quite similar interests and practices, it is not completely homogeneous in terms of Internet use by university students in each country.

Certain significant differences may be conditioned by specific social, economic, and political issues, the possibility of access to the network, etc. However, it can be determined that in general and what is of our main interest, the use they make of digital technologies is by no means focused exclusively on specifically university activities. There is homogeneity in this sense.

Discussion

As it has been possible to verify, the use and interests of communication and computer systems by university students from Hispanic countries are not directly related to educational use. On the contrary, most of them focus on activities of a social or recreational nature.

Some previous studies have also shown this (Gómez-Galán et al., 2020a; Gómez-Galán et al. 2020b; Gómez-Galán et al., 2021). This has also been determined in some countries analyzed in this research, such as Spain (Garrote et. al., 2018; Marín et al., 2019) or Mexico (González, Palacios, 2019; Morales et al., 2020; Veytia et al., 2020). As for specific devices, a recent study (Sáez-López et al., 2019) has determined that these results would apply to most of them. Only the use of the laptop is more limited to academic use; however, others, such as the smartphone, are practically limited to the field of leisure and communication. However, it is possible to use almost all digital media for educational purposes, as it happens in several organizational developments (Sousa, Rocha, 2019). Properly integrated into the teaching-learning process and the didactic objectives of their employment are defined, they provide pedagogical benefits (Livingstone, 2012; Frolova et al., 2020). Moreover, teachers of all educational levels are increasingly aware of this (Amhag et al., 2019; Záhorec et al., 2019).

Therefore, and despite the clear progress in integrating ICTs in higher education, university students' academic use in the Hispanic cultural and geographical context is not yet predominant. More than to carry out tasks related to their studies, digital technologies are used mainly as a means of social communication and for different activities related to entertainment.

Effective integration of the digital paradigm in the university is still a challenge. As different studies have shown (Siddiquah, Salim, 2017; Maldonado et al., 2019), university students

adequately handle essential tools such as office automation programs or search and navigate the Internet handle e-mail or social media. However, they are limited in using digital libraries, discussion forums, creation of blogs, work on academic platforms, etc., in other words, activities with great potential for their university studies.

Furthermore, the skills they possess with ICTs, regardless of their nature, have usually been acquired autonomously and not through informal learning processes (Fernández-Márquez, 2017; Veytia, 2019; González-Zamar, 2020). The condition of digital natives of today's university students has made them grow in their coexistence with the Internet and new technologies, but this does not imply adequate training for academic or professional use.

Besides, today we find the need for pedagogical skills in media education, which is fundamental as developed in the studies of Fedorov, Levitskaya and Camarero (Fedorov et al., 2016), Grandío-Pérez (Grandío-Pérez et al., 2016) or Antonelli, Di Risio and Di Felice (Antonelli et al., 2016). It is relevant for the proper training of students at all different educational levels. Moreover, in higher education, it is essential. ICTs must be studied and analyzed by university students, as a sign of their potential in academic settings but, at the same time, to create critical attitudes in them regarding their power of influence, which today leads to many significant problems: addiction, alienation, irrational consumer, cyber-bullying, etc. (Lázaro et al., 2020; Gómez-Galán et al., 2020c). Moreover, in parallel, to the growing media manipulation taking place in today's society, of complex mechanisms as recently presented by Levitskaya and Fedorov (Levitskaya, Fedorov, 2020).

4. Conclusion

To achieve the research objectives and answer the questions posed for analysis, a descriptive approach has been made to observe the differences in the use's behavior of communication and computer systems, taking the Internet as a paradigmatic reference among university students in the Hispanic countries analyzed. The information has been obtained considering those surveyed with the validated instrument COBADI®, which allows for high objectivity in the study.

There are general patterns in the activities in which respondents are interested in using these technologies. Besides getting information, most respondents ask about leisure activities associated with the use of social networks, music, and other multimedia content. They also expressed a great deal of interest in educational issues, which we can consider logical when dealing with university students. However, it is surprising that they are behind activities mainly related to entertainment, which shows that the potential of these tools for academic and university activities is not sufficiently exploited today.

The activities for which most respondents express rejection in using technology are more homogeneous. Three terms are highly representative in almost all countries, and we refer to celebrity journalism, games, and pornography.

The differences observed are justified by each country's specific social and political characteristics and the differences in economic potential between them. However, it is more important to emphasize that there is a cultural and common ground throughout the Hispanic area that links all the countries. Even Spain, which is in the European sphere, takes part in practically the same affinity and rejection of the primary uses and interests.

The Hispanic common space has solid cultural roots and everyday practices that, in this specific case, are reflected in its university students. It could be analyzed if this is also the case concerning other different cultural spaces (such as the Anglo-Saxon) or the world globalization that exists today, leading to future comparative studies of great importance.

In general, we believe that the information obtained helps provide an overview of the current use and consumption of the Internet by university students in Hispanic countries. And we think it is precious to demonstrate an urgent need for training to carry out an effective integration of ICTs in higher education. It would be reduced to training for academic purposes and become an authentic media literacy due to the power of influence that these technologies and media have today in our society. This requires, without a doubt, a trained, prepared, and educated citizenry.

5. Acknowledgments

We would like to thank the hundreds of students who participated in the study for their time and interest in this research, and also the dozens of academics who provided them with the

questionnaire with which the answers were obtained. Without their collaboration, it would have been impossible to carry out this work.

References

Acosta, 2018 – *Acosta, A.H.* (2018). Innovación, tecnologías y educación: las narrativas digitales como estrategias didácticas [Innovation, technology and education: Digital narratives as teaching strategies]. *Killkana Sociales: Revista de Investigación Científica*. 2(2): 31-38. DOI: 10.26871/killkana_social.v2i2.295

Agudo et al., 2020 – *Agudo, A., González-García, E., Martínez-Heredia, N.* (2020). Desafíos para una ciudadanía inclusiva: competencia digital entre adultos mayores y jóvenes [Challenges for inclusive citizenship: Digital competence among older adults and youth]. *Comunicação, Mídia e Consumo*. 17(48): 11-33.

Amhag et al., 2019 – *Amhag, L., Hellström, L., Stigmar, M.* (2019). Teacher educators' use of digital tools and needs for digital competence in Higher Education. *Journal of Digital Learning in Teacher Education*. 35(4): 203-220. DOI: 10.1080/21532974.2019.1646169

Antonelli et al., 2017 – *Antonelli, G., Di Risio, R., Di Felice, G.* (2017). New media education: The contribution of social sciences to training teachers. In Studies in Systems, Decision and Control (pp. 417-426). Berlin/Heidelberg: Springer Science and Business Media.

Antons et al., 2020 – *Antons, D., Grünwald, E., Cichy, P., Salge, T.O.* (2020). The application of text mining methods in innovation research: current state, evolution patterns, and development priorities. *R&D Management*. 50(3): 329-351. DOI: 10.1111/radm.12408

Area, 2014 – *Area, M.* (2014). Alfabetización digital y competencias profesionales para la información y la comunicación. Organización y gestión educativa [Digital literacy and professional competencies for information and communication. Educational organization and management]. *Revista del Fórum Europeo de Administradores de la Educación*. 22(1): 9-13.

Aristizabal, Cruz, 2018 – *Aristizabal, P. y Cruz, E.* (2018). Desarrollo de la competencia digital en la formación inicial del profesorado de Educación Infantil [Development of digital competence in the initial training of early childhood education teachers]. *Píxel-Bit*. 52: 97-110. DOI: 10.12795/pixelbit.2018.i52.07

Bauman, 2013 – *Bauman, Z.* (2013). Liquid Times: Living in an Age of Uncertainty. New York: John Wiley & Sons.

Bhardwaj, Khosla, 2017 – *Bhardwaj, P., Khosla, P.* (2017). Review of text mining techniques. *IITM Journal of Management and IT*. 8(1): 27-31.

Buckingham, 2003 – *Buckingham, D.* (2003). Media Education: Literacy, Learning and Contemporary Culture. Cambridge, UK: Polity Press.

Christ, Potter, 1998 – *Christ, W.G., Potter, W.J.* (1998). Media literacy, media education, and the academy. *Journal of communication*. 48(1): 5-15.

Concepción et al., 2019 – *Concepción, J.D., Veytia, M.G., Gómez-Galán, J., López-Meneses, E.* (2019). Integrating the digital paradigm in Higher Education: ICT training and skills of university students in a European context. *International Journal of Educational Excellence*. 5(2): 47-64. DOI: 10.18562/IJEE.048

Daniel, 2019 – *Daniel, B.K.* (2019). Big Data and data science: A critical review of issues for educational research. *British Journal of Educational Technology*. 50(1): 101-113. DOI: 10.1111/ bjet.12595

Echeverría, 1999 – *Echeverría, J.* (1999). Los Señores del Aire: Telépolis y el Tercer Entorno [The Lords of the Air: Telepolis and the Third Environment]. Barcelona: Destino.

Fedorov et al., 2016 – *Fedorov, A., Levitskaya, A., Camarero, E.* (2016). Curricula for media literacy education according to international experts. *European Journal of Contemporary Education*. 17(3): 324-334.

Fedorov, 2015 – *Fedorov, A.* (2015). Media Literacy Education. Moscow: ICO.

Fedorov, 2008 – *Fedorov, A.* (2008). On Media Education. Moscow: ICOS-UNESCO.

Fedorov, Levitskaya, 2015 – *Fedorov, A., Levitskaya, A.* (2015). The framework of media education and media criticism in the contemporary world: the opinion of international experts. *Comunicar*. 45(23): 107-115.

Fernández-Márquez et al., 2017 – *Fernández-Márquez, E., Leiva, J.J., López-Meneses, E.J.* (2017). Formación en competencias digitales en la universidad. Percepciones del alumnado [Digital skills training at the university. Student perceptions]. *Campus Virtuales*. 6(2): 79-89.

Frolova et al., 2020 – *Frolova, E.V., Rogach, O.V., Ryabova, T.M.* (2020). Digitalization of education in modern scientific discourse: New trends and risks analysis. *European Journal of Contemporary Education*. 9(2): 313-336. DOI: 10.13187/ejced.2020.2.313

Garrote, 2018 – *Garrote, D., Jiménez-Fernández, S., Gómez-Barreto, I.M.* (2018). Problemas derivados del uso de internet y el teléfono móvil en estudiantes universitarios [Problems derived from the use of internet and cell phone in university students]. *Formación Universitaria*. 11(2): 99-108. DOI: 10.4067/S0718-50062018000200099

George, Mallery, 2003 – *George, D., Mallery, P.* (2003). SPSS for Windows Step by Step: A Simple Guide and Reference. Boston, MA: Allyn & Bacon.

Gómez-Galán et al., 2020a – *Gómez-Galán, J., Martínez-López, J.A., Lázaro-Pérez, C., García-Cabrero, J.C.* (2021). Open innovation during web surfing: Topics of interest and rejection by Latin American college students. *Journal of Open Innovation: Technology, Market, and Complexity*. 7(1): 17. DOI: 10.3390/joitmc7010017

Gómez-Galán et al., 2020b – *Gómez-Galán, J., Vergara, D., Ordóñez-Olmedo, E., Veytia-Bucheli, M.G.* (2020). Time of use and patterns of Internet consumption in university students: A comparative study between Spanish-speaking countries. *Sustainability*. 12(12): 5087. DOI: 10.3390/su12125087

Gómez-Galán et al., 2020c – *Gómez-Galán, J., Martínez-López, J.Á., Lázaro-Pérez, C., Sarasola Sánchez-Serrano, J.L.* (2020). Social networks consumption and addiction in college students during the COVID-19 pandemic: Educational approach to responsible use. *Sustainability*. 12(18): 7737. DOI: 10.3390/su12187737

Gómez-Galán, 1999 – *Gómez-Galán, J.* (1999). Tecnologías de la Información y la Comunicación en el Aula [Information and Communication Technologies in the Classroom]. Madrid: Seamer.

Gómez-Galán, 2002 – *Gómez-Galán, J.* (2002). La integración de la telemática en la escuela [The integration of telematics in the school]. *Revista Latinoamericana de Tecnología Educativa-RELATEC*. 1(2): 47-59.

Gómez-Galán, 2015 – *Gómez-Galán, J.* (2015). Media education as theoretical and practical paradigm for digital literacy: An interdisciplinary analysis. *European Journal of Science and Theology*. 11(3): 31-44.

Gómez-Galán, 2020a – *Gómez-Galán, J.* (2020). Media education in the ICT era: Theoretical structure for innovative teaching styles. *Information*. 11(5): 276. DOI: 10.3390/info11050276

Gómez-Galán, 2020b – *Gómez Galán, J.* (2020). Educación frente a la infodemia: Estrategias en el ámbito universitario [Education in the face of infodemic: Strategies in the university setting]. In M. Reyes, D., & E. López-Meneses (Eds.). *Innovación Pedagógica Universitaria: Reflexiones y Estrategias* [University Pedagogical Innovation: Reflections and Strategies] (pp. 97-117); Barcelona: Octaedro.

González, Palacios, 2019 – *González, G.H., Palacios, P.W.* (2019). Los jóvenes ante las TIC: Discursos en torno al uso de redes sociales y su relación con la sociabilidad en universitarios de Querétaro, México [Young people and ICTs: Discourses on the use of social networks and their relationship with sociability among university students in Queretaro, Mexico]. *PSOCIAL*. 5(2): 6-16.

González-Zamar et al., 2020 – *González-Zamar, M.D., Abad-Segura, E., López-Meneses, E., Gómez-Galán, J. (*2020). Managing ICT for sustainable education: Research analysis in the context of Higher Education. *Sustainability*. 12(19): 8254. DOI: 10.3390/su12198254

Grandío-Pérez, 2016 – *Grandío-Pérez, M.M.* (2016). The Transmedia in University Education: Analysis of the Subjects of Media Education in Spain (2012-2013). *Palabra Clave*. 19(1): 85-104.

Gutiérrez-Espalza, Gómez-Zermeño, 2017 – *Gutiérrez-Espalza, A.M., Gómez-Zermeño, M.G.* (2017). La educación virtual de posgrado: estudio exploratorio sobre competencias digitales en estudiantes de especialización [Virtual graduate education: An exploratory study on digital competencies in specialization students]. *Revista de Investigación Educativa del Tecnológico de Monterrey*. 8(15): 51-57.

Jorgenson, Vu, 2016 – *Jorgenson, D.W., Vu, K.M.* (2016). The ICT revolution, world economic growth, and policy issues. *Telecommunications Policy*. 40(5): 383-397.

Lázaro-Pérez et al., 2020 – *Lázaro-Pérez, C., Martínez-López, J.Á., Gómez-Galán, J.* (2020). Addictions in Spanish college students in confinement times: Preventive and Social Perspective. *Social Sciences*. 9(11): 195. DOI: 10.3390/socsci9110195

Leaning, 2019 – *Leaning, M.* (2019). An approach to digital literacy through the integration of media and information literacy. *Media and Communication*. 7(2): 4-13. DOI: 10.17645/mac.v7i2.1931

Levitskaya, Fedorov, 2020 – *Levitskaya, A., Fedorov, A.* (2020). Typology and mechanisms of media manipulation. *International Journal of Media and Information Literacy*. 5(1): 69-78. DOI: 10.13187/ijmil.2020.1.69

List, 2019 – *List, A.* (2019). Defining digital literacy development: An examination of pre-service teachers' beliefs. *Computers & Education*. 138: 146-158. DOI: 10.1016/j.compedu.2019.03.009

Livingstone, 2012 – *Livingstone, S.* (2012). Critical reflections on the benefits of ICT in education. *Oxford Review of Education*. 38(1): 9-24. DOI: 10.1080/03054985.2011.577938

López-Gil, Bernal, 2019 – *López-Gil, M., Bernal, C.* (2019). El perfil del profesorado en la Sociedad Red: reflexiones sobre la competencia digital de los y las estudiantes en Educación de la Universidad de Cádiz [The profile of teachers in the Network Society: Reflections on the digital competence of students in Education at the University of Cadiz]. *IJERI: International Journal of Educational Research and Innovation*. 11: 83-100.

López-Meneses et al., 2020 – *López-Meneses, E., Gómez-Galán, J., Bernal-Bravo, C., Vázquez-Cano, E.* (2020). Fortalezas y debilidades de los cursos masivos abiertos en línea (MOOC) frente a otros modelos de enseñanza en contextos socio-educativos [Strengths and weaknesses of massive open online courses (MOOCs) versus other teaching models in socio-educational contexts]. *Formación Universitaria*. 13(6): 77-84.

López-Meneses, Gómez-Galán, 2010 – *López-Meneses, E., Gómez-Galán, J.* (2010). Prácticas universitarias constructivistas e investigadoras con software social [Constructivist and investigative university practices with social software]. *Praxis*. 6(1): 15-31. DOI: 10.21676/23897856.77

Maldonado et al., 2019 – *Maldonado, G.A., García-González, J., Sampedro, B.E.* (2019). El efecto de las TIC y redes sociales en estudiantes universitarios [The effect of ICT and social networks on university students]. *RIED. Revista Iberoamericana de Educación a Distancia*. 22: 153-176. DOI: 10.5944/ried.22.2.23178

Marín et al., 2019 – *Marín, V., Vega, E., Passey, D.* (2019). Determinación del uso problemático de las redes sociales por estudiantes universitarios [Determination of problematic use of social networks by university students]. *RIED. Revista Iberoamericana de Educación a Distancia*. 22(2): 135-152. DOI: 10.5944/ried.22.2.23289

Masterman, 1990 – *Masterman, L.* (1990). Teaching the Media. New York: Routledge.

Mattelart, Mattelart, 1987 – *Mattelart, A., Mattelart, M.* (1987). Pensar sobre los Medios. Comunicación y Crítica Social [Thinking about the Media. Communication and Social Criticism]. Madrid: Fundesco.

Morales et al., 2020 – *Morales, A., Zacatenco, J.D., Luna, M., García-Lozano, R.Z., Hidalgo, C.* (2020). Acceso y actitud del uso de Internet entre jóvenes de educación universitaria [Access and attitude of Internet use among young people in university education]. *Revista Digital de Investigación en Docencia Universitaria*. 14(1). DOI: 10.19083/ridu.2020.1174

Negroponte et al., 1997 – *Negroponte, N., Harrington, R., McKay, S.R., Christian, W.* (1997). Being digital. *Computers in Physics*. 11(3): 261-262. DOI:10.1063/1.4822554

Nevado-Peña et al., 2019 – *Nevado-Peña, D., López-Ruiz, V.R., Alfaro-Navarro, J.L.* (2019). Improving quality of life perception with ICT use and technological capacity in Europe. *Technological Forecasting and Social Change*. 148: 119734. DOI: 10.1016/j.techfore.2019.119734

Palvia et al., 2018 – *Palvia, P., Baqir, N., Nemati, H.* (2018). ICT for socio-economic development: A citizens' perspective. *Information & Management*. 55(2): 160-176. DOI: 10.1016/j.im.2017.05.003

Pérez-Parras, Gómez-Galán, 2015 – *Pérez-Parras, J., Gómez-Galán, J.* (2015). Knowledge and influence of MOOC courses on initial teacher training. *International Journal of Educational Excellence*. 1(2): 81-99. DOI: 10.18562/ijee.2015.0008

Piette, Giroux, 1997 – *Piette, J., Giroux, L.* (1997). An international overview of media education. In R. Kubey, *Media Literacy in the Information Age: Current Perspectives* (pp. 89-105). New Brunswick and-London: Transaction Publishers.

Riss, 2017 – *Riis, S.* (2017). ICT literacy: An imperative of the Twenty-First Century. *Foundations of Science*. 22(2): 385-394. DOI: 10.1007/s10699-015-9456-5

Sáez-López et al., 2019 – *Sáez-López, J.M., Sevillano, M.L., Vázquez-Cano, E.* (2019). El uso académico del ordenador portátil y del smartphone en estudiantes universitarios españoles e iberoamericanos [Academic use of laptop and smartphone in Spanish and Ibero-American university students]. *Education in the Knowledge Society*. 20(15): 1-12. DOI: 10.14201/eks2019_20_a15

Siddiquah, Salim, 2017 – *Siddiquah, A., Salim, Z.* (2017). The ICT facilities, skills, usage, and the problems faced by the students of higher education. *EURASIA Journal of Mathematics, Science and Technology Education*. 13(8): 4987-4994. DOI: 10.12973/eurasia.2017.00977a

Sousa, Rocha, 2019 – *Sousa, M.J., Rocha, Á.* (2019). Digital learning: Developing skills for digital transformation of organizations. *Future Generation Computer Systems*. 91: 327-334. DOI: 10.1016/j.future.2018.08.048

UNESCO, 2013 – UNESCO (2013). Enfoque estratégico sobre TIC en educación en América Latina y el Caribe. Oficina Regional de Educación para América Latina y el Caribe [Strategic approach to ICT in education in Latin America and the Caribbean. Regional Bureau of Education for Latin America and the Caribbean]. Santiago: OREALC/UNESCO.

Veytia et al., 2019 – Veytia, M. G., Gómez-Galán, J., & Morales, M. B. (2019). Competencias investigativas y mediación tecnológica en doctorandos de Iberoamérica [Research skills and technological mediation in Iberoamerican doctoral students]. *IJERI: International Journal of Educational Research and Innovatio*n, 12: 1-19.

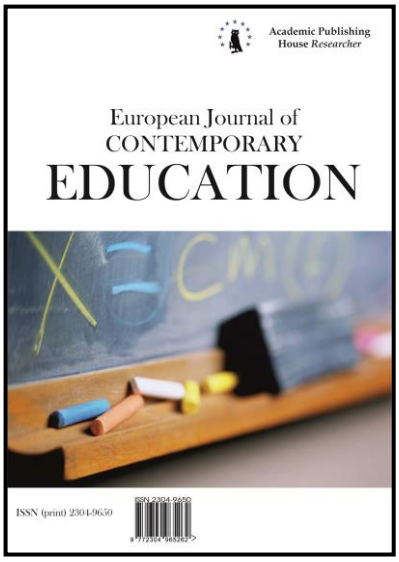
Veytia et al., 2020 – *Veytia, M.G., Gómez-Galán, J., Vergara, D.* (2020). Presence of New Forms of Intercultural Communication in Higher Education: Emojis and Social Interactions through WhatsApp among Graduate Students. *Education Sciences*. 10(11): 295. DOI: 10.3390/educsci10110295

Williams, 2011 – *Williams, G.* (2011). Data Mining with Rattle and R: The Art of Excavating Data for Knowledge Discovery. New York: Springer Science & Business Media.

Záhorec et al., 2019 – *Záhorec, J., Hašková, A., Munk, M.* (2019). Teachers' professional digital literacy skills and their upgrade. *European Journal of Contemporary Education*. 8(2): 378-393. DOI: 10.13187/ejced.2019.2.378

Zhao, Cen, 2013 – *Zhao, Y., Cen, Y.* (2013). Data Mining Applications with R. Oxford: Academic Press/Elsevier.

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 66-76
DOI: 10.13187/ejced.2021.1.66
www.ejournal1.com



Emotion Regulation and Its Relationship to Social Competence Among Kindergarten Children in Jordan

Diala A. Hamaidi [a, *], Jehan W. Mattar [b], Yousef M. Arouri [b]

[a] Qatar University, Qatar
[b] The University of Jordan, Jordan

Abstract

The study aimed at exploring the levels of emotional regulation and social competence among kindergarten children. Further, the relationship between emotional regulation and social competence and its sub-domains: (overall emotional adjustment, social interactions with peers, and social interaction with adults). Furthermore, the significant differences in the relationship between emotional regulation and social competence that are caused by gender. The study researchers used the descriptive and relational approaches to answer the study questions. After ensuring the validity and reliability of the two research instruments, they were applied among 220 (110 females, 110 males) Jordanian kindergarten children: The Social Competence and Behavior Evaluation Preschool Edition (SCBE) and the Emotion Regulation Checklist (ERC). The study results revealed that there is an average level of emotion regulation and an average level of social competence among the participants. There was a statistically significant relationship between children's emotion regulation competence and their social competence, as a correlation between emotion regulation and each of the social competence subscales (general adaptation, overall emotional adjustment, social interactions with peers, and social interactions with adults) was high and statistically significant. Finally, the results revealed that there was no statistically significant gender discrepancy in the relationship between emotion regulation and social competence. Implications and future research recommendations were discussed.

Keywords: emotion regulation competence, social competence, relationships, kindergarten children, Jordan.

1. Introduction

Social competence is one of the essential indicators of children's functioning across several settings. It predicts their ability to sufficiently interact with others like their peers, teachers, and

* Corresponding author
E-mail addresses: dhamaidi@ju.edu.jo (D.A. Hamaidi)

other community members. Social competence is a broad construct which comprises of social skills, social acceptance, relationships with others and the functional outcomes of social interactions (Rose-Krasnor, 1997; Rubin et al., 2006).

Social competence has been mentioned as a vital indicator of adaptive functioning in early childhood. It involves the formation of relationships with others, as well as managing to maintain these relationships (Burt et al., 2008). The inability to fulfill social competence can result in several negative outcomes, which include peer rejection (Miller-Johnson et al., 2002) as well as possible withdrawal from peer groups (Hodges et al., 1999).

Research has frequently found that during preschool years, social competence steadily rises because children obtain substantial cognitive and emotional maturity and self-control. At the same time, aggressive behaviour and angry outbursts steadily decrease (Lafreniere, Dumas, 2003).

Previous research related to predictors of social skills and peer relationships has concentrated on how children perceive social partners, and how they handle social cues and produce responses to various behaviours when interacting with peers (Dodge et al., 1986). However, recent research has paid attention to children's emotion-relevant behaviours which can be seen in an environment where they interact with their peers. It includes the possibility of predicting children's responses to others' behaviours (Denham et al., 2003; Eisenberg et al., 2000; Graziano et al., 2007). These behaviours include children's temperament and their reactions to both positive and negative behaviours coming from others, as well as their ability to manage those reactions adequately, that is also known as their emotion regulation ability (Calkins, Hill, 2007).

In general, emotion regulation competence refers to the management of responses emerging from cognitive-experiential, behavioural-expressive, and physiological biochemical components (Salovey, Sluyter, 1997). Specifically, it is defined as the "Extrinsic and intrinsic processes responsible for monitoring, evaluating and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (Thompson, 1994: 27-28). Moreover, emotion regulation processes are defined as the skills, behaviours, and strategies that aim to regulate, amplify, or inhibit emotional experiences and expressions. These skills and strategies can range from conscious to unconscious, and automatic to effortful behaviours (Calkins, Hill, 2007). Research suggests that emotional knowledge is used by children, in order to assist in the process of regulating their own emotions (Salovey, Sluyter, 1997). Furthermore, previous studies had found that children's self-regulation abilities predicted children's social skills and peer acceptance during preschool (Eisenberg et al., 1993).

Recent studies have suggested a link between self-regulation abilities and social competence. Blandon et al. (2010) suggested that toddlers with lower self-regulation skills have higher levels of behavioural problems. That is, they were less liked by their peers due to having fewer social skills by the time they attended kindergarten (Blandon et al., 2010). Rydell et al. (2007) also suggested that emotion regulation predicted social functioning for children up until they entered middle childhood.

The relationship between emotion regulation and children's vagal regulation was discussed in previous literature. For example, Cole et al. (1996) found that there are no significant differences between the vagal regulation of expressive and inexpressive groups. Stifter and Corey (2001) experimenters rated infants with greater vagal regulation as more social. Finally, Graziano et al. (2007) found that higher respiratory sinus arrhythmia (RSA) was related to more positive relationships, which provided support for the hypothesis stating that children who have better vagal regulation have a more significant capacity for social functioning than children with less vagal regulation.

When it comes to emotion regulation, Florence Good enough was among the first researchers who studied age trends as he conducted a study where he supplied mothers with a questionnaire about certain behaviours. He found a developmental trend which suggested that anger and aggression were highest at age two, after which they steadily declined through preschool years, though they remained more common in boys than in girls. These age trends were later accompanied by gender trends. Studies suggest that girls are more likely to seek social support than boys, in order to deal with affliction or distress (Salovey, Sluyter, 1997). Furthermore, emotion focused regulation that is connected to the cognitive experiential component of emotion is more likely to be used by girls than boys. Thus, there are several noticeable differences between the strategies used by girls and boys for regulating negative emotions. As example, girls are being more likely to seek support and guidance from other individuals. They prefer to use emotion-focused

regulation whereas boys are more likely to prefer to use physical exercise to diminish negative emotions (Salovey, Sluyter, 1997).

As for social competence, a study with a sample of 257 participants examined emotion regulation as a mediator between early behavioural inhibition and later social competence. The results showed that behavioural inhibition predicted less engaged emotion regulation strategies, which is engaged emotional regulation predicted higher social competence for highly inhibited children (Penela et al., 2015).

Finally, a current research study utilized data from the National Institute of Child Health and Human Development (NICHD) examined a development model focusing on early caregiver environments as predictors of social emotional competence. The model included features of parenting and emotion regulation, and the findings supported the hypothesis that features of the caregiver environment in early stages like toddler and preschool periods had significant influence on social emotional competence in 1st grade children (Underwood, Rosen, 2011).

In conclusion, emotion regulation skills predict children's adjustment and social competence (Diener et al., 2002; Thompson, Lagattuta, 2006; Zeman et al., 2006). Thus, when children with high social competence face peer rejection, they employ more effective coping strategies (Reijntjes et al., 2006).

Given the previous discussion, the importance of examining emotion regulation among children was discussed thoroughly in international settings. As a result, this study is important because it presents existing knowledge within a different early education national context in Jordan regarding the topic of emotion regulation among kindergarten children in Jordan. This study highlights many aspects related to emotion regulation and social competence among children in Jordan.

1.1. Emotion Regulation in the Jordanian Context

Some studies were conducted to investigate emotion regulation in early childhood in the Jordanian context. One of the studies investigated the relationship between emotion regulation and academic difficulties in early childhood education (Mattar et al., 2018). The study examined the level of emotion regulation and the level of academic difficulties of first grade students in Jordan. Findings showed that there is a significant relationship between emotion regulation and academic difficulties especially for male students. The results draw attention to emotion regulation as an essential factor in predicting academic success. It can play an effective role in raising children's preparedness for school and making them more capable of completing tasks in the elementary stage. This is expected to lead to better school functioning in their future education. In addition, Alziyoudi and Mattar (2019) investigated the predictive ability of cognitive control for emotion regulation and social competence with (adults and peer) among first grade students at private schools in Amman-Jordan. The results showed a positive relationship between cognitive control and emotion regulation among children. Furthermore, results indicated that there are no differences in the relationship between cognitive control and emotion regulation according to gender variable.

Finally, Bisharat and Mattar (2019) identified the relationship between the emotional regulation and school readiness among first-grade students. the results showed a statistically significant positive relationship at the significance level (0.05) between emotional regulation and school readiness, the results also showed that emotional regulation explained (12.3 %) of the variance in school readiness.

The review of previous research of the Jordanian context regarding emotion regulation showed that the focus was on the emotion regulation relation with academic difficulties and school readiness of first grade students (6 years of old). In addition, previous research investigated the predictive ability of cognitive control for emotion regulation and social competence with (adults and peer) among first grade students. All of the conducted studies in the field of emotion regulation in Jordan recommended conducting further studies at different age stages. As a result, this study investigated preschool stage and focused on kindergarten children's emotion regulation and its relationship to social competence.

1.2. Research Questions

This study aimed to examine the relationship between kindergarten children's emotion regulation and social competence in Jordan. Specifically, the study attempted to answer the following questions:

(1) What are the levels of emotional regulation and social competence among kindergarten children?

(2) What is the relationship between emotional regulation and social competence and its sub-domains: (overall emotional adjustment, social interactions with peers, and social interaction with adults)?

(3) Are there significant differences in the relationship between emotional regulation and social competence that are caused by gender?

1.3. Theoretical Framework

Social competence is considered as an indicator of adaptation in early childhood stage. It refers to how individuals can form and maintain relationships with others. Failure in achieving this competence can affect various developmental aspects of the child. In the past, focus on this component has been solely related to social skills and peer relationships and their relation to social competence. However, recently more attention was given to emotions and behaviours pertaining to them, and how they might relate to social competence. One of these behaviours is emotion regulation. In early childhood period, children are still developing their abilities to regulate emotions through modelling, language acquisition, and social interactions, which adds to their ability to regulate.

The research revealed that studying emotional regulation seems to emerge from two theoretical approaches: the personality psychological approach and the functionalist emotion theory. The personality psychological approach has roots in research on stress and coping, as well as the psychoanalytic study of psychological defenses. On the other hand, the functionalist emotion theory – along with the developmental psychology approach – has roots in functionalist theory which focuses on the development of emotion regulation in light of factors like socialization and temperament (Gross, Thompson, 2007). Other research has also emphasized that the study of emotions from a functional point of view pays focus to the organizational and adaptive role of emotions (Campos et al., 2004).

Thompson's (1994) definition of regulation outlines six possible ways with which emotion is regulated; these include neurophysiological responses, access to coping resources, exposure to environment, attentional processes, responses and behaviour, and construals and attributions. Furthermore, Cole et al. (1994) have highlighted the fact that emotion regulation brings out the variation between control and regulation. Most theorists perceive emotion regulation as something which surpasses simply reducing, stopping, or controlling emotions but involves adjustment of emotional behaviors, while control merely refers to restraining of emotional processes, regardless of adjusting or regulating them (Cole et al., 1994).The opposite of suppressing or restraining emotions is sometimes needed as part of emotion regulation, in order to increase emotional arousal when needed to create a certain kind of positive atmosphere (Fredrickson, 1998).

Child's environmental variables play a role in emotion regulation. Particularly, child temperament and caregiver characteristics and behaviors, as the context of these variables, directly influence emotion regulation, which is viewed as an essential process in socioemotional competence as well as mental health (Southam-Gerow, 2013). Furthermore, it has been argued that emotional development is highly associated with social development. That is regulation between the child and his or her caregiver affects the ability of self-regulation, stressing that the ability to successfully regulate one's emotions is ingrained in positive and affective interactions between children and their caregivers (Sroufe, 1996).

Finally, several theories explain the powerful relationship between emotional and social developments. Ekman (1992) suggested that emotions prepare people to respond in interpersonal situations. Moreover, theorists suggest that emotional experiences can impact children's responses to social situations (Crick, Dodge, 1994).

2. Methods and procedures

2.1. Participants

Study participants consisted of kindergarten children (KG 2) from private Jordanian kindergartens. The study sample was randomly chosen. It comprised of 220 children: 110 males and 110 females with a mean age of 5.5 years. Stratified random sampling was employed. Twelve kindergartens were randomly selected from the same sector. From each kindergarten, one KG 2 classroom was chosen. Following this, 10 children were picked randomly from each classroom, 5 of

whom were males and 5 females. The lead teachers of each classroom filled in the two questionnaires for the selected children.

2.2. Measurements

The implemented research instruments consisted of: (1) The Social Competence and Behavior Evaluation Preschool Edition (SCBE) by Lafreniere and Dumas (2003), and (2) the Emotion Regulation Checklist by Shields and Cicchetti (1997).

The SCBE is a standardized instrument which investigates patterns of social competence, affective expression as well as adjustment difficulties in children whose age ranges between 30 months to 78 months. It is a questionnaire consisting of 80 items on a six-point rating scale. It can be completed by teachers. The SCBE not only provides contextual, reliable and valid description of behavior which is useful to early childhood specialists, but also assesses children's positive social adaptation or competence.

The SCBE offers eight basic scales and four summary scales. Each basic scale contains 10 items. To answer the research questions three basic and two summary scales were used. The basic scales are: (1) the Overall Emotional Adjustment Scale, (2) the Social Interactions with Peers Scale, and (3) the Social Interaction with Adults Scale. As for the summary scales, both of the Social Competence Scale and the General Adaptation Scale were used (Lafreniere, Dumas, 2003).

The Emotion Regulation Checklist consisted of 24 items that describe child's behavior on a four point Likert scale. It evaluates emotion regulation in preschool and school aged children. It can be completed by parents, teachers, or adults who know the child well. It is a valid and reliable measure which has been extensively used in research on emotion regulation in children (Shields, Cicchetti, 1997). It has been translated to different languages and successfully used (Molina et al., 2014).

2.3. Validity and Reliability of Research Instruments

For both of the instruments, the following steps were taken to ensure validity and reliability in the Jordanian version of these measures.

The items in the scales were initially translated, and then three university faculty members reviewed the primary translation individually according to the following criteria: (a) the linguistic correctness (word by word translation/vocabulary correctness) of the translation in comparison to the English version; (b) the content resemblance (to ensure that each item in the translated version is similar to the one in the original version in terms of content, meaning, and the purpose of measurement of the item; the total number of items is similar to the ones in the original version; the total number of subscales if applicable and the sequence of subscales is similar in both versions; and completion directions are similar in both versions); (c) the cultural appropriateness of each item's content for the Jordanian culture; and (d) the comprehensibility and clarity for its targeted populations. All amendments were mainly related to improving and modifying the readability of the translated items. All of the reviewers' comments were considered and modifications were made on the translated version.

Back translation was another procedure used to assure the translation correctness and the ability to match the original version. A faculty member proficient in Arabic and English translated the translation back from Arabic to English. This back-translated version was then compared with the English version item by item to ensure that it was similar to the original one.

The validity of the scales was achieved in the following ways: (a) face validity which was accomplished through the previously mentioned translation steps for both of the scales, and (b) construct validity, as the internal consistency of the translated version of the SCBE was checked through calculating the correlation coefficient between the sub-scales forming the scale, and the total score of the scale, and the internal consistency of the translated version of the ERC was checked through calculating the correlation coefficient between items, and the total score of the scale. Both measures had internal consistency which was statistically significant.

The reliability coefficients were checked through looking at the internal consistency: This was measured according to Cronbach's Alpha, with a reliability coefficient of (0.952) for the total score of the SCBE. As for the ERC, the reliability coefficient of the total score was (0.84), which indicated high reliability for both instruments.

2.4. Statistical treatments

The researchers used The Statistical Package for Social Sciences (SPSS) software to analyze research data and accomplish the following statistical treatments: 1) Means and standard

deviations were used to answer the first question, 2) Pearson Correlations were used to answer the second question, and 3) Pearson Correlations and Fisher r-to-z Transformation were used to answer the third question.

3. Results

3.1 First Question

Means and standard deviations were used to answer the first question: What are the levels of emotional regulation and social competence among kindergarten children? Table 1 explains the results.

Table 1. Means and standard deviations of the social competence subscales

Social competence subscales	Mean	Std. Deviation
Emotional adjustment	4.3	.838
Peer interaction	4.16	.789
Adult interaction	4.28	.847
General adaptation	4.24	.767
Social competence	3.83	1.228
Level of emotion regulation	2.86	.475

Table 1 revealed that the mean level of emotion regulation for the sample was (2.86). That is the level of emotion regulation was average. On the other hand, the mean level of social competence for the sample was (3.83), general adaptation (4.24), overall emotional adjustment (4.30) social interactions with peers (4.16), and social interactions with adults (4.28), which was also average for all the subscales.

3.2 Second Question

Pearson Correlations were used to answer the second question: What is the relationship between emotional regulation and social competence and its subdomains: (overall emotional adjustment, social interactions with peers, and social interaction with adults)? Table 2 describes the results.

Table 2. Pearson Correlations between emotional regulation and social competence and its subdomains

Social competence subscales		Emotional Regulation
Emotional adjustment	Pearson Correlation	.728**
	Sig. (2-tailed)	.000
Peer interaction	Pearson Correlation	.676**
	Sig. (2-tailed)	.000
Adult interaction	Pearson Correlation	.697**
	Sig. (2-tailed)	.000
General adaptation	Pearson Correlation	.751**
	Sig. (2-tailed)	.000
Social competence	Pearson Correlation	.553**
	Sig. (2-tailed)	.000

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

Table 2 indicated that the correlation between emotion regulation and social competence was (0.553), general adaptation (0.751), overall emotional adjustment (0.728), social interactions with peers (0.676), social interactions with adults (0.697). The correlation between emotion regulation and each of the social competence subscales was high and statistically significant.

3.3. Third Question

To answer the third question: "Are there significant differences in the relationship between emotional regulation and social competence that are caused by gender?" Pearson Correlations were used, and Table 3 demonstrates the results.

Table 3. Pearson Correlations between emotional regulation and social competence regarding gender

Gender			Emotional Regulation	Social Competence
Male	Emotional Regulation	Pearson Correlation	1	.740**
		Sig. (2-tailed)		.000
	Social Competence	Pearson Correlation	.740**	1
		Sig. (2-tailed)	.000	
Female	Emotional Regulation	Pearson Correlation	1	.761**
		Sig. (2-tailed)		.000
	Social Competence	Pearson Correlation	.761**	1
		Sig. (2-tailed)	.000	

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

Table 3 indicated that the correlation between emotion regulation and social competence regarding male gender was (0.740), and regarding female gender (0.761). That is, the correlations between emotion regulation and each of the social competence regarding male and female were high and statistically significant.

Fisher r-to-z Transformation was used to determine if there are significant differences in the relationship between emotional regulation and social competence that are caused by gender. Table 4 demonstrates the results.

Table 4. Fisher r-to-z Transformation between emotional regulation and social competence that are caused by gender

Sig	z-value	Female	Male
0.741	-0.335	.761**	.740**

**. Significance level of 0.01

Table 4 showed no statistically significant gender discrepancy in the relationship between emotion regulation and social competence when using the Fisher r-to-z Transformation, as the z-value equalled (-0.335).

4. Discussion

The study results indicated average levels of emotion regulation among kindergarten children in Jordan. This result is expected because at this age children have just entered the school environment and they are starting the process of building their emotion regulation strategies and their social skills. Children in preschool are learning to talk about their emotions. They are developing their emotion language including receptive and productive vocabulary. By spending more time in preschool settings, children can develop the language by which they can describe their emotions (Zeman et al., 2006). By spending more time in preschool, children's verbal abilities continue to develop which notably contributes to their emotion regulation skills (Camspos et al., 2004).

The emerging capacity for children to control and manage their emotions is related to language and cognition development. That is, emotional development can be understood in relation to social, cognitive, and linguistic development. Also, it is affected by different cultures. For example, the components of school environment, such as teachers, peers, and even parents contribute to emotion regulation through feedback and modelling within the context of the micro-system, which places several demands on the child in order to adapt to different groups and learn to apply emotion regulation (Berns, 2016).

In addition to the above factors, there is a biological as well as environmental transition from late childhood into adolescence that affects emotion regulation. Recent evidence in developmental

neuroscience research indicates that the regions of the brain which are associated with emotion regulation include the prefrontal cortex, anterior cingulate cortex, and the amygdala, are actually continuing to mature and develop through childhood to adolescence (Beauregard et al., 2004).

The study results also indicated average levels of social competence among the participants. This is consistent with research that noted a consistent rise in social competence throughout early childhood education as children acquire greater cognitive skills, emotional maturity, and self-control. These factors are associated with lower levels of angry outburst and aggressiveness. Children also learn negotiation skills as well as emotion regulation in this developmental stage (Lafreniere, Dumas, 2003).

In addition, the results of this research also indicated that the correlation between emotion regulation and social competence was high and statically significant. Children with high emotion regulation ability tend to have higher attention and lower impulsiveness, as well as more efficient coping strategies which all go to hone their social skills that they employ in their interactions with peers and others which in its turn affects all aspects of children's growth and development. This result agrees with previous research that found a relationship between emotion regulation and general adaptation, overall emotional adjustment, social interactions with peers, and social interactions with adults. Children who have high emotion regulation are expected to be more competent in managing negative emotions as well as interacting with others. It is possible that the children's anger management abilities when interacting with peers are related to the conscious control of emotion (Eisenberg et al., 1994). This effortful control is also thought to be related to high levels of sympathy, prosocial behavior, and ultimately, social competence (Spinrad et al., 2006; Eisenberg et al., 1993; Eisenberg et al., 1995; Eisenberg et al., 2003). Therefore, effortful control may give the child the base or skills needed to engage in socially constructive behaviors while interacting with peers. This can enhance peer liking (Arsenio, Lemerise, 2004). Therefore, school aged children have a higher ability to employ effortful, active, and effective regulation strategies, and to re-evaluate different situations more positively (Kalpidou et al., 2004; Stansbury, Sigman, 2000).

When it comes to the lack of gender discrepancy in the relationship between emotion regulation competence and social competence, some previous studies disagreed and suggest that girls are more likely to seek social support than boys, in order to deal with affliction or distress (Salovey, Sluyter, 1997). However, other previous studies do not appear to have looked at gender differences when it comes to social competence, and past research has indicated mixed results on gender differences effect on the display of social competence (Eisenberg, 2001). Moreover, while studying gender effect on emotional functioning can be helpful, the results are inconsistent across personality, social, cultural, and situational variables, as well as the types of emotional processes employed (Brody, Hall, 2008).

Moreover, the sample used in this study was relatively small and it is possible that a larger sample would reveal significant gender discrepancies. Finally, while some studies report that girls are more likely to rate themselves as more emotionally expressive than boys, the fact that the teachers who filled out the measures could account for more objective reporting (Simon, Nath, 2004).

In summary, as children cognitively, socially, and linguistically mature within the context of preschool after they leave their care giving environment, they employ their learned skills and continue to develop more advanced self-regulation skills, including emotion regulation, managing to inhibit negative behaviors like impulsivity and anger, and learning to deal with lower emotional intensity, allowing the child to form positive socially constructive relationships with peers which can lead to higher levels of social competence and general adaptation.

5. Conclusion

This study aimed at investigating the relationship between kindergarten children's emotion regulation and social competence in Jordanian kindergartens. The main findings indicate that there was a statistically significant relationship between children's emotion regulation competence and their social competence, as correlation between emotion regulation and each of the social competence subscales (general adaptation, overall emotional adjustment, social interactions with peers, and social interactions with adults) was high and statistically significant. In addition, the results revealed that there was no statistically significant gender discrepancy in the relationship between emotion regulation and social competence.

The implications of this study can affect early childhood educators' teaching practices related to emotional development of their children. Based on the results of this research kindergarten teachers are encouraged to integrate learning outcomes that enhance emotional development in their educational plans and design more learning activities in kindergarten setting. Such activities and learning experiences can assist children in understanding and interpreting emotional cues in their environment before they can begin to learn the strategies needed to regulate these emotions. As for parents, it is recommended that they regulate their own emotions as they are their children's models. This includes emotionally coaching their children on how to interact with their peers, including showing sympathy, inhibiting impulsivity and managing their anger. All these aspects and more can be developed with emotional coaching and through parental modelling so that children can develop better social skills. Finally, further future research on identifying the effect of gender on the indicators of regulation of emotions and social competence is recommended. Furthermore, the effect of emotion regulation on other variables related to early childhood settings is highly recommended.

References

Alziyoudi, Mattar, 2019 – *Alziyoudi, N., Mattar, J.* (2019). The predictive ability of cognitive control for emotion regulation and social competence (with adults and peers) among first grade students at private schools in Amman – Jordan. Unpublished Doctoral Dissertation, University of Jordan, Jordan.

Arsenio, Lemerise, 2004 – *Arsenio, W F., Lemerise, E.A.* (2004). Aggression and moral development: Integrating social information processing and moral domain models. *Child Development*. 75: 987-1002.

Beauregard et al., 2004 – *Beauregard, M., Levesque, J., Paquette, V.* (2004). Neural basis of conscious and voluntary self-regulation of emotion. In M. Beauregard (Ed.), Consciousness, emotional self-regulation and the brain (pp. 163-194). Amsterdam: Benjamins.

Berns, 2016 – *Berns, R.M.* (2016). Child, Family, School, Community: Socialization and Support. 10th Edition. Connecticut: Cengage Learning.

Bisharat, Mattar, 2019 – *Bisharat, R., Mattar, M.* (2019). Emotional regulation and its relation to school readiness among first grade students in private schools in Amman. Jordanian Educational Association. Accepted for publication.

Blandon et al., 2010 – *Blandon, A.Y., Calkins, S.D., Keane, S.P.* (2010). Predicting emotional and social competence during early childhood from toddler risk and maternal behavior. *Development and psychopathology*. 22(1): 119-132.

Brody, Hall, 2008 – *Brody, L.R., Hall, J.A.* (2008). Gender and emotion in context. In: M. Lewis, J.M. Haviland-Jones, L.F. Barrett (Eds.), Handbook of emotions (pp. 395-408). New York, NY: The Guilford Press.

Burt et al., 2008 – *Burt, K.B., Obradović, J., Long, J.D., Masten, A.S.* (2008). The interplay of social competence and psychopathology over 20 years: Testing transactional and cascade models. *Child Development*. 79(2): 359-374.

Calkins, Hill, 2007 – *Calkins, S.D., Hill, A.* (2007). Caregiver influences on emerging emotion regulation. In J. J. Gross (Ed.), Handbook of emotion regulation (pp. 229-248). New York: Guilford Press.

Campos et al., 2004 - *Campos, J.J., Frankel, C.B., Camras, L.* (2004). On the nature of emotion regulation. *Child Development*. 75(2): 377-394.

Cole et al., 1994 – *Cole, P.M., Mitchel, M.K., Teti, L.O.* (1994). The development of emotion regulation and dysregulation: A clinical perspective. *Monographs of the society for Research in Child Development*. 59: 73-283.

Cole et al., 1996 – *Cole, P.M., Zahn-Waxler, C., Fox, N.A., Usher, B.A., Welsh, J.D.* (1996). Individual differences in emotional regulation and behavior problems in preschool children. *Journal of Abnormal Psychology*. 105: 518-529.

Crick, Dodge, 1994 – *Crick, N., Dodge, K.* (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin*. 115: 74-101.

Denham et al., 2003 – *Denham, S.A, Blair, K.A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Majorm, S. et al.* (2003). Preschool emotional competence: Pathway to social competence? *Child Development*. 74: 238-256.

Diener et al., 2002 – *Diener, M.L., Mangelsdorf, S.C., McHale, J.L., Frosch, C.A.* (2002). Infants' behavioral strategies for emotion regulation and with fathers and mothers: Associations with emotional expression and attachment quality. *Infancy*. 3: 153-174.

Dodge et al., 1986 – *Dodge, K.A., Pettit, G.S., McClaskey, C.L., Brown, M.M.* (1986). Social competence in children. *Monographs of the Society for Research in Child Development*. 51(2): 1-85.

Eisenberg, 2001 – *Eisenberg, N.* (2001). The core and correlates of affective social competence. *Social Development*. 10: 120-124.

Eisenberg et al., 1993 – *Eisenberg, N., Fabes, R.A., Bernzweig, J., Karbon, M.* (1993). The relations of emotionality and regulation to preschoolers' social skills and sociometric status. *Child Development*. 64(5): 1418-1438.

Eisenberg et al., 2000 – *Eisenberg, N., Fabes, R.A., Guthrie, I.K., Reiser, M.* (2000). Dispositional emotionality and regulation: Their role in predicting quality of social functioning. *Journal of Personality and Social Psychology*. 78: 136-157.

Eisenberg et al., 1995 – *Eisenberg, N., Fabes, R.A., Murphy, B., Maszk, P., Smith, M., Karbon, M.* (1995). The role of emotionality and regulation in children's social functioning: A longitudinal study. *Child Development*. 66: 1239-1261.

Eisenberg et al., 1994 – *Eisenberg, N., Fabes, R.A., Nyman, M., Bernzweig, J., Pinuelas, A.* (1994). The relations of emotionality and regulation to children's anger-related reactions. *Child Development*. 65: 109-28. DOI: 10.1111/j.1467-8624.1994.tb00738.x

Eisenberg et al., 2003 – *Eisenberg, N., Valiente, C., Morris, A.S., Fabes, R.A., Cumberland, A., Reiser, M. et al.* (2003). Longitudinal relations among parental emotional expressivity, children's regulation, and quality of socioemotional functioning. *Developmental Psychology*. 39: 3-19.

Ekman, 1992 – *Ekman, P.* (1992). An argument for basic emotions. *Cognition and Emotion*. 6: 169-200. DOI: 10.1080/02699939208411068

Fredrickson, 1998 – *Fredrickson, B.L.* (1998). Cultivated emotions: Parental socialization of positive emotions and self-conscious emotions. *Psychological Inquiry*. 9: 279-281.

Graziano et al., 2007 – *Graziano, P.A., Keane, S.P., Calkins, S.D.* (2007). Cardiac vagal regulation and early peer status. *Child Development*. 78: 264-278.

Gross, Thompson, 2007 – *Gross, J.J., Thompson, R.A.* (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), Handbook of emotion regulation (pp. 3-24). New York: Guilford Press.

Hodges et al., 1999 – *Hodges, E.V., Boivin, M., Vitaro, F., Bukowski, W.M.* (1999). The power of friendship: Protection against an escalating cycle of peer victimization. *Developmental Psychology*. 35(1): 94-101.

Kalpidou et al., 2004 - *Kalpidou, M.D., Power, T.G., Cherry, K.E., Gottfried, N.W.* (2004). Regulation of emotion and behavior among 3- and 5-year-olds. *Journal of General Psychology*. 131: 159-178.

Lafreniere, Dumas, 2003 – *Lafreniere, P.J., Dumas, J.E.* (2003). Social Competence and Behavior Evaluation Preschool Edition (SCBE). Western Psychological Services. Los Angeles: CA.

Mattar et al., 2018 – *Mattar, J., Hamaidi, D., Al Anati, J.* (2018). Emotion regulation and its relationship to academic difficulties among Jordanian first grade students. *Early Child Development and Care*. DOI: 10.1080/03004430.2018.1534842

Miller-Johnson et al., 2002 – *Miller-Johnson, S., Coie, J. D., Maumary-Gremaud, A., Bierman, K., & the Conduct Problems Prevention Research Group* (2002). Peer rejection and aggression and early starter models of conduct disorder. *Journal of Abnormal Child Psychology*. 30(3): 217-230.

Molina et al., 2014 – *Molina, P., Sala, M.N., Zappulla, C., Bonfigliuoli, C., Cavioni, V., Zanetti, M.A., … Cicchetti, D.* (2014). The Emotion Regulation Checklist – Italian translation. Validation of parent and teacher versions. *European Journal of Developmental Psychology*. 11(5): 624-634.

Penela et al., 2015 – *Penela, E.C., Walker, O.L., Degnan, K.A., Fox, N.A., Henderson, H.A.* (2015). Early Behavioral Inhibition and Emotion Regulation: Pathways toward Social Competence in Middle Childhood. *Child Development*. 86(4): 1227-1240. DOI: 10.1111/cdev.12384

Reijntjes et al., 2006 – *Reijntjes, A., Stegge, H., Terwogt, M.M.* (2006). Children's coping with peer rejection: The role of depressive symptoms, social competence, and gender. *Infant and Child Development*. 15: 89-107.

Rose-Krasnor, 1997 – *Rose-Krasnor, L.* (1997). The nature of social competence: A theoretical review. *Social Development*. 6(1): 111-135.

Rubin et al., 2006 – *Rubin, K.H., Hemphill, S.A., Chen, X., Hastings, P., Sanson, A., Lo Coco, A. et al.* (2006). A cross-cultural study of behavioral inhibition in toddlers: East-west-north-south. *International Journal of Behavioral Development*. 30: 219-226.

Rydell et al., 2007 – *Rydell, A.M., Thorell, L.B., Bohlin, G.* (2007). Emotion regulation in relation to social functioning: An investigation of child self-reports. *European Journal of Developmental Psychology*. 4: 293-313. DOI: 10.1080/17405620600783526

Salovey, Sluyter, 1997 – *Salovey, P., Sluyter, D.J. (Eds.)* (1997). Emotional development and emotional intelligence: Educational implications. New York: Basic Books.

Shields, Cicchetti, 1997 – *Shields, A., Cicchetti, D.* (1997). Emotion Regulation Checklist. PsycTESTS Dataset.

Simon, Nath, 2004 – *Simon, R.W., Nath, L.E.* (2004). Gender and emotion in the U.S.: Do men and women differ in self-reports of feelings and expressive behavior? *American Journal of Sociology*. 109: 1137-1176.

Southam-Gerow, 2013 – *Southam-Gerow, M.A.* (2013). Emotion regulation in children and adolescents: A practitioner's guide. New York: Guilford Press.

Spinrad et al., 2006 – *Spinrad, T., Eisenberg, N., Cumberland, A., Fabes, R., Valiente, C., Shepard, S., Reiser, M., Losoya, S., Guthrie, I.* (2006). Relation of emotion-related regulation to children's social competence: a longitudinal study. *Emotion*. 6(3): 498-510. DOI: 10.1037/1528-3542.6.3.498

Sroufe, 1996 – *Sroufe, A.L.* (1996). Emotional development: The organizational of emotional life in the early years. New York: Cambridge University Press.

Stansbury, Sigman, 2000 – *Stansbury, K., Sigman, M.* (2000). Responses of preschoolers in two frustrating episodes: Emergence of complex strategies for emotion regulation. *Journal of Genetic Psychology*. 161: 182-202.

Stifter, Corey, 2001 – *Stifter, C.A., Corey, J.M.* (2001). Vagal regulation and observed social behavior in infancy. *Social Development*. 10: 189-201.

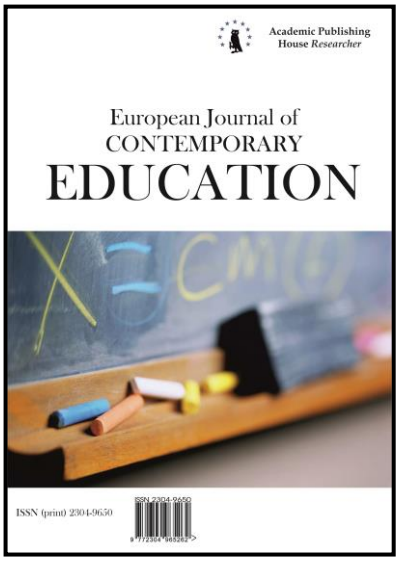
Thompson, 1994 – *Thompson, R.* (1994). Emotion regulation: A theme in search of definition. *Monographs of Society for Research in Child Development*. 59(2-3): 25-52.

Thompson, Lagattuta, 2006 – *Thompson, R.A., Lagattuta, K.H.* (2006). Feeling and understanding: Early emotional development. In K. McCartney & D. Philips (Eds.), Blackwell handbook of early childhood development (pp. 317-337). Malden, MA: Blackwell.

Underwood, Rosen, 2011 – *Underwood, M.K., Rosen, L.H. (Eds.)* (2011). Social development: Relationships in infancy, childhood, and adolescence. New York: Guilford Press.

Zeman et al., 2006 – *Zeman, J., Cassano, M., Perry-Parrish, C., Stegall, S.* (2006). Emotion regulation in children and adolescents. *Developmental and Behavioral Pediatrics*. 27: 155-168.

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 77-88
DOI: 10.13187/ejced.2021.1.77
www.ejournal1.com



Self-Assessment and EFL Literature Students' Oral Reproduction of Short Stories

Fatemeh Khonamri [a], Roman Králik [b, c], Miluše Vítečková [d], Lucia Petrikovičová [e, *]

[a] University of Mazandaran, Babolsar, Iran
[b] Peoples' Friendship University (RUDN University), Moscow, Russian Federation
[c] Kazan Federal University, Kazan, Russian Federation
[d] University of South Bohemia in České Budějovice, Czech Republic
[e] Constantine the Philosopher University in Nitra, Nitra, Slovakia

Abstract

The purpose of the current study is to investigate self-assessment as a helpful strategy for facilitating teaching and learning in language classrooms and to investigate the effects of this technique on EFL learners' oral performance. To achieve the purpose of the study and answer the research questions, a quasi-experimental study was conducted. The participants of the study were a group of five EFL learners who were called self-assessment. The self-assessment technique was incorporated to this group. There were a pretest and posttest sessions and four sessions of treatment between the pretest and posttest. The instruments used in this study were storyboards and checklists. The data was collected via a recording device and then it was transcribed for further analysis. Paired sample T-test was used to analyze the quantitative data and for the qualitative analysis, the data on the checklist and students' self-assessment reports were used. The data on the checklist also helped to find the extent to which learners have improved in fluency in their own ideas through self-assessment. The findings of the present study showed self-assessment was helpful in improving Error free clause ($p = 0.031$) meaning self-assessment group made significant improvement in this feature. Considering the three other features, the comparison of pre- and posttest scores also showed a significant difference which approved effectiveness of the related treatment. The qualitative analysis of the students' self-assessment report also revealed that students found it as a helpful technique to monitor themselves and reflect on their own work.

Keywords: self-assessment, oral production, autonomy.

* Corresponding author
E-mail addresses: lpetrikovicova@ukf.sk (L. Petrikovičová)

1. Introduction

1.1. The relevance of the problem

Nowadays there is a great emphasis on encouraging learners to judge their own language ability which has led to an increased interest in the use of the self-assessment technique in English as a Second Language (ESL) classrooms since the late 1970s (Oskarsson, 1978; Von Elek, 1985; Dickinson, 1987; Brindley, 1987). The main reason for this emphasis is that it is claimed that self-assessment can help learners get to know 'how to learn' (Nunan, 1988). In addition, the ability to reflect on teaching and self-reflection on one's own work is one of the main goals of teacher training (Procházka, 2015; Matulníková, 2018). As von Elek (1985) and Benson (2006) argue, while learners assess their own language proficiency and their progress, they become aware of their ability. By recognizing their weaknesses, they will then be able to seek help with the areas in which they need to improve. Finally, they will see how close or how distant their actual language proficiency is from the level they wish to achieve (cited in Lim, 2007: 170).

As Harris (1997) states teaching should not be simply targeted at introducing learners to a foreign language, but it should be targeted at leading learners to perform well without teachers' support in different situations, i.e. learners need to be autonomous, and the skill of "self-assessment" is one way to reach autonomy (cited in Jabr, 2011: 26). Bachman and Palmer (1989) refer to self-assessment as a "reliable and valid measure of communicative language ability" (cited in Patri, 2002: 109-110).

Self-assessment has several benefits: a) when they assess their own effort, they become encouraged to try "harder for next time"; b) it helps them to be aware of their own abilities, thus developing positive self-image and self-confidence; and c) it assists them in recognizing the distinction between competence and performance and this would lead to improvement in their knowledge about "where to direct their efforts in future" (Blue, 1994).

With regard to the significant role of self-assessment in promoting learner autonomy Hunt, Gow and Barnes (1989) argue that without learner self-assessment and evaluation "there cannot be real autonomy" (cited in Khodadady, Khodabakhshzade, 2012: 207).

In spite of the recognition of the significance and importance of self-assessment in language learning, little is known about its effect on oral production of EFL learners. Indeed, a few studies have been done to investigate the effect of self-assessment on oral production (Ariafar, Fatemipour, 2013).

This study is an attempt to investigate differences, if any, in students' improved aspects of oral performance in the used technique and the types and degree of the changes observed.

1.2. Background

Pierce (1999) defines assessment as a beneficial tool which shows students that they are making progress in foreign language development, and this would promote their motivation to identify their own strengths and weaknesses and increase their autonomy and independent learning skills. He asserts "learning activities upon which assessment is based have relevance and meaning for students and promote application of skills" (p. 128). Students who are involved in the process of assessment would achieve maturity and responsibility in making progress in language learning (Nedzinskaitė et al., 2006: 84-85).

Recently many studies have been done to show the effectiveness of self-assessment in language learning (Gardner, 2000; Blue, 1994; Chen, 2008; Harris, 1997; Valdez, 1999; Pierce, 1999; Ahangari, 2014; Ahangari et al., 2013; Butt-Bethlendy, 2013; Cunningham, 2011; Kiyomi, 2009; Polio, 1997). For example Harris (1997) in his paper "self-assessment of language learning in formal settings" defines self-assessment as a learning strategy through which students can monitor their progress and "relate learning to their individual needs". If students cannot see any progress in their learning, they will be demotivated. With regard to the value of self-assessment, he further continues that it helps students to be more active and focused and "better placed to assess their own progress in terms of communication" (p. 12).

O'Malley and Valdez (1996) state that self-assessment would encourage responsibility in the learners. They believe that self-assessment is a technique which promotes critical thinking and involves students directly in their process of learning. By applying self-assessment in language classrooms teacher is not the only one who is responsible for students' performance rather students participate actively in the process of assessment "to become critical and look for adequate solutions

to the constraints encountered". They further add that self-assessment helps both the teacher and the learners to "become aware of students' attitudes, strengths and weaknesses" (cited in Ochoa 2007: 234-235).

Yukomoto (2012) conducts a study on 94 university students in Tokyo in an English discussion class to investigate the effect of self-assessment on their English discussion skills. Students were provided with a self-check sheet after each discussion class to self-assess how they used the discussion skills they had studied. By reflecting on their first self-check they chose the criteria they wished to focus on in the second discussion. The scores of the two discussions were compared and it was found that the scores of the chosen criteria improved significantly more than the criteria they had not chosen. Students had positive reaction to use self-assessment and in interview they reported that the self-check had helped them understand the lesson objectives better and remember the skills for discussion.

Ariafar and Fatemipour (2013) conducted a study on 60 pre-intermediate EFL learners to see whether self-assessment has any effect on their speaking skill or not. They concluded that self-assessment helps participants to improve their speaking ability. By administering a self-assessment questionnaire among learners to elicit their opinions and reactions to self-assessment, the researchers concluded that participants have positive attitude toward self-assessment.

Khodadady and Khodabakhshzade (2012) conducted a study on 59 TEFL students in a writing class who were divided into control and experimental group to find out the effect of self-assessment and portfolio assessment on writing ability and autonomy. For this purpose, they administered a writing IELTS task at the beginning of the project as pre-test and at the end of the project as post-test to determine the level of the students' writing ability. A questionnaire was used to determine the students' autonomy in writing. The results of their study have shown that while the two groups had no significant difference in their writing and self-regulation abilities at the beginning of the course, the experimental group scored significantly higher than the control group on the writing task at the end of the course and also gained higher self-regulation ability as a result of writing portfolios and self-assessment.

Bahmani (2014) conducts a study in which she seeks to investigate the effects of self-assessment on oral skill of Iranian EFL learners. The results of her study indicate that self-assessment has positive effects in improving learners' oral skill. Participants in the self-assessment group were given self-assessment rubrics specifically designed for the speaking assignment task. They rated themselves analytically by answering 5 questions in their self-assessment rubrics which related to their pronunciation, vocabulary, fluency task, and grammar of their speaking. The results of the study showed that there was a gradual improvement in participants' speaking skill during thirty sessions of treatment.

Nedzinskaitė et al. (2006) conduct a study to prove students can become more active to judge their performance in developing their skills in the process of language learning through their self-assessment essays. They conclude that students' self-assessment results are a useful tool for helping them to focus on their own performance. The analysis was concerned with students' opinions and ideas about reflection of their own learning. The results also show that students' self-confidence during speaking activities was developed and their pronunciation was improved significantly as a result of learning hard and preparing for discussion regularly. As a result they improve speaking ability by preparing and presenting reports.

Liang (2006) also concluded that self-assessment makes learners aware of their learning goals and needs, thus improves their motivation and goal orientation (cited in Birjandi, Tamjid, 2010: 212). Gardner (2000) also believes that self-assessment assists learners in monitoring their individualized progress. Monitoring process helps learners to know how they are doing in their learning. Self-assessment is also effective in increasing motivation. Doing a successful job leads to increased confidence. When self-assessment demonstrates success, learners' motivation will be enhanced. He further adds that self-assessment also provides learners with "personalized feedback" on the usefulness of their learning strategies, specific learning methods and materials. By these feedbacks learners can evaluate their approach to learning.

Thus, the current study aimed at shedding further light on a group of learners' self-assessment activities to explore whether it could enhance their oral skills. This small group of participants were scrutinized and monitored closely through different self-assessment techniques

to gain an insight into how encouraging autonomy and giving more responsibility to the learners may result in achievement.

2. Methodology

2.1. Participants

The participants of the current study were 5 female students, randomly selected from English literature majors in the University of Mazandaran taking their oral reproduction of short stories course. Only five learners were included to allow for a more in-depth analysis of their activities as well as their results over the course of a semester. The range of their age was about 20 to 24 years old. They received instruction about the technique of self-assessment and how to engage in it fully at the beginning of the study.

2.1.2. Materials

In order to achieve the objectives of the current study, some instruments were utilized by the re-searcher. The instruments are as follow:

Oral Presentation Evaluation Checklist

There was a checklist named as "Oral Presentation Evaluation Checklist" – provided by the teacher- to inform students of the criteria of a good oral presentation. It had five sections: delivery, content, organization, presentation aids and resources. The checklist provided students with some tips in different sections of a proper oral presentation, e.g. what kind of language and body language should be used to have the maximum amount of delivery, how to deliver the content properly, how to organize one's speech, what kind of presentation aids is needed and which resources to use.

Recording devices

Students were supposed to use recording devices to record their voice for the purpose of self-assessment. In order to do that, they use their cellphones to record their voices. They had to listen to the recordings for several times at home and reflect on themselves. Then they had to write a report of their performance as a self-assessment report. Having those reports, they could monitor themselves and see the area of strengths and weaknesses in themselves and try to compensate for those weaknesses. They could also see the progress or change in their performance if any.

The purpose of these reports was to see whether they could find their deficiencies and problems and try to eliminate them for the next presentation or not.

Storyboards

As the study was seeking the influence of self-assessment on learners' oral performance, there was a need to make the learners produce language orally at the beginning and the end of the semester to investigate the changes, if any. For this purpose, a storyboard was provided for the students to use as pretest and posttest instrument. In the pretest session, each learner in self-assessment group was given the selected picture series. They were given sufficient time to think about it, make a story and present the story for the researcher individually. While they were presenting, their voices were recorded and no aids or clues was provided for them. In the posttest session, the same procedures were done.

Procedure

The participants were provided with a checklist in which different elements of a good oral presentation were included and they marked the checklist and identified the strengths and weaknesses of their performance, after presenting the stories to the group. Every session one student in the group was supposed to choose a short story, read it and summarize it and prepare herself to present it to the group. Students were free in choosing the stories and the way of presenting it (Azizi et al., 2020; Pavlikova, 2020, Azizi et al., 2020). They also provided some pictures related to the story for warm up and better understanding. During the presentation, they recorded their voices in order to listen it at home and reflect on it. They were supposed to monitor themselves and write down their comments about themselves and give it to the teacher.

At the beginning of the project a pretest was conducted for the learners to measure their fundamental level of proficiency in oral production. For the purpose of conducting pretest, picture series were given to the participants in order to have a record of their production. There were given enough time to think about the storyboard and produce the story. After they got ready for presenting the story, they went to a room in which just the researcher was waiting for them. They

were invited individually and presented the story from the pictures. And the researcher recorded their voices.

At the end of the project a posttest was conducted, the procedures of which were the same as the pretest's procedures.

After all the data was recorded the researcher began to transcribe the data for micro-analysis. The data was transcribed meticulously. After the transcription, the transcribed data was divided into clauses and these clauses were read several times by the researcher and a second rater to find the recurring errors in the participants' speech in each clause. Three kinds of errors were identified as the most recurring errors in all students' speech. Those recurring errors were subject-verb agreement (SVA) errors, tense inconsistencies (TI) and word choice (WC) problems. Chu (2010) in his work refers to accuracy, complexity and fluency as three important parts of oral speaking and continues "every teacher should keep balance of the three parts". So the linguistic accuracy (grammatical and syntactic accuracy) and fluency are examined in this study. For measuring linguistic accuracy, the three common errors in students' speech were taken into account (subject-verb agreement, tense consistency and word choice) and at the end the percentage of error-free clauses (EFC) were also calculated. The higher the percentage the more accurate the language is. So the total numbers of subjects and verbs, verb tenses and words happened in the speech were counted. After that the numbers of these features that happened correctly were counted and they were divided by the total to find out the accuracy percentage for each feature:

The number of a feature that happened correctly in the speech × 100 = accuracy percentage

The total number of the same feature that happened in the speech

In order to measure and analyze the fluency in participants' oral presentation, two criteria were considered for fluency: organization and fluency. For measuring fluency, a speaking rubric evaluation checklist was provided in which different levels of fluency and organization were classified, and for each level a specific score was considered. The range of scores was from zero (below proficient) to five (exceeds expectations). The researcher listened to the collected data and scored the two features according to the predetermined checklist. Then a colleague, as a second rater, does the same task and scored the fluency of participants' oral production. The means of the two sets of scores were calculated for each participant and then the descriptive statistics and paired sample t-test were used for further analyzing the data and find the results.

Furthermore for analyzing the data qualitatively the data on the checklist and students' self-assessment reports were used. The data on the checklist also helped the researcher to find how much learners have improved in fluency in their own ideas by receiving self-assessment technique.

In order to achieve the purpose of the study and find the results, the data was analyzed both qualitatively and quantitatively.

3. Results

Regarding the quantitative analysis first the normality of data were confirmed and then the homogeneity of data were checked.

By employing Kolmogorov-Smirnov test, the normality of all data was checked. In order to do the test of normality One-sample Kolmogorov-Smirnov Test is used. Tables 1-3 shows that the variables of the study both in pretest and posttest are normal because in all of the items the P-value is greater than 0.05.

To investigate the impact of self-assessment on oral performance based on the collected data, first the descriptive statistics of the data in both pretest and posttest were obtained.

Table 1. Test of normality of the data, One-Sample Kolmogorov-Smirnov Test

		In mode general		Self-assessment	
		K-S	p-value	K-S	p-value
Pre test	EFC	.945	.333	.677	.749
	SVA	.533	.939	.548	.925

	TC	.481	.975	.479	.976
	WC	.465	.982	.550	.922
	Fluency	1.015	.255	.610	.851
	Organization	.905	.386	.515	.953
Post test	EFC	.822	.508	.723	.673
	SVA	.704	.705	.579	.891
	TC	.689	.729	.533	.939
	WC	.720	.678	.565	.907
	Fluency	.956	.320	.671	.759
	Organization	.734	.655	.543	.930

Table 2. Statistics of the self-assessment group in terms of accuracy in pretest

	Mean	Std.	Min	Max
EFC	55.54	16.21	43.38	83.33
SVA	84.35	8.75	75.23	95.00
TC	62.91	19.08	43.94	90.00
WC	97.20	.52	96.66	97.95

Table 3 Statistics of the self-assessment group in terms of accuracy in posttest

	Mean	Std.	Min	Max
EFC	87.78	6.57	76.66	93.33
SVA	90.62	8.54	80.00	100.00
TC	94.14	5.93	86.95	100.00
WC	99.12	.71	98.07	100.00

Comparing the statistics of pre and posttest, it can be seen that all linguistic features showed increase from pre- to posttest. Table 4 displays the result of paired samples t-test on all linguistic features.

Table 4. Paired samples t-test comparing the accuracy of linguistic features from pre to posttest of the self-assessment group

	T	df	p-value
EFC	3.276	4	.031

SVA	9.145	4	.001
TC	5.051	4	.007
WC	5.416	4	.006

As can be seen in Table 4 in the first feature, Error free clause, a significant difference (p = 0.031) was observed between the two testing sessions. This means that self-assessment group made significant improvement in Error free clause.

Considering the three other features, the comparison of pre- and posttest scores of self-assessment group in these features also showed a significant difference which indicates the effectiveness of the related treatment.

In general, the researcher and the second rater considered two items to evaluate the students' oral fluency (fluency and organization). The following Tables 5, 6 show the descriptive statistics of the fluency features of the self-assessment group in pretest and posttest respectively.

Table 5. Statistics of the fluency features of the self-assessment group in pretest

	Mean	Std.	Min	Max
Fluency	3.30	.67	2.50	4.00
Organization	2.80	.84	2.00	4.00

Table 6. Statistics of the fluency features of the self-assessment group in posttest

	Mean	Std.	Min	Max
Fluency	4.50	.35	4.00	5.00
Organization	3.90	.89	3.00	5.00

Comparing the statistics of pre and posttest, it can be observed that the mean of Fluency is shifted from 3.30 to 4.50 in the self-assessment group. The minimum and maximum scores of Fluency shifted from 2.5 and 4.00 to 4.00 and 5.00 respectively.

As it is clear from the above table in both items there is a significant difference before and after the treatment because the P-value in both of them is smaller than 0.05 (in Fluency 0.016 and in Organization 0.000) which Table 7 shows that there was progress in these items from the pretest to the posttest. Therefore, based on the above results, it can be concluded that self-assessment has a positive effect on the fluency of students' oral production.

Table 7. Paired samples t-test comparing the fluency features from pre to posttest of the self-assessment group (self-assessment)

	T	df	p-value
Fluency	4.000	4	.016
Organization	11.000	4	.000

3.1. Qualitative Analysis of the results

In addition, the qualitative analysis of the students' self-assessment report also reveals that it was a helpful technique for them to monitor themselves and reflect on their own work.

For example S3 in her self-assessment report mentioned her weak and strong points by writing down: *"I seem to think that the manner of speaking were not effective and did not convey feelings enough. I had a few pauses that make the audience to be disturbed. The sentence structures were almost correct but there were a few inconsistencies of using present tense or past tense. These were because of not practicing enough. About voice and pacing, the speed was a little fast, so it could not be easily followed by the audience. The volume and modulation was not very well. By improving the modulation and making the volume higher, the presentation will be more effective and it causes the audience to be involved with the presentation. But totally, it was understandable and simple".*

From this note it can be understood the checklist made the student aware of the different aspects of oral skill and it also helped her to monitor herself consciously. They have written some notes and comments about their performance in the presentation according to the oral presentation evaluation checklist given to them. An analysis of their self-assessment through the checklist showed some interesting results. Some of those notes are as follows:

S1: *"I tried my best at using meaningful gestures I think.*
I may have some grammatical error.
I tried my best at maintaining a good eye-contact.
I used simple words not just for audience but for my own sake.
It (the presentation) didn't have any new information".
S2: *"at first it (voice) was monotone but I tried to have ups and downs.*
I didn't use any transitions between main points.
My presentation was very informative.
My story didn't have hard words.
I prepared three questions and I think audience could get what's going on.
I saw one or two words (on note) to remember".
S3: *"I don't look at my notes so much.*
My rate of speech was a little fast.
I distract a little during telling the story.
I didn't support the main points.
My vocabulary was simple".
S4: *"sometimes I looked at my notes to not loos (lose) the line.*
I had some mistakes in using standard grammar.
I really was well informed on my topic.
I organized ideas somehow in a meaningful way I think".
S5:*"I used filter words (uh, ah, like,..) two times.*
I think my pronunciation was clear and easy to understand.
I didn't use any attention-getting device.
I didn't use any supportive details".

As it is evident in the above extracts, learners in self-assessment group monitor themselves and reflect on their work. In their comments as it is seen, they pointed to both their weakness and strength points. It means self-assessment led them to pay attention more carefully to their works and may be it could help them to compensate for the weakness points in further oral presentations.

4. Discussion

The analysis of data obtained from the self-assessment group of this study suggested that self-assessment had an effective role on the accuracy of the learners' production in particular subject verb agreement, word choice, tense choice and error-free clauses and in terms of fluency and organization, this technique was shown to be beneficial. These findings are in accordance with the study conducted by Ariafar and Fatemipour (2013) since they also examined the impact of self-assessment on oral performance and they concluded that self-assessment helps participants to improve their speaking ability. Therefore similar to the current study, they reported the positive effect of this technique on oral production of the students.

As the focus of the current study was on the efficacy of self-assessment on EFL learners' oral production skill, two features were considered for oral performance, accuracy and fluency. It is founded from the results that there was a significant difference between the pretest and posttest

results. It meant this treatment had positive effects on students' oral production and through this treatment learners improved their oral skill. These results also, are in line with the results of another study conducted by Yokomoto (2012), the purpose was to investigate the effect of self-assessment on their English discussion skills. The results of the study showed that the scores of the chosen criteria improved significantly from the first discussion to the second one. The self-check sheets also showed that students had positive reaction to use self-assessment and in interview they reported that the self-check had helped them understand the lesson objectives better and remember the skills for discussion.

The results of the study also are in accordance with Bahmani (2014) who in her study investigated the effects of self-assessment on oral skills. She investigated the effects of self-assessment on participants' pronunciation, vocabulary, fluency task, and grammar of their speaking. She concluded that self-assessment has positive effects on improving oral skill of EFL learners.

As it is evident from the self-assessment comments which students wrote, learners became aware of their weaknesses and strengths. So, it could be said that through this technique, learners could monitor their own performance and comment on their own production, i.e. they became aware of their own performance. By noticing their own comments, they could find that in which areas they were proficient enough and which areas needed more work. This finding is in line with Harris (1997) who in his paper defines self-assessment as a learning strategy through which students can monitor their progress and "relate learning to their individual needs". He further adds that the progress which students see during self-assessment would motivate them in learning. He argues that self-assessment helps students to be more active and focused and "better placed to assess their own progress in terms of communication" (p. 12).

Liang (2006) also concluded that self-assessment makes learners aware of their learning goals and needs, thus improves their motivation and goal orientation. This conclusion is in line with the results of the qualitative analysis of this study which showed that the checklist made the student aware of the different aspects of oral skill and it also helped them to monitor themselves consciously. This monitoring made the learners aware of their performance and their needs. So, by knowing their needs, they would know in which areas they need more practice. So, it could be said that by self-assessment learners could set the goals for further presentations i.e. they would focus the areas that needs more attention and dedicate more time to the weaknesses.

5. Conclusion

In this study, the effectiveness of self-assessment on the accuracy and fluency of L2 oral performance of EFL students was investigated. It was shown that the technique made students' progress in their accuracy of L2 oral production from the pretest to the posttest. Therefore, it seems to be important and useful technique in EFL contexts, and teachers can incorporate it in their classrooms. Also, to gain better results, it is recommended that teachers train students in this technique so that they could use it effectively. It is hoped that this paper could have clarified the concepts of self-assessment as a practical and effective approach for teachers to employ it in their teaching pro-grams.

5.1. Implication

The current study adds to the existing body of research on the role of self-assessment in EFL con-texts, especially on oral production. In this way, this study has some important implications for both teachers and learners. The findings of this study suggest that the self-assessment technique is valuable and effective asset that teachers can employ in English classes. Due to the lack of time, teachers cannot provide feedback to all students' oral performance. Therefore, giving students time and opportunity to critically listen to themselves and then provide them with feedbacks can also make them more critical of their own performance during their self-assessment procedures, and also can lead them to be more responsible presenters. Although Iranian foreign language learners may prefer teacher-fronted activities, teachers are required to create more opportunities for the students to take the responsibility of giving feedback to themselves.

Authorities and policy makers of the Education Department should be encouraged to incorporate self-assessment in their general policies, teaching principles, and strategies of their organizations.

Teacher trainers should take the results of this research and other similar studies on self-assessment to their teacher training classes; familiarize teacher students with the principles of self-

assessment on oral performance. Moreover, the ability of self-assessment belongs to key competences of any teacher professional profile (Stranovská et al., 2018; Gadušová, Hašková, 2016; Hašková, Lukáčová, 2017; Hašková et al., 2019; Polok et al., 2020; Pavlikova, Mahrik, 2020; Pavlikova, Ambrozy, 2019; Pavlikova, Žalec, 2019; Pushkarev, Pushkareva, 2019; Martin et al., 2019; Kobylarek, 2020, Stranovská, Gadušová, 2020, Gadušová et al., 2020a, Gadušová et al., 2020b, Hodáková, Welnitzová, 2013; Pupikova et al., 2020; Birova, Kralova, 2018; Weda et al., 2020). As stated by Švec (2002), self-evaluation and self-reflection are important factors influencing the formation and development of student educational skills. Teaching, according to Procházka (2013), also depends on the ability to carry out a continuous reflection of the acquired experience.

Self-assessment can also provide the opportunity for students to capture and analyze their own speech, which under normal circumstances is hard to recall. They can also get the chance to review their spoken output and to self-correct before getting feedback in the form of peer- or tutor-correction. Interested teachers may also use self-assessment as a tool to encourage students to take greater responsibility for their own learning that finally leads to deeper learning.

Finally, the results of the present study are not definitive and may not be generalizable to all situations due to certain limitations. There were only five participants whose classroom activities and self-reports were meticulously analyzed. Even though it was tried to make the study strong by using all the sessions of the semester, still having more participants may yield more reliable results.

6. Acknowledgements

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

References

Ahangari, 2014 – *Ahangari, S.* (2014). The Effect of Self, Peer and Teacher Correction on the Pronunciation Improvement of Iranian EFL Learners. *Advances in Language and Literary Studies*. 81-89.

Ahangari et al., 2013 – *Ahangari, S., Rassekh-Alqol, B., Ali Akbari Hamed, L.* (2013). The Effect of Peer Assessment on Oral Presentation in an EFL context. *International Journal of Applied Linguistics & English Literature*. 45-53.

Ariafar, Fatemipour, 2013 – *Ariafar, M., Fatemipour, H.* (2013). The Effect of Self-Assessment on Iranian EFL Learners' Speaking Skill. *International Journal of Applied Linguistics & English Literature*. 2(4).

Azizi et al., 2020 – *Azizi, M., Pavlíková, M., Masalimova, A.R.* (2020). Exploring literature reading classes in terms of types of feedback provided by EFL teachers: Does teaching experience play a determining role? *Education and Self Development*. 15(3): 19-36. DOI 10.26907/esd15.3.02

Azizi et al., 2020 – *Azizi, M., Tkáčová, H., Pavliková, M., Jenisová, Z.* (2020). Extensive Reading and the Writing Ability of EFL Learners: the Effect of Group Work. *European Journal of Contemporary Education*. 9(4): 726-739.

Bahmani, 2014 – *Bahmani, F.* (2014). The Washback Effects of Self-Assessment, Analytic, And Holstic Scoring On The Speaking Skills Of Iranian Efl Learners. *International Journal of Language Learning and Applied Linguistics World*. 339-355.

Benson, 2006 – *Benson, P.* (2006). Autonomy in language teaching and learning. Language Teaching, 21-40.

Birjandi, Hadidi Tamjid, 2010 – *Birjandi, P., Hadidi Tamjid, N.* (2010). The Role of Self-assessment in Promoting Iranian EFL Learners' Motivation. *English Language Teaching*. 3(3).

Birova, Kralova, 2018 – *Birova, J., Kralova, Z.* (2018). A tool called communicative curve applied for evaluation of similarities and differences between foreign language textbooks. *European Journal of Contemporary Education*. 7(1): 39-50.

Blue, 1994 – *Blue, G.M.* (1994). Self-Assessment Of Foreign Language Skills: Does It Work?

Butt-Bethlendy, 2013 – *Butt-Bethlendy, K.* (2013). Developing fluency, accuracy and complexity in oral production through corrective peer feedback. Sheffield Hallam University.

Chen, 2008 – *Chen, Y.-M.* (2008). Self Assessment of Oral Performance in the EFL University Classroom.

Chu, 2010 – *Chu, R.* (2010). Effects of Teacher's Corrective Feedback on Accuracy in the Oral English of English-Majors College Students. *Theory and Practice in Language Studies*, 454-459.

Cunningham, 2011 – *Cunningham, N.* (2011). Using Self-Assessments in a University Academic English Class in Japan: Experiences and Analyses. *Josai International University, Bulletin, Faculty of Humanities*. 19(2): 43-68.

Gadušová, Hašková, 2016 – *Gadušová, Z., Hašková, A.* (2016). Evaluation of Teachers' Competences as a Part of School Leadership. *Communication, Business and Education 2016: International Conference on Communication, Business and Education*, pp. 7-12. Singapore, Singapore Management and Sports Science Institute.

Gadušová et al., 2020 – *Gadušová, Z., Predanocyová, Ľ, Malá, E.* (2020). Planning Education - Assessment of the Competence: (Case Study). *Ad Alta: Journal of Interdisciplinary Research*. 10(1): 82-86.

Gadušová et al., 2020 – *Gadušová, Z., Hašková, A., Szarszoi, D.* (2020). Teachers` competences evaluation: Case study. *Science for Education Today*. 10(3): 164-177.

Gardner, 2000 – *Gardner, D.* (2000). Self-assessment for autonomous language learners. *Links & Letters*. 7: 49-60.

Harris, 1997 – *Harris, M.* (1997). Self-assessment of language learning in formal settings. *ELT Journal*. 51/1.

Hašková, Lukáčová, 2017 – *Hašková, A., Lukáčová, D.* (2017). Teacher assessment in internal quality assurance systems. *Efficiency and responsibillity in education: Proceedings of the 14th international conference ERIE,* pp. 156-169. Prague, PEF, Czech University of Life Sciences.

Hašková et al., 2019 – *Hašková, A., Lukáčová, D., Noga, H.* (2019). Teacher self-assessment as a part of quality management. *Science for Education Today*. 9(2): 156-169.

Hodáková, Welnitzová, 2013 – *Hodáková, S., Welnitzová, K.* (2013). Evaluation of interpreter's non-verbal performance by listeners. *Xlinguae*. 6(4): 59-83.

Jabr, 2011 – *Jabr, R.K.* (2011). Introducing the Skills of Self-assessment and Peer Feedback. *SiSAL Journal*. 2(1): 26-31.

Khodadady, Khodabakhshzade, 2012 – *Khodadady, E., Khodabakhshzade, H.* (2012). The Effect of Portfolio and Self Assessment on Writing Ability and Autonomy. *Journal of Language Teaching and Research*. 3(3): 518-524.

Kiyomi, 2009 – *Kiyomi, Y.* (2009). To what extent can self-assessment of language skills predict language proficiency of EFL learners in school context in Japan? 65-82.

Kobylarek, 2020 – *Kobylarek, A.* (2020). The pedagogy of shame education in the face of the Demokratur1 of Ignoramuses. *Journal of education culture and society*. 11(1): 5-12.

Kwiecień-Niedziela et al., 2020 – *Kwiecień-Niedziela, E., Polok, K., Mala, E.* (2020). Drama techniques as correlators of the level of english language speaking anxiety. *Integration of Education*. 24(1): 98-110.

Lim, 2007 – *Lim, H.* (2007). A Study of Self- and Peer-Assessment of Learners' Oral Proficiency. *CamLing*, pp. 169-176. [Electronic resource]. URL: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.424.6026&rep=rep1&type=pdf

Martin et al., 2019 – *Martin, J.G., Cobo, M.O., Kondrla, P.* (2019). Ethics, motivation and education from the perspective of Søren Kierkegaard's philosophy. *Xlinguae*. 12(4): 183-191. DOI: 10.18355/XL.2019.12.04.16

Matulníková et al., 2018 – *Matulníková, Ľ., Kimuli D., Tvrdoň, M. Hvizdák, F., Bartkovjak, M., Kalátová, D., Mulama, K., Berešová, A. Sabo, A.* (2018). Competencies of Midwifery Graduates in Kenya, Slovakia, Hungary and Czech Republic: Do We Want to Replace Obstetrics? (Short communication). *Clinical Social Work and Health Intervention*. 9(4): 78-80.

Nedzinskaitė et al., 2006 – *Nedzinskaitė, I., Švenčionienė, D., Zavistanavičienė, D.* (2006). Achievements in Language Learning through Students' Self-assessment. *Studies About Languages*. 8.

Ochoa, 2007 – *Ochoa, E.O.* (2007). Self-assessment Practices: an empowering Tool in the teaching and learning EFL Processes. *Colombian Applied Linguistics Journal*. 229-246.

Patri, 2002 – *Patri, M.* (2002). The influence of peer feedback on self- and peer-assessment of oral skills. *Language Testing, sage publications*. 109-131.

Pavlikova, 2020 – *Pavlikova, M.* (2020). American Literature Reader: 20th Century Writers. 1. ed. Praha: Verbum, p. 76.

Pavlikova, Ambrozy, 2019 – *Pavlikova, M., Ambrozy, M.* (2019). Extremely gifted students and teaching philosophy in secondary school. *ICERI 2019: 12th International conference of education, research and innovation: Seville (Spain) 11-13 November 2019, INTED,* pp. 6474-6479.

Pavlikova, Žalec, 2019 – *Pavlikova, M., Žalec, B.* (2019). Struggle for the Human Self and Authenticity: Kierkegaard's Critique of the Public, Established Order, Media, and False Christianity. *Bogoslovni vestnik: glasilo Teološke fakultete v Ljubljani*. 79(4): 1015-1026.

Pavlikova, Máhrik, 2020 – *Pavlikova, M., Máhrik, T.* (2020). Auden's creative collision with Kierkegaard. *Xlinguae*. 13(3): 145-156.

Polok et al., 2020 – *Polok, K., Mala, E., Muglova, D.* (2020). On the salience of becoming a creative foreign language teacher. *Xlinguae*. 13(4): 152-162. DOI: 10.18355/XL.2020.13.04.11

Pierce, 1999 – *Pierce, L.V.* (1999). Preparing Independent Learners: The Role Of Self-Assessment. *Revista Canaria de Estudios Ingleses*. 38: 127-137.

Polio, 1997 – *Polio, C.G.* (1997). Measures of linguistic accuracy in second language writing research. *Language learning*. 47(1): 101-143.

Procházka, 2013 – *Procházka, M.* (2013). Teacher competence and authority. In Somr, M. et al. *Pedagogy of teachers: Tradition and current state of teaching profession*. Č. Budějovice: PF JU, pp. 155-165.

Procházka, 2015 – *Procházka, M.* (2015). Different views on teacher competences and their formation in pre-service and in-service teacher education. In Danielová, L. et al. *Development of educators' competences in the context of the modern concept of education*. Brno: Mendelova univerzita, pp. 228-224.

Pupikova et al., 2020 – *Pupikova, E., Kollarova, D., Birova, J.* (2020). Career growth of teacher of pre-primary education through self-reflection in qualification thesis. *Science for Education Today*. 10(1): 174-190.

Pushkarev, Pushkareva, 2020 – *Pushkarev, Y.V., Pushkareva, E.A.* (2020). Virtualization of social communication in education: Values-based approach to information development (a critical review). *Science for Education Today*. 10(2): 73-90. DOI: http://dx.doi.org/10.15293/2658-6762.2002.05

Stranovská et al., 2018 – *Stranovská, E., Lalinská, M., Gadušová, Z.* (2018). Assessment of Teacher Competences with Respect to Their Linguistic vs Non-Linguistic Professional Orientation. *International Journal of Economic research*. 15(2): 281-287.

Stranovská et al., 2019 – *Stranovská, E., Gadušová, Z., Ficzere, A.* (2019). Factors Influencing Development of Reading Literacy in Mother Tongue and Foreign Language. I*CERI 2019: conference proceedings: 12th International conference of education, research and innovation: Seville (Spain) 11-13 November 2019*. Valencia: IATED, pp. 6901-6907.

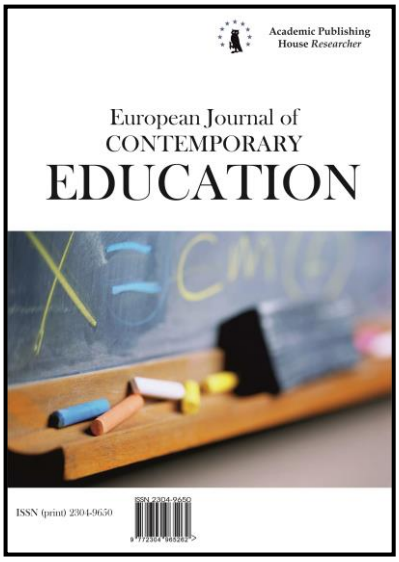
Stranovská, Gadušová, 2020 – *Stranovská, E., Gadušová, Z.* (2020). Learners' Success and Self-esteem in Foreign Language Reading Comprehension. *Education and Self Development*. 15(3): 109-119.

Švec, 2002 – *Švec, V.* (2002). Factors influencing the development of pedagogical skills student. *Pedagogical orientation*. 12(1): 63-82.

Weda et al., 2020 – *Weda, S., Sakti, A.E.F., Pasenrigading, A.R.* (2020). An exploration of Indonesian EFL learners' unwillingness to communicate. *Xlinguae*. 13(4): 129-141.

Yokomoto, 2012 – *Yokomoto, K.* (2012). Self-assessment to improve learners' English discussion skills.

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 89-102
DOI: 10.13187/ejced.2021.1.89
www.ejournal1.com



Relationship between Mathematical Education and the Development of Creative Competencies of Students

Lýdia Kontrová [a, *], Vladimír Biba [a], Daniela Šusteková [a]

[a] Department of Quantitative Methods and Economic Informatics, University of Žilina, Slovak Republic

Abstract

Information and the information revolution have brought many changes to our lives. The most revolutionary is the unlimited access of most people to an incredible amount of information. Today we no longer must "keep important information and facts in our heads". With the right technology, we are always within reach. The new age also changes the nature of education. It is not necessary to remember the massive amounts of information. However, it is necessary to move the student to the position of a logical, creative subject that can effectively process, select and analyze the information obtained. As mathematics teachers, we believe that it is mathematical education that positively affects the development of student creativity. Also, the creative thinking of an individual opens the way for him to solve mathematical problems successfully. New technologies replace routine and stereotypical activities in many areas of life, not excluding mathematical activities. We believe that the human factor is irreplaceable in the area of flexible, creative and resourceful connecting of information and creation of new original ideas.

Nowadays, we believe the priority mission of teachers is to identify and develop creativity in students. One of the most significant concerns of teachers is to achieve that the mathematics develops logical thinking in students using constructivist methodologies, to make mathematics a tool to be applied to daily life. In this regard, we presume the existence of the relation between creativity and teaching of mathematics. Mathematical thinking encourages the development of creativity since it requires to make conjectures and distinguish opinions to solve a situation set out.

Our article aims to use the statistical tools to verify the hypothesis: more mathematics teaching has a significant impact on the development of students' creative potential. We expected to confirm the positive impact of mathematical education on the development of creative competences. The research was carried out on a sample of 126 students – graduates of secondary schools. To obtain the necessary data, we used the standardized Figurative Urban Creativity Test as

* Corresponding author
E-mail addresses: lydia.kontrova@fpedas.uniza.sk (L. Kontrová)

a screening tool to provide relevant insight into the creative potential of the individual. The results of the educational experiment confirmed our expectations: mathematical education has a significant impact on the development of students' creative potential.

Keywords: mathematical education, creative thinking, pedagogical experiment, Figurative Creativity Urban test.

1. Introduction

Education nowadays faces approaching technological and information revolution that fundamentally changes the way we think about the meaning, objectives and methods of teaching and learning. The fact is that the student, the citizen of the future, has available access to an almost unlimited database of information. In the future, there will be no issue to get any information, the results of scientific studies, any knowledge. It is essential to master the selection, hierarchization and creative implementation of knowledge in practice. One will not have to do the tasks of mechanical, routine and algorithmic activities; artificial intelligence can handle these instead. However, what remains irreplaceable is creative potential, innovative thinking, innovative approaches, creative problem-solving. These ideas indicate the direction of future education: great efforts must be paid to develop the creative potential of the individual. We believe that creativity is deeply rooted in many mathematical activities, and therefore mathematics education is an essential and unique platform for the formation of creative competencies of any individual. They are also critical mathematical activities such as analysis, synthesis, comparison, induction, deduction, selection, which fundamentally influence the development of students' creative potential.

The goal of mathematics education as an essential discipline to cultivate character is developing cognition and powers of thought and creativity. Similarly, Woo stated that learning mathematics paralleled performing mental gymnastics such as judgment and inference, thus teaching mathematics to include character education can lead students to exercise judgment and justice in the moral sense. These views point to the potential of mathematics instruction to inculcate not only the nature of mathematical truth but also aesthetic and moral values.

The current curriculum (educational program) for primary schools known as ISCED1 and ISCED2 places sufficient emphasis on the development of students' mathematical competencies within the educational field of Mathematics and Working with Information. Students have the subject of mathematics for 5 hours per week, which we consider sufficient to develop other competencies such as analytical, synthetic, deductive and divergent thinking skills.

The current concept of higher education in Slovakia does not favor mathematical education. There is a constant reduction in the mathematics lessons at secondary schools. While 20 years ago, 90 % of high school students attended mathematics at least three years with a minimum of 2 hours a week. Today, 70 % of students have no mathematics for more than two years at secondary schools. In the academic year 2018/19, only 12,8 % of the school graduates passed the school-leaving examination in mathematics in Slovakia. If we consider mathematics as an essential subject for developing student competence in the area of analytical, logical and creative thinking, this figure is alarming. If we consider mathematics as an essential subject for developing student competence in the area of analytical, logical and creative thinking, this figure is alarming.

2. Literature review

Nowadays, the request (well-known for decades) to develop and appreciate critical and creative thinking of students is becoming more and more topical. Furthermore, this is the reason why this paper deals with the development of creativity. Not only in earlier (Torrance, 1975) but also in the following resources (Zelina, 2000; Szobiová, 2004), we can find critical opinions claiming that the support of creativity in schools (also universities) has significant reserves. According to Zelina (1977), only 2 % (!) of tasks and questions asked during lessons focused on the support of creative and divergent thinking. *After all, in our everyday life, we need mainly creativity;* the author states and we have to agree with him. The stated discrepancy between the university offers and practice requirements indicates that a school does not prepare students for practice and life sufficiently. The acceptance of requirement – to develop the creative potential of students by implementation suitable study modules into study programs seems to be a necessity.

The present school of the 21st century, aligned with the metamorphoses of society, needs specific transformation. Classes can no longer act as packages of the same goods and with the same

characteristics. Students are not goods to be made unified, because they are all born unique with a desire to discover new things.

Nowadays, when one cannot be sure what next year will bring, it does not need like-minded people who only know the answers to existing issues and questions. When all of us are created to the same unified image following a certain standard, the imagination and resourcefulness of people are also limited. Nevertheless, it should continue to be woken up, not fall asleep, already far in childhood.

Students are even discouraged from divergent thinking and are often afraid to express themselves and share a different opinion because they would probably say something not clever. Teachers follow the linked curriculum, which is expected of them as well. If we force students to use learned techniques for years, can innovation be expected of them? Probably not. So why isn't the opposite done?

Thinking unconventionally was not an original part of the school system. Besides, convergent thinking is also easier to assess. Sixty questions in the test are easier to evaluate than 20 questions, where students should be free to express themselves and present their thinking. If the answer is correct/incorrect, it is either correct/incorrect. It is quick and easy. With a clear answer, you have to read the text, think about it and evaluate it properly. It comes with a lot more work.

It is well known for the professional public that the term creative thinking was first introduced by scientist J.P. Guilford in a paper at a conference of the American Psychological Association in 1949. Aspects of creativity today involve several disciplines, such as psychology, pedagogy and didactics. Within the didactics of subjects taught, creativity is considered to be an activity that helps to produce new ideas. In Slovakia, the term creativity is associated mainly with the name of Miron Zelina, who analyzes and describes this term in several of his works. Creativity is an essential but complex idea to define. Though there is enormous diversity the way creativity is defined, exemplified and measured, yet there is an agreement of opinion that creativity is a significant construct of human cognition. J.P. Guilford (1949) was among the founder researchers who viewed creativity distinctively from intelligence and emphasized the role of creativity in human development. According to Guilford (Guilford, 1950) is creativity a natural resource and creativity can be studied objectively. Any effort to encourage creativity would pay high dividends to society, as cited by Runco (2014).

Definitions of creativity differ depending on various theoretical concepts, which they are based on, and are differently oriented – on personality, abilities, process and intellectual activity. Creativity is a natural trait whose development depends on the socio-cultural environment (Sillamy, 2001). It needs favourable conditions to be able to prove itself. Creativity in a potential state exists in each individual in each age. The ability of a person to clarify problems, to synthesize a previous order of elements into new contexts, to perceive an existing problem in a new way, discover new relations and produce new and untraditional views on situations are according to essential building (constituent) components of creativity (Fülöpová, 2006). The personal features of a creative personality are *tolerance towards ambiguity* and *stimulated freedom* (a creative person does not solve the problems in a traditional, generally used way). „Creativity is such interaction of a subject with an object in which the subject changes the surrounding world, creates new, useful and for a subject, referential group or population important values“ (Zelina, Zelinová, 1990).

An idea is considered creative if it is original, surprising and non-routine. Creative ideas must be functional and expressive. For example, the solution to a problem is considered creative if it is new and also provides a solution to the problem. It can be considered more creative if the solution is simpler than the other previous solutions or it has a broader application or it gives a new perspective of the problem altogether. Simonton (2014) highlighted three significant perspectives to discuss creativity: the process generates a creative idea; the person who thinks and delivers a creative idea; the product which represents or communicate the creative idea.

According to Žák (2004), creativity can be understood as:

- ability to imagine or invent something new; to create solutions, ideas, thoughts by the combination, change or other use of existing ideas;
- willing attitude to accept something new, to accept a change, the courage to risk, play with thoughts and ideas and react flexibly on the newly arising situations;

• process characterized by hard work, the systematic mental activity of new ideas and solutions formation, by the space for improvisation as well as for the order and discipline. In order to clarify and accent the insistence of creative abilities of a person in the occupational performance, we will define the overview of creative abilities stated by many authors (Ďurič, Grác, 2017; Dargová, 2001) and others:

• sensitivity (problem sensitivity) – the ability to notice a problem where other people do not notice it;

• fluency – the ability to produce several ideas quickly and easily in a limited period;

• flexibility – the ability to make various solutions to problems which differ in content;

• originality – the ability to produce unusual, often witty, bright and surprising solutions and ideas;

• elaboration – the ability to solve a problem by working out the details in the solution of a problem, elegance of the solution;

• redefinition – the ability to change the meaning of an object or its part, the ability to get over the used ways of a problem solution.

Based on the stated characteristics, we can say that today many qualities of a creative personality are necessary when whatever professions are performed. For this reason, we have decided to test the rate to which the study of mathematics encourage the development of creative abilities and qualities of the students. In our article we also deal with the development of the above-mentioned components of creativity.

Mathematical thinking and creativity development

One view of mathematics is the belief that mathematics is a territory of free, innovative, inspiring, constructive and stimulating thinking. The world of mathematics is a world of constant problem-solving. Mathematical thinking has all the attributes of creative thinking. It provides students with the space to think beyond borders – even close to eternity. Mathematics is a discipline that originated in the social environment and spread throughout all civilizations, communities and cultures as a social and cultural force. It continues to evolve thanks to the passion and creativity of those remarkably brilliant mathematicians who are in love with the constant discovery of new ideas. Mathematics works with bold ideas, the synergy of the process of thinking, the power of abstraction, freedom of application and spreading ideas. All mathematical concepts are abstract, but they still systematize and explain the universe using equations and identities. It is daunting to see that the creative aspect of mathematics, as a subject in school, is often ignored or remains beyond the reach of students. Students very rarely have the opportunity to play and develop mathematical ideas, communicate mathematically or apply various solving procedures in mathematical research and develop divergent thinking. At the same time, we think that teaching mathematics can be a way to support and develop an individual's creative potential. We oppose the idea of reducing the teaching of mathematics in secondary schools and universities. The development of creative thinking is also possible with the help of a stimulating and encouraging learning environment (Runco, 1991). We think that a math teacher creating positive learning conditions promotes alternative thinking or provides an opportunity for creative dialogue to give students more than just mathematical science. He gives space and a chance for the development of creative thinking.

3. Materials and methods

The main goal of our research task was to answer the question, considering the previous thinking: Can we confirm the assumption that mathematical education has an essential influence on the development of the individual's creative abilities? Is it possible to verify the validity of the statement that students who devote themselves to mathematics to a greater extent are consequently more disposed in the field of creative thinking? As a result of the experiment, we expected:

Confirmation of the positive impact of teaching mathematics on the development of the creative potential of those learning (students who had more mathematics lessons per week in secondary school achieved a higher level of creative abilities tested by a standardized test of creative thinking). As part of this central subject, we looked at a set of issues that we can formulate by using questions:

- Does the type of secondary school attended have a positive effect on the level of students' creative abilities?
- Does the education of students' parents affect the level of student's creative potential?
- Do men and women differ in figural creativity?
- Will we demonstrate significant differences for selected indicators defining creative thinking (flexibility, fluency, originality, sensitivity, elaboration, the courage to experiment) in the experimental and control groups? For which indicators there is a significant positive relationship with extensive mathematical education?

We have defined the following goals for research:

1. Verify the relationship between creativity and the type of attended secondary school.
2. Verify the relationship between students' creativity and evaluation of the subject Mathematics at secondary school.
3. To verify the relationship between creativity and the number of years of mathematics absolved at high school.
4. Verify inter-sex differences concerning creativity.
5. Verify the relationship of the TSD-Z test subcategories to the type of secondary school attended and to the number of years of studying mathematics at the secondary school.

Based on the studied literature sources and previous research, we have established the following hypotheses:

H1: We assume that there will be differences in creativity among students evaluated in the subject Mathematics during secondary school by different grades.

H2: We assume that statistically significant differences in creativity will be found between students of the high and secondary vocational school students.

H3: We assume that the relationship between creativity and the number of years of learning mathematics at secondary school will be statistically significant.

H4: We assume that men and women will not differ significantly in figural creativity.

H5: We assume that the relationship between education of the students' parents and student creativity will be statistically positively significant.

H6: We assume that men and women in the individual subcategories of the TSD-Z test categories will not differ statistically significantly.

H7: We assume that students of high schools and secondary vocational schools will differ statistically significantly in individual subcategories of the TSD-Z test categories.

H8: We assume that students with different numbers of years of mathematics learning at secondary schools will differ statistically significantly in individual subcategories of categories.

H9: We assume that there will be statistically significant differences in the individual subcategories of the TSD-Z categories between students evaluated in the subject Mathematics during secondary school studies.

Description of research sample

The sample was selected randomly. It consisted of 126 students of the first year of the Faculty of PEDAS ŽU in Žilina. The respondents were graduates of various secondary schools from all over Slovakia. The selected sample consisted of 64 women and 62 men. The age of the participants ranged from 18 to 19 years. Sixty-four of them graduated in the gymnasium (secondary school) and 62 at secondary vocational school.

Applied tool

To get the necessary statistical data, we used the Urban's figural test of creative thinking, TSD-Z (Urban, Jellen, 1993), which meets the criteria of a culturally neutral as well knowledge-independent test. All respondents completed a short questionnaire in addition to the TSD-Z test. They answered questions about gender, the type of secondary school attended the number of years of education in the high school subject of mathematics, grades from the subject of mathematics at secondary school, education of their parents, hobbies. After completing the questionnaire and the TSD-Z test, we obtained a set of relevant data about each participant in the experiment, which allowed us to determine and verify the hypotheses.

Method of distribution, filling in and evaluation of TSD-Z test

Urban's test takes into consideration not only cognitive dimensions but also personal aspects of creativity: the complexity of perspective, the courage to take a risk, humour, emotionality,

unconventionality and overcoming the barriers. According to its authors, it identifies creativity in a more sophisticated way than other performance measures. The figural test of creative thinking is a suitable screening tool that can provide an initial view of the creative potential of an individual. It is based on the principles of unfinished figures which have to be completed. There are five figures located in a frame; the sixth one is situated outside the frame (see Figure 1). Unlike traditional tests of creativity focused on the quantity (production), resp. on one of the factors of divergent thinking, a TSD-Z test takes into consideration also qualitative features of creative performances. The total score provides a general estimate of creative potential. It is an adequate tool in identifying the influences of creativity development programs in school conditions by the form of a test or retest.

The subjects are asked to complete the uncompleted drawing; somebody else had begun and finished without knowing what would come out of it, in whatever way they wish; everything is allowed and correct, they are free to draw how and whatever they wish. The test sheets are collected after completion, the latest after 15 minutes for each drawing. Figure 1 shows clean test sheets a Figure 2 shows two out of 126 drawing examples as published with our probands. The drawings were evaluated using a certified Urban test manual.

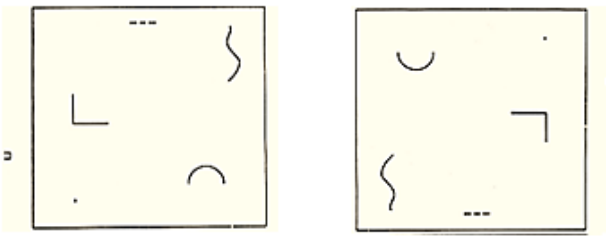


Fig. 1. TSD-Z sheet with no answers

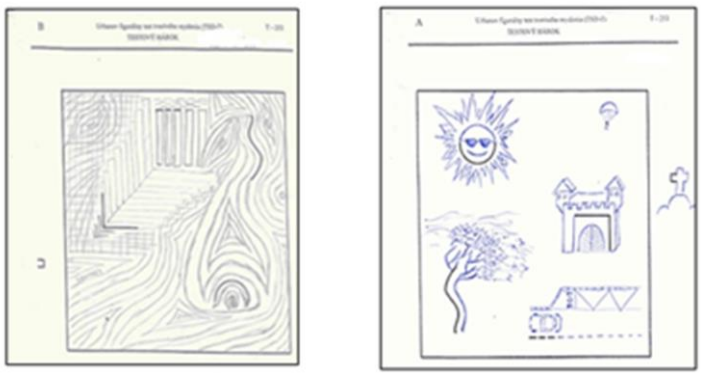


Fig. 2. Example of TSD-Z sheets filled in
Source: Own

Figural production is evaluated according to 14 evaluation criteria which represent the present test construct:

1. Continuations (Cn): Any use, continuation or extension of the six given figural fragments.
2. Completion (Cm): Any additions, completions, complements, supplements made to the used, continued or extended figural fragments.
3. New elements (Ne): Any new figure, symbol or element.
4. Connections made with a line (Cl) between one figural fragment or figure or another.
5. Connections made to produce a theme (Cth): Any figure contributing to a compositional theme or "gestalt".
6. Boundary breaking that is fragment dependent (Bfd): Any use, continuation or extension of the "small open square" located outside the square frame.
7. Boundary breaking that is fragment independent (Bfi).
8. Perspective (Pe): Any breaking away from two-dimensionality.

9. Humour and affectivity (Hu): Any drawing which elicits a humorous response, shows affection, emotion, or strong expressive power.

10. Unconventionality, a (Uc,a): Any manipulation of the material.

11. Unconventionality, b (Uc,b): Any surrealistic, fictional and/or abstract elements or drawings.

12. Unconventionality, c (Uc,c): Any usage of symbols or signs.

13. Unconventionality, d (Uc,d): Unconventional use of given fragments.

14. Speed (Sp): A breakdown of points, beyond a certain score-limit, according to the time spent on drawing production.

For the possibility of results comparison in an international context, we kept the original signing of individual categories. The stated criteria used during the evaluation process of each figure will provide an estimated value of the creative abilities of an individual. The result will not evaluate the quality of figural, artistic production; however, it provides the view on the willingness of a respondent to deal freely and flexibly with a submitted task. A total maximum score in a TSD-Z test is 72 points.

Weaknesses of research

First of all, it should be noted that the total sample of 126 people is not large enough to be able to generalize the results to the whole population. The results may also be affected due to the lack of motivation of the respondents to fill in. Some probands did not have to pay due attention to the test, as they were aware that they were doing it voluntarily, they can withdraw from testing at any stage, their decision will in no way affect their classification of any subject, for example. They also knew that the results would be anonymous and used for this work and that they would only know the result if they were interested. Another factor in the possible bias of the results is the potential cheating and checking the answers from a desk mate or other classmate. However, research participants were told before testing that no solution and no possibility was wrong. They knew that their task was to be more unique, original and diverse as the others. So possibly inspiring themselves by the ideas of others can ultimately put them to the lower rank. It is also impossible to rule out completely the possibility that some of the probands have already passed this test, or a similar one (for example, Torrance's test of creative thinking). Therefore, after the initial familiarization with the test and the initial instructions, they were asked to raise their hands if they did. No one has done so. If it would be the case, it is assumed that previous experience with the type of test could affect the result only to a small extent.

We worked with the gross score of the TSD-Z test. Since we performed the administration only once, we could not perform retest reliability as part of Urban's figural test of creative thinking. However, since we subsequently administered both forms of the test, we were able to use a comparison of the results of Form A and Form B to verify the reliability of the test.

Methodology

In particular, we conducted correlation research because we examined the relationships between variables. Independent variables – grade from mathematics (X1), type of secondary school (X2), number of years of mathematics at secondary school (X3), gender (X4), education of the parents (X5) and dependent variables (response variables): total creativity score (Y) and partial score Y01 – Y14 were analyzed. We were interested in partial scores in terms of evaluating the essential components of creativity, such as originality, the ability to take risks, the ability to overcome obstacles in thinking, the complexity of thinking, fluency, flexibility, redefinition. After manual evaluation of the tests, the obtained data were entered and statistically processed utilizing Mathematical Statistical Software R. Descriptive statistics was primarily used to describe the research sample and the data obtained, and primary statistical indicators such as number, mean, standard deviation, mode, range, variance, maximum and minimum were identified.

To test the effect of individual indicators (X01 to X05) on the total score obtained in the Urban test (Y), we used a two-sample t-test, as well as an analysis of variance (ANOVA).

For an application of the statistical method of ANOVA three conditions were necessary:

1. Selected samples come from basic complexes with normal division.
2. Selected samples are independent.
3. Variances of the basic complexes are equal.

The first condition, (the selected samples come from the basic sample with normal division), was verified using several normality tests as: the Shapiro–Wilk, Shapiro–Francia, Cramér–von

Mises criterion as well as using QQ – plot. Test of normality were also conducted on residuals of ANOVA models.

The second condition, (the selected samples are independent) was accomplished in relation to the construction of random variables.

For the verification of the third condition, (the variances of basic samples are equal), we used the Bartlett´s test for the equality of variances.

However, these parametric tests are no longer suitable for testing the impact of individual indicators X01 – X05 for individual sub-evaluations from the Urban test. For this reason, we used nonparametric tests: two-sample Wilcoxon or Kruskal-Wallis (KW-test) for partial scores of Y01 – Y05 and Y14.

If the sub-score has only two possible values (Y06-Y13) (see Urban test evaluation procedure), we used the population share agreement test or chi-square test of independence. However, the latter test is used for testing with larger samples, so sometimes the conditions for using it in our case are not met. We presented its results in only a few places and checked that the preconditions for its use are met here.

4. Results

Verification of hypothesis H1

We verified hypothesis 1 using analysis of variance for $n = 126$, at the selected level of significance $\alpha = 0{,}05$. The results of the analysis of the variation for a grade in mathematics as an independent variable X01 and total creativity Y as a dependent (response) variable are presented in Table 1.

The resulting p-value ($p = 0{,}000021 < 0{,}01$) of expresses the probability of the error we make if we do not confirm the null hypothesis. This means that we reject the null hypothesis. We found significant differences in creativity between students evaluated in the subject of Mathematics during high school studies with various grades.

There is a strong relationship between the overall evaluation of the Urban test and the mark. The Tukey HSD test further indicates the existence of two separate groups – one consisting of students with a grade of 1 or 2, the other students with a grade of 3 or 4.

Table 1. Verification of hypothesis H1

	UrbT	mark1	mark2	mark 3	mark4	test statistic	df	p-value	sgn	test
Y1	Cn	5,67	5,26	4,5	5,08	29,891	3	10^{-6}	***	KW-test
Y2	Cm	5,67	2,23	4,39	4,94	29,789	3	10^{-6}	***	KW-test
Y3	Ne	4,33	3,18	3,42	2,92	8,961	3	0,03	*	KW-test
Y4	Cl	1,13	2,08	1,47	1,72	4,129	3	0,25		KW-test
Y5	Cth	2,73	2,1	2,22	2,39	1,176	3	0,76		KW-test
Y6	Bfd	4	3,23	1,17	0,67	26,01	3	10^{-5}	***	chi-squared
Y7	Bfi	2,8	1,54	0,83	0,33					
Y8	Pe	4,8	4,31	1,67	0,67	39,943	3	10^{-8}	***	chi-squared
Y9	Hu	4	3,84	4,67	3,33					
Y10	Uc (a)	1,2	1,31	1,08	1,25					
Y11	Uc (b)	2	2,46	1,92	1	19,196	3	0,0002	***	chi-squared
Y12	Uc (c)	1,6	1,85	1,5	1,08					
Y13	Uc (d)	1,6	2,61	2,25	2,33					
Y14	Sp	0,67	0,41	0,86	0	15,043	3	0,002	**	KW- test

Y	**Sum**	**42,2**	**39,41**	**31,94**	**27,72**	**10,465**	**3; 48**	**21.10^{-6}**	***	**ANOVA***
	sdY	**14,6**	**9,38**	**8,01**	**10,78**					

Note: n – number of respondents; * means $p < 0,05$; ** means $p < 0,01$;
*** means $p < 0,005$.

When verifying the first hypothesis, the agreement of the variances of the sample files was not confirmed. Therefore, a modification of the basic ANOVA test was used. In case of inequality of variances, R – software performs heteroskedastic F – test instead of ANOVA.

Table 1 also presents the results of statistical calculations related to the verification of hypothesis 9. We verified the hypothesis 9 in the case of categories Y1-Y5 and Y14 by Kruskal – Wallis test, within the categories Y6-Y13 we used the chi-squared test. The significance value is < 0.005 for categories Y1, Y2, Y6, Y8 and Y11. A positive relationship between grades in mathematics and the level of student creativity in the factor of complexity of thinking, overcoming borders and unconventional thinking has been confirmed. We also noted a positive correlation of $\boldsymbol{p < 0,05}$ in the area of the originality of thinking itself. On the contrary, we were surprised that the positive relationship in the field of thinking fluctuation in favor of grade 1 (also for grade 2) was not confirmed.

Verification of hypothesis H2

To verify hypothesis 2, we used one sided alternative of two-sample t-tests for the total creativity score and two sample Wilcoxon test for the sub-indicators and two proportion z-test for n = 126, at the selected significance level $\alpha = 0,05$.

Table 2. The results of the statistical tests for hypothesis H2

	UrbT	High schools	Secondary vocational schools	test statistic	df	p-value	sgn	test
Y1	Cn	5,25	4,82	2686		0,00006	***	Wilcoxon
Y2	Cm	5,23	4,68	2780		0,00001	***	Wilcoxon
Y3	Ne	3,42	3,19	2233		0,11		Wilcoxon
Y4	Cl	2	1,37	2386,5		0,019	*	Wilcoxon
Y5	Cth	2,78	1,79	2491,5		0,0048	**	Wilcoxon
Y6	Bfd	2,62	1,35	5,434	1	0,0099	*	2 prop z-test
Y7	Bfi	1,69	0,58	5,806	1	0,008	**	2 prop z-test
Y8	Pe	3,28	1,84	6,484	1	0,005	**	2 prop z-test
Y9	Hu	4,78	3,1	9,828	1	0,00086	***	2 prop z-test
Y10	Uc (a)	1,64	0,77	9,737	1	0,0009	***	2 prop z-test
Y11	Uc (b)	2,16	1,5	5,454	1	0,0098	**	2 prop z-test
Y12	Uc (c)	1,92	1,06	9,177	1	0,0012	***	2 prop z-test
Y13	Uc (d)	2,39	2,23	0,271	1	0,3		2 prop z-test
Y14	Sp	0,52	0,39	2099		0,2071		Wilcoxon
Y	**Sum**	**39,7**	**28,7**	**6,149**	**124**	**4,00E-09**	***	**t-test**
	sd(Y)	**10,32**	**9,78**					

The results of the two-sample t-tests for the type of secondary school as an independent variable X2 and the total creativity Y as a dependent (response) variable are presented in Table 2. It is shown that the achieved score of high school students in the TSD-Z test is significantly higher

compared to vocational schools. The same trend applies to individual partial reviews. In most cases, the difference is statistically significant ($p < 0{,}005$). We also noted a positive correlation of $p < 0{,}05$ also in the categories of thinking fluency (Y4, Y5), overcoming borders (Y6, Y7), unconventional thinking, the courage to take risks in favor of gymnasium students. Therefore, we reject the null hypothesis and we confirmed the influence of the type of secondary school on the creativity of students determined by the TSD – Z test.

Verification of hypothesis H3

We verified hypothesis 3 using analysis of variance for $n = 126$, at the selected level of significance $\alpha = 0{,}05$. The results of the analysis of variance for the number of years of mathematics learning as an independent variable X3 and the total creativity Y as a dependent (response) variable are presented in Table 3.

Table 3. The results of the statistical tests for hypothesis H3

	UrbT	2 years	3 years	4 years	test statistic	df	p-value	sign	test
Y1	Cn	4,82	5,29	5,09	9,886	2	0,007	**	KW – test
Y2	Cm	4,63	5,26	5,09	14,42	2	0,0007	***	KW – test
Y3	Ne	3,39	3,47	3,09	0,744	2	0,69		KW – test
Y4	Cl	1,63	1,82	1,65	0,269	2	0,87		KW – test
Y5	Cth	2,2	2,17	2,48	0,496	2	0,78		KW – test
Y6	Bfd	1,71	2,29	2,09					
Y7	Bfi	0,61	1,24	1,67					
Y8	Pe	1,96	1,59	4,05	16,424	2	0,0002	***	chi-squared
Y9	Hu	3,31	4,59	4,19					
Y10	Uc (a)	0,92	1,15	1,6					
Y11	Uc (b)	1,78	1,41	2,23					
Y12	Uc (c)	1,16	1,85	1,6					
Y13	Uc (d)	2,08	2,74	2,23					
Y14	Sp	0,49	0,18	0,63	3,806	2	0,15		KW – test
Y	**Sum**	**30,7**	**35,1**	**37,7**	**4,694**	**2; 123**	**0,01**	*	**ANOVA**
	sd(Y)	**9,32**	**10,53**	**13,24**					

This table also presents the results of statistical calculations related to the verification of hypothesis 8. We performed hypothesis 8 for category Y1-Y14 using Kruskal-Wallis test, except for category Y8, where we used the chi-squared test. In this case, the minimum relationship $p = 0{,}010$, between the achieved creativity score and the number of years of math learning at secondary school is shown.

We used Tukey's honest significance test, or Tukey's HSD (honestly significant difference) test for the statistical significance of contrast. It can be used to find means that are significantly different from each other. The significant differences were confirmed only between students who studied mathematics for 2 years and 4.

Significant differences exist so for some partial scores. We were surprised by the outstanding results in the Y8 (perspective) and Y2 (completion) categories. The result obtained reflects the fact that the number of years of mathematics study does not provide relevant information on how much math the students actually learned. There are differences in the number of mathematics lessons at different types of high schools.

Verification of hypothesis H4

To verify hypothesis 4, we used Welch's *t*-test for unequal variances for the total creativity score Y, two sample Wilcoxon test for the sub-indicators and two proportion z-test. The results of this statistical tests for gender (independent variable X4) and total creativity Y as a dependent (response) variable are presented in Table 4.

Table 4. The results of the statistical tests for hypothesis H4

	UrbT	M	F	test statistic	df	p-value	sign	test
Y1	Cn	5,03	5,05	2014		0,87		Wilcoxon
Y2	Cm	4,97	4,95	2015,5		0,87		Wilcoxon
Y3	Ne	3,2	3,41	1803		0,37		Wilcoxon
Y4	Cl	1,77	1,61	2072		0,65		Wilcoxon
Y5	Cth	2,42	2,16	2102,5		0,55		Wilcoxon
Y6	Bfd	2,44	1,55	2,481	1	0,12		2 prop z-test
Y7	Bfi	1,22	1,07	0,02	1	0,89		2 prop z-test
Y8	Pe	2,81	2,32	0,556	1	0,46		2 prop z-test
Y9	Hu	4,22	3,68	0,774	1	0,38		2 prop z-test
Y10	Uc (a)	1,17	1,26	0,022	1	0,88		2 prop z-test
Y11	Uc (b)	2,02	1,65	1,535	1	0,22		2 prop z-test
Y12	Uc (c)	1,64	1,35	0,794	1	0,37		2 prop z-test
Y13	Uc (d)	2,3	2,32	0	1	1		2 prop z-test
Y14	Sp	0,45	0,45	1977,5		0,99		Wilcoxon
Y	**Sum**	**35,7**	**32,8**	**1,139**	**122,98**	**0,17**		**Welch t-test**
	sd(Y)	**13,5**	**18,25**					

As expected, there is no relationship between the assessment of students' creativity by the Urban test and the gender of students. This applies both to the overall score and all sub-indicators. The results are not surprising, as similar results were recorded, for example, in the works of Szobiová (2002).

Verification of hypothesis H5

To verify hypothesis 5, we again used two-sample t-tests for the total creativity score and two sample Wilcoxon test for the sub-indicators and two proportion z-test for $n = 126$, at the selected significance level $\alpha = 0{,}05$. The results of the two-sample t-tests are presented in Table 5.

Once again, the dependence was relatively stable. However, this was particularly evident in the overall assessment, with partial results, only minor differences were presented. We can, therefore, confirm the positive impact of higher education of parents on the development of the creative competencies of the individual.

Table 5. The results of the statistical tests for hypothesis H5

	UrbT	2	3	test statistic	df	p-value	sgn	test
Y1	Cn	4,99	5,11	1746,5		0,26		Wilcoxon
Y2	Cm	4,9	5,04	1778,5		0,35		Wilcoxon
Y3	Ne	3,21	3,44	1736,5		0,28		Wilcoxon
Y4	Cl	1,3	2,2	1378		0,003	**	Wilcoxon

Y5	Cth	1,99	2,69	1607		0,07		Wilcoxon
Y6	Bfd	1,77	2,29	0,682	1	0,41		2 prop z-test
Y7	Bfi	0,76	1,64	3,388	1	0,07		2 prop z-test
Y8	Pe	2,11	3,16	3,2	1	0,07		2 prop z-test
Y9	Hu	3,38	4,69	5,642	1	0,02	*	2 prop z-test
Y10	Uc (a)	1,01	1,47	2,406	1	0,12		2 prop z-test
Y11	Uc (b)	1,52	2,24	6,443	1	0,01	*	2 prop z-test
Y12	Uc (c)	1,22	1,85	4,646	1	0,03	*	2 prop z-test
Y13	Uc (d)	2,32	2,29	0	1	0,99		2 prop z-test
Y14	Sp	0,42	0,49	1868,5		0,55		Wilcoxon
Y	**Sum**	**30,92**	**38,6**	**-4,001**	**124**	**0,00006**	***	**t-test**
	sd(Y)	**11,26**	**10,24**					

5. Discussion

Several reasons led us to solve the research issue above. These were mainly the tendencies prevailing in the implementation of school reforms in Slovakia. They are trying to reduce the teaching of mathematics at all types of schools; the final exam leaving exam at secondary schools for more than 10 years has not been compulsory. Many students are coming to technical universities whose knowledge of secondary school level of mathematics is minimal. These students consequently have significant problems in mastering mathematical subjects as well as subjects closely related to it (physics, operational analysis, etc.). Of course, there are also students with excellent knowledge of mathematics (they are those who graduated from mathematics – in 2019, it was only 12 % of all secondary school students). We notice a significant knowledge gap between these groups.

Our belief that mathematics education should not be minimized, but rather expanded, is based on the fact that mathematical activities include analytical, synthetic, deductive, inductive, divergent thinking, which is potentiated in the process of mathematical education. The period we live in, in which routine and stereotypical activities (whether manual or mental) can be performed by technology for us, need to put the development of an individual's creative potential at the forefront of the educational process (that is the activities or things technology cannot do for us). We need people with clear, original, innovative and divergent thinking.

The research works of Sequera (2007) consider creativity as a methodological element that helps to acquire mathematical knowledge and ensures that general creative skills are also developed while solving mathematical problems. Several studies are describing the relationship between mathematical knowledge and the development of creativity. Authors such as Krutetskii (1969) and Ellertoh (1986) suggest the existence of an implicit relationship between problem-solving capabilities (level of creativity) and the mathematical competence of an individual. The existence of a relationship between creativity and problem solving is also mentioned by (Callejo, 2003), which emphasizes that if one is forced to solve problems, one's creativity is activated. Ayllón and Gómez (2014) argue that problem-solving mathematical problems activate students' creative thinking, and in turn, improve mathematical thinking.

Similarly, we believe that creative thinking and mathematical thinking are "connected bowls" that interact with each other. In our work, we, therefore, tried to point out the existence of a relationship between mathematics education and creativity.

Hypothesis 1 confirmed the strong relationship between the student's creativity and his grade in mathematics. The Tukey HSD test showed the existence of two separate groups – one consisting of students with a grade of 1 or 2, the other students with a grade of 3 or 4. We can, therefore, say that a grade in mathematics (which to some extent, reflects the student's relationship to this subject) and creative abilities students are closely related. We can assume that students, better rated in the subject of mathematics, have better developed logical, analytical and divergent thinking and thus more competences in the field of creative thinking.

The relationship between creativity and the type of secondary school in hypothesis 2 pointed to the fact that gymnasium students, who generally have more mathematics lessons, achieve a higher creative thinking score than secondary school students where there is less mathematics. It was also interesting to note that higher education of parents has a positive effect on the creative potential of their children.

As expected, there is no relationship between the assessment of students' creativity by the Urban test and the gender of students. This applies both to the overall score and all sub-indicators. The similar results were recorded, for example, in the works of Szobiová (2002), Sequera (2007), Žák (2004).

6. Conclusion

Creativity and mathematics are disciplines that usually do not appear together. Both concepts represent complex elements of process sharing, such as fluency (number of ideas), flexibility (range of ideas), novelty (unique idea) and elaboration (development of ideas). These factors contribute, among other things, to the students being competent in mathematics. Problem-solving, research can be perceived as a suitable evaluation tool that points to a person's creative level.

We are convinced that, as creative and divergent thinking is part of mathematical solving processes, the components of mathematical thinking are: (deduction, induction, synthesis, analogy). They are inherent to the development of the individual's creative potential. We appeal to this fact with our paper as well. Mathematical education cannot "harm" anyone; on the contrary, it contributes to the development of such much-needed competences of the individual.

The primary function of education is to contribute to the development and perfection of society as a whole. Education enables the development and progress of society. For the society in which we live, receiving, transmitting and application of new knowledge, which becomes its part, is typical. Education is related to the holder whose only task is a continual completion of his/her theoretical knowledge and practical skills for his/her personal as well as society-wide benefit (Plavčan, 2006). The educational policy acquires new dimensions that become an inseparable part of the present society (Chuguryan, 2008).

The aim of a knowledgeable society has to be a desire for wisdom, understanding the world, self-knowledge and self-formation, desire to observe the world mentally and to understand its laws, desire to create, construct and cultivate a practical wit. It has to respect a complex development of cognitive, psychomotor and socio-affective sides of a personality (Turek, 1998). Education becomes one of the most important factors influencing employment.

Creativity is an essential feature of a personality that is used in everyday life. It allows us to be flexible in dealing with many life situations. Mathematical education can also be seen as one of the opportunities for developing an individual's creativity. Therefore, in this paper, we also want to fight for this statement: give mathematics a chance, do not perceive it as an unpopular and useless subject. However, we need people for the future who are not afraid to think original, flexible, courageous and, above all, using their creativity. Solving of mathematical problems will lead to the development of creativity (Haylock, 1987). For that reason, it is important to develop mathematical strategies and instruments favoring the creative learning in our classrooms.

John Adam (2006) wrote: „There exist two types of education: One teaches us how to earn a living and the other one how to live“.

References

Ayllón et al., 2014 – *Ayllón, M., Gómez, I.* (2014). La invención de problemas como tarea escolar [The invention of problems as a school task]. Escuela Abierta. *Revista de Investigación Educativa*. 17: 29-40. [in Spain]

Adam, 2006 – *Adam, J.* (2006). Mathematics in Nature. Princeton University.

Boaler, 1997 – *Boaler, J.* (1997). Experiencing School Mathematics. Buckingham, Open University Press.

Böhm, Vojteková, 2017– *Böhm, P, Vojteková, M.* (2017). Evaluation of research and educational performance of selected faculties in Slovakia In. *IATED: International Academy of Technology, Education and Development*. 6263-6270. Valencia.

Callejo, 2003 – *Callejo, M.* (2003). Creatividad matemática y resolución de problemas [Mathematical creativity and problem solving]. Sigma 22, 25-34. *Pensamiento matemático y creatividad a través de la invención y resolución de problemas matemáticos.* [in Spain]

Ďurič, 1986 – *Ďurič, L.* (1986). Psychológia tvorivosti [Psychology of creativity]. UK Bratislava. [in Slovak]

Ďurič et al., 1991 – *Ďurič, L., Grác, J., Štefanovič, J.* (1991). Pedagogická psychológia [Educational psychology]. Bratislava. *Jaspis*. 331 p. [in Slovak]

Ellertoh, 1986 – *Ellertoh, N.* (1986). Children's made up mathematics problems. A new perspective on talented mathematicians. *Educational Studies in Mathematics*.

Fülöpová, 2006 – *Fülöpová, E.* (2006). Výchova k tvorivosti [Education for creativity]. Vydavateľstvo Univerzity Komenského. Bratislava. [in Slovak]

Goméz, 2007 – *Goméz, J.* (2007). We Know About Creativity*? The Journal of Effective Teaching*. 7: 1.

Chuguryan, 2008 – *Chuguryan, S.* (2008). Výchova v pedagogickom výskume a praxi [Education in pedagogical research and practice]. *Zborník z medzinárodnej vedeckej konferencie Trnava*. Pp. 151-163. [in Slovak]

Haylock, 1987 – *Haylock, D.W.* (1987). A framework for assessing mathematical creativity in school children. *Education Studies in Mathematics*. 18(1): 59-74.

Krutetskii, 1969 – *Krutetskii, V.A.* (1969). An investigation of mathematical abilities in schoolchildren. *Soviet studies in the psychology of learning and teaching mathematics*. Vol. 2, pp. 5-57. Chicago, IL: University of Chicago Press.

Malacká, 2016 – *Malacká, Z.* (2016). Stav matematickej gramotnosti študentov prvého ročníka vysokých škôl technického smeru po školskej Žiline [The state of mathematical literacy of first-year students of technical universities after school Žilina]. ŽU v Žiline. Edis. [in Slovak]

Piggott, 2005 – *Piggott, J., Pumfrey, M.* (2005). Mathematics Trails. Generalising CUP.

Plavčan, 2007 – *Plavčan, P.* (2007). Vedomostná spoločnosť v Slovenskej republike [Knowledge society in the Slovak Republic]. Merkury. Bratislava. [in Slovak]

Sequera, 2007 – *Sequera, E.* (2007). Creatividad y desarrollo profesional docente en matemáticas para la educación primaria [Creativity and teacher professional development in mathematics for primary education]. Universidad de Barcelona. España. [in Spain]

Sillamy, 2001 – *Sillamy, N.* (2001). Psychologický slovník [Psychological dictionary]. Univerzita Palackého v Olomouci. [in Slovak]

Szobiová, 2002 – *Szobiová, E.* (2002). Existujú rozdiely v indikátoroch tvorivosti mužov a žien [There are differences in the indicators of creativity between men and women]. Psychológia na rázcestí. Stimul. Bratislava. [in Slovak]

Szobiová, 2005 – *Szobiová, E., Hrebíčková, M.* (2005). Osobnostné vlastnosti adolescentov v Čechách a na Slovensku – podobnosti a odlišnosti [Personality traits of adolescents in the Czech Republic and Slovakia - similarities and differences]. [in Slovak]

Szobiová, 1998 – *Szobiová, E.* (1998). Fenomén tvorivosti – základné pojmy a ich chápanie v retrospektíve a dnes [The phenomenon of creativity – basic concepts and their understanding in retrospect and today]. *Československá psychologie*. 52: 525-534. [in Slovak]

Švecová, 2012 – *Švecová, V., Rumanová, L.* (2012). Supporting mathematical creativity in realistic surroundings. Generalization in mathematics at all educational levels. Rzeszów. Wydawnictwo Uniwersytetu Rzeszowskiego, pp. 248-256.

Torrance, 1975 – *Torrance, E.* (1975). Creativity Research in Education: Still Alive. Chicago.

Torrance, 1967 – *Torrance, E.* (1967). Education and the creative potential. Minneapolis. Minnesota Press.

Turek, 1998 – *Turek, I.* (1998). Zvyšovanie efektívnosti vyučovania [Increasing the effectiveness of teaching]. Edukácia Bratislava. [in Slovak]

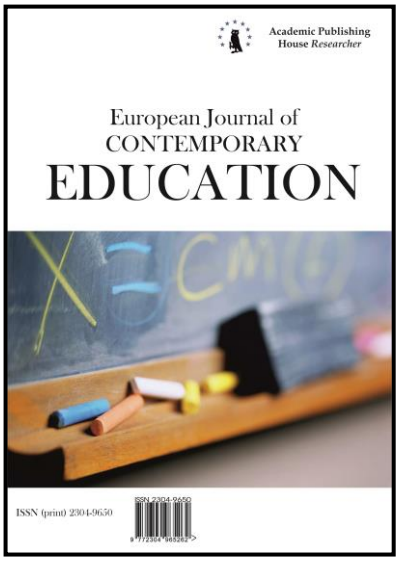
Urban, 1993 – *Urban, K., Jellen, H.* (1993). Test zum schopferischen Denken – zeichnerisch – TDS Universität Hannover [Test for creative thinking – drawing – TSD University of Hanover]. [in German]

Zelina, 1995 – *Zelina, M.* (1995). Výchova tvorivej osobnosti [Education of creative personality]. Pedagogická fakulta UK Bratislava. [in Slovak]

Zelina, 2000 – *Zelina, M.* (2000). Alternatívne školstvo [Alternative education]. Iris. Bratislava. [in Slovak]

Žák, 2004 – *Žák, P.* (2004). Kreativita a její rozvoj [Creativity and its development]. Computer Press. Brno. [in Slovak]

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 103-112
DOI: 10.13187/ejced.2021.1.103
www.ejournal1.com



Case Study of the Formation of the Operational Component of the Psychological Readiness of University Graduates to Overcome Difficult Life Situations in Their Future Professional Activities

Alexander Yu. Prosekov [a], Irina S. Morozova [a, *], Zoya V. Kretsan [a]

[a] Kemerovo State University, Kemerovo, Russian Federation

Abstract

The present research featured the operational component of the psychological readiness to cope with stressful events in the workplace and its development in senior university students.

The authors believe that only practice-oriented technologies can provide the experience that will help new grades to overcome adversities they might face at work and choose an appropriate coping style.

The article introduces some theoretical prerequisites that develop the operational component of psychological readiness, which allow students to cope with stressful events in the workplace. The senior students defined the concept of stressful event, or adversity, as a certain state of uncertainty and ambiguity. The respondents evaluated such a situation as possible or impossible to cope with on their own and described typical stressful events they had to face in their lives or focused on their own experiences.

Finding themselves in a situation of uncertainty, the students tried to appraise the situation and plan the mode of action. Upon comprehending their actions in a situation of adversity, they strove to resolve it promptly. An intentional influence based on practice-oriented technologies diversified their responses to the stressful event. In addition, the experimental so improved their ability to compare their own needs and demands with the opportunities provided by the educational environment. In addition, the students learnt to analyze their own previous experience in order to find resources to cope with stressful events in the present.

The experiment registered positive changes in the parameters of the operational component of students' psychological readiness to cope with stressful events. Adequate ideas they acquired about adversities allowed the students to use adaptive coping strategies and use their experience in order to diversify their behavior strategies in stressful events.

* Corresponding author
E-mail addresses: rector@kemsu.ru (A. Yu. Prosekov), ishmorozova@yandex.ru (I.S. Morozova), z.kretsan@gmail.com (Z.V. Kretsan)

Keywords: psychological readiness, stressful event, self-management technologies for professional and personal development, developmental technologies for competencies, personal responsibility, coping style, professional activity.

1. Introduction

The current stage of social development makes it important to teach future specialists how to work effectively in rapidly changing conditions. Therefore, students should develop psychological readiness to overcome adversity in everyday life and in their future workplace, as well as at university.

V.A. Lugovskiy considered psychological readiness for professional activity as a system of integrative properties and personality traits formed while working (Lugovskiy et al., 2018). A.A. Derkach interpreted readiness for professional activity as a set of functional, operational, and personal parameters, the relationship of which transforms during lifetime (Derkach, 2017).

I.A. Kalinina proved that psychological readiness for professional activity presupposes a change in its content, depending on the stage of university education (Kalinina, 2007).

L.M. Popov studied how psychological readiness develops during vocational training. They believe it depends on vocational training conditions and runs parallel to the development of professional attitudes, motives, and personality traits (Popov et al., 2015).

Psychological readiness for professional activity and its components become focus of numerous studies. For instance, E.A. Zakharova and Yu.M. Ezhova studied medical students. They proved that psychological readiness for a certain activity is, in fact, a complex structure. In their research, the psychological content of its components depended on the context of the activity in question, as well as on the student's personality with his or her capabilities, orientations, activeness, and inner world (Zakharova, 2018).

D.A. Vodopianov analyzed the phenomenon of psychological readiness in students of psychology.He believes that readiness reflects the degree to which one's personality correspondswith the requirements of this particular activity: ifperformedsuccessfully, this activity realizes one's personal and professional potential (Vodopianov, 2017).

The authors of the present paper have already reported results of a successful research that featured the development of psychological readiness for professional activity in future speech therapists (Morozova, 2015).

O.V. Pleshakova, who studied social workers and their professional readiness,also manifested the complex structure of this phenomenon: it consists of motivational, orientational, operational, personal, and reflexive components, which should be considered as a single system. O. V. Pleshakova suggests that professional skills are not the only parameters of operational readiness: it also includes such skills as communication, empathic communication, and competitive behavior (Pleshakova, 2007).

S.A. Falkina analyzed various theoretical aspects of professional and psychological readiness in future prosecutors. Their operational component of readiness included not only communication and deconfliction skills, but also flexibility in choosing appropriate communication style and good organizational skills (Falkina, 2016).

Thus, all scientists speak about a set of individual psychological parameters of psychological readiness for professional activity. However, the information remains incomplete without data on the attitude of future professionals to the problem of coping with stressful events, i.e. their ability to understand the essence of the adversity they face and choosing the best coping style.

According to D.M. Rogozin, stressful events destroy the balance between the system of personality relations and self-attitude, creating a discrepancy between aspirations, values, goals, and opportunities (Rogozin, 2013).

Psychology pays much attention to the way people appraisea situation and classify it as stressful. For instance, R. Lazarus and S. Folkman introduced parameters for subjective appraisal of stress and identified the following criteria for determining a stressful event: intensity, duration, loss of control, and taxingone's adaptation resources. They defined life strain as "a *process* of *categorizing* an encounter, and *its* various facets, with respect to *its significance* for *well-being*" (Folkman, Lazarus, 1980).

M. Sharpe linked the cognitive appraisal of a complex situation to the decision-making on how to cope with it. Making decisions in environments with few choice options is easy, as one

selects the action that results in the most valued outcome. However, they found it much harder to make decisions in more complex environments, where the same action can produce different outcomes in different conditions (Sharpe et al., 2019).

B. Fischhoff and St. Broomell distinguished three main elements of decision-making: judgment, or how people predict the *outcomes* that will *follow possible choices*; preferences, or how people weigh these possible outcomes; and choice, or how people combine judgment and preference to work out a decision (Fischhoff, Broomell, 2020).

A conscious choice increases the degree of satisfaction with the decision made and reduces the subjective character of one's appraisal of the stressful event. According to B.E. Compas et al., the use of cognitive strategies increases a person's sense of control over the situation and, as a consequence, *lowers the level* of *negative emotion* (Compas et al., 2001). E. Frydenberg proved that successful adaptation to complex and changing environment depends on how often these adaptive behavioral strategies are used (Frydenberg, 2004).

B. Little differentiated between such strategies of passive coping as avoiding, escaping, and denial of the stressor, which can be contrasted to active coping strategies, namely seeking social support, engaging in activism, or acceptance (Little et al., 2018).

M. Zeidner praised emotional intelligence, which allows people to identify, understand, control, and choose the best coping strategy in difficult life situations (Zeidner et al., 2018).

A.B. Soares identified the following ways of coping with interpersonal situations that are considered difficult in university context: focus on emotion, focus on social support, focus on religious coping, and focus on the problem (Soares et al., 2018).

2. Material and methods

The present study featured the development level of the operational component of the psychological readiness to cope with stressful situations in the future workplace. The research involved 54 fifth-year undergraduate students of the Institute of Education at the Kemerovo State University (Kemerovo region, Russia). The experiment included such empirical methods as testing and psychosemantic technique.

S.S. Goncharova's questionnaire "Ways to Cope with Stressful Events" made it possible to assess the parameters of the operational component of readiness. This questionnaire tests the frequency of using various ways to cope with stressful events in adolescence and is a modification of the Bern "Ways of Coping" *Questionnaire* (A. Blaiser, E. Heim, H. Ringer, M. Tommen). It includes 25 statements that describe possible ways to cope witha stressful situation. Respondents define how often they rely on each option using a five-position scale. The five scales include three adaptive coping strategies (seeking help, increasing self-esteem, self-blame) and two non-adaptive (problem analysis and seeking a guilty party).

Other methods included "The Methods of Coping Behavior" by R. Lazarus and S. Folkman, designed to determine coping strategies for stressful events in various areas, e.g. in the workplace, at university, in communication, in private life, etc. The coping test was adapted for Russian audience by T.L. Kryukova, E.V. Kuftyak, and M.S. Zamyshlyaeva.

R. Lazarus and S. Folkman defined eight coping strategies. The coping test shows how often the respondent uses each coping strategy and how effective proves to be. The questionnaire includes 50 statements, each of which reflects a certain behavior in a difficult or stressful situation. The respondent has to assess how often they appeal to these behavior strategies.

The psychosemantic technique consisted of an incomplete-sentence test, which helped to determine the peculiarities of students' perception of adversities and the ways to cope with them in their future professional career.

The incomplete sentences were based on the method of psychosemantics: the participants had to appraise stressful events according to various parameters, which corresponded to the criteria for choosing behavior in a stressful environment. The methodology tested the personal experience of the respondent, who was asked to evaluate behaviors, feelings, and actions theyassociate with a stressful situation.

The quantitative and qualitative analysis involved mathematical statistics (Student's t-distribution), checked using the Statistica 6.0 computer program.

The research involved two groups of the fifth (final) year of study. The experimental group consisted of 27 Bachelor students that majored in Primary Education, while the control group

included 27 students of Preschool Education. Their curricula have an almost identical study time and nearly the same number of disciplines; both presuppose in-depth studies of humanity subjects. Both groups had the same environment for the development of the operational component of psychological readiness for their future professional activity, hence the legitimacy of the comparative analysis. However, the environments changed during the formation stage, as a new discipline was introduced in the experimental group.

The educational experiment included a complex of practice-oriented technologies, which made it possible to adjust the interaction methods and technique, as well as to define the dynamics of the psychological readiness. The experimental group participated in a club called *I am a Teacher*, which exercised formative effect through regular discussion platforms, workshops, and simulation exercises. The students had to participate in the so-called educational events organized by the teaching staff of the Institute of Education. An educational event is a special environment which allows children to comprehend the experience obtained and turn it into a tool that helps them to achieve a new, higher goal. The students had to role-play children, thus gaining the experience of understanding the child's emotional stress. As a result, they learnt how to act professionally while solving various tasks.

The element of dialogue interaction allowed the students to accept their own emotions and feelings caused by the interlocutor. By projecting their interaction on the teacher – child communication model, the students learnt how to regulate their own emotional stress, while adjusting their own actions.

The formative influence developed the psychological readiness for future career. The present research measured the qualitative changes in the cognitive processes and personality characteristics of the students, as their ability to reproduce the environment improved and actions became more sophisticated. This idea has roots in various practice-oriented cases practiced by leading universities.

For instance, S.-S. Tseng and H.-C. Yeh (Tseng, Yeh, 2019) believe that this approach allows students of pedagogical departments to link new knowledge with their own studies and, thereby, build connections between content, activities, and tools. Another effective technology is the so-called flipped classroom, developed by V.I. Marín et al. First, students study new material on their own, and after that they discuss new concepts and their possible application together with the teacher (Marín et al., 2018). In general, educational innovations focused on active learning always prove highly effective (Arruabarrena et al., 2019).

3. Results

The ascertaining stage of the experiment focused on the way students perceive the phenomenon of a stressful event, or adversity, and the ways to cope with it.

When asked to finish the sentence "*For me, a stressful event means…*", most participants point out its uncertainty and ambiguity. 14.8 % mentioned conflicts with family and friends, as well as the lack of support. 18.5 % defined adversity as a situation that breaks the routine. 37 % defined a stressful event as a situation of choice or personal and professional self-identification. 29.7 % described it via negative emotions that they cause.

Thus, the students demonstrated diverse ideas about the essence of this phenomenon. The students appraised the possibility of coping with such a situation on their own. They also described their own experiences they perceive as stressful.

The incomplete sentence "*Realizing my actions in a difficult life situation, I …*" triggered two types of response, namely behavioral and emotional.

The students often dwelled upon the strong negative emotions that prevent them from coping with a stressful event. 14.8 % of respondents mentioned a feeling of helplessness, inability to cope with the situation, and a lack of strength.

18.5 % of the respondents expressed a strong desire to cope with the difficulty on their own. Some even wrote that they see adversities as a resource for personal development.

All in all, 27.8 % mentioned their attempts to cope with a stressful event, while 39 % put stress on the fact that they tried to do it on their own.

Facing a situation of uncertainty, students try to assess the environment and plan the ways of action. After that, they strive to resolve it as soon as possible.

The results obtained made it possible to actualize the problem of developing psychological readiness in students, which would allow them to cope with stressful situations in the workplace.

In the experimental group, the formative influence combined the technology of managing one's own professional and personal development and the technology of competency development. While managing their own professional and personal development, the students became aware of their own individual and personal characteristics. The new knowledge let them build up and expand their self-concept, realize their own motives and aspirations, and experience the environment.

As a result, the students developed and realized their personal attitude to education and self-development, realized their potential, and, most importantly, learnt to compare them with the potentials of the educational environment. For the approach to be successful, the teaching staff must abandon both directive forms of work and judgment-based attitude. The students have to find the answers to the questions posed by the supervisor within themselves, and not receive them as an outside evaluation (Klochko, 2009).

Technologies of competency development usually feature non-specific competencies, i.e. the so-called soft skills, or universal, quasi-professional skills that determine one's success in almost any kind of activity (Salnaya, 2016). They include social, communicative, emotional competencies, etc. (Bogacheva, 2011).

The present research introduces a new model that unites various techniques as means of formative influence, which correspond to different groups of technologies, skill training and reflexive training being the most important ones. Skill training is connected with technologies of competency development, while reflexive training is part of technology of managing one's own professional and personal development.

Training is a traditional form of psychological support, which remains highly effective and easy. Training aims at both solving the existing problem and at preventing its reoccurrence in the future by developing various problem-solving skills (Vachkov, 2007).

Training presupposes a favorable safe environment, which allows students to acquire skills, develop habits, and receive feedback from other participants. This way the interaction happens easier than in traditional classroom environment.

E.A. Gorbatova formulated some specific requirements a successful training should follow in order to develop a favorable training environment. The list includes permanent members, a list of norms, appropriate spatio-temporal organization, and a professional trainer, who uses both active and reflective methods of work (Gorbatova, 2008).

The idea of skill training first appeared in behavioral studies as a way to develop effective patterns of behavior. In its contemporary understanding, the term encompasses cognitive and emotional components (Toropov, 2011).

Reflexive training allows participants to develop their reflective qualities through rethinking their experience together with an algorithm for analyzing new similar experience.

According to V.I. Slobodchikov, reflection is a set of human abilities, which make you aware of your own emotional and cognitive state, your place and status in the group, the limits of your skills and knowledge, etc. (Slobodchikov, 1990). Thus, reflection contributes to personality development and relationship with the outside world.

E.V Bityutskaya believes that reflection plays an important role in the process of cognitive appraisal of a stressful event (Bityutskaya, 2013). Therefore, good reflection abilities can develop readiness for coping with adversities. According to N.I. Avramenko, a well-developed reflection allows people to choose pro-social coping strategies, thus decreasing in the chance of impulsive reactions in stressful environment. In addition, the higher the reflection level, the greater the variability of coping strategies (Avramenko, 2016). Thus, a well-developed reflection makes it possible to choose a more effective coping behavior and cope with adversities. Reflexive forms of work also prove effective in that they prepare people for choice making situations (Kargina et al., 2020).

Thus, these technologies develop non-specific universal competencies, including their components, i.e. certain knowledge, skills, and abilities. In fact, they provide positive changes in the operational component of psychological readiness to cope with stressful events.

Table 1 illustrates the data obtained at the initial and final stages of the experimental study. They show the dynamics in the operational component of the psychological readiness of students to cope with stressful events.

Table 1. Operational component of the psychological readiness: Dynamics of the parameters

Index	Mean values in groups		Student's t-distribution	Significance of differences (p)
	Initial stage	Final stage		
Ways to cope with stressful events (S.S. Goncharova)				
seeking help	9.65	11.98	2.25	0.05
increasing self-esteem	20.82	24.18	-2.26	0.05
self-blame	13.29	10.76	2.43	0.03
problem analysis	16.06	18.71	-2.35	0.04
Seeking the guilty party	9.06	7	2.64	0.02
Methods of Coping Behavior (R. Lazarus, S. Folkman)				
Avoiding and escaping	13.41	10.58	3.14	0.01
Planning solution	10.26	12.56	- 2.44	0.03

As a result of the practice-oriented technologies, self-accusation was a much less frequent coping strategy in the experimental group ($t = 2.43$, variance = 52 at $p < 0.05$). Much the same could be said about the looking-for-someone-to-blame strategy ($t = 2.64$, variance = 52 at $p < 0.05$). Both strategies are non-adaptive; thus, they could not possibly contribute to coping with problems that arose during the considered period. Therefore, the students from the experimental group were much less likely to avoid the emerging problems by turning inward to pity and blame themselves for what happened, reproaching themselves for not taking actions, etc. The data are consistent with those obtained by R. Masiran et al., who wrote that introspection and self-blame result from psychological stress (Masiran et al., 2018). In the present research, the test subjects proved much less prone to blame external factors and other people, as well as to delegate responsibility for resolving the problem to somebody else ($t = -2.35$, variance = 52 at $p < 0.05$).

In addition, the students in the experimental group tended to accept the responsibility for their own failures, not only their own achievements and successes. This fact might indicate the harmonious development of self-control. The participants agreed that their own actions can help them to achieve their goals ($t = -2.44$, variance = 52 at $p < 0.05$). They were aware of the effect their actions have on the problem to solve. As a result, they believed that coping with those stressful events which they associated with failures demanded a conscious effort on their side. In addition, these participants felt more responsible for relationships with other people ($t = 2.25$, variance = 52 at $p < 0.05$). To sum up, they felt able to change events, responsible for relationships with others, and capable of winning the favor of other people through their own conscious actions. They saw their failures as an area of possible development and strengthening, which improved their adaptive attitude to coping with stressful events.

4. Discussion

As a result of intentional influence, the students learnt to see a stressful event as a source of opportunities. They were also able to harmonize their needs and demands with the opportunities provided by the educational environment. In addition, they saw their past experience as a resource for coping with stressful events in the present. The results proved similar to the data obtained by E. Santarnecchi, who interpreted coping as a separate psychological construct, not as a personality trait or a cognitive ability. As a psychological construct, coping consists of a locus of control, self-efficacy, and such skills as problem solving or ability to perform executive functions (Santarnecchi at al., 2018).

The strategy of seeking the guilty party was also poorly represented in the experimental group. This result confirms the data obtained by E. Keser: emotionally-oriented coping reduces conflict (Keser et al., 2020).

In this experiment, the participants were less likely to look for external causes of their problems, transfer responsibility for their resolution to other people, and experience negative emotions. They accepted responsibility for the situation and agreed that problem solving and related choices depended on them only.

The transformations that occurred in the test group were comparable to the results obtained by P. Gaudreau, who focused on active coping with its variety of behavioral and cognitive

strategies. Such strategies make it possible to manage the demands that arise in a stressful situation, as well as to cope with the resulting emotional and physiological reactions (Gaudreau et al., 2018).

Unlike the control, the experimental group students felt that their actions expressed their own aspirations and desires, while identifying their emotions and feelings with the events of their lives. These data correlate with the experiment performed by Y. Chishima, who identified a link between self-compassion and stress coping, mediated by cognitive appraisal (threat, controllability, etc.) of stressful events. The scientists emphasized that self-compassion improves adaptive coping, as it decreases the sense of threat and increases the controllability of a stressful event (Chishima et al., 2019).

The training enabled the students to master universal vocational and non-specific skills, which are helpful in any field of activity, especially in the university environment. The skills included their ability to understand other people, to employ diverse behavioral reactions, to be aware of their emotions and their triggers, to manage their emotional state and behavior, to exercise time management and planning skills, and to determine the motives behind their own behavior. All these prove quite useful, as higher education and formative years demand well-developed self-control and planning skills.

The reflexive training helped to develop self-regulation skills. The main objective of the training was to form a stable and conscious image of attitudes towards the trainees themselves, other people, and environment at the emotional, cognitive, axiological, and action levels. The participants developed such abilities as to identify and analyze their own emotions, thoughts, causes and consequences of their behavior, as well as to predict and correct it. According to M. Akhtar and B. Kroener-Herwig, reflexive coping increases the level of psychological well-being (Akhtar, Kroener-Herwig, 2018).

Thus, the reflective training proved to be a universal form of work, which could include various blocks, depending on its goals and objectives. In addition, the reflexive training made it possible to implement the principle of non-directive influence in teacher support, which allowed students to form a conscious self-image as a future specialist.

This statement correlates with the point of view expressed by S. Keng, who supported the idea that mindfulness contributes to adaptive coping with everyday stressful situations (Kengetal, 2018).

To sum up, the participants in the experimental group, who underwent a complex of practice-oriented technologies, proved more successful in developing the operational component of the psychological readiness to cope with stressful events than their fellow students in the control group.

5. Conclusion

The theoretical study, experimental research, and best practice analysis showed that the development of psychological readiness to cope with stressful events in students can be approached from several positions.

First, psychological readiness to cope with stressful events is a special case of readiness for professional activity. It is a complex structural and functional formation that enables individuals to make decisions based on several conscious procedures. The person analyzes the appraised situation, determines available alternatives, evaluates possible risks, studies his or her life experience, and comes to a variety of ways to cope with the stressful situation. Operational component is part of psychological readiness to cope with stressful events. It is a set of professional skills and coping strategies, as well as skills of empathic communication and competitive behavior.

Second, coping strategies are a set of actions and efforts aimed at resolving a particular situation. Its choice depend on the impact exercised directly in the stressful event, as well as on the resources and capabilities the individual obtained earlier in life, which are not associated with the stressful event. As a result, the skills and resources obtained by the individual in everyday life enables him or her to expand the range of behavioral patterns in a stressful event.

Third, a stressful event is part of the context of a subjectively appraised adversity taken in its connection with the particular value-semantic content. Students demonstrated a wide variety of ideas about stressful events. Their interpretations of professional choice and self-identification also proved diverse, as they approached the final stage and final exams. Most students appraised their coping abilities as low, the most popular coping strategies being self-esteem improvement, self-blame, and problem analysis.

The experiment involved an intentional influence via practice-oriented technologies, which increased the variability of responses to the current situation. Also, it enriched the experience of the participants in their ability to compare their own needs and demands with the opportunities provided by the educational environment. This set of means proved effective in developing the readiness to cope with stressful events, as it united the efforts of all members of the educational environment.

The participants resorted to adaptive coping strategies more often, as they developed adequate ideas about stressful events and diversified their coping strategies based on their previous experience.

References

Akhtar, Kroener-Herwig, 2019 – *Akhtar, M., Kroener-Herwig, B.* (2019). Coping styles and socio-demographic variables as predictors of psychological well-being among international students belonging to different cultures. *Current Psychology*. 38: 618-626. DOI: https://doi.org/10.1007/s12144-017-9635-3

Arruabarrena et al., 2019 – *Arruabarrena, R., Sánchez, A., Blanco, J.M., Vadillo, J.A., Usandizaga, I.* (2019). Integration of good practices of active methodologies with the reuse of student-generated content. *International Journal of Educational Technology in Higher Education*. 16(10): 2. DOI: https://doi.org/10.1186/s41239-019-0140-7

Avramenko, 2016 – *Avramenko, N.N.* (2016) Rol' refleksivnykh protsessov v vybore strategii sovladaniya s trudnymi zhiznennymi situatsiyami u studentov [The role of reflexive processes in the choice of strategies for coping with stressful events in students]. *Vestnik Kostromskogo gosudarstvennogo universiteta. Seriya: Pedagogika. Psikhologiya. Sotsiokinetika*. 22(3): 128-132. [in Russian]

Bityutskaya, 2013 – *Bityutskaya, E.V.* (2013). Kognitivnoe otsenivanie trudnoi zhiznennoi situatsii s pozitsii deyatel'nostnogo podkhoda A. N. Leont'eva [Cognitive assessment of a stressful event from the standpoint of A. N. Leontiev's activity approach]. *Vestnik Moskovskogo universiteta. Seriya 14: Psikhologiya*. 2: 40-56. [in Russian]

Bogacheva, 2011 – *Bogacheva, T.G.* (2011). K voprosu o kommunikativnoi sotsial'noi kompetentnosti [To the issue of communicative social competence]. *Vestnik Novosibirskogo gosudarstvennogo pedagogicheskogo universiteta*. 3: 6-12. [in Russian]

Chishima et al., 2018 – *Chishima, Y., Mizuno, M., Sugawara, D., Miyagawa, Y.* (2018). The influence of self-compassion on cognitive appraisals and coping with stressful events. *Mindfulness*. 9: 1907-1915. DOI: https://doi.org/10.1007/s12671-018-0933-0

Compas et al., 2001 – *Compas, B.E., Connor-Smith, J.K., Saltzman, H., Thomsen, A.H., Wadsworth, M.E.* (2001). Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psychological Bulletin*. 127: 87-127.

Derkach, Vodopianov, 2017 – *Derkach, A.A., Vodopianov, D.A.* (2017). Teoreticheskie osnovy psikhologicheskoi gotovnosti studentov – budushchikh psikhologov k professional'noi deyatel'nosti [Theoretical basics of psychological readiness of students — future psychologists for professional activity]. *Akmeologiya*. 2(62): 7-13 [in Russian]

Falkina, 2016 – *Falkina, S.A.* (2016). Teoreticheskie aspekty professional'no-psikhologicheskoi gotovnosti budushchikh prokurorov k professional'noi deyatel'nosti [Theoretical aspects of professional and psychological readiness of future prosecutors for professional activities]. *Uspekhi sovremennoi nauki i obrazovaniya*. 11(7): 54-58. [in Russian]

Fischhoff, Broomell, 2020 – *Fischhoff, B., Broomell, St.B.* (2020). Judgment and decision making. *Annual Review of Psychology*. 71: 331-355. DOI: https://doi.org/10.1146/annurev-psych-010419-050747

Folkman, Lazarus, 1980 – *Folkman, S., Lazarus, R.* (1980). An analysis of coping in a middleaged community sample. *Journal of Health and Social Behavior*. 21(3): 219-239.

Frydenberg, 2004 – *Frydenberg, E.* (2004). Coping competencies. *Theory in to Practice*. 43(1): 14-22.

Gaudreau et al., 2018 – *Gaudreau, P., Zeigler-Hill, V., Shackelford, T.* (2018). Active coping strategies. Encyclopedia of personality and individual differences. Springer, Cham, 76. DOI: https://doi.org/10.1007/978-3-319-28099-8

Gorbatova, 2008 – *Gorbatova, E.A.* (2008). Teoriya i praktika psikhologicheskogo treninga [Theory and practice of psychological training]. Saint Petersburg: Rech, 320 p. [in Russian]

Kalinina, 2007 – *Kalinina, I.A.* (2007). Metodika kompleksnogo izucheniya psikhologicheskoi gotovnosti k professional'noi deyatel'nosti [Methods of complex estimation of psychological readiness for professional activity]. *Vestnik Tambovskogo universiteta. Seriya: Gumanitarnye nauki*. Tambov. 9(53): 73-75. [in Russian]

Kargina et al., 2020 – *Kargina, A.E., Morozova, I.S., Medovikova, E.A., Grinenko, D.N.* (2020) Formirovanie sposobov preodoleniya trudnykh zhiznennykh situatsii v budushchei professional'noi deyatel'nosti vypusknikov vuza sredstvami refleksivnykh seminarov [Development of ways to cope with stressful events in the future professional activity of university graduates by means of reflexive seminars]. *Science for Education Today*. 10(4): 75-90. DOI: http://dx.doi.org/10.15293/2658-6762.2004.05 [in Russian]

Keng et al., 2018 – *Keng, S., ChooX, Tong, E.M.W.* (2018). Association between trait mind fullness and variability of coping strategies: adiary study. *Mindfulness*. 9: 1423-1432. DOI: https://doi.org/10.1007/s12671-018-0885-4

Keser et al., 2020 – *Keser, E., Kahya, Y., Akın, B.* (2020). Stress generation hypothesis of depressive symptoms in interpersonal stressful life events: the roles of cognitive triad and coping styles via structural equation modeling. *Current Psychol.* 39: 174-182. DOI: https://doi.org/10.1007/s12144-017-9744-z

Klochko, 2009 – *Klochko, V.E., Galazhinsky, E.V.* (2009). Psikhologiya innovatsionnogo povedeniya [Psychology of innovative behavior]. Tomsk, 240 p. [in Russian]

Little et al., 2018 – *Little, B., Zeigler-Hill, V., Shackelford, T.* (2018). Passive coping strategies. Encyclopedia of personality and individual differences. Springer, Cham, 46-76. DOI: https://doi.org/10.1007/978-3-319-28099-8

Lugovskiy et al., 2018 – *Lugovskiy, V.A., Surzhenko, L.V., Kokh, M.N.* (2018) Psikhologicheskaya gotovnost' k professional'noi deyatel'nosti kak osnova konkurentosposobnosti vypusknikov vuza [Psychological readiness for professional activity as the basis of competitiveness of university graduates]. *Vestnik Kostromskogo gosudarstvennogo universiteta. Seriya: Pedagogika. Psikhologiya. Sotsiokinetika*. 1:66-70. [in Russian]

Marín et al., 2018 – *Marín, V.I., Duart, J.M., Galvis, A.H., Zawacki-Richter, O.* (2018) Thematic analysis of the international journal of educational Technology in Higher Education (ETHE) between 2004 and 2017. *International Journal of Educational Technology in Higher Education*. 15: 8. DOI: 10.1186/s41239-018-0089-y

Masiran et al., 2018 – *Masiran, R., Ismail, S.I.F., Ibrahim, N., Tan, K.-A., Andrew, B.Ng., Chong, S.Ch., Soh, Kw.-Y.* (2018)Associations between coping styles and psychological stress among medical students at Universiti Putra Malaysia Current Psychol, 37. DOI: https://doi.org/10.1007/s12144-018-0049-7

Morozova, Voronova, 2015 – *Morozova, I.S., Voronova, E.V.* (2015). Psikhologicheskaya gotovnost' studentov napravleniya «Spetsial'noe defektologicheskoe obrazovanie» k professional'noi deyatel'nosti na razlichnykh etapakh obucheniya v vuze [Psychological readiness of students of special defectological education for professional activity at different stages of university education]. *Izvestiya Irkutskogo gosudarstvennogo universiteta. Seriya: Psikhologiya*. 13: 36-44. [in Russian]

Pleshakova, 2007 – *Pleshakova, O.V.* (2007). Komponenty psikhologicheskoi gotovnosti k professional'noi deyatel'nosti sotsial'nogo rabotnika [Components of psychological readiness for professional activity of a social worker]. *Vestnik Bashkirskogo universiteta*. 3: 208-211. [in Russian]

Popov, 2015 – *Popov, L.M., Puchkova, I.M., Ustin, P.N.* (2015). Psikhologicheskaya gotovnost' k professional'noi deyatel'nosti i metody ee formirovaniya [Psychological readiness for professional activity and methods of its formation]. *Uchenye zapiski Kazanskogo universiteta. Seriya: Gumanitarnye nauki*. 4: 216-224. [in Russian]

Rogozin, 2013 – *Rogozin, D.M.* (2013). Trudnye zhiznennye situatsii v predstavleniyakh starshego pokoleniya rossiyan [Stressful events in the perceptions of the older generation of Russians]. *Monitoring*. 5(117): 32-50 [in Russian]

Salnaya, 2016 – *Salnaya, S.K.* (2016). Softskills v kompetentnostnoi modeli vypusknika vuza [Softskills in the competence model of a university graduate]. *Nauka. Obrazovanie. Kul'tura. Vklad molodykh issledovatelei. Sbornik statei po materialam III Mezhdunarodnoi nauchnoi konferentsii prepodavatelei, molodykh uchenykh, aspirantov i studentov vuzov,* 331-334. [in Russian]

Santarnecchi et al., 2018 – *Santarnecchi, E., Sprugnoli, G., Tatti,, E., Mencarelli, L., Neri, F., Momi, D., Lorenzo, G., Pascual-Leone, A., Rossi, S., Rossi, A.* (2018). Brain functional connectivity correlates of coping styles. *Cognaffectbehave neurosci.* 18: 495-508. DOI: https://doi.org/10.375 8/s13415-018-0583-7

Sharpe et al., 2019 – *Sharpe, M.J., Stalnaker, Th., Schuck, N.W., Killcross, S., Schoenbaum, G., Niv, Y.* (2019). An integrated model of action selection: distinct modes of cortical control of striatal decision making *Annual review of psychology.* 70: 53-76. DOI: https://doi.org/10.1146/annurev-psych-010418-102824

Slobodchikov, 1990 – *Slobodchikov, V.I., Tsukerman, G.A.* (1990). Genezis refleksivnogo soznaniya v mladshem shkol'nom vozraste [Genesis of reflexive consciousness at primary school age]. *Voprosy psikhologii.* 3: 28-29. [in Russian]

Soares et al., 2018 – *Soares, A.B., Mourão, L., Maia, F.A., Medeiros, H.Cl.P., Monteiro, M.Cr., Barros, R. de S. N., Rodrigues, P.V.S.* (2018). Construction and validity evidence of a scale for coping with difficult social academic interpersonal situations. *Psychology: Reflection and Criticism*. 31(24). DOI: https://doi.org/10.1186/s41155-018-0103-2

Toropov, 2011 – *Toropov, P.B.* (2011) Formirovanie povedeniya: prakticheskoe primenenie idei bikheviorizma [Behavior formation: practical application of the ideas of behaviorism]. *Vestnik Baltiiskogo federal'nogo universiteta im. I. Kanta. Seriya: Filologiya, pedagogika, psikhologiya*. 11: 81-85. [in Russian]

Tseng, Yeh, 2019 – *Tseng, S.-S., Yeh, H.-C.* (2019). Fostering EFL teachers' CALL Competencies Through Project-based Learning. *Educational Technology & Society*. 22(1): 94-105.

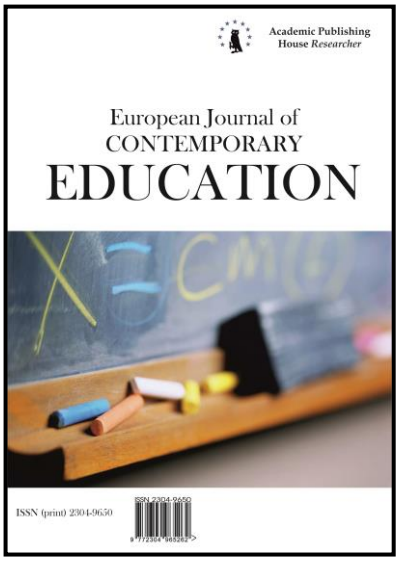
Vachkov, 2007 – *Vachkov, V.I.* (2007). Psikhologiya treningovoi raboty: Soderzhatel'nye, organizatsionnye i metodicheskie aspekty vedeniya treningovoi gruppy [Psychology of training work: Substantive, organizational, and methodological aspects of supervising a training group]. M.: Eksmo, 416 p. [in Russian]

Vodopianov, 2017 – *Vodopianov, D.A.* (2017). Fenomen psikhologicheskoi gotovnosti studentov – budushchikh psikhologov k professional'noi deyatel'nosti [Phenomenon of psychological readiness for professional activity of students – future psychologists]. *Akmeologiya*. 4(64): 41-46. [in Russian]

Zakharova, Yezhova, 2018 – *Zakharova, E.A., Yezhova, Yu.M.* (2018). Motivatsionnaya gotovnost' kak komponent psikhologicheskoi gotovnosti k professional'noi deyatel'nosti studentov-medikov [Motivational readiness as a component of psychological readiness for professional activity in medical students]. *Meditsinskii al'manakh*. 1(52): 14-18. [in Russian]

Zeidneret al., 2018 – *Zeidner, M., Matthews, G., Keefer, K., Parker, J., Saklofske, D.* (2018). Grace under pressure in educational contexts: emotional intelligence, stress, and coping. Emotional intelligence in education. The springer series on human exceptionality. Springer, Cham, 83-110. DOI: https://doi.org/10.1007/978-3-319-90633-1_4

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 113-126
DOI: 10.13187/ejced.2021.1.113
www.ejournal1.com



Involvement of Critical Thinking Education in University Studies: A Qualitative Research

Tomas Saulius [a, *], Romualdas K. Malinauskas [a]

[a] Lithuanian Sports University, Lithuania

Abstract

The current research addresses interesting and still mostly neglected question of how introductory philosophical disciplines (such as "Introduction to philosophy", "Introduction to ethics" etc.) affects students' comprehension of the concept of critical thinking which is one of the most important descriptive and normative notions in contemporary education. Addressing this issue we formulated following tasks. First, to outline a theoretical framework of the research by introducing models of critical thinking that are relevant in contemporary education. Second, to discover and compare undergraduate students' understanding of critical thinking before and after the completion of their philosophy classes. To complete the first task, the common methods of literature review (scoping, analysis, synthesis) were applied. The second task was completed by means of empirical (qualitative) research. Actual sample of current research consists of 15 undergraduates (first year) students from study program "Physical education and sports" in Lithuanian Sports University (LSU). The method of semi-structured interview was used in the current research. Participants were asked to give elaborated answers to 10 questions prepared in advance, as well as a range of additional questions which appeared to be relevant in the course of the interview. The participants were interviewed twice: the first time before the beginning of their philosophy classes (module "Philosophy of education"), and the second time after their completion. Our research leads to two conclusions. The first (conceptual) conclusion is that despite a great diversity of definitions and theoretical models of critical thinking the underling idea remains the same, namely, that of reflectivity, a general ability to discern different prospects of actions and to associate particular action with initial motives (needs, goals). The second (empirical) conclusion is that philosophical classes, as a kind of educational intervention, makes the idea of reflectivity more articulated in students' conceptions of critical thinking.

Keywords: critical thinking, reflectivity, argumentation, philosophy, physical education, sports.

* Corresponding author
E-mail addresses: tomassaulius@yahoo.com (T. Saulius), Romualdas.Malinauskas@lsu.lt (R.K. Malinauskas)

1. Introduction

Contemporary educational practice tends towards ideals of "student-centered education" and "meaningful education". These ideals, as well as strategies of their implementation, can be understood in different ways, depending on one's presuppositions. Among many options available, critical thinking education is widely recognized way to make studying in schools and universities meaningful. Researches and practitioners prioritize student's engagement in critical thinking both as an integral element of various specialized disciplines (Huber, Kuncer, 2016) and as separate subject of studies (Byerly, 2019). It is indispensable in the area of humanities which generally deal with qualitative information presented in the form of text (discourse, narrative) (McLaughlin, McGill, 2017). However, even studies of natural and behavioral sciences, that is, sciences, usually dealing with quantitative data, orient towards critical thinking ideal as one of the most important study outcome (Basel et al., 2013). Sport science and physical education (PE) is not an exception here. Future couches and PE teachers need critical thinking skills not only in academic contexts, but in practical problem-solving situations as well (Lodewyk, 2009; Pill, SueSee, 2017). Although these general topics are sufficiently covered in contemporary researches, the significance of particular disciplines, e.g. philosophy, for acquiring critical thinking skills needs more clarification. Especially interesting and still mostly neglected issue is how introductory philosophical disciplines (such as "Introduction to philosophy", "Introduction to ethics" etc.) changes students' comprehension of the very concept of critical thinking. Once one keeps in mind that the Western philosophy is traditionally occupied with "radical questioning" an "problematisation" of common beliefs, one is motivated to expect that in higher education philosophy classes has something to do with engaging in critical thinking and acquiring deeper understanding of what it means to think critically.

This paper aims to investigate how philosophy classes influence undergraduate students' understanding of the concept of critical thinking.

Pursuing the main aim of our research, we formulated following tasks:

First, to outline a theoretical framework of the research by introducing models of critical thinking that are relevant in contemporary education.

Second, to discover and compare undergraduate students' understanding of critical thinking before and after the completion of their philosophy classes.

To complete the first task, the common methods of literature review (scoping, analysis, synthesis) were applied. The second task was completed by means of empirical (qualitative) research. Actual sample of current research consists of 15 undergraduates (first year) students from study program "Physical education and sports" in Lithuanian Sports University (LSU). The method of semi-structured interview was used in the current research. Participants were asked to give elaborated answers to 10 questions prepared in advance, as well as a range of additional questions which appeared to be relevant in the course of the interview. The participants were interviewed twice: the first time before the beginning of their philosophy classes (module "Philosophy of education"), and the second time after their completion.

2. Literature review

"Critical thinking" has become a catchword in today academic language, including technical vocabulary of education science. It is a notion with difficult history and controversial contemporary usage. In what follows we will outline the main aspects of its development and semantics with the view of indicating the relevance of these aspects to the educational practice.

The idea of critical thinking dates back to Ancient Greece. In the teaching of the most Western philosophers – Socrates, Plato, and Aristotle – we find the same leitmotiv: one should enhance one's intellectual capacities, if one intends to attain true knowledge (theoretical aim) and true happiness (practical aim). For, example Socrates encourages his fellow citizens "to take care of their soul" what is intended to mean something opposite to "craving for pleasures" and "craving for glory", the most basic motives of human behavior (Vlastos, 1991). In Greek tradition, philosophy is a "therapy" of human soul, and in the case of Socrates it becomes a form of examination, so-called "elenctics" (Gr. *elenchos*), that is, the enquiry into the most dominant opinions concerning matters of morality. According to Socrates, "unexamined life is not worth living" (Hadot, 1995). This implies that philosophical education of Greek youth must aim at the skills of critical examination or reflection which are the necessary conditions of the meaningful life. The same idea underlies Platonic conception of "pure intellect" (Gr. *dianoia, nous*), as opposed to the faculties of

throughout "imperfect" human body, and Aristotelian notion of so-called "theoretical knowledge" (Gr. *theōretikē epistēmē*).

This Ancient conception finds new proponents among philosophers in 20th century. For example, John Dewey, forefather of philosophy of education (as an independent branch of theoretical enquiry), introduces the concept of reflection and explicates it as capacity to relate logically possible prospects of action and one's current aims (Dewey, 1997). In more precise language, to reflect means being able to gain information from one's environment, to infer multiple solutions of an issue from it, envisage the best possible solution, to implement this solution, to evaluate it in action, and, if one faces adverse consequences, to consider implementing other solution (Ibid.). Thus, critical thinking is a kind of problem solving and decision making the essential characteristic of which is "trials and errors method".

As we see, already Deweyan notion of reflectivity emphasizes contexts of problem solving which is important to later conceptualization of critical thinking. In 1990-ies the task to define the essential cognitive factors of something known under the heading of "critical thinking" was brought into interdisciplinary perspective. This enterprise finally resulted in *The Delphi Report* (Facione, 1990). According to this "statement of expert consensus", "critical thinking" signifies contemporary educational ideal which has two main dimensions: *skill dimension*, that is, wide repertoire of cognitive capacities, mainly associated with making sense of large or smaller bits of information; *disposition dimension*, that is, psychological tendencies to apply these skills in various problem-solving contexts (Ibid.). In short, "critical thinking" is both ability and stance.

There are several important elaborations of the paradigm presented in *The Delphi Report*. One of these – Robert Ennis' "a streamlined conception of critical thinking" (Ennis, 1962; 1989; 1991; 1996; 2013; 2018). According to Ennis' provisional definition, as a technical term "critical thinking" signifies "reasonable reflective thinking that is focused on deciding what to believe or do"" (Ennis, 1991: 8). In a sense, it is restatement of Deweyan ideal of reflectivity. Relative novelty and significance of Ennis' research lies in detailed classification of critical thinking skills and dispositions. In the skills dimension Ennis puts following categories of cognitive capacities (abilities): those involving clarification of an issue (argument analysis; identification of assumptions; etc.); abilities that provide basis for judgment on an issue (observation; deciding credibility of sources); those that involve inference or judgement making (deduction; induction; generalization; explanation); so-called "metacognitive abilities" (ensuring logical coherence, integration of beliefs into larger systems); finally, so-called "auxiliary critical thinking abilities" (monitoring of thinking procedure; identifying emotional aspects of thinking; feedback reception) (Ennis, 1991). Ennis identifies twelve dispositions of critical thinking (e.g., "to try to be well informed", "to look for alternatives" etc.) (Ibid.) which, on a closer look, have the same underlying idea: among the things that make our everyday thinking critical is an objective stance, a tendency to withhold our hasty conclusions and spontaneous judgements. One can question theoretical (philosophical) an empirical basis of Ennis' model, however, it has one evident merit, namely, practical applicability. It enables researches to operationalize the concept of "critical thinking", to identify quantitative factors for psychological testing.

For example, Ennis contributed significantly in composing *Cornell Critical Thinking Test (CCTT)*, one of the most popular instruments, which measures such factors as induction, deduction, observation, assumption, credibility of sources evaluation (Ennis et al., 1985). It seems, this instrument retains its validity in cross-cultural context (French et al., 2014). There is another instrument to evaluate critical thinking capacities – *The Ennis-Weir Critical Thinking Essay Test* (Ennis, Weir, 1985). It is designed to measure factors that are important in discourse comprehension and meaningful discussion: "getting the point"; "seeing the reasons and assumptions"; "stating one's point"; "offering good reasons" etc. According to authors of the test, it emphasizes "the logical dimension of critical thinking", understanding "logical" in a broad sense here (Ibid., p. 2). To put it otherwise, skills of argumentations are at the core of critical thinking.

According to *The Delphi Report* and Ennis' "streamlined conception", "critical thinking" is a much wider concept than "logical thinking". Formal (symbolic) logic courses focus on "logical structure" and "patterns of inference" sorting out valid ones and invalid ones (fallacies). In contrast, concept of critical thinking indicates that one should concern not only about validity of inference, but also about truth of one's premises and wider context of the legitimation of one's conclusions. Thus, the main issue to researches and educators is complexity of critical thinking, involvement of different skills and sets of skills in "deciding what to believe or do". Model of Jane

Halonen (1995) encompasses cognitive (performative), metacognitive (monitoring), and emotional dimensions, as well as attitudes of critical thinker. Here cognitive dimension is elaborated more thoroughly comparing with other aspects. It consists of foundation skills (describing; recognizing; interpreting; identifying; listening), higher level skills (applying; evaluating; generating; challenging), and complex skills (problem-solving; theory building; formal criticism etc.) (Ibid.). Thus, Halonen introduces hierarchical order in critical thinking skills taxonomy. This is what Ennis opposes to. He emphasizes that critical thinking skills are interdependent; "although synthesis and evaluation generally do require analysis, analysis generally requires synthesis and evaluation" (Ennis, 1991: 179). At any rate, Halonen's model does not differ from that of Ennis significantly. In both cases critical thinking keeps close to the process of argumentation, legitimation of one particular belief at expense of alternatives. It seems that these two models have a following implicit presupposition in common: one applies the same cognitive capacities whether one is arguing with himself or with others.

The main issue is that educational practice needs definite guidelines, even at the cost of theoretical precision. Usually the level of "resolution" (number of conceptual items) of a theoretical model is inversely proportional to its intelligibility and practical applicability. Thus, we have a quite natural tendency to simplification in the modeling of critical thinking. For example, the model of critical thinking which was constructed by Richard Paul and Linda Elder (Elder, 2005; Paul, Elder, 2006; 2007; 2008; Elder, Paul, 2013; Paul, Heaslip, 1995; Paul et al., 1997) includes three main sets: elements of reasoning/thought (clarity; accuracy, relevance; logicalness etc.); intellectual standards (purposes; questions; points of view; information); intellectual traits (humility; autonomy; integrity etc.). Being critical means application of particular standards (rational criteria) to particular elements (information, content) aiming to elaborate certain traits (personal characteristics). Thinking critically has an offshoot of becoming a critical thinker (Sullivan, 2012). It implies that critical thinking education makes a substantial contribution to personal growth. One can regard practice of critical thinking as a dimension of character development.

In recent years, we have an important shift from *critical thinking* as a special set of skills view to a broader conception that focuses on *critical thinker* as a special type of personality. This shift is evident in the work of Vincent Ruggiero (2003; 2014; 2015). He emphasizes that "intelligence isn't just something we have. It is, more importantly, something we do" (Ruggiero, 2015: 1). According to popular opinion, critical thinking implies a particular attitude towards *others* (information providers, discussion participators): we intend to examine *externalized* beliefs and sources of these beliefs. However, Ruggiero stresses an *internal* orientation of critical thinking, that is, one's readiness to introspect, to identify one's own beliefs and examine them in the light of personal experience and common knowledge (Ruggiero, 2014). He introduces critical thinking as based on fundamental principles: first, one should discover truth, not invent it; second, among two incompatible statements one is false; third, human mind is biased, fallible; fourth, our beliefs have practical consequences (Ruggiero, 2003). These principles ground Ruggiero's ideal of reflective practical thinking.

In summary, at the conceptual level we have different models which, in general, imply the same idea of reflectivity. Critical thinking is "thinking about one's thinking", and it is something opposite to automatic decision-making or spontaneous generating of ideas ("brainstorming"). "Critical thinking" is a designation not so much of a distinctive feature of "professional thinkers" (philosophers, theoreticians, scientists etc.), as of a capacity (or a set of capacities) which, among other things, constitutes an educated individual, a bearer of Western culture.

3. Materials and methods

In our research qualitative approach was employed. According to John Creswell (2007; 2012; 2016), adoption of this approach enables researches to concentrate on a phenomenon in its immediate context; to observe a phenomenon taking into account its dynamics (continuous change) and complexity; to make smaller groups and lesser-scale phenomena legitimate objects of scientific research and theory construction. All these aspects motivated our methodologic preferences in the current research. There are various different designs of qualitative research (grounded theory, phenomenology, narrative research etc.). However, our research is a basic study the distinctive feature of which is that it does not conform to any of these specific designs (Creswell, 2016). Reflective attitude to theoretical presuppositions of a researcher and

sensitiveness to participant's lived experience of a phenomenon – these are the basic methodological principles of the current qualitative research.

To perform our research, we made purposeful sampling which is recommended for qualitative studies (Frost, 2011; Creswell, 2012). Our target sample consisted of all (n = 31) first year undergraduate students of study program "Physical education and sports" in Lithuanian Sports University (LSU). However, actual sample of our research included 15 of overall 31 students, because of the evident repetition of participants' answers (sample saturation).

In accordance with recommendations (Frost, 2011), semi-structured interview was chosen as a data collection method. Participants were given 10 items questionnaire prepared in advance. It included such open-ended questions as following: *"What features makes one's thinking something you call 'critical thinking'?"*; *"Could you give a detailed example of a situation where critical thinking was especially helpful to you?"*; *"Which popular person is exemplary critical thinker in your opinion? Why?"* etc. The questionnaire was prepared on the basis of the theoretical models of Ennis, Paul and Elder, and Ruggiero discussed above. Depending on their answers, participants were given a range of additional questions, such as following: *"You named your coach as an exemplary critical thinker? What about representatives of other professions or activities?"*; *"You stressed an importance of critical thinking for your studies? What about your other activities?"* etc. Participants were interviewed individually, face-to-face. They were initially provided with information about objectives of the research, as well as guaranties of anonymity and confidentiality of gathered data. A duration of an interview varied from about 34 to 60 min., with an average interview lasting about 42 min. The interviews were recorded and transcribed literatim.

Participants were interviewed twice: the first time before taking their "Philosophy of education" classes in January, and the second time after a completion of this study module in June. Our research was conducted in 2018.

Participants of the research were exposed to educational intervention, that is, lectures and seminars of the module "Philosophy of education" (which was included among general university studies courses until the fall of 2018). During lectures participants learned about the main paradigms of Western educational philosophy (rationalism, empiricism, pragmatism, existentialism). The concept of critical thinking was discussed in the contexts of Plato's rationalism and Dewey's pragmatism. During seminars students were familiarized with and practically applied such methods of active learning as concept mapping and argument diagramming. In their classes students were being encouraged not only to question popular pre-philosophical beliefs and philosophical doctrines, but also to argue for and reflect on their own opinions about education. This practice was explicitly identified by teacher as critical thinking.

4. Results

In what follows, we are presenting analysis of the qualitative data acquired during our research. The main aim of such analysis is making sense of raw data by application of the four-step procedure: first, dividing interview transcriptions into segments of information and labeling these segments with codes; two, discarding overlapping and redundant codes; third, collapsing codes into themes; finally, different themes can make a coherent storyline or can be combined into dimensions which provide explanation of the central phenomenon (Saldaña, 2011; Creswell, 2016).

Answers which participants gave before educational intervention are combined in 14 codes, 6 themes and 2 dimensions.

Our research shows that first year undergraduate students tend to associate the concept of the critical thinking with their earlier school learning experiences and current academic experiences in the university (the first dimension) (see Table 1). According to participants (A2, A3, A4, A7, A9, A11, A12), critical thinking is useful for individual assignments, such as essay writing and presentations. The lack of critical thinking skills is very frequently associated with group discussion contexts (A1, A2, A3, A5, A9, A11, A12, A14, A15). The third of participants (A2, A3, A6, A9, A12) apply critical thinking in evaluation of study materials.

Table 1. Comprehension of critical thinking in the dimension of school experiences and university studies (before educational intervention)

Themes	Codes	Examples of quotations
Academic writing	Detecting contradictions	*"<…> I kept searching [materials] for the essay and finally noticed that all these articles contradict one another"* (A11); *"I completed my work [essay] <…> I got nervous because what I was saying in the introduction [i.e. thesis statement] refuted these things at the end of the [body] text"* (A2); *"He [school teacher] contradicted himself all the time"* (A3).
	Detecting nonsense	*"He [author of an article] said nonsense. He tried to say that external motivation does not matter. Absurd."* (A3); *"When I looked at my article review later, I saw that I couldn't understand myself. Many sentences made no sense whatever"* (A7).
Reception of study materials	Evaluating sources	*"In his lecture the [university] teacher was citing old handbooks. I mean, from the previous age"* (A12); *"Then he [school teacher] asked us to watch a clip of very poor quality from YouTube. <…> It is ridiculous"* (A9).
	Questioning competences	*"The [university] teacher all the time speaks about NBA, their offence, tactics. As if he ever worked here. I doubt it"* (A6); *"Then he [university teacher] said that our group project is nonsense. <…> How could he decide it? He just reads the same lectures for years without inventing something new"* (A3).
	Requiring facts	*"One requires critical thinking when during lecture one is told that so and so is a case without any facts"* (A6); *"To became a specialist <…> means not to learn a handbook by heart, but, namely, to ask why these things are in the handbook"* (A2).
Participation in group discussion	Grasping a point	*"He [another student] was keeping trying to prove me wrong until the end of the seminar without hearing what I wanted to say"* (A1); *"Speaking about lectures, seminars and presentations and so on, one thinks critically if one is able to understand what another person says. Even if the latter speaks unclearly"* (A12).
	Making a point	*"She [school teacher] could speak hours and hours and she used to forget what she wanted to say"* (A5); *"The worst thing is when during a seminar everybody is arguing and nobody of them knows what they want to prove"* (A1).

"Everyday extracurricular activities" is the second dimension which unfolds in participants' answers before educational intervention (see Table 2). Two thirds of participants acknowledge the importance of critical thinking in verbal communication (A1, A2, A3, A5, A6, A8, A9, A12, A15). As for this theme, for most of participants to think critically means being able to identify true and false information in the claims of other people (family members, friends, peers etc.) (A1, A2, A3, A5, A9, A12, A15). Two another important themes are articulated in the second dimension, namely, dealing with mass media information (A2, A6, A7, A10, A11, A15) and making moral decisions in various contexts (A2, A6, A7, A13).

Table 2. Comprehension of critical thinking in the dimension of everyday extracurricular activities (before educational intervention)

Themes	Codes	Examples of quotations
Everyday communication	Discerning lie and truth	*"My mom is a perfect critical thinker [laughs]. She always know when I try to lie about my studies and other things"* (A9)*; "Thinking critically is an ability to tell whether somebody is cheating or speaking truth"* (A15)
	Saying what one knows	*"My coach is a critical thinker. He says only things he knows. When he does not know, he acknowledges it"* (A6); *"Our history teacher taught us to think critically, because she always asked for facts and used to say that people usually distort truth"* (A2).
	Being impartial	*"<…> only very few people think critically, to put it otherwise, are impartial and interested in things different people what to prove"* (A1); *"I think critically when I find out what different people say and belief <…> and then decide what truth is"* (A3)
Making sense of mass media information	Detecting fake news	*"There are many fake news in the internet and Facebook, especially in comments. I always read them critically"* (A11); *"In dorm I always hear rumors that somebody stole something or cheated her boyfriend or something else. One must think critically in these cases"* (A10).
	Reading and watching without believing	*"If you read about something in the internet, in the Reddit, for example, or watch something on TV, you usually think 'Oh, this is interesting!' But you shouldn't believe it"* (A9). *"People read all this junk [in the internet] and, for example, they decide to become vegetarians. Thus they do harm to themselves"* (A7).
Making moral decisions	Choosing the best option	*"Playing football or basketball, you can make different decisions. But you cannot play selfishly. <…> You must choose what is the best for your team"* (A5); *"By 'critical thinker' I mean that we must decide what must be done in a particular situation. Young people usually do what they want to do"* (A7).
	Learning from one's mistakes	*"Everybody makes many mistakes in their lives and feels guilty, but only few learn from them. I think this is a critical thinking"* (A13). *"My rule is that a wrong deed always brings bad consequences. <…> I know it from my own experience and I try not to do bad things to other people"* (A2).

Answers which participants gave after educational intervention are combined in 16 codes, 7 themes and 3 dimensions.

After being exposed to educational intervention, participants articulate very similar dimension – that is, "university studies" – as before intervention (see Table 3). This dimension becomes narrower, to be more precise, after educational intervention participants tend to focus on their experiences in the university leaving their learning in shool experiences behind. In this dimension, participants (B1, B2, B3, B8, B13, B14, B15) tend to associate critical thinking with the theme of the study materials reception (as before intervention). There is the second theme, namely, "participation in group discussion", which remains important for most participants (B1, B4, B7, B8, B10, B13, B14, B15) after educational intervention. Finally, participants' answers (B1, B2, B4, B8, B10) unfold the third theme of making personal sense of one's studies in university (that is,

"meaningful learning"), the theme which is rather new comparing with participants' interview before intervention.

Table 3. Comprehension of critical thinking in the dimension of university studies (after educational intervention)

Themes	Codes	Examples of quotations
Reception of study materials	Discerning what is important	*"Preparing for exams, you just cannot learn and remember everything. One must think critically and chose what is the most important"* (B8); *"Teachers say many things, but not all of them make any sense for me as a future PA teacher. There are many things which, I think, are unimportant"* (B1)
	Asking questions	*"<…> many students don't ask questions to teachers. According to them, to ask a question is something shameful. Critical thinker, I mean a student, asks questions"* (B13); *"They [other students] pretended that they understood everything. There were no questions. <…> But you must ask in order to learn something"* (B3).
Meaningful learning	Testing things in practice	*"I think that you must practice something first and only then read scientific articles, because not everything they say are effective in practice"* (B10); *"I work in a gym and I know that what he [teacher] said is not a case. Nobody works in the way he speaks about"* (B1).
	Enriching oneself with knowledge	*"When one thinks and learns <…>, one enriches oneself with knowledge. He knows what scientist have discovered in their articles"* (B2); *"When I study I learn something new what, maybe, my school teachers do not know"* (B8).
Participation in a group discussion	Learning to argue	*"But in our group students usually shout, but not argue <…>. But I think they learn little by little to argue"*(B14); *"It is easier to talk about various things with others when you know about 'argument', 'premises', what these things mean"* (B7).
	Accepting reasonable opinions of others	*"It is not true that I do not accept an opinion if it is not my opinion. <…> I can accept anyone's opinion if he can speak clearly and prove it"* (B1); *"What is a point in claiming something if you cannot defend it? <…> Everybody will think that you are speaking nonsense"* (B4).

After educational intervention participants tend to be more explicit about how they imagine themselves working as teachers in future and about the most important challenges of being a teacher in general. Thus, their answers unfold the second dimension – "teacher's professional development" (see Table 4). It comprises two themes. Firstly, about a half of participants emphasizes the importance of teacher's reflective stance towards common educational beliefs and practices (B1, B3, B4, B8, B11, B13, B15). Secondly, some respondents (B5, B8, B13, B11) stress the teacher's lifelong learning orientation as a major of his professional success.

Table 4. Comprehension of critical thinking in the dimension of teacher's professional development (after educational intervention)

Themes	Codes	Examples of quotations
Reflecting common educational beliefs and practices	New attitude toward students	*"Teachers, especially PE teachers, treat students as children, but not as personalities. I think it is old-fashioned attitude"* (B15)*; "If a she [a teacher] does not respect you, she can only shout at you or ignore you, but not make you better"* (B3).
	Knowing students' needs and expectations	*"All people have their needs and expect to satisfy their needs. But teachers usually do not know what students need"* (B8); *"In schools <…> teachers' job was to stuff student with lots of information. But students need something else. For example, to find a job, to write a CV"* (B1)
	Teacher is not Wikipedia	*"I know that a teacher is not a walking Wikipedia <…>. But my personality must be attractive if I want to work as a teacher"* (B13); *"Teacher comes and tells something you can find in the internet. But young people come to school or university not to listen about something you can find in Google"* (B4).
Teacher's lifelong learning	Following scientific development	*"The best teachers know not only what they learned in universities, but they are interested in science, read a lot"* (B5); *"Being PE teacher, one must know how to do warming-up, how to run, even what to eat. <…> He [PE teacher] must read scientific papers all the time, to understand [them] and to explain [them] to students"* (B8).
	Discarding what does not work	*"If I were PE teacher, I would say: 'Okay, this is not working. I will do it in a new way. I will make my lesson interesting'"* (B13); *"A teacher thinks critically when she knows that some things go wrong in her lessons and she tries to make her lessons better, to immerse students in her subject"* (B11).

Finally, there is the third dimension – "moral decisions and interactions" – which unfold in participants' answers after educational intervention (see Table 5). After completion of their philosophy classes, more than a half of participants (B2, B3, B5, B7, B9, B10, B12, B13) associated critical thinking with reflective attitude toward their own moral beliefs and decisions. An idea of moral autonomy is another important theme in the third dimension. Some participants (B1, B2, B4, B15) tend to associate critical thinking with being moral subjects which are reflective and unrestrained by social context.

Thus, our research shows that that after educational intervention participants' answers tent to be more diverse (unfolding more qualitative categories) comparing with participants' answers before educational intervention. As one can expect, after their philosophical classes participants tends to be more elaborate on themes (e.g., reflection of commonsensical notions, moral autonomy) which are more or less significant in the field of academic philosophy.

Table 5. Comprehension of critical thinking in the dimension of moral decisions and interactions (after educational intervention)

Themes	Codes	Examples of quotations
Reflecting one's own moral beliefs and decisions	Defining personal values	*"If a person has no values, he definitely is not a critical thinker, he just drifts down the stream"* (B13); *"Many young people have no strong values and imitates their peers, uses alcohol, drops their studies <…>"* (B5).
	Choosing goal	*"You should know what to do with your life. <…> [one should] chose a definite goal and purse it consistently"* (B10); *"Without a goal everything is meaningless. <…> A person which thinks critically has a goal even in the darkest period of his life"* (B3).
	Choosing means	*"Say, I want to be a scientist or a coach. So what? <…> You can want anything, but you must decide what means leads to something you want"* (B9); *"If a person is unsuccessful this means that you [i.e. this person] live[s] in your [his] fantasies. <…> think what can you do here and now"* (B13)
Becoming autonomous	Question moral norms of others	*"To think critically is to philosophize, to think that what all people think to be good or moral, maybe, is not moral, because they just learned it from their parents"* (B2); *"When you watch TV a lot or spend much time in Facebook, you find out that it is a normal thing to slander someone or even to rob or kill. But if you are reasonable, you know it is nonsense"* (B15)
	Using one's own head	*"Nobody can decide what is best for me, what I should do. <…> one should not listen to others but use one's own head"* (B1); *"To think critically <…> is being free, not under control of others, <…> not doing what other people makes you to do"* (B4).

5. Discussion

In what follows, there is a discussion of the most important findings of our research. First of all, we are to outline a general context relevant to the understanding of these results. Next, we will address the most conspicuous dimensions and themes which unfolded before and after educational intervention.

How do notions of critical thinking and critical thinker apply to contemporary educational practice? This is a complex question, and, for the purposes of the paper, it will suffice to make the following points. First, there is strong tendency to make argumentation the paradigm case of critical thinking in action. That is, contemporary literature implies that to be a critical thinker means to be good in argument analysis and argument presentation (e.g. Rainbolt, Dwyer, 2012). Theory of argumentation provides clear criteria for teaching and testing student's critical thinking skills. These skills include ability to formulate and identify thesis statement, premises and sub-premises, ability to ensure and evaluate logical coherence of an argument (Lau, 2011). Beginning with the Greeks and, maybe, with the exception of Dewey, there is an inclination to interpret problem-solving contexts as contexts of public discussion, beliefs exchange. Following Plato, thinking is being interpreted as "soul's silent dialogue with herself", and educators try to make this dialogue to conform to the standards of informal logic (see Hooks, 2010: 43ff.). Second, in contemporary education, there is strong tendency to conceptualize critical thinking in terms of productivity. To be a critical thinker means to produce sound arguments and make correct decisions. Educators avoid to identify critical thinking with skeptical stance (withholding one's judgement or decision on the issue on question) (Lipman, 1995; 2003). Thus, "critical" becomes a synonym for "efficient". Finally, philosophy tends to lose its status of unique discipline where critical thinking is "at its best". Recent handbooks identify critical reasoning with so-called

"scientific method" the essence of which is the ability to discern between objective facts and subjective truths and the ability to infer testable predications from reliable facts (e.g. Carey, 2011). That is, thinking critically means thinking in scientific way, conforming to scientific standards of meaning and truth in daily life situations.

Keeping in mind the first tendency, theme "Participation in a group discussion" quite expectedly unfolds both in the interview before educational intervention (when school learning experiences of the participants are still lively) and after intervention (when university curriculum plays a more important role). In both interviews this theme appears in dimension of personal studying in university experiences. In this theme, critical thinking, mostly, is understood to be a set of skills that student lacks. According to participants, immediate result of this deficiency is that group discussions become tedious and unconstructive (remember the second tendency mentioned above). This accord well with other researches. For example, qualitative research of Basel and colleagues (2013) addressed question how students argue discussing the topic of evolution in biology (that is, in the context of scientific education). In this research it was found that students use different schemes in their argumentation and that causal reasoning, argument from example(s), argument from analogy are the most preferable among them. However, students' arguments, in general, are of very low complexity (single claims without justification) and low complexity (claim justified by a single ground). The same difficulties with argumentation in scientific contexts are reviled by other researches (Berland, McNeill, 2010). In our research after educational intervention in a few cases group discussion theme unfolds in positive light, that is, participants note improvement of students' argumentation skills. However, previous quantitative researches (e.g. Harell, 2011) notices that introduction of argument diagramming (a method used in our educational intervention) increases significantly the scores of low-achieving students in their philosophy classes.

As noticed earlier, our research shows that before educational intervention in the dimension of school and university learning experiences participants tends to associate the notion of critical thinking with a rather reserved attitude to study materials. Questioning teachers' claims, sources and competences is conspicuous leitmotiv here. However, after educational intervention participants associate critical thinking with prospect of their future work as teachers. In this respect, critical thinking has something to do with one's professional development. It accords with other studies. For example, researches (Moeti et al., 2017) found out that PGDE (Post-Graduate Diploma in Education) students associate critical thinking with teachers' career and professional development, even if they feel lacking critical thinking skills themselves and notice the lack of critical thinking education in current programs. In another qualitative study (Marin, de la Pava, 2017) EFL (English as a Foreign Language) teachers acknowledge critical thinking as an important element of teacher's competence although they have some difficulties to explicate the very notion of critical thinking at conceptual level.

Finally, our research indicates interesting unfolding of the association between critical thinking and moral intelligence (or competence) due to educational intervention. Before intervention participants discussed moral decisions in the dimension of everyday activities (engaging in sports, meeting friends, interacting with family members, dealing with informational influence of the mass media etc.). However, after educational intervention moral intelligence constitutes a separate dimension where the main emphasis lays on reflective attitude toward common morality and moral autonomy. It is in line with other studies on the issue. For example, in qualitative research of Davies and Heyward (2019) participants emphasized that teaches education should focus on "student teachers finding their own authentic ethical voice, through the examination of ethical dilemmas via critical thinking and the wider examination of the political, historical and social contexts that led to the dilemma" (p. 1). This is not unexpected outcome for, as researches conclude (Maxwell, Schwimmer, 2016), for the last 30 years, there has been general and unchallenged consensus in literature that ethical element should be persistent throughout teacher education curriculum. According to quantitative researches (Park et al., 2012), longer involvement in thinking about ethical issues is associated with higher principled thinking scores.

Being compared with the findings of other researchers, the results of current research clearly indicates that due to educational intervention concept of critical thinking is being associated with inward orientation, that is, recognition of one's personal responsibility for one's moral decisions and professional success.

6. Conclusion

Current research leads to two main conclusions. The first conclusion (conceptual one) is that despite a great diversity of definitions and theoretical models of critical thinking the underling idea remains the same, namely, that of *reflectivity*, a general ability to discern different prospects of actions and to associate particular action with initial motives (needs, goals). To put it otherwise, it is idea of moral agent who not only enjoys freedom of decisions (at least conceived freedom, if not actual) but also takes consciously risks to turn his decisions into actions and to face their consequences. The second conclusion (empirical one) is that philosophical classes, as a kind of educational intervention, makes the idea of reflectivity more articulated in students' conceptions of critical thinking. Before educational intervention they tend to emphasize external orientation in their conceptions of critical thinking, that is, to treat it as an attitude towards knowledge, beliefs, decisions and norms of others (peers, family members, teachers, media). After intervention students tends to articulate the notion of critical thinking in terms of their own decisions, skills and prospects of professional development. Of course, it is only provisional conclusion which need elaboration in future researches (both qualitative and quantitative).

References

Basel et al., 2013 – *Basel, N., Harms, U., Prechtl, H.* (2013). Analysis of Students' Arguments on Evolutionary Theory. *Journal of Biological Education*. 47(4): 192-199.

Berland, McNeill, 2010 – Berland, L.K., McNeill, K.L. (2010). A Learning Progression for Scientific Argumentation: Understanding Student Work and Designing Supportive Instructional Contexts. *Science Education*. 94(5): 765-793.

Buerly, 2019 – *Buerly, T.R.* (2019). Teaching for Intellectual Virtue in Logic and Critical Thinking Classes: Why and How. *Teaching Philosophy*. 42(1): 1-27.

Carey, 2011 – *Carey, S.S.* (2011). A Beginner's Guide to Scientific Method. Boston (MA): Cengage Learning.

Creswell, 2007 – *Creswell, J.W.* (2007). Qualitative Inquiry & Research Design. Choosing Among Five Approaches. London: Sage Publications.

Creswell, 2012 – *Creswell, J.W.* (2012). Educational Research. Planning, Conducting, and Evaluating Quantitative and Qualitative Research. Boston, MA: Pearson Education, Inc.

Creswell, 2016 – *Creswell, J.W.* (2016). 30 Essential Skills for the Qualitative Researcher. Los Angeles: Sage Publications.

Davies, Heyward, 2019 – *Davies, M., Heyward, P.* (2019). Between A Hard Place and A Hard Place: A Study of Ethical Dilemmas Experienced by Student Teachers While on Practicum. *British Educational Research Journal*. 45(2): 372-387.

Dewey, 1997 – *Dewey, J.* (1997). How We Think. Mineola, New York: Dover Publications, Inc.

Elder, 2005 – *Elder, L.* (2005). Critical Thinking as the Key to the Learning College: A Professional Development Model. *New Directions for Community Colleges*. 130: 39-48.

Elder, Paul, 2013 – *Elder, L., Paul, R.* (2013). 30 Days to Better Thinking and Better Living Through Critical Thinking, Revised & Expanded: A Guide for Improving Every Aspect of Your Life. Upper Saddle River, NJ: FT Press.

Ennis, 1962 – *Ennis, R.H.* (1962). A Concept of Critical Thinking. *Harvard Educational Review*. 32(1): 81-111.

Ennis, 1989 – *Ennis, R.* (1989). Critical thinking and subject specificity: Clarification and needed research. *Educational Researcher*. 18: 4-10.

Ennis, 1991 – *Ennis, R.H.* (1991). Critical Thinking: A Streamlined Conception. *Teaching Philosophy*. 14(1): 5-23.

Ennis, 1996 – *Ennis, R.H.* (1996). Critical Thinking. New Jersey: Prentice Hall.

Ennis, 2013 – *Ennis, R.H.* (2013). Critical Thinking Across the Curriculum: The Wisdom CTAC Program. *Inquiry: Critical Thinking across the Curriculum*. 28(2): 25-45.

Ennis, 2018 – *Ennis, R.H.* (2018). Critical Thinking across the Curriculum: A Vision. *Topoi*. 37(1): 165-184.

Ennis, Weir, 1985 – *Ennis, R.H., Weir, E.* (1985). The Ennis-Weir Critical Thinking Essay Test. Pacific Grove, CA: Midwest Publications.

Ennis et al., 2005 – *Ennis, R.H., Millman, J., Thomko, T.N.* (2005). Cornell Critical Thinking Tests Level X & Level Z Manual. USA: The Critical Thinking Co.

Facione, 1990 – *Facione, P.A.* (1990). Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction. Executive Summary: "The Delphi Report". Millbrae, CA: The California Academic Press.

French et al., 2014 – *French, B.F., Hand, B., Nam, J., Yen, H.J., Vazquez, J.A.V.* (2014). Detection of Differential Item Functioning in the Cornell Critical Thinking Test across Korean and North American students. *Psychological Test and Assessment Modeling*. 56(3): 275-286.

Frost, 2011 – *Frost, N.* (2011). Qualitative Research Methods in Psychology. Combining Core Approaches. Maidenhead (Berkshire, England): Open University Press.

Hadot, 1995 – *Hadot, P.* (1995). Philosophy as a Way of Life: Spiritual Exercises from Socrates to Foucault. Malden, MA: Blackwell Publishing.

Halonen, 1995 – *Halonen, J.S.* (1995). Demystifying Critical Thinking. *Teaching of Psychology*. 22(1): 75-81.

Harel, 2011 – *Harel, M.* (2011). Argument Diagramming and Critical Thinking in Introductory Philosophy. *Higher Education Research & Development*. 30(3): 371-385.

Hooks, 2010 – *Hooks, B.* (2010). Teaching Critical Thinking. Practical Wisdom. London: Routledge.

Huber, Kuncel, 2016 – *Huber, C.R., Kuncel, N.R.* (2016). Does College Teach Critical Thinking? A Meta-Analysis. *Review of Educational Research*. 86(2): 431-468.

Lau, 2011 – *Lau, J.Y.F.* (2011). An Introduction to Critical Thinking and Creativity: Think More, Think Better. New York: John Wiley & Sons.

Lipman, 1995 – *Lipman, M.* (1995). Moral Education Higher-Order Thinking and Philosophy for Children. *Early Child Development and Care*. 107(1): 61-70.

Lipman, 2003 – *Lipman, M.* (2003). Thinking in Education. Cambridge: University Press.

Lodewyk, 2009 – *Lodewyk, K.R.* (2009). Fostering Critical Thinking in Physical Education. *Journal of Physical Education, Recreation & Dance*. 80(8): 12-18.

Marin, de la Pava, 2017 – *Marin, M.A., de la Pava, L.* (2017). Conceptions of Critical Thinking from University EFL Teachers. *English Language Teaching*. 10(7): 78-88.

Maxwell, Schwimmer, 2016 – *Maxwell, B., Schwimmer, M.* (2016). Professional Ethics Education for Future Teachers: A Narrative Review of the Scholarly Writings. *Journal of Moral Education*. 45(3): 354-371

McLaughlin, McGill, 2017 – *McLaughlin, A.C., McGill, A.E.* (2017). Explicitly Teaching Critical Thinking Skills in a History Course. *Science & Education*. 26(1-2): 93-105.

Moeti et al., 2017 – *Moeti, B., Mgawi, R.K., Moalosi, W.T.S.* (2017). Critical Thinking among Post-Graduate Diploma in Education Students in Higher Education: Reality or Fuss? *Journal of Education and Learning*. 6(2): 13-24.

Park et al., 2012 – *Park, M., Kjervik, D., Crandell, J., Oermann, M.H.* (2012). The Relationship of Ethics Education to Moral Sensitivity and Moral Reasoning Skills of Nursing Students. *Nursing Ethics*. 19(4): 568-80.

Paul, Elder, 2006 – *Paul, R., Elder, L.* (2006). Critical Thinking. Tools for Taking Charge of Your Learning and Your Life. Columbus, Ohio: Pearson Prentice Hall.

Paul, Elder, 2007 – *Paul, R., Elder, L.* (2007). Critical Thinking Competency Standards. Dillon Beach, CA: The Foundation for Critical Thinking Press.

Paul, Elder, 2008 – *Paul, R., Elder, L.* (2008). Intellectual Standards: The Words That Name Them and the Criteria That Define Them. Dillon Beach, CA: The Foundation for Critical Thinking Press.

Paul, Heaslip, 1995 – *Paul, R., Heaslip, P.* (1995). Critical Thinking and Intuitive Nursing Practice. *Journal of Advanced Nursing*. 22: 40-47.

Paul et al., 1997 – *Paul, R., Elder, L., Bartell, T.* (1997). California Teacher Preparation for Instruction in Critical Thinking: Research Finding and Recommendations. Sacramento: California Commission on Teacher Credentialing.

Pill, SueSee, 2017 – *Pill, S., SueSee, B.* (2017). Including Critical Thinking and Problem Solving in Physical Education. *Journal of Physical Education, Recreation & Dance*. 88(7): 43-49.

Rainbolt, Dwyer, 2012 – *Rainbolt, G.W., Dwyer, S.L.* (2012). Critical Thinking. The Art of Argument. Boston: Wadsworth, Cengage Learning.

Ruggiero, 2003 – *Ruggiero, V.R.* (2003). Making Your Mind Matter. Strategies for Increasing Practical Intelligence. Lanham, Maryland: Rowman & Littlefield Publishers, Inc.

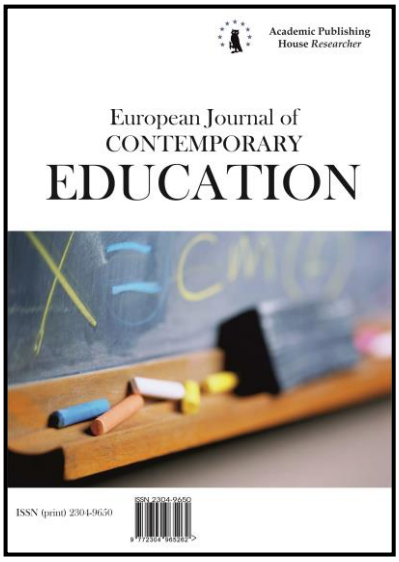
Ruggiero, 2014 – *Ruggiero, V.R.* (2014). Becoming a Critical Thinking. Boston: Wadsworth, Cengage Learning.

Ruggiero, 2015 – *Ruggiero, V.R.* (2015). Beyond Feelings: A Guide to Critical Thinking. New York: McGraw-Hill.

Saldaña, 2011 – *Saldaña, J.* (2011). Fundamentals of Qualitative Research. Oxford: Oxford University Press.

Vlastos, 1991 – *Vlastos, G.* (1991). Socrates: Ironist and Moral Philosopher. Cambridge: Cambridge University Press.

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 127-136
DOI: 10.13187/ejced.2021.1.127
www.ejournal1.com



Virtual Reality – Part of Supervised Teaching Practice for University Students – Future Teachers?

Mariana Sirotová [a], Veronika Michvocíková [a, *]

[a] University of ss. Cyril and Methodius, Slovak Republic

Abstract

The submitted study is of theoretical-empirical character. The theoretical part defines given key terms related to the issue of supervised teaching practice for future teachers. In addition to a brief characterisation of supervised teaching practice, attention is paid to the position and importance of information and communication technologies in the life of young people today. There is a brief definition of virtual reality and the attention of the study is focused on its using by young people, especially university students. The empirical part contains partial results of our own empirical study executed via a quantitative analysis of data acquired through online questionnaires, in which students of teaching answered questions related to using virtual reality during their supervised teaching practice. The acquired data were analysed by a statistical software called SPSS 20. The interpretation of results related to the given issue is based on the results of univariate, bivariate and multivariate data analyses. Multivariate data analyses was realized by correspondence analyses and the most important results of our research are illustrated in the graph of correspondence analyses – correspondence map. The main goal of the study is to emphasize the possibilities and methods of utilising virtual reality in supervised teaching practice for university students – future teachers.

Keywords: education, supervised teaching practice, university students, virtual reality.

1. Introduction

University education of future teachers is an integral part of the young people's preparation for the teaching profession. The job of a teacher, who not only educates but also shapes future generations' character, is very demanding. Through his or her activities, every teacher should communicate to children and youth the generally accepted social norms and values. For this reason, it is important to ensure that the preparation of future teachers corresponds to

* Corresponding author
E-mail addresses: veronika.michvocikova@ucm.sk (V. Michvocíková), mariana.sirotova@ucm.sk (M. Sirotová)

contemporary social development. What becomes important is not only the content and focus of the pre-graduate preparation but also its character. The efficiency of future teachers' education can be achieved by an ongoing improvement of the educational process at a university. Today, this process can be aided by various modern information and communication technologies and their extensive utilisation in the educational process. Because the university education of future teachers includes the realisation of supervised teaching practice, the gradual penetration of modern information and communication technologies will apply to this area as well. As a result, this study would like to introduce some possibilities and methods of using information and communication technologies to improve the supervised teaching practice's efficiency.

Supervised teaching practice

"The goal of supervised teaching practice is to gradually change a student's attitude to the attitude of a teacher. It enables future teachers to acquire basic pedagogical skills necessary for the teaching profession." (Dytrtová, 2009: 73). Through supervised teaching practice realisation, a university student ceases to look at the educational process in the chosen type of school from a student's point of view. Over time, a future teacher starts to realise the importance of particular activities closely connected to the teaching profession. Based on the stated general characteristic and the subsequently set goal of supervised teaching practice, we can summarise the main tasks of this practical part of future teachers' pre-graduate preparation (Dytrtová, 2009: 73):

- motivating students for the teaching profession;
- developing students' pedagogical thinking and the ability to apply the knowledge of psychology in their work with pupils;
- applying professional education into a school reality;
- developing the ethical part of a teacher's personality in the context of social communication;
- developing the organisational and managerial skills of future teachers.

In our opinion, one of the main tasks of supervised teaching practice is to motivate students of teaching to perform their future teaching profession. Only by participating in supervised teaching practice during their university study, students – future teachers can become acquainted with the educational reality and, at the same time, be able to see the true essence of the educational process from the teacher's point of view. Through recognising the importance of the role teachers play in the process of educating and shaping future generations, students' motivation for the teaching profession develops. On the other hand, we should emphasize that, in some cases, it is the contact with educational reality from the position of a teacher that can actually demotivate students of teaching to continue on their chosen path. When changing the point of view from a student to a teacher and realizing the demands placed on the teacher in educating children and youth, a student of teaching might start doubting his or her ability to optimally and adequately participate in the educational process as a teacher.

In addition, we would like to emphasize that supervised teaching practice develops future teacher's pedagogical thinking (Danek, 2019: 32). Pre-graduate preparation of teachers provides students with a great deal of information connected to the essence of the educational process. By participating in supervised teaching practice, students of teaching develop their organisational skills as they will have to know how to independently organize their classes in the future.

During his or her supervised teaching practice, a university student preparing for the teaching profession should focus his or her pedagogical activities mainly in the following way (Dytrtová, 2009: 73-74):

- to clearly and explicitly formulate educational goals to pupils;
- to effectively organise classes;
- to use the content in compliance with the educational program;
- to deliver the content to pupils effectively and correctly;
- to use adequate methods;
- to use connections between subjects;
- to engage and maintain pupils' attention;
- to shape pupils' character;
- to objectively evaluate pupils;
- to approach pupils in a helpful way;
- to develop and support pupils' independent activity;

- to create an optimal atmosphere during classes;
- to express himself or herself exactly and terminologically;
- to use adequate verbal and written expression;
- to pay attention to his or her non-verbal communication;
- to evaluate his or her performance based on a consultation with the practice teacher.

In our view, it is important for a future teacher to be able to acquaint pupils with the educational goals even during practice teaching. A university student must know exactly how to explain the focus of the education to pupils as clearly as possible. At the same time, he or she should know how to organise the classes, which means to divide the lessons into parts, one in which he or she explains a given topic to pupils and another one in which the key facts are revised. The optimum course of a class is determined by suitable methods of teaching as well as by appropriate material tools facilitating an efficient delivery and revision of a particular topic. Only by participating in supervised teaching practice can future teachers form their professional approach to those being taught. The professional approach of future teachers lies mainly in an objective evaluation of pupils. A future teacher must view every pupil objectively and not based on his or her own feelings. It is the supervised teaching practice that offers students of teaching their first contact with more pupils from the position of a teacher. Based on the gradual acquisition of a teacher's position, a university student – future teacher becomes aware of why the objective approach to each pupil is important. Last but not least, we should emphasise the significance of using exact terminology. It is important for a practising student to influence pupils via his or her verbal as well as non-verbal expression.

It is possible to say that "by participating in supervised teaching practice, university students become gradually involved in the interactions taking place among the team of educators. The practice helps to increase students' independence and responsibility in activities related to the teaching profession" (Michvocíková-Sirotová, 2019: 230). A future teacher gradually develops his or her ability to lead the educational process. While doing so, a trainee must act decidedly and with confidence, must be sure of his or her decisions and be able to promptly justify his or her actions. In our opinion, the necessary confidence to lead the education process can be achieved by participating in the teaching practice in a simulated environment of a practice school through virtual reality.

Virtual Reality

In the last several years, contemporary society has been experiencing an ongoing progress in many areas related to more or less regular interactions of people with other individuals or social groups. Interactions between two or more members of society can be considered a necessary precondition of human existence and its continuation. A contact between individuals or between various groups takes place constantly and has various forms. The course of social interactions is nowadays determined, among others, by the development of information and communication technologies, creating a specific environment that requires no physical contact or presence. We are talking about an online world. The online world enables an interaction with other people through virtual reality (Shultz-Shultz, 2017: 6). An online contact – a contact of individuals without physical presence creates a specific reality referred to as virtual reality. Virtual reality is formed by interactions between individuals or groups that take place based on an online contact – a contact without physical presence. The development of modern technologies facilitates communication and subsequent interaction of individuals or groups in virtual reality without the need for the participants to be congregated in a particular place at the same time. The virtual environment, and the reality existing within, cross the borders between time and space. Mentioned virtual space is created by digital technologies (Jursova, 2015: 261). The birth and subsequent development of virtual reality is determined by the hardware and software platform we call the Internet. "The Internet as a worldwide heterogenous computer network, in its essence, represents not only a huge source of memory and computing capacity, but its popularity among lay users grows rapidly mainly due to its multimedia possibilities of accessing information and communication." (Práznovská, Stupka, 1999: 51). As a result of the spread of the Internet, the use of virtual reality is growing as well. In the past, the Internet had not been a common and automatic part of everyday life. Its use had mostly been connected with work responsibilities and it, surely, hadn't been as automatic as it is today. The initial work-related use gradually spread to the consumer area.

The internet collects a huge amount of information and the access to it is easy, which was something that users of all age groups quickly realised. The last few years have brought a huge growth in the area of accessing virtual reality through social networks. The results of foreign studies have shown that an excessive amount of time spent on social networks can induce depression among young people. What also suffers are their personal feelings and the overall quality of relationships with others (Lam-Peng, 2010; Blais-Craig-Pepler-Conooly, 2008; Huang, 2010; Kross, 2013; Schultz-Schultz, 2017: 7; Malach, Chmura, 2017: 97). On the one hand, we can argue that communication through social networks represents a fast and effective mode of interchange which, as had been stated above, is not tied to a certain time, space or physical presence of the individual participants, on the other hand, we agree with the results of the stated studies. In our view, young people spend too much of their free time on social networks. In this case the online communication does not represent an efficient way of personal interaction. A generation is gradually being formed for which a life in virtual reality of social networks is very important. In virtual reality, everybody tries to present himself or herself in the best possible light, devoid of any shortcomings or realistic image. Virtual reality often does not reflect true reality. As a result, young people are often discontented, depressive, lacking necessary confidence in communication with the real world. Another expert, trying to draw attention to the problem of young peoples' excessive use of social networks is Johnston. He refers to the generation born between the years 1984 and 1994 as the "net generation" or "digital natives". This generation is submerged into the world of digital technologies and prefers using the Internet or mobile devices in communication (Johnston, 2010: 7). We agree with the use of the above-stated terms but believe that in connection with the extensive use of the Internet and mobile phones, it is necessary to move the upper age border of the "net generation" or "digital natives". According to Vagnerová (Vagnerová, 2012: 469), "adolescents are attracted to the virtual world with its clearly set rules, in which they don't need to reveal their identity, or only if they want to. They can experiment with various, often realistically unattainable, images of themselves. This is not possible in real relationships. Internet chatting does not require any social correction, an adolescent can impersonate anybody and satisfy his or her needs in a way that is unacceptable or unavailable in real life." We believe, however, that the virtual world is becoming attractive not only to adolescents but also to young people whose personality development is in the phase of early adulthood. This also includes university students. As a result, we can say that for university students, too, the virtual world is becoming an integral part of their everyday interactions. Unlike younger adolescents, university students' view of virtual reality is partially different. University students' personality development has passed through the phase in which a maturing young person needed to idealise his or her own identity in an anonymous online space. We are supposing that the majority of university students' priority is to successfully finish their university study. In most cases, young people subordinate their actions to this goal. A university student thinks about the ways of streamlining the study while realising the importance of communication technologies. University students, in our opinion, see virtual reality as one of the ways to optimize their university study. For students, the availability of the Internet represents the availability of much of the required information related to the content of their study. For this reason, we would like to draw attention to the gradual utilisation of digital technologies in the area of education. These technologies mainly relate to the collection, recording, subsequent storing, processing and exchanging different pieces of information (Kostrub-Severini-Marher, Milovčiková, 2014: 80-81, Vasbieva, Saienko, 2018: 127). For students, using modern technologies in the educational process represents a simpler way of acquiring and recording particular information. Using a notebook or a PC becomes a necessity and a common occurrence. Notebooks, in particular, enable students to quickly record the content of teaching and the subsequent distribution of notes from lectures, seminars or exercises among other students through social networks, e-mail, etc. As a result of identifying the importance of virtual reality in young people's lives today, we expect that virtual reality is going to gradually penetrate into educational processes, as well. Because young people see virtual reality as an environment that feels natural, its utilisation in education becomes necessary. For example, 3D visualisations became a suitable tool of interactive learning. Integrating virtual reality into education makes learning more accessible and efficient (Parisy, 2016: 8). The efficiency and accessibility of education is, in our opinion, possible also in the area of supervised teaching practice. In particular, we can mention visualisations of various pedagogical situations in virtual

reality. As virtual reality is becoming a natural environment for young people today, simulating particular pedagogical situations into a virtual space and subsequently searching for solutions to these situations would help future teachers to acquire necessary confidence that could be put to the test during supervised teaching practice at a real practice school. University students – future teachers are able to independently orient themselves in the online space, and the decisions they make in virtual reality are also marked by a high level of independence. As a result, we see 3D visualisations of chosen educational situations as a suitable method for learning adequate solutions to these situations. In virtual reality, possible mistakes (incorrect decisions) don't have serious consequences. This simulated space can show a future teacher the potential consequences of his or her decisions. At the same time, we suppose that university students are evolved enough to be able to differentiate between a virtual space and true reality and to realise the importance and consequences of their independent decisions in the position of a teacher.

Another potential use of virtual reality during pre-graduate preparation of teachers are online courses for future teachers. Students see high-quality online courses as a good method of going deeper into areas where they had learned the basics. The basics need to be learned live from somebody who understands the subject (Novotná, 2019: 108). Online courses led by a practice teacher could acquaint students with the course of supervised teaching practice in the environment of the practice school and help them better prepare for the educational reality. The question remains, if online courses for future teachers should precede students' participation in a real educational process at a practice school or should serve only as an accessory to collecting feedback related to the efficiency of the said educational process.

It can be concluded that the penetration of modern information and communication technologies is visible in all areas of everyday life, and because university education is an integral part of our social system, it makes sense to use these technologies in university education as well. This applies to all existing study programs. Information and communication technologies are not only one tool for learning. It is necessary to integrate their using in the traditional educational system (Švarbová, Bírová, 2009: 34). We especially emphasize the use of virtual reality by students of teaching because, as had been stated above, during supervised teaching practice, future teachers are expected to act decisively and with confidence. As a result, we believe that in the course of a few years, we are going to witness new innovative ways of realising supervised teaching practice based on linking virtual with true realities.

2. Materials and methods

In the course of an empirical study related to the given issue, we have addressed 70 university students – future teachers. Addressed university students were students of university field of study in Slovak Republic – "Teaching and Pedagogical Sciences". Respondents had not had an opportunity to specify their place of study in Slovak Republic in the online questionnaire. We can state, that online questionnaire were addressed to university students of "Teaching and Pedagogical Sciences" field of study at Universities in Slovak Republic.

The prepared questionnaire contained ten questions. According to the focus of our study, we have analysed selected issue by analysis of two questions of mentioned questionnaire. The analysis of the recorded answers was executed through univariate, bivariate and multivariate data analyses using the SPSS 20 software. We have realized univariate data analysis by first-level data sorting. We generated the illustration of first question analysis. Mentioned illustration shows the count of received answers of first analysed question clearly. It is the most importance of univariate data analysis. Moreover, we have realised bivariate data analysis by second-level data sorting using the SPSS 20 software. We defined two statistical hypothesis – null and alternative hypothesis. In the process of hypothesis verification, we determined significance level (α) by the statistical software SPSS. We are talking about the probability of null hypothesis validity (significance level α is 0,05 in the SPSS). We are not assuming the null hypothesis validity in the case of computed value of significance level is lower than determined significance level α. Subsequently, we are assuming the validity of null hypothesis alternative with the probability of 95 % (Ritomský, Solar, 2002: 134-136). Finally, we have realised multivariate data analysis using the SPSS 20 software. In our opinion, one of the important statistical analysis of multivariate data analysis is correspondence analysis. Mentioned data analysis is based on multivariate analysis of

contingency tables. The graphical output of correspondence analysis is correspondence map. There is an exact graphical views of statistical dependence of examined variables in the correspondence map.

3. Results and discussion

Through an online questionnaire, the respondents were asked questions focusing on the general use of information and communication technologies in personal life and during their university study. We have also studied student's attitudes and opinions of the complementarity of a virtual and the real space in the realisation of supervised teaching practice.

During the initial study of the given issue, we were interested if students saw the use of modern information and communications technologies during supervised teaching practice as necessary. The collected results can be seen below (Figure 1).

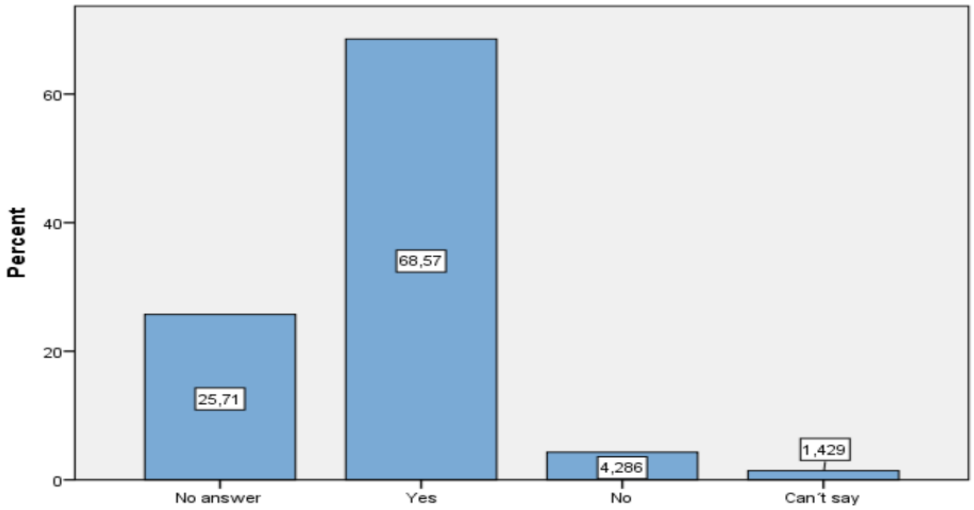


Fig. 1. Expanding the use of information and communication technologies during supervised teaching practice

We can say that the vast majority of future teachers – 69 % pointed to the need for a greater use of modern information and communication technologies during supervised teaching practice. University students – future teachers belong to the generation that grew up in the age of technological progress, during which information and communication technologies gradually became an indispensable part of everyday reality. For a generation labelled as the "net generation", using modern information and communication technologies in various forms became entirely natural, even in the area of university education. Since supervised teaching practice is an integral part of future teachers' university education, more extensive use of information and communication technologies is needed in this area as well, mainly by employing virtual reality.

Based on respondents' opinions related to the need for greater utilisation of modern technologies during supervised teaching practice, we have also studied potential ways of using the virtual space for the optimization of the teaching practice. In the context of the above-said, we have focused on collecting students' opinions related to the possibility of becoming acquainted with the characteristic of chosen educational situations taking place in a school reality through a virtual space.

Our goal was to find out if the above-stated simulations of chosen educational situations common in the school environment can be considered one of the ways of introducing modern information and communication technologies into supervised teaching practice in a more extensive way.

According to the above-stated text, we realized bivariate analysis of collected data by statistical software SPSS 20. We defined two statistical hypothesis – null and alternative hypothesis:

H_0 – We assume, that there is no statistical dependence between Expanding the use of information and communication technologies in the process of supervised teaching practice and Simulating chosen situations from educational reality into a virtual space by surveyed university students opinions.

H_a – We assume, that there is statistical dependence between Expanding the use of information and communication technologies in the process of supervised teaching practice and

Simulating chosen situations from educational reality into a virtual space by surveyed university students opinions.

Table 1. Chi-Square Tests

	Value	df	Asympt. Sig. (2 sided)
Pearson Chi-Square test	39,415	9	0,000
N of valid case	70		

The computed value of Chi-Sqaure is 39,415. There is the critical value 16,9 at nine degrees (df) in the significance level α = 0,05 (The table of Critical Values – Hendl, 2006: 398-399). The contingency coefficient is 0,600. Mentioned value indicated relatively strong degree of statistical dependence. Based on the data above (Table 1: $p < \alpha$ – computed value of significance level *p* is 0,000 and it is lower than determined significance level α: α = 0,05; 0,000 < 0,005), we are not assuming the validity of null hypothesis (H_o) and subsequently we are assuming the validity of null hypothesis alternative (H_a) with the probability of 95 %. We can state, that surveyed university students supporting the idea of expanding the use of modern information and communication technologies in supervised teaching practice also found simulating chosen educational activities into virtual reality meaningful.

The results of a bivariate data analysis can be found in the following table (Table 1).

Table 2. Expanding the use of information and communication technologies in the process of supervised teaching practice and simulating chosen situations from educational reality into a virtual space

Simulating chosen situations from educational reality into a virtual space		Expanding the use of information and communication technologies in the process of supervised teaching practice				Together
		No answer	Yes	No	Can't say	
No answer	*Number*	6	3	0	0	9
	%	8,3	4,3	0,0	0,0	12,3
Yes	*Number*	3	35	0	0	38
	%	4,3	50	0,0	0,0	54,3
No	*Number*	6	4	3	0	13
	%	8,6	5,7	4,3	0,0	18,6
Can't say	*Number*	3	6	0	1	10
	%	4,3	8,6	0,0	1,4	14,3
Together	*Number*	18	48	3	1	70
	%	25,7	68,6	4,3	1,4	100

Based on the data in the table (Table 2), we can say that 50 % of respondents supporting the idea of expanding the use of modern information and communication technologies in supervised teaching practice also found simulating chosen educational activities into virtual reality meaningful. The simulations concern educational situations that might occur during the realisation of supervised teaching practice and students would review them before staring their practice. For young people today, the virtual space, in our opinion, represents an important place for interacting. For this reason, the said group of people might consider virtual reality the optimal possibility for getting acquainted with the characteristic of some situations of the educational reality. On the other hand, we would like to draw attention to a group of respondents (4.3 %) who expressed their satisfaction with the use of modern information and communication technologies during supervised teaching practice but disagreed with the potential method of learning about chosen educational situations likely to take place during future teaching practice through virtual reality.

Since we have identified a mutual dependency of the researched answers, we focused on a multivariate analysis of the data. The results of the multivariate data analysis can be observed on

the graph below. In a transparent way, the graph groups the positive answers to both questions on one side, and on the other side, it groups unanswered questions and answers through which students disagree with the expansion of modern information and communication technologies into supervised teaching practice as well as with simulating chosen educational situations into virtual reality. The multivariate analysis of data clearly confirms and emphasizes the previous results of our research.

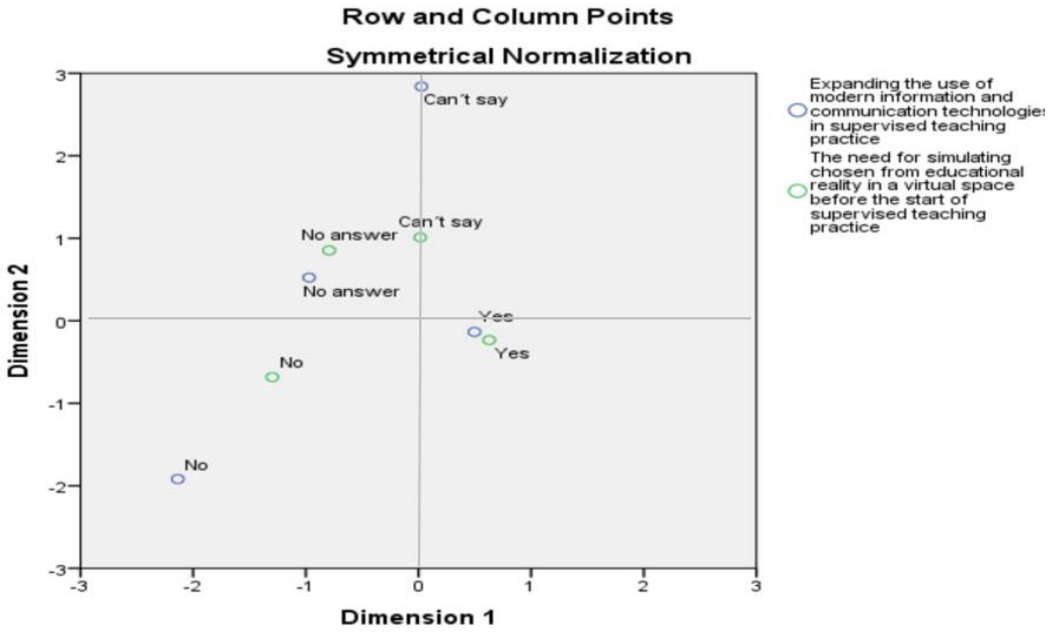


Fig. 2. The correspondence map of the multivariate data analysis

In contemporary society, the use of modern information and communication technologies became an integral part of young peoples' everyday interactions. This group of people includes university students preparing themselves for their future profession. Young people – university students use modern technologies everyday mainly for personal communication. In recent years, the wide spectrum of modern technological devices used by young people has included various ways of participating in the university educational process. University education is a necessary precondition of many professions, including the teaching profession. The professional preparation of future teachers at universities consists of theoretical acquisition of necessary knowledge but also includes a practical preparation in the form of supervised teaching practice. The area of pre-graduate preparation of future teachers is also experiencing gradually increasing integration of information and communication technologies into education. As has been said above, young people are accustomed to using modern technologies and that's why students see their integration into the educational process at a university as a positive process, in some cases even rather insufficient.

Since virtual reality can be considered an inseparable part of young people's lives, it is, in our opinion, necessary to integrate it into supervised teaching practice for future teachers. If we ask ourselves what would be an efficient method for gradual integration of virtual reality into supervised teaching practice, we would like to, first of all, emphasize the need to use virtual reality before students start their supervised teaching practice. University students who regularly participate in online interactions would benefit from the transformation of typical educational situations into virtual reality. This way, students would get acquainted with the characteristics, but also with the possible course or potential consequences deriving from the various educational situations typically occurring in a school reality. All of this would take place before students participate in their supervised teaching practice, rendering them better prepared for the practical training. The transformation of the real educational environment into virtual reality that represents the first contact of a future teacher with the educational processes from the position of a teacher can be considered an efficient method of students' preparation for their teaching practice.

Because virtual interactions are natural for young people today, their first contact with the educational reality from the position of a teacher through virtual reality would also be perceived as natural. The ongoing progress in the area of information and communication technologies makes it possible to use the virtual space for the purpose of stimulating the educational reality. It is necessary, in our opinion, for university students to learn to react to various stimuli that could be encountered in a school educational process mainly by solving educational quizzes or by playing educational computer games. These virtual reality activities would also require students' virtual self-evaluation related to the correctness of their decisions in reaction to given educational situations but also an assessment by a university teacher with subsequent feedback for the student. Moreover, we can outline limitations of our findings briefly. According to the low number of surveyed university students we cannot generalize our findings to the attitudes and opinions of all university students in Slovak Republic.

4. Conclusion

The focus of this study was to introduce some methods of optimizing supervised teaching practice for university students – future teachers via the use of information and communication technologies. The theoretical part of the study defined supervised teaching practice as an important part of pre-graduate preparation of future teachers. In addition, we have talked about the importance of using information and communication technologies today and emphasized the need for integrating virtual reality into university education for future teachers. Mainly, we have highlighted the gradual penetration of virtual reality into supervised teaching practice for future teachers.

The empirical part of the study focused on collecting university students – future teachers' attitudes and opinions related to the given issue. Using online questionnaires, we have assessed 70 students of teaching. The analysis of collected data was performed through a statistical software called SPSS 20. Based on the results of univariate, bivariate and multivariate analyses, we can emphasize the considerable benefit of integrating virtual reality into supervised teaching practice realization. The participating students of teaching are members of the generation that considers the use of information and communication technologies a natural part of their everyday interactions. As a result, future teachers see the partial simulation of chosen educational situations through virtual reality as a possibility to become better prepared for supervised teaching practice that takes place in a real educational environment of a high school. Since we see the gradual penetration of the virtual space into pre-graduate preparation of teachers as an inevitable reality, we believe that this issue requires more extensive research. The findings of our quantitative study can be considered a base for potential qualitative research executed through in-depth, semi-structured discussions aiming to collect future teachers' opinions about the benefits and shortcomings of using virtual reality to study chosen educational situations from a real school environment.

5. Acknowledgements

The study is a part of scientific project solving – KEGA 015UCM – 4/2018 „Pedagogická prax vysokoškolských študentov s podporou virtuálnej dimenzie.“

References

Danek, 2019 – *Danek, J.* (2019). Pedagogical Practice – Position, Contribution and Importance in the process of preparing of future teachers. *Slavonic Pedagogical Studies Journal.* 8(1): 31-41.

Dytrtová, 2009 – *Dytrtová, R.* (2009). Teacher. The preparation for the profession. Praha: Grada Publishing.

Hendl, 2006 – *Hendl, J.* (2006). The overview of statistical method of data processing: analysis and metaanalysis. Praha: PORTÁL.

Johnston, 2010 – *Johnston, B.* (2010). The First Year at University: Teaching students in transition. Glasgow: Open University Press.

Jursova, 2015 – *Jursova, J.* (2015). Internet – a new environment for life and education (?). *Slavonic Pedagogical Studies Journal*. 4(2): 259-271.

Kosturb et al., 2014 – *Kosturb, D., Severini, E., Mahreh Milovčíková, K.* (2014). Digital technologies as tool in the evaluation processess. *The evaluation of key competencies in the process of school education*. Ostrava: Ostravská univerzita v Ostrave. Pp. 78-101.

Malach, Chmura, 2017 – *Malach, J., Chmura, M.* (2017). Preparing for academic staff educational activity in the light of trends in teaching and learning at universities. *Slavonic Pedagogical Studies Journal*. 6(1).

Novotná, 2019 – *Novotná, E.* (2019). New trends in education of new generation of teachers. Actual trends and perspectives of pregradual preparation of teachers. Bratislava: Univerzita Komenského. Pp. 13-21, 104-110.

Parisy, 2016 – *Parisy, T.* (2016). Learning Virtual Reality. Sebastopol: O'Reilly Media.

Práznovská, Stupka, 1999 – *Práznovská, L., Stupka, T.* (1999). The computer as a new medium. In *Actual youth subcultures*. Bratislava: Slovenská sociologická spoločnosť pri SAV. Pp. 51-54.

Ritomský, Solar, 2002 – *Ritomský, A., Solar, T.* (2002). The application of statistics in the social research. Nitra: FSV UKF.

Schulz, Schulz, 2017 – *Schulz, D., Schulz, S.E.* (2017). Theories of Personality. Boston: Cengage Learning.

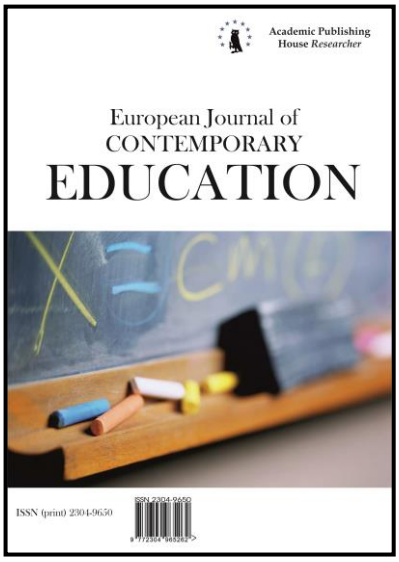
Sirotová, Michvocíková, 2019 – *Sirotová, M., Michvocíková, V.* (2019). The importance of supervised practice teaching in university study of university students – future teachers of Slovak and foreign languages. *Xlinguae*. 12(3): 228-239.

Švarbová, Bírová, 2009 – Švarbová, E., Bírová, J. (2009). ICT as an activator of language education and initiator of communication in French language. *Xlinguae*. Special Issue French Language, June. Pp. 34-60.

Vágnerová, 2012 – *Vágnerová, M.* (2012). Developmental psychology. Childhood and adolescence. Praha: Karolinum.

Vasbieva, Saienko, 2018 – *Vasbieva, D. Saienko, N.* (2018). Exploring students' perception and efficiency of technology-mediated ESP teaching. *Xlinguae*. 11(1): 127-137.

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 137-147
DOI: 10.13187/ejced.2021.1.137
www.ejournal1.com



Production of Comics in POWTOON as a Teaching-Learning Strategy in an Operations Research Course

Laura Plazola Zamora [a], Salvador Sandoval Bravo [a, *], Alejandra Gómez Padilla [a]

[a] Centro Universitario de Ciencias Económico Administrativas,
Universidad de Guadalajara, Mexico

Abstract

This paper proposes the production of animated comics in POWTOON to serve as a visual collaborative tool and a teaching-learning strategy for a course on Operations Research. This proposal aims to achieve meaningful learning of the subject matter, incentivizing the creativity of undergraduate students of marketing and business at the Guadalajara University, given that the production of comics develops, in students, cognitive and practical abilities such as the following: reflection; critical thinking; observation; analysis; synthesis; analogy; systematization; a sense of collaboration; and, teamwork. To validate the substantial improvement in student performance after producing the comic, a paired two-sample means t-test was carried out for 35 undergraduate students of marketing and business at the Guadalajara University who were enrolled in the same Operations Research course. The results obtained show that student performance improved considerably after the production of the comics, facilitating both teaching and the students' significant learning. In this sense, the use of POWTOON demonstrated to be a good learning alternative, since the students for the realization of the comic were able to recover and review the information acquired, write a script, and organize images, videos, sounds, and text in a congruent and didactic way, even when it comes to complex topics.

Keywords: collaborative learning, undergraduate education, educational comics, teaching-learning strategy.

1. Introduction

Operations Research (OR) and decision making are of fundamental importance for economics and the administrative sciences, given that these disciplines involve the study of a series of formal procedures applicable to a large number of organizational situations, such as production,

* Corresponding author
E-mail addresses: Salvador.sandoval@academicos.udg.mx (S.S. Bravo), lplazola@gmail.com (L.P. Zamora), alejandra.gomez@cucei.udg.mx (A. Gómez Padilla)

transport, logistics, resource allocation, profit maximization, and cost minimization problems. These disciplines require the use of optimization and control models for supply, demand, production, and consumption functions, among others. The professional training of Guadalajara University undergraduate students includes the development of logical and mathematical abilities that enable them to make adequate business decisions, based on the application of quantitative tools. In this sense, an essential characteristic of decision making in business is that it is based on the rationality assumption. Therefore, organizations and companies act reflexively, possess information, calculate the risks and benefits of their decisions, and try to maximize profitability or minimize costs, namely, optimizing their expectations based on their limited resources. Thus, operations research methods enable the best possible options to be chosen, depending on the specific characteristics of each situation or problem.

Unfortunately, courses such as Operations Research, do not inspire the total interest of the students and always represent a challenge for the professors teaching such courses. At an undergraduate level, access to optimization and Operations Research concepts requires a lengthy process of abstraction which obliges the student to undertake rigorous mental activity, but which also offers a propitious field for the development of creativity.

The term learning strategies refers to the cognitive operations that the student undertakes in order to organize, integrate, and prepare information (Valle et al., 1999). These strategies are understood to be sequences of activities that are chosen to facilitate the construction, permanence and transfer of information or knowledge. This term also corresponds to those strategies used by the professor to mediate, facilitate, promote and organize learning (Campos, 2000). It is essential, for both the learning process and for students to learn, that the course content is meaningful to them (Barbosa et al., 2017).

Stemming from the aim of motivating students, active methodologies have emerged as an important instrument in the use of problematization as a teaching-learning strategy (Caldarelli, 2017). These active methodologies facilitate interaction among the student body, social integration, the ability to communicate and collaborate, the change of attitudes, the development of thought, and discovery, at the same time fostering attitudes of cooperation and solidarity (Silva et al., 2014).

According to Silva et al. (2012), active learning is associated with a collection of strategies for carrying out the learning process in such a way as to involve active student participation, among which strategies are problem-based learning, simulations and business games. The use of movies, comics and comic strips, conceptual maps, and improvisational theatre, among others, also contribute to the learning process (Ramírez, 2010; Rodrigues, Arroio, 2011; Carvalho, Dias, 2014; Oliveira, 2014; Kim et al., 2017).

The latest trends in education advocate working in groups as a predominant methodology, in which students themselves are the protagonists in the work undertaken in the classroom. Students do not learn solely from the professor and/or the textbook nor solely in the classroom, also learn from many other sources, such as communication media, their classmates, and society in general (Meso et al., 2011). There are many and varied tools used to facilitate communication and cooperation among those participating in a collaborative work project, ranging from email to collaborative online environments.

It is important that higher education institutions reflect on the changes that have occurred in the educational process. New educational proposals must prioritize the active and collaborative methodologies that can be combined with traditional methods (Silva et al., 2014), and must prepare teachers to plan strategies that increase their efficacy in the classroom (Barbosa et al., 2017).

This paper proposes the production of comics in POWTOON to be used as a visual collaborative tool and a teaching-learning strategy on the Operations Research course. This proposal aims to achieve the meaningful learning of the subject matter, incentivize the creativity of marketing and business students at the Guadalajara University. In this sense, the present study is distinguished from prior research by its use of comics, developed in POWTOON, as a complementary learning strategy for course content pertaining to Operations Research, which is studied particularly in higher education and on which no research is reported in the current literature. The present study then describes, in detail, both the teaching practice undertaken and the results obtained.

2. The comic as an educational tool

The comics are a visual resource for transmitting a message in an entertaining and enjoyable way, which can be used for educational purposes and which has become a tool that, further to facilitating distinct abilities, also promotes the formation of values and attitudes. The impact of the visual image, on its own, transmits sensations, feelings and emotions favorable for motivating students to study in each of the academic areas and, at the same time, becomes, itself, a source of learning (León, 2014).

Sones' (1944) classical study demonstrated the enormous impact of comics on popular culture, given that, in 1944, 95 % of all 8-14-year-old children and 65 % of 15-18-year-old adolescents read comic books, which both age groups thought were easy to read and depicted interesting stories. These readerships levels led to a broad and wide-ranging debate on the advantages of this tool for educational and instructional purposes.

Carter (2018) explores the characteristics of graphic novels, comics, and other visual tools of great value for classroom teaching, analyzing the abilities and competencies that can be taught using these educational resources. Furthermore, said author offers an explanation of the resistance, observed in academic environments, to the use of these resources as a product of policy and practice deeply embedded in traditional educational systems.

Tatalovic (2009) identified and reviewed a large variety of scientific comic strips and their application in both education and the popularization of science, finding a wide diversity of comics in terms of style, presentation, size, depth, and scientific discipline. His analysis highlights the potential benefits of comics for promoting scientific literacy across all educational levels, although it does recognize their limited utility outside the classroom.

Trnova et al. (2013) consider that the use of comics in scientific education may provide meaning for science, making it relevant, interesting, and accessible for students. They conclude that comics should be used adequately as a complementary teaching tool, given that they help to detect and correct some erroneous concepts, deepen comprehension of natural phenomena, and develop communication and problem-solving competencies in students.

Lazarinis et al. (2015) analyze the benefits of tools for creating comic strips for producing alternative attractive didactic material in different academic disciplines, despite the lack of technical training for teachers in comic strip design. They conclude that, despite the limitations, these didactic resources are often very useful for teaching.

Koutníková (2017) analyzes the application of comics (supported by conceptual maps) in preschool education, with the objective of teaching children to understand certain physical phenomena and ascertaining how the use of comics contributes to changing the perceptions of said phenomena. She shows that comics represent a modern pedagogic resource that makes the study of nature interesting and understandable for preschool children.

Green and Myers (2010) analyze the use of comics in medical education and patient care, considering that comics represent a new and creative form of learning about and teaching public health topics, such as those related to patient care, medical education, and social criticism of the medical profession.

Gonik and Smith (1993) develop, in comic form, a complete text dealing with descriptive statistics, probability, and inferential statistics, showing that it is possible to design a comic for an entire academic discipline. Gonik has also, either as author or co-author, published academic texts in diverse areas (algebra, economics, calculus, physics, and chemistry, etc), using comics as the main teaching resource.

Some successful experiences with the use of comics as a teaching-learning strategy for different disciplines. García (2013) uses comics as a didactic resource in the teaching of foreign languages. Alonso (2012) presents a didactic proposal which considers comics as a valuable tool for the teaching and learning of Spanish. Ramírez (2010) presents comics as educational support material for the subject of mathematics for children in the first grade of primary school. Barraza (2006) uses the comic as didactic material for history teaching at secondary level in Chile. Green (2015) and Kim et al. (2017) use comics as both a learning strategy and a strategy for forming students' professional identity during their medical training. Toh (2009) proposes the use of comics for teaching algebra to academically disadvantaged children. Chen (2015) compares an easy-to-use comic composition system (CCS) and drawing on paper in order to identify the level of confidence in elementary school students as they learn how to draw.

There are various applications that could be used as tools for creating material to enable students to actively participate in their learning process, some of which are specific to the production of comics, such as Pixton, Storyboard, and Comic maker, among many others.

According to León (2014), the construction of comics leads the student to reflect and engage in critical thinking and reasoning, and, in the same way, enables the student to develop thought processes, such as observation, comparison, classification, analysis and synthesis.

In this exercise, the students used an online application called POWTOON (https://www.powtoon.com/) to create videos and animated presentations with objects, text, images and sound, which may be either predetermined or uploaded by the user.

POWTOON is commonly used in the academic environment for communicating an idea through animated videos. The final result is a cartoon of a person speaking and displaying dialogue boxes written by the user, giving the appearance of a comic.

Recent studies have successfully used POWTOON in distinct educational experiences, with, for example; Rioseco et al. (2017) incorporating POWTOON as a learning activity in a course on the use of technological innovations as a didactic resource for pedagogic programs. Bravo-Acosta and García-Vera (2020) use POWTOON as a collaborative learning tool under the flipped classroom model for developing multiple intelligences in students. Highlighted among other similar studies is the analysis conducted by Herawati et al. (2019) about the development of educational videos on POWTOON-based work and energy topics to support learning under a flipped classroom model.

Fig. 1. Screenshot of a video prepared by the students on the Operations Research II course

This tool is useful in collaborative learning activities, such as alternative evaluation, or to incentive students to create content for the class and thus raise their academic performance.

The following can be listed as advantages of using POWTOON (Rioseco et al., 2017):

1. It enables the development and presentation of any topic of interest.
2. It captures the attention of the audience (students)
3. It is easy to use.
4. It includes a wide variety of resources.
5. It is easy to share via social networks.
6. It makes classes more dynamic.
7. It requires the students to read, analyze, and synthesize the topics assigned, in order to then present them.
8. It enables a higher level of comprehension and assimilation of the content assigned.
9. Different types of formats can be incorporated, widening their potential and flexibility by means of audio and visual (both static and dynamic) resources.
10. Communication is clearer, more concise and more fun.
11. It is free to use and compatible with various operating systems.

The main disadvantages are that it requires much more work than some other applications, while a video cannot be edited if the application is not connected to the internet, and it cannot be downloaded.

3. Implementation of the strategy

The course Operations Research belong to the basic subjects for the Guadalajara University's Marketing and International Business undergraduate degree programs. The curriculum for these programs includes two Research Operations courses, the first of which (IO1) mainly covers topics related to complete linear programming. The second course, titled Operations Research II (IO2), aims to ensure that the student applies optimization techniques to the resolution of problems in real situations focused on decision-making as part of the process of managing organizations.

The content of IO2, comprises the five units listed below:

1. Decision-making models.
2. Multiobjective Programming.
3. Markov Chains.
4. Inventory Models.
5. Queueing Models.

Further to the extent of its content, this course is particularly complex for the students on these degree programs. According to Guadalajara University registers, the fail rate for the first Operations Research course (IO 1) is approximately 40 %; however, there are no global registers for the second course.

The exercise of producing comics was implemented in the course II from the first semester of 2019 (2019-A) academic year. The group comprised 40 students from the Marketing and International Business undergraduate degree programs, of which 65 % were women and 35 % men. It is important to note that the group of 40 students were all students enrolled in the said course with one of the authors of this document who teaches the subject, and in this sense, the results of this learning experience can be considered as a case study.

Over the length of the course, 3 mid-term exams were applied, in which the following results were obtained: 62 % of students passed the first mid-term and 38 % failed; 22 % passed the second mid-term and 78 % failed; and, in the third mid-term, 69 % passed and 31 % failed.

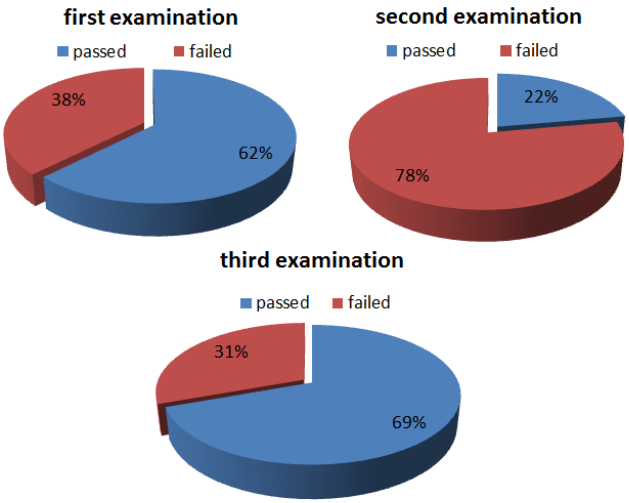


Fig. 2. Percentages for passing and failing mid-term exams
Source: Prepared by the author based mid-term exams results

The weighting assigned to each mid-term exam was 20 points for the first mid-term, 20 points for the second, and 15 points for the third. The students were notified of both this weighting and the content to be included in each mid-term at the beginning of the course.* As can be observed in Figure 2, which presents the results for each exam, a higher fail percentage was obtained for the second mid-term exam. The subjects evaluated by this exam were multi-objective programming and multi-criteria decision-making.

* The course was graded on a scale of 100 points, with a passing grade of at least 60 for the course to be obtained based on the exams, coursework, and a final project.

With the aim of providing students a better understanding of the subjects of the second mid-term exam, the strategy of producing comics was implemented. It is important to note that this experiment was not explicitly planned at the beginning of the course, but was implemented, in response to the poor performance of the students, especially in the second mid-term exam. In this sense, this strategy was devised like an alternative learning experience based on the instructor reflections and sought to explore the use of this visual tool both to foster autonomous learning in the students and to reinforce the knowledge and abilities developed via the thematic content included in the second mid-term exam.

The students used POWTOON to explain both the methods and the solution of multi-criteria and multi-objective problems. The main intention was to involve students in the production of comics which could be used to show the potential for the development of abilities for undertaking research and preparing summaries, as well as their analytical capacity, and at the same time learning the course content.

Listed below are the instructions the students followed to produce the comic, from assignment the topic to presenting the comic to their classmates and teacher; likewise, these steps can be adapted by other teachers who wish to implement this methodology in their courses.

1. For the production of the comics, the students worked in three-person teams, which were formed based on affinity among the classmates. The assignment topics were the following: multi-objective programming models; the restrictions method; weighted goal programming; lexicographic goal programming; analytical hierarchical programming (AHP), as used for discrete multicriteria decision making problems; and, the PROMETHEE method.
2. The teams were given two weeks to produce the comic. The work began with the search for information on the subject to be developed and the related aspects that were to be covered by the comic.
3. The teams then began to work on producing the script, which would include the protagonists and their characteristics, the setting and the dialogue. The students were required to research and learn to use the POWTOON software independently, although their teacher could respond to their general doubts about how it works.
4. The comic produced by each team was required to include a theoretical section explaining the concepts and algorithms related to the method assigned. It also had to include a practical section developing a concrete example of the method's application in the administrative economic sciences, in terms of minimizing costs, maximizing profit, or optimizing the use of time in a production process, etc.
5. The presentation of the comic by each team was required to last five to six minutes, while the topic must be explained in such a way that it could be understood by anyone educated to a minimal level of mathematics.
6. Finally, the presentation was made for discussion in class. Time was set aside for questions and answers at the end of the presentation. The members of the team that had presented the topic were responsible for answering their classmates' questions.

All the previous steps were monitored by the teacher in order that the students could make the pertinent reorientations both in the use of the software and the methodology, as well as in the theoretical part of the topics. The professor provided complementary comments during the question and answer sessions.

Fig. 3. Screenshot of a video made by the IO2 students

It should be noted that the present study does not aim to quantify the influence of the instructor's support in the feedback given on the topics selected for the production of the comics. However, a personal analysis of the errors made may lead to significant student learning. Given that it consists in more than simply passively receiving information from the professor, this process of error review may help students to modify their learning strategies (Lee, 2020). Additionally, the professor's feedback serves as a point of reference which will enable the student to self-evaluate and correct their errors, further to identifying their strengths and weaknesses, thus leading them to be self-regulating learners (Juwah et al., 2004).

The collaborative creation of content for courses is a learning experience that strengthens the development of abilities and competencies in students. The opportunity to become creators and not only consumers helps the students perfect their research, writing, and critical thinking abilities, further to the benfits of working in a collaborative peer-reviewed environment. In summary, they will discover the mechanisms via which knowledge is created (Monaco, Martin, 2007; Jain, 2015).

According to Jain (2015), students today are more adept at learning via technology and in a more visual manner, preferring environments that are more inclusive and respectful to the contribution of the team and which offer solid learning among one's peers. Furthermore, there is evidence that the use of animation promotes learning in students when used with both words and images, based on the theoretical foundation that students are more capable of making mental connections when the words and their corresponding images are worked on simultaneously (Mayer, Moreno, 2002). The use of POWTOON is, therefore, a good alternative for achieving significant learning by requiring that the student, in order to produce the comic, is able to recover and review the information acquired, write a script, and organize the images in a congruent chain of events. The video produced will be used to demonstrate the students' comprehension of the content and to help teach their classmates, even more so if it deals with a complex topic.

4. Results

After the presentations, an additional second mid-term exam was applied. On the first application of the second mid-term exam, the average grade was 40/100 with a failing rate of 78 %. On the second application of the second mid-term exam, the average grade was 89/100 with no students failing. It should be noted that both exams presented the same topics (multi-objective programming and multicriteria decision-making) with similar difficulty levels. The exams consisted in six open questions, in which the student had to construct and solve models of practical situations referring to economic and administrative topics. Figure 4 presents the results of the four mid-term exams applied, with a notable difference between bars 2 and 4, which represent the second mid-term and the additional exam, respectively.

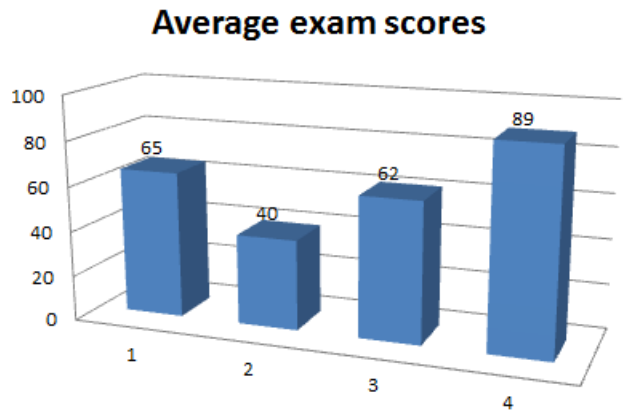


Fig. 4. Average scores corresponding to the mid-term exams
Source: Prepared by the author based on mid-term exams results

Figure 4 shows an evident increase in the average performance of the 35 students who took the recovery exam for the second mid-term exam (5 of the 40 students who made up the initial group did not take the recovery exam due to having obtained a good score in the first application of the second mid-term exam, so they preferred not to risk his obtained score).

To validate the substantial improvement in student performance after taking the comic, a paired two-sample means *t*-test was carried out for the 35 students who took the second partial exam and the recovery test for that exam, assuming the mean of the recovery exam is significantly higher than the second partial exam. Table 1 below strongly supports the hypothesis.

Table 1. Paired two sample means *t*-test

	Second mid-term exam	Recovery exam
Mean	40.21	89.24
Variance	759.23	141.42
Observations	35	35
Hypothesized mean difference	0	
df	34	
t stat	9.35	
t critical one-tail (α=.05)	1.69	
P(T<=*t*) one-tail	0.0000	

Source: Prepared by the author based on the second partial exam and recovery exam results in R.

In this sense, the experiment conducted during this course was successful, given that, on producing their comic, the students had to go into more detail on the concepts and methodologies corresponding to the topics cited above. This enabled them to produce a high-quality video, in which the topics assigned were presented with clarity and rigor, both in theoretical and practical terms, which was then reflected in a significantly improved student performance. Certainly, part of the performance increase can be explained by the similar tests that were applied; but, on the other hand, the improvement in motivation and the academic evaluation of the subjects of the course due to the realization of the comic was very remarkable. In these sense, the results confirmed that the use of these tools represents a good way of presenting, explaining and describing ideas and concepts, with the comic proving to be a fun alternative for achieving the learning objectives. In fact, due to these encouraging findings, the professor who implemented the production of comics in Powtoon decided to continue this teach-learning strategy in his subsequent courses with very favorable results.

5. Conclusion

The production of the comic by the students facilitates collaborative work and the exchange of ideas, and emphasizes the role of the teacher as a facilitator of learning. The results show not only the potential of comics as a didactic resource that promotes creativity and analytical abilities, but also how comics can facilitate students' learning.

In this particular case, it is evident that the production of comics and animated videos positively influenced the significant improvement of students' performance. In the specific case of Operations Research, the use of the comic as a teaching strategy enables the reversion of negative attitudes and beliefs about the subject and the learning of it, and helps to understand its utility in real day-to-day situations.

With this tool, the students actively participate in the construction of their knowledge, about which they are able to investigate, reflect on, discuss and reconstruct. Moreover, the environment generated in the classroom enables the development of learning strategies. This tool is an effective resource for learning about operations research and for enabling the teacher to innovate in the classroom.

References

Alonso, 2012 – *Alonso, M.A.* (2012). El cómic en la clase de ELE: una propuesta didáctica [The comic in the ELE class: a didactic proposal]. *Suplementos marco ELE*. 14: 2-89. [in Spanish]

Barbosa et al., 2017 – *Barbosa, A.D., Tavares, G.D., Kruta de Araújo, A.C.* (2017). The comics as teaching strategy in learning of students in an undergraduate management program. *Mackenzie Management Review*. 18(1): 40-65. DOI: https://doi.org/10.1590/1678-69712017/administracao.v18n1p40-65

Barraza, 2006 – *Barraza, E.M.* (2006). La historieta y su uso como material didáctico para la enseñanza de la historia en el aula [The comic strip and its use as didactic material for the teaching of history in the classroom]. *Perspectiva Educacional*. 47: 73-97. [in Spanish]

Bravo-Acosta, García-Vera, 2020 – *Bravo-Acosta, A.E., García-Vera, C.E.* (2020). Flipped classroom with powtoon to develop multiple intelligences. *Dominio de las ciencias*. 6(3): 4-25.

Caldarelli, 2017 – *Caldarelli, P.G.* (2017). A importancia da utilizacao de práticas de metodologías ativas de aprendizagem na formacao superior de profiddionais da saúde [The importance of using practices of active learning methodologies in higher education for health professionals]. *Sustinere*. 5(1): 175-178. DOI: http://dx.doi.org/10.12957/sustinere.2017.26308 [in Portuguese]

Campos, 2000 – *Campos, Y.C.* (2000). Estrategias de enseñanza aprendizaje [Teaching-learning strategies] [Electronic resource]. URL: http://www.camposc.net/orepositorio/ensayos/00estrategiasenseaprendizaje.pdf [in Spanish]

Carter, 2008 – *Carter, J.B.* (2008). Comics, the canon, and the classroom. In Frey, N., Fisher, D. (eds). *Teaching visual literacy: using comic books, graphic novels, anime, cartoons, and more to develop comprehension and thinking skills*: 47-60. Corwin Press: USA.

Carvalho, Dias, 2014 – *Carvalho, F.J., Dias, M.F.* (2014). Improvisação e competências comportamentais em processo decisório: uma proposta pedagógica baseada no teatro de improviso [Improvisation and behavioral skills in decision-making: a pedagogical proposal based on improvisation theater]. *Proceedings of the XXXVIII Encontro da ANPAD*. 1-16 [Electronic resource]. URL: http://www.anpad.org.br/diversos/down_zips/73/2014_EnANPAD_EPQ8.pdf [in Portuguese]

Chen, 2015 – *Chen, L.C.* (2015). My comic-utilizing "comics composition system" to improve students´self-efficacy and satisfaction of arts learning. *International Journal of Learning and Teaching*. 1(1): 33-37.

García, 2013 – *García, I.M.* (2013). El cómic como recurso didáctico en el aula de lenguas extranjeras [The comic as a didactic resource in the foreign language classroom]. Unpublished Master Thesis, Universidad de Cantabria, España. [in Spanish]

Gonik, Smith, 1993 – *Gonik, R., Smith, W.* (1993). The Cartoon Guide to Statistics. HarperPerennial: New York.

Green, 2015 – *Green, M.J.* (2015). Comics and medicine: peering into process of professional identity formation. *Academic Medicine*. 90(6): 774-779. DOI: http://dx.doi.org/10.1097/ACM.0000000000000703

Green, Myers, 2010 – *Green, M.J., Myers, K.R.* (2010). Graphic medicine: use of comics in medical education and patient care. *BMJ*. 340: 574-577. DOI: https://doi.org/10.1136/bmj.c863

Herawati et al., 2019 – *Herawati, R., Sulisworo, D., Fayanto, S.* (2019). The development of learning videos on powtoon-based work and energy topics to support flipped classroom learning. *IOSR Journal of Research & Method in Education*. 9(4): 51-58.

Jain, 2015 – *Jain, A.* (2015). Teach me, let me learn! millennial learning. *Indore Management Journal*. 8(1): 64-71.

Juwah et al., 2004 – *Juwah, C., Macfarlane-Dick, D., Matthew, B., Nicol, D., Ross, D., Smith, B.* (2004). Enhancing student learning through effective formative feedback. Higher Education Academy Generic Centre: York, UK.

Kim et al., 2017 – *Kim, J., Chung, M.S., Jang, H.G., Chung, B.S.* (2017). The use of educational comics in learning anatomy among multiple student group. *Anatomial Sciences Education*. 10(1): 79-86. DOI: https://doi.org/10.1002/ase.1619

Koutníková, 2017 – *Koutníková, M.* (2017). The application of comics in science education. *Acta Educationis Generalis*. 7(3): 88-98. DOI: https://doi.org/10.1515/atd-2017-0026

Lazarinis et al., 2015 – *Lazarinis, F., Mazarakis, A., Verykios, V.S., Panagiotakopoulos, C.T.* (2015). E-comics in teaching: evaluating and using comic strip creator tools for educational purposes. *2015 10th International Conference on Computer Science & Education (ICCSE)*. DOI: https://doi.org/10.1109/ICCSE.2015.7250261

Lee, 2020 – *Lee, W.* (2020). An experimental investigation into the application of a learning-from-mistakes approach among freshmen students. *SAGE Open*. 10(2), 1-10. DOI: https://doi.org/10.1177/2158244020931938

León, 2014 – *León, N.G.* (2014). Creando, dibujando... aprendiendo matemática a través del comic [Creating, drawing... learning math through comic]. *Cuadernos de Investigación y Formación en Educación Matemática*. 9(12): 111-123. [in Spanish]

Mayer, Moreno, 2002 – *Mayer, R.E., Moreno, R.* (2002). Animation as an aid to multimedia learning. *Educational Psychology Review*. 14(1): 87-99. DOI: https://doi.org/10.1023/A:1013184611077

Meso et al., 2011 – *Meso, K.A., Perez, J.D., Mendiguren, T.G.* (2011). Las redes sociales como herramientas para el aprendizaje colaborativo presentación de un caso desde la upv/ehu [Social networks as tools for collaborative learning presentation of a case from the upv/ehu] [Electronic resource]. URL: https://es.slideshare.net/RagdeAtocsauc/las-redes-sociales-como-herramientas-para-el-aprendizaje-colaborativo-presentacin-de-un-caso-desde-la-upv-ehu [in Spanish]

Monaco, Martin, 2007 – *Monaco, M., Martin, M.* (2007). The millennial student: a new generation of learners. Athletic *Training Education Journal*. 2(2): 42-46. DOI: https://doi.org/10.4085/1947-380X-2.2.42

Oliveira, 2014 – *Oliveira, R.M.* (2014). Problem based learning como estratégia de ensino: diagnóstico para a aplicabilidade no curso de ciéncias contabeis da Universidades federal do Paraná [Problem-based learning as a teaching strategy: diagnosis for applicability in the accounting science course at Federal Universities of Paraná]. Unpublished Master Thesis, Universidade Federal do Paraná, Brasil. [in Portuguese]

Ramírez, 2010 – *Ramírez, A.V.* (2010). La historieta como material de apoyo educativo [Comic as educational support material]. Unpublished Bachelor Thesis, Universidad Nacional Autónoma de México. [in Spanish]

Rioseco et al., 2017 – *Rioseco, M.H., Paukner, F., Ramírez, B.* (2017). Incorporating powtoon as a learning activity into a course on technological innovations as didactic resources for pedagogy programs. *International Journal of Emerging Technologies in Learning*. 12(6): 120-131. DOI: https://doi.org/10.3991/ijet.v12i06.7025

Rodrigues, Arroio, 2011 – *Rodrigues, E. S., Arroio, A.* (2011). Comics: a tool for teachers and students in teaching and learning Science. *Natural Sciences Education*. 31(2): 49-59.

Silva et al., 2012 – *Silva, A.B., Lima, T.B., Sonaglio, A.B., Godoi, C.K.* (2012). Dimensões de um sistema de aprendizagem em ação para o ensino de administração [Dimensions of a learning-in-action system for teaching business]. *Administração: Ensino e Pesquisa*. 13(1): 9-41. [in Portuguese]

Silva et al., 2014 – *Silva, C. S., Giraldes, A. I., Pazin-Filho, A.* (2014). Estratégias inovadoras para métodos de ensino tradicionais – aspectos gerais [Innovative strategies for traditional teaching methods – general aspects]. *Revista da Faculdade de Medicina de Ribeirão Preto*. 47(3): 284-292. DOI: https://doi.org/10.11606/issn.2176-7262.v47i3p284-292 [in Portuguese]

Sones, 1944 – *Sones, W.W.D.* (1944). The comics and instructional method. *The Journal of Educational Sociology*. 18(4): 232-240. DOI: https://doi.org/10.2307/2262696

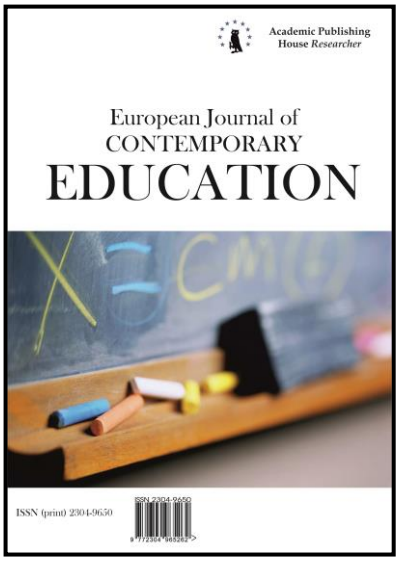
Tatalovic, 2009 – *Tatalovic, M.* (2009). Science comics as tools for science education and communication: a brief, exploratory study. *Journal of Science Communication*. 8(4): 1-17. DOI: https://doi.org/10.22323/2.08040202

Toh, 2009 – *Toh, T.L.* (2009). Use of cartoons and comics to teach algebra in matematics classrooms [Electronic resource]. URL: https://www.academia.edu/35538958/Use_of_Cartoons_and_Comics_to_Teach_Algebra_in_Mathematics_Classrooms_USE_OF_CARTOONS_AND_COMICS_TO_TEACH_ALGEBRA_IN_MATHEMATICS_CLASSROOMS

Trnova et al., 2013 – *Trnova, E., Trna, J., Vacek, V.* (2013). The roles of cartoons and comics in science education [Electronic resource]. URL: https://www.researchgate.net/profile/Josef_Trna/publication/272978319_The_Roles_of_Cartoons_and_Comics_in_Science_Education/links/54f42c810cf299c8d9e654a4.pdf

Valle et al., 1999 – *Valle, A., Barca A., González R., Núñez, J.C.* (1999). Las estrategias del aprendizaje: revisión teórica y conceptual [Learning strategies: a theoretical and conceptual review]. *Revista Latinoamericana de Psicología*. 31(3): 425-461. [in Spanish]

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 148-158
DOI: 10.13187/ejced.2021.1.148
www.ejournal1.com



Correlations between Living Values and Life Skills of Secondary School Students in Vietnam

Thu Le Thi Tran [a, *], Huong Mai Thi Phan [b], Ai Nhan Thi Nguyen [a], Huong Dieu Nguyen [c]

[a] Hanoi National University of Education, Vietnam
[b] Institute of Psychology, Vietnam Academy of Social Science, Vietnam
[c] Vietnam National Foundation for Science and Technology Development, Vietnam

Abstract

This study was conducted to examine the relationship between the living values and life skills of 883 students in five secondary schools in Hanoi, Ho Chi Minh City and Da Nang. The questionnaire used in the study consists of 42 items reflecting 9 living values (Patriotism, Cooperation, Safety, Happiness, Tolerance, Hardworking, Love – Respect, Responsible for the future and Honesty) and 23 items reflecting 3 life skills (Autonomy, Problem Solving and Creativity, and Communication). The results show that: The students made a clear expression of the 9 living values and the 3 life skills. The living values and life skills were positively correlated with the Pearson correlation coefficients of from 0.33 to 0.684. The correlation coefficients between living values and life skills expressed by females are higher than those for males. The correlation coefficients between living values and life skills by grade level are positive. This study also showed the need to focus on educating the living values and life skills under the focus of the general education program in Vietnam today. The research provides a scientific basis and evidence that many high secondary schools in Vietnam are focusing on educating only life skills in the past decade will review and adjust their model and approach of life skills education. These practical results help reinforce the approach and educational model for integrated living values and life skills. Many schools, especially five schools of the sample group in Ho Chi Minh City, Da Nang and Hanoi, can immediately adjust their current model of living values and life skills education.

Keywords: correlation, living value, life skill, secondary school student, living values and life skills education.

* Corresponding author
E-mail addresses: thuttl@hnue.edu.vn (T.L. Thi Tran), huongphanmai@gmail.com (H.M. Thi Phan), nhanai77@gmail.com (A.N. Thi Nguyen), ngdhuong@gmail.com (H.D. Nguyen)

1. Introduction

Living values and life skills have been studied in many educational researches in order to be included in educational and mental health care systems (Dewey, 1939; Raths, 1959; Fichter, 1972; Kohlberg, Mayer, 1972; Raths et al., 1966, 1978; Bartlett, 1987; Oades, Anderson, 2012; Komalasari, 2012; Suyatno et al., 2017).

There are many different concepts of values and living values. Value can be understood as something that is gained, thanks to the way it is viewed (how it is appreciated), or something that is a result of the condition of itself and in relation to other things (e.g.: in relation to work, money, or any sort of standard metric) (Dewey, 1939). Everything that is beneficial, desirable or respectable for an individual and a society has a value (Fichter, 1972). Values are beliefs, attitudes, goals, emotions, and reasons that are assessed and selected after they have been considered, challenged and instilled in life (Raths et al., 1978). Values are socially shared ideas about what is good, desirable or important (Thio, 2005). Values refer to ideas held by individuals or organizations concerning the standards that define what is 'good' or 'bad', what is desirable, and what is not desirable (Giddens, 1991). Values can be defined as "principles and fundamental convictions that act as general guides to behaviors and standards by which particular actions are judged to be good or desirable" (Halstead, Taylor, 1996). Living values refer to core and common values of human beings; they reflect the nature of human beings, such as peace, love, respect, responsibility, tolerance, honesty, humility, happiness, cooperation, simplicity, freedom, safety, and solidarity, etc. *(*Living Values Education*, 2020*).

There are various life skills concepts. According to UNICEF, life skills are defined as psychosocial and interpersonal skills that are generally considered important (UNICEF, 2012). Life skills are the ability to perform functions fully and to participate in the daily life of an individual. They are the practical skills people need to lead a safe, healthy life, to control themselves, to behave appropriately towards others and in society and the ability to respond positively in daily life situations (WHO, 1999; UNESCO, 2003; Singh, 2003; UNICEF, 2013). OECD sorted life skills into three criteria, specifically: a) Key competencies which contribute to an overall successful life and a well-functioning society, b) Instrumental competencies which meet important challenges in a wide spectrum of relevant contexts, and c) Competencies that are relevant to all individuals.

Generally, life skills refer to a mixture of knowledge, behaviors, attitudes and values and some skills in order to do something and/or reach an aim. They include competencies such as critical thinking, creativity, organisation, social communication, adaptability and problem solving and cooperation on a democratic basis that are needed to actively shape a peaceful future (Singh, 2004).

Living values set a foundation for the orientation, leading, and regulation of human behaviors. Therefore, living values education is to help individuals perform behaviors/skills according to standards and values. A strong foundation of living values is undoubtedly an incentive to develop appropriate skills and/or behaviors. Life skills are influenced by living values; they are the expression of living values or the way an individual behaves in specific situations.

In many studies on social psychology, living values are considered an important factor motivating behaviors (Rockeach, 1968); Living values are also considered a factor especially relating to an adolescent's behavior and capacity. It has recently been realized by many researchers that an adolescent's values and goals can play an important role in determining similarities between social skills and capacity of behaviors. Joseph P. Allen (1989) et al. pointed out certain associations between values and social competencies (a sub-component of life skills) in adolescents. That is why living values education programs often also cover life skills. UNESCO and the International Association of Living Values Education (ALIVE) defined living value education as the discovery and development of 12 basic values (i.e.: Peace, Love, Respect, Responsibility, Tolerance, Honesty, Humility, Happiness, Cooperation, Simplicity, Freedom and Solidarity) and to educate and develop social-emotion and communication (Tillman, 2008).

It can be seen that the similarity of living values and life skills is that they help individuals live and work effectively and provide the foundation for an individual to adapt and integrate successfully into social life. UNESCO and ALIVE identified the fundamental criteria of building and maintaining a safe, healthy and happy school that are living values and life skills (UNESCO, 2016; Tillman, Colimina, 2000; UNESCO, 2019). The Mental Health Promotion and Policy (MHP) team of the Department of Mental Health in the World Health Organisation (WHO) stated: "Life skills education is designed to facilitate the practice and reinforcement of psychosocial skills in a

culturally and developmentally appropriate way; it contributes to the promotion of personal and social development, the prevention of health and social problems, and the protection of human rights" (WHO, 1999).

Therefore, living values and life skills education programs are provided in Vietnamese schools for grades 1-12. Most of the programs cover life skills; few cover living values or both life skills and living values. Those programs are diverse. They are spontaneously provided. There is no research evidence to help understand how logical or scientific they are and if there are any duplications.

We studied the relationship between living values and life skills in secondary school students so as to determine what living values and life skills should be included in a living values and life skills education program; Moreover, the study provides evidence for the selection of a living values and life skills education model.

2. Materials and methods

Research sample

The study was conducted on a total of 883 students from grades 6 to 9 at five secondary schools in Hanoi, Ho Chi Minh City and Da Nang. The samples were selected with the consent of the local Districts Office of Education and Training (DOET), administrators and parents. All of the five schools are located in the cities, and they are not schools for talented students.

Table 1. The research samples

Items		N	%
Gender	Male	406	46.0
	Female	476	54.0
	vacant	1	
Grades	6 (11 years old)	213	24.1
	7 (12 years old)	221	25.0
	8 (13 years old)	213	24.1
	9 (14 years old)	236	26.7
Places	Ha Noi	343	38.8
	Ho Chi Minh	355	40.2
	Da Nang	185	21.0
Total		883 samples	

Research tools

A questionnaire was developed by the research team through three steps. In the first step, a set of living values and life skills based on 12 core values in the living values education program (LVEP) was added to a value of patriotism and 3 life skills program according to the orientation that the Ministry of Education and Training has set forth on learners' quality and capacity in a general education program. In the second step, an item pool of living values and life skills was set up based on previous researches and guiding documents on educational innovation promulgated by the Ministry of Education and Training. As a result, 95 items under 13 living values and 30 items under 3 life skills were developed. In the third step, the questionnaire was piloted on 2 sample groups and adjusted accordingly. The first group of 48 samples helped to determine the level of understanding of the items. The items which were questioned repeatedly were rewritten. The second group of 67 samples helped to determine the reliability of each scale. The items with an item total correlation in each scale of < 0.3 were removed. As a result, 60 items in living values (i.e.: "Be honest with yourself", "Have fun, be satisfied with what you have", etc.) and 30 items in life skills (i.e.: "Proactively propose new ideas, new solutions", "Non-verbal communication and effective expression", etc.) were accepted for the official survey. The questionnaire employed a 7 point Likert scale (from point 1 – strongly disagree to point 7 – strongly agree).

The data from the official survey showed that some items were removed because they did not meet the criteria of reliability and validity (Factor loadings of <0.5, Item – total correlation of < 0.3); the remaining items and the living values and life skills detected are shown in Table 2. It was

indicated that the reliability and validity of the scales on living values and life skills were guaranteed. The remaining 42 items reflect 9 living values and 23 items reflect 3 life skills in secondary school students.

Table 2. Reliability of the scales

Values – Skills	Items	α	Values – Skills	items	A
Patriotism	6	0.908	Cooperation	3	0.875
Safety	7	0.892	Happiness	5	0.848
Tolerance	6	0.845	Hard working	3	0.843
Love – Respect	5	0.787	Honesty	4	0.860
Responsibility for the future	3	0.841	Communication	9	0.938
Problem solving and creativity	8	0.914	Autonomy	6	0.882

Statistical analysis

In this study, factor analysis and Cronbach Alpha were employed to examine the validity (convergence and discrimination) and the reliability of the scales. Statistical parameters such as mean and standard deviation were calculated to describe the current status of the living values and life skills of secondary school students. Finally, Pearson correlation was calculated to analyze the relationship between living values and life skills.

3. Results

3.1. The living values and life skills of secondary school students

The living values and life skills of secondary school students are presented in Table 3.

The mean of the living values and life skills ranged from 5.14 to 5.89.

In Table 3, the expression of the secondary school students in 9 living values and 3 life skills ranges from 5.14 to 5.89 on the 7-point scale. The deviation between living values and life skills is negligible.

On living values: The living values that the students expressed at a higher level included: (1) happiness, (2) responsibility, (love – respect) with a mean of from 5.49 to 5.89. The living values that the students expressed at a lower level are (1) patriotism, (2) hard working, and (3) honesty with a mean of from 5.23 to 5.45. The living values that the students expressed at the lowest level are (1) tolerance, (2) safety, (3) cooperation with a mean of from 5.14 to 5.22.

On life skills: The mean of the three life skills has no significant difference ranging from 5.14 to 5.55. The skill expressed the most is (1) autonomy followed by (2) problem solving and creativity. The skill that gained the lowest mean is (3) communication (5.14). This result is similar to the results found for the secondary school students in Hanoi (Tran et al., 2020)

Table 3. Description of the living values and life skills of secondary school students

Values – Skills	Mean	SD	Values – Skills	Mean	SD
Living values					
Patriotism	5.23	1.17	Cooperation	5.22	1.22
Safety	5.16	1.20	Happiness	5.49	1.16
Tolerance	5.14	1.14	Hard work	5.44	1.18
Love – Respect	5.89	0.87	Honesty	5.45	1.14
Responsibility for the future	5.63	1.26			
Life skills					
Autonomy	5.55	1.06	Communication		
Problem solving and Creativity	5.30	1.09		5.14	1.24

Note: The highest average score = 7 (values, skills expressed at a high level) and the lowes = 1 (Do not show values and skills)

The students expressed the highest levels in the living values of: (1) happiness, (2) responsibility, (3) love – respect and in the life skills of: (1) autonomy, (2) problem solving and creativity. This indicated that the students showed clearly that they are happy, satisfied with what they have, think positively and optimistically about life, have dreams and a clear orientation for their future. They sympathize, share and listen to themselves and people around them and are accepting of differences... At the same time, they also expressed their attitudes more clearly through specific behaviors in dail-life and learning situations such as: not to rely or depend on others; be able to recognize their strengths and limitations; take initiative in setting goals; be aware and adjust their personal emotions; identify problematic situations; take initiative in solving problems and proposing new ideas; understand the thoughts of others and sympathize with them and like to do things in new, interesting ways.

The two living values the students expressed at the lowest level are tolerance and safety. The life skill that the students gave the lowest score is communication. Therefore, it is possible to see that in the living value of tolerance the students neither understood nor expressed clearly that they should accept and forgive themselves and others and they didn't really accept the limitations of others. On the living value of safety: the students were very afraid and worried when they make mistakes, they were hesitant to ask questions if they don't know or don't understand. On the life skill of communication: They are still hesitant to communicate and do not really feel confident and actively participate in exchanges and communication activities in public. These limitations are possibly due to their psychological and cognitive characteristics. At the same time, it could be due to the fact that the educational curricula, living environment, and learning environment has not yet promoted either safe interactions or tolerance. These results indicated that education as well as education on living values and life skills should be improved to maintain and promote the living values and life skills that secondary school students have developed stably and positively, and also strengthen the living value and life skills that are under-developed.

3.2. The correlation between living values and life skills

3.2.1. The general correlation between living values and life skills

The statistical analysis of Pearson's correlation coefficient of the nine living values and the three life skills is presented in Table 4.

Table 4. The general correlation between living values and life skills

Living values	*Autonomy*	*Problem solving and creativity*	*Communication*
1. Patriotism	0.521**	0.499**	0.516**
2. Cooperation	0.540**	0.603**	0.584**
3. Love – Respect	0.431**	0.349**	0.330**
4. Tolerance	0.392**	0.357**	0.361**
5. Safety	0.663**	0.662**	0.684**
6. Happiness	0.530**	0.473**	0.467**
7. Responsibility for the future	0.557**	0.470**	0.464**
8. Honesty	0.557**	0.499**	0.500**
9. Hard working	0.507**	0.469**	0.459**

*Note:*** p < 0,01

The correlation coefficient of each living value and life skill is positively correlated with r = 0.3-0.68 (p < 0.01). The correlation of all living values and life skills is statistically significant with the values being from average to relatively strong. The highest correlation coefficient is between the living value of safety and the three life skills (r 0.66-0.68, of which the highest correlation is communication (r = 0.684); followed by the quite high correlation between life skills and the living values of cooperation, honesty and patriotism (r 0.5-0.6). This indicated that when the students expressed life skills, they also expressed living values and vice versa. The expression of living values and that of the life skills is quite similar. For example: For safety, the students expressed their opinions, proactively found somebody to ask what they didn't know and they dared to apologize. This expression is very consistent with pro-activity in communicating (the life skill of

communication); proposing new ideas (the life skills of problem solving and creativity); setting career goals and determining to implement them (the life skill of autonomy). This result is consistent with the published studies suggesting that living values and life skills are closely related (Lovat, Clement, 2008, 2005; Lovat, 2009; Nguyen, 2018; UNESCO, 2019; Tran et al., 2020; Tillma, Colimina, 2000; Tillma, 2010).

The living value of tolerance has the lowest correlation with the life skills (autonomy (r = 0.392); problem solving and creativity (r = 0.357) and communication (r = 0.36). This result is quite similar to the survey results on the expression of living values of the secondary school students as discussed above, while the expression of tolerance has the lowest mean among the living values.

3.2.2. The correlation between living values and life skills by sex and grade

Table 5 provides statistical analysis of the correlation between living values and life skills in male and female students.

Table 5. The correlation between living values and life skills by gender

Living values	*Autonomy*		*Problem solving and creativity*		*Communication*	
	Male	*Female*	*Male*	*Female*	*Male*	*Female*
1. Patriotism	0.491**	0.546**	0.458**	0.544**	0.483**	0.553**
2. Cooperation	0.526**	0.549**	0.564**	0.647**	0.547**	0.625**
3. Safety	0.662**	0.668**	0.599**	0.722**	0.639**	0.725**
4. Happiness	0.540**	0.514**	0.439**	0.515**	0.434**	0.507**
5. Tolerance	0.379**	0.403**	0.327**	0.389**	0.330**	0.394**
6. Hard working	0.524**	0.482**	0.415**	0.532**	0.432**	0.496**
7. Love – Respect	0.413**	0.431**	0.333**	0.386**	0.319**	0.363**
8. Responsibility for the future	0.534**	0.572**	0.469**	0.482**	0.455**	0.483**
9. Honesty	0.593**	0.516**	0.433**	0.577**	0.482**	0.531**

Note: ** p < 0,01

In terms of gender, the living values and life still have positive correlation coefficients at an average level (r from 0.4 to over 0.5; p < 0.01) and some correlation coefficients are quite high (r from about 0.6 to over 0.7).

Overall, the biggest difference in the living value-life skill correlation between males and females is in autonomy. In communication and problem-solving and creativity, between males and females, there are more similarities, especially in communication. The correlation coefficients between living values and life skills expressed by females are higher than those for males. For example, the correlation between safety and autonomy for females is greater than that for males. The correlation of safety and problem solving – creativity for females is higher than for males. The correlation of safety and communication for females is higher than that for males. However, the correlation coefficients between males and females also consist of similarities and differences if the correlation of each skill or each value is considered. For autonomy: Both males and females have the highest positive correlation. The lowest correlation in both males and females is for tolerance and love-respect (r = 0.38-0.43). For the remaining values, the correlation is very different between males and females. For problem solving and creativity: Both males and females have a high correlation in safety, cooperation and patriotism (r = 0.46-0.72). The correlation of both males and females is lower in tolerance and love-respect (r = 0.33-0.38). For communication: both males and females have the highest correlation in safety, cooperation, patriotism and honesty (r from 0.48 to 0.73). The lowest correlation for both males and females is in love – respect and tolerance (r = 0.3-0.36). The research results are similar to those for secondary school students in Hanoi (Tran et al., 2020).

Table 6 provides an analysis of the correlation between living values and life skills by grade level.

Table 6. The correlation between living values and life skills by grade level

Living values	*Autonomy*		*Problem solving and creativity*		*Communication*	
	Grades 6-7	*Grades 8-9s*	*Grades 6-7*	*Grades 8-9*	*Grade 6-7*	*Grades 8-9*
1. Patriotism	0.552**	0.481**	0.579**	0.406**	0.562**	0.461**
2. Cooperation	0.589**	0.479**	0.684**	0.510**	0.632**	0.526**
3. Safety	0.723**	0.593**	0.685**	0.630**	0.699**	0.656**
4. Happiness	0.579**	0.471**	0.491**	0.444**	0.523**	0.396**
5. Tolerance	0.463**	0.300**	0.419**	0.275**	0.431**	0.264**
6. Hard working	0.515**	0.480**	0.469**	0.453**	0.420**	0.468**
7. Love – Respect	0.516**	0.348**	0.409**	0.286**	0.391**	0.273**
8. Responsibility for the future	0.566**	0.547**	0.489**	0.448**	0.500**	0.427**
9. Honesty	0.598**	0.502**	0.540**	0.445**	0.506**	0.471**

Note: ** p < 0,01

The correlation coefficients between living values and life skills by grade level are positive. The correlation between living values and life skills of grade 6-7 students is higher than that of grade 8-9 students. In grades 6-7 and 8-9, all of the 3 skills are highly correlated in (1) safety and (2) cooperation. The lowest is in (1) tolerance and (2) love-respect.

When looking at the correlation of each skill in a grade, it also shows certain similarities and differences. Autonomy: in grades 6-7 and 8-9, the highest correlation is in safety, in which grades 6-7 have the highest correlation (r = 0,72) and the lowest in tolerance. The rest have different correlations between grades. For problem solving and decision-making: in grades 6-7 and 8-9 safety and cooperation are most highly correlated; the lowest correlation is in tolerance and love-respect; the correlation in the rest of the values is different between grades. For communication: in grades 6-7 and 8-9, the highest correlation is in safety and cooperation; the lowest in love – respect and tolerance. In the rest of the values, the correlation is very different between grades. These research results are similar to those for the secondary school students in Hanoi (Tran et al., 2020).

4. Discussion

This study aims to indicate the status of living values and life skills and their relationships in secondary school students. The research results can help educators consider the reasonableness and effectiveness of existing living values and life skills education programs for secondary school students. At the same time, there is evidence found to facilitate the selection of a living values and life skills educational model.

The research results for 883 secondary school students in Hanoi, Ho Chi Minh City, and Da Nang show that: the students made a clear expression of the nine core living values, in which the clearest and highest expression is observed in: love – respect, responsibility for the future, happiness and honesty; and the lowest expression is seen in safety, tolerance, patriotism and cooperation. The highest expression is seen in autonomy; lower in problem solving and creativity; and the lowest in communication. This result indicated that the education the students received from a young age to secondary school age has built and developed several living values and life skills quite well. However, some of the values and skills were not well expressed. Therefore it is necessary to focus on developing those values and skills. This result is similar to the study authored by Nguyen Thanh Binh et al., on developing core competencies for students following the living values and life skills approach in 2018 (Nguyen et al., 2018).

The study also found that the living values and life skills of the secondary school students have a strong and positive correlation. Actually, it is a dialectic, inseparable relationship. This was proved in previous studies and affirmed that living values set the foundation for students to nurture life skills and to apply life skills. Life skills provide a way for living values to be revealed and effectively applied in the learning and life of each individual student (Tillman, 2020; Medcalf,

1950; Mckie, 2010). This result is similar to that of the studies on educating living values simultaneously with communication, life skills and/or social emotional skills (Lovat et al., 2009; Payton et al., 2008; Raths, 1978; Nguyen, 2019; Nguyen et al., 2018; Tran et al., 2020; Allen et al., 1989; Durlk et al., 2011).

Currently in Vietnam, some secondary schools have integrated living values and life skills learning into their educational curricula in different ways, such as: Including living values and life skills in an educational curricula for the whole school; integrating living values and life skills into school subjects, depending on the specific subjects and separating living values education from life skills education. In schools that teach both living values and life skills in their educational curricula, agreement of the educational objectives and the sustainability of the educational curricula can be seen. This means that when students are fully equipped with living values, they will be able to express life skills and thus in other words, learners' behaviors and habits will be consolidated more firmly. This study provides clear evidence that the inclusion of living values and life skills is a correct and necessary trend – this is also the approach that has been confirmed in many theoretical and practical studies (Do, 2011; Dang, 2011; Nguyen, 2020; Nguyen et al., 2018; Lovat, 2009; Hanbury, 2008; Bartlett, 1987; Daunic et al., 2013; Covey, 2015; Payton et al., 2008; Makie, 2010; Nguyen & Tran, 2018; Nguyen et al., 2010).

The correlation analysis indicates that community-oriented values such as patriotism, cooperation and safety are highly and strongly correlated with the two more community-driven skills of communication and problem solving. And the values associated with individuals themselves (e.g.: safety, responsibility for the future and honesty) are highly correlated with the skill of autonomy. This skill requires individuals to make efforts towards themselves. Particularly, safety is always strongly and highly correlated with all skills, because the value itself is related to the feeling of security inside the individual and towards the society (in interactions with everyone). Differences in the level of expression of living values and life skills in the students and the correlation of living values and life-skills by gender and grade also shows the development and implementation of an educational curriculum on living values and life skills should be adjusted in terms of content, form, and method. This has also been mentioned in many publications related to the selection, translation, and Vietnamisation of existing or new educational curricula on living values and life skills for secondary students (Halstead) (Halstead, Taylor, 1996; Tillman, Colimina, 2000; Tillman, 2010; UNESCO, 2013; Wilson et al., 2001; UNESCO, 2002; Blackmore, 2010).

However, our study still has certain limitations. The evaluation of the student's living values and life skills is only based on the analysis of the self-report questionnaire results, with no comparison with the parents' and teachers' assessment or the observations as well as interviews. Therefore, long-term observation, as well as the addition of interview results or case studies can support this study to be deployed on a larger scale and to become more accurate. Moreover, this study is as yet to analyze the differences between living values and life skills in the students across the regions (Hanoi, Ho Chi Minh City, Da Nang) or to discuss the determinants affecting the expression of living values and life skills of the students, such as a living values and life skills educational curriculum, educational methods, educational forms, school settings, classroom atmosphere, family and teachers... Other aspects relating to living values and life skills educational curricula, models of the implementation of living values and life skills education can all be subjects for further research in the future.

5. Conclusion

These research results have practical implications for living values and life skills education in Vietnam today. If the expression of living values and life skills is considered a result of the integration of living values and skill education, the relationship between living values and life skills shows that the combination of living values and life skills in one educational curriculum may ensure the high efficiency of comprehensive personality education. This combination will have a highly sustainable effect as it promotes the education of safety, cooperation, patriotism, happiness and honesty together with the education of the 3 skills. Especially, it is necessary to clarify and further promote the effectiveness of the education of tolerance, love-respect and responsibility for the future and hard working for the three life skills. Overall, it is suggested to promote the education of the three core values of safety, cooperation, tolerance and the skill of communication.

6. Acknowledgements

This research is funded by Vietnam National Foundation for Science and Technology Development (NAFOSTED) under grant number 501.01 – 2016.01.

All Authors contributed equally to the conception and design of the study.

References

Allen et al., 1989 – *Allen, J.P., Weissberg, R.P., Hawkins, J.A.* (1989). Relation Between Values and Social Competence in Early Adolescence. *Development Psychology*. 25(3): 458-464.

Bartlett, 1987 – *Bartlett, K.T.* (1987). Teaching Values: A Dilemma. *Journal of Legal Education*. 37(4): 519-521.

Beane, 1990 – *Beane, J.A.* (1990). Affect in the curriculum: Toward democracy, dignity, and diversity. New York: Teachers College Press.

Blackmore et al., 2010 – *Blackmore, J, Bateman, D, Loughlin, J, O'Mara, J., Aranda, G.* (2010). The connection between learning spaces and student learning outcomes: a literature review. Department for Education and Early Childhood Development, Melbourne, Australia.

Covey, 2015 – *Covey, S.R.* (2015). The 7 Habits of Highly Effective People. Franklin Covey.

Dang, 2011 – *Dang, B.Q.* (2011). Living values education for the youth. *Capital educational journal*. 20: 15-17.

Daunic et al., 2013 – *Daunic, A., Corbett, N., Smith, S., Barnes, T., Santiago-Poventud, L., Chalftant, P., Pitts, D., Gleaton, J.* (2013). Integrating social-emotional learning with literacy instruction: an intervention for children at risk for emotional and behavioural disorders. *Behavioural Disorders*. 39(1): 43-49.

Dewey, 1928 – *Dewey, J.* (1928). Human nature and conduct. New York: The Modern Library.

Dewey, 1939 – *Dewey, J.* (1939). Theory of valuation. Chicago: University of Chicago Press.

Do, 2011 – *Do, H.D.* (2011). Living values education for pupils. *Capital educational journal*. 20: 14-49.

Do, 2011 – *Do, H.D.* (2011). To be successful in school living values education. *Capital educational journal*. 23: 24-25.

Durlak et al., 2011 – *Durlak, J.A., Weissberg, R.P., Dymnicki, A.B., Taylor, R.D., Schellinger, K.B.* (2011). The Impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*. 82(1): 405-432.

Fichter, 1972 – *Fichter, J.H.* (1972). The Concept of Man in Social Science: Freedom, Values and Second Nature. *Journal for the Scientific Study of Religion*. 11(2): 109-121.

Griffin, 1942 – *Griffin, A.F.* (1942). A philosophic approach to the subject-matter preparation of teachers of history (Unpublished doctoral dissertation). Ohio State University, Columbus, OH.

Hair et al., 2014 – *Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E.* (2014). Multivariate Data Analysis, 7th Edition. Pearson Education Limited.

Halstead, Taylor, 1996 – *Halstead, J., Taylor, M.* (eds). (1996). Values In Education And Education In Values. London: Falmer Press.

Hanbury, 2008 – *Hanbury, C.* (2008). The life skills Handbook. VSO.

Jessica et al., 2014 – *Jessica, M., Nguyen, T.T., Nguyen, T.L., Vu, S. H., Nguyen, T. N., Vu, T.L., Tran, L.* (2014). Initial survey report – Safe, friendly and equal schools in Hanoi. Plan International.

Kohlberg, Mayer, 1972 – *Kohlberg, L., Mayer, R.* (1972). Development as the aim of education. *Harvard Educational Review*. 42: 449-496.

Komalasari, 2012 – *Komalasari, K.* (2012). The Living Values-Based Contextual Learning to Develop the Students' Character. *Journal of Social Sciences*. 8(2): 246-251

Lickona, 1992 – *Lickona, T.* (1992). Educating for character: how schools can teach respect and responsibility, 1st, Edn. Bantam.

Lions Clubs International Foundation, 2015 – Lions Clubs International Foundation. (2015). Lions Quest – Life skills for Action – Skill banks. Lions Clubs International Foundation.

Living Values Education, 2020 – Living Values Education. (2020). Why would I want to develop my values? [Electronic resource]. URL: http://livingvalues.net/why-develop-values/; http://living values.net/research/

Lovat et al., 2009 – *Lovat, T., Clement, N., Dally, K., Toomey, R.* (2009). Project to Test and Measure the Impact of Values Education on Student Effects and School Ambience. The University of Newcastle, Australia.

Lovat, Clement, 2008 – *Lovat, T., Clement, N.* (2008). Quality teaching and values education: Coalescing for effective learning. *Journal of moral education*. 37(1): 1-16.

Mackie, 2010 – *Mackie, C.* (2010). 16 Guidelines at pine River. Essential Education.

Mackie, 2010a – *Mackie, C.* (2010). Ready set happy. Essential Education.

Metcalf, 1950 – *Metcalf, L.Ê.* (1950). The failure to promote values or to promote valuing. *Progressive Education*. 28(2): 41-45.

MOET, 2013 – Ministry of education & training. Developing school education program. Ministry of education & training, 2013.

MOET, 2018 – Ministry of education & training (MOET). General education program. Ministry of Education and Training, 2018.

Nguyen Binh Khiem, 2014 – Nguyen Binh Khiem (NBK). School Psychology section. Education Program of Living values and life skills for secondary students. Nguyen Binh Khiem school system, 2014.

Nguyen et al., 2010 – *Nguyen, L.T.M., Dinh, T.T.K., Phan, H.T.T.* (2010). Living values & life skills education for pre-school children. Hanoi National University Publishing House.

Nguyen et al., 2010a – *Nguyen, L.T.M., Dinh, T.T.K., Bui, H.T.T.* (2010). Living values & life skills education for primary children. Hanoi National University Publishing House.

Nguyen et al., 2010b – *Nguyen, L.T.M., Dinh, T.T.K., Dang, M.H.* (2010). Living values & life skills education for high secondary school children. NXB ĐHQG HN.

Nguyen et al., 2010c – *Nguyen, L.T.M., Dinh, T.T.K., Tran, T.V., Vu, L.P.* (2010). Living values & life skills education for high school children. Hanoi National University Publishing House.

Nguyen et al., 2018 – *Nguyen, B.T.T., Luu, T.T., Dao, O.T., Nguyen, D.K.T. Le, H.T., Nguyen, H.H.D., Vu, H.T.* (2018). Develop core competencies for high school students based on the living values and life skills approach. Hanoi National University of Education publishing house.

Nguyen, 2009 – *Nguyen, B.T.* (2009). Life skills education. Hanoi National University of Education Publishing House.

Nguyen, 2012 – *Nguyen, C.K.* (2012). Methods of life skills & living values education. Hanoi National University of Education Publishing House.

Nguyen, 2019 – *Nguyen, H.V.* (2019). Report of Happy school development. VTV7 – Vietnam Television Station.

Nguyen, Tran, 2018 – *Nguyen, L.P., Tran, T.T.L.* (2018). The role of living values & life skills education for the process of building a school culture in the context of educational innovation. Journal of educational equipment. No. 179. Agency of the Vietnam Association of Educational Equipment. 4-6.

Oades, Anderson, 2012 – *Oades, L.G., Anderson, J.* (2012). Recovery in Australia: Marshaling strengths and living values. *International Review of Psychiatry*. 24(1)" 5-10. DOI: 10.3109/0954026 1.2012.660623

Payton et al., 2008 – *Payton, J.W., Weissberg, R.P., Durlak, J.A., Dymnicki, A.B., Taylor, R.D., Schellinger, K.B.* (2008). The positive impact of social and emotional learning for kindergarten to eighth-grade students: Findings from three scientific reviews, Collaborative for Academic, Social, and Emotional Learning, Chicago, IL.

Raths, 1959 – *Raths, L.E.* (1959). Values are fundamental. *Childhood Education*. 35: 246-247.

Raths et al, 1978 – *Raths, L.E., Harmin, M., Simon, S.B.* (1978). Values and teaching: Working with values in the classroom (2nd ed.). Columbus, OH: Charles Merrill.

Rokeach, 1968 – *Rokeach, M.* (1968). A Theory of Organization and Change Within Value-Attitude Systems. *Journal of social issues*. DOI: https://doi.org/10.1111/j.1540-4560.1968.tb01466.x

Rychen, Salganik, 2001 – *Rychen, D.S., Salganik, L.H.* (eds.). (2001). Defining and Selecting Key Competencies, Göttingen, Hogrefe and Huber Publications.

Singh, 2004 – *Singh, M.* (2004). Understanding life skills. The UNESCO Institute of Education [Electronic resource]. URL: https://unesdoc.unesco.org/ark:/48223/pf0000146963

Suyatno et al., 2017 – *Suyatno, Jumintono, Dholina Inang Pambudi, Asih Mardati, Ahmad Dahlan* (2017). Design of Values Education in School For Adolescents. *Advances in Social Science, Education and Humanities Research*. Vol. 134. 2nd International Conference on Innovative Research Across Disciplines. University Yogyakarta, Atlantis Press.

Thio, 2005 – *Thio, A.* (2005). Sociology – A Brief Introduction. Boston: Pearson.

Tillman, 2010 – *Tillman, D.G.* (2010). Living Values – Parent Values Groups. An Educational Program. Inc.

Tillman, 2019 – *Tillman, D.* (2019). Living value activities for young adults. Health communications, Inc.; Deerfield Beach, Florida, USA.

Tillman, 2020 – *Tillman, D.* (2020). Living value activities for Children Ages 8-14. Book 2. Health communications, Inc.; Deerfield Beach, Florida, USA.

Tillman, Colimina, 2000 – *Tillman, D.G., Colimina, P.Q.* (2000). Educator training guide. Living Values: An Educational Program. Inc.

Tillman, Hsu, 2018 – *Tillman, D., Hsu, D.* (2018). Living value activities for Children Ages 8-14. Book 1. Health communications, Inc.; Deerfield Beach, Florida, USA.

Tran et al., 2020 – *Tran, T.T.L., Phan, H.M., Nguyen, A.T.N., Tran, T.T.C., Phạm, T.T.D.* (2020). From Living values and Life skills of junior high school students to the education of Living values and Life skills at school. *Journal of Psychology*. 4(253): 23-40.

Tran et al., 2020 – *Tran, T.T.L., Vu, T.T.N., Bui. N.T., Bui L.B., Vu, L.H., Nguyen, D.H.* (2020). Expression of living values and life skills of junior high school students in the current educational innovation. *Journal of Social Psychology*. 19-33.

Tran, 2009 – *Tran, T.T.L.* (2009). Making a good example for students- the best way to form and develop life value orientation for students. *Educational journal*. 3: 20-26.

Tran, 2013 – *Tran, T.T.L.* (2013). Integrated approach in living values & life skills education for students. Enhancing the quality of living values & life skills education for teacher training college students. Ha Tay Teacher Training College, 21-26.

Tran, 2014 – Tran Thi Le Thu (2014). Living Values & life skills programs in Vietnamese schools. *ICER 2014, Innovations & good Practices in Education: Global Perspective*. 7: 343-352.

Tran, 2015 – Tran, T.T.L. (2015). Education program of Living values and life skills for elementary students. Psychology and Education with the development of learners' qualities and competencies. World Publishing House. Pp. 226-235.

Tran, Tran, 2020 – *Tran, T.T.L., Tran, T.T.C.* (2020). Approaching tendencies and relationships between Living values and Life skills education for high school students. *Journal of Science, Hanoi National University of Education*. 65(4): 70-78.

UNESCO, 2002 – UNESCO (2002). World Education Forum, 2002. Education for All – The Dakar Framework for Action. UNESCO, Paris.

UNESCO, 2013 – UNESCO. Life skills the bridge to human capabilities, UNESCO education sector position paper, Draft 13 UNESCO, 2013.

UNESCO, 2019 – UNESCO. Cognitive, social and emotional, and behavioral learning in Education for Sustainable Development and Global Citizenship from pre-primary to secondary education. UNESCO Education Sector, 2019.

UNICEF, 2012 – UNICEF. Global Evaluation of Life Skills Education Programmes. United Nations Children's Fund, New York, 2012.

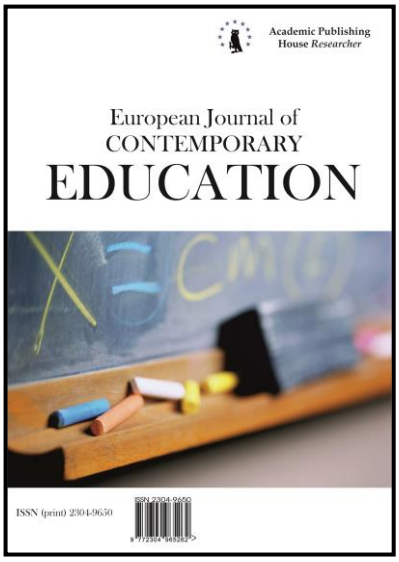
UNICEF, 2012 – UNICEF. Global Evaluation of Life skills Education Programs, Evaluation office, 2012.

UNICEF, 2013 – UNICEF. Asia – Pacific End of Decade Notes on Education for All: Life skills & Lifelong Learning, UNESCO Bangkok, 2013.

WHO, 1999 – WHO. Partners in Life Skills Education. Conclusions from a United Nations Inter – Agency Meeting. Geneva, WHO, 1999 (WHO/MNH/MHP/99.2).

Wilson et al., 2001 – *Wilson, D.B, Gottfredson, D.C., Najaka, S.S.* (2001). School-based prevention of problem behaviors: A meta-analysis. *Journal of Quantitative Criminology*. 17: 247-272.

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 159-172
DOI: 10.13187/ejced.2021.1.159
www.ejournal1.com



International Students Cultural Diversity Clustering for Building HEI`s Adaptive Academic Environment

Yulia P. Ten [a, *], Liliya V. Prikhodko [a], Alexander S. Linnikov [a]

[a] Financial University under the Government of the Russian Federation, Moscow, Russian Federation

Abstract

The relevance of this study is due to the increasing importance and role of universities in the context of growing competition in the international market of educational services. Higher education institutions face the problem of needing to adapt their educational and socio-cultural environment for international students from different countries. Therefore, the aim of this study is to classify the national cultures of students so as to formulate recommendations for universities regarding the development of effective strategies for helping foreigners adapt to their host socio-cultural and educational environments. The study is interdisciplinary in nature and based on international concepts, approaches and methods from the philosophy of education, sociology, theory of intercultural communication and cross-cultural management. The authors use system-structural and comparative methods of culture analysis, as well as cluster analysis techniques.

The authors' sociological survey of international students studying in Russia during the 2019–2020 academic year formed the empirical base of the research. The regression analysis was applied to reveal correlation relations between indicators such as the degree of socio-cultural adaptation, learning adaptation, and degree of external locus of control of international students. The article presents culture as a multilevel system, with individual, organizational, national and global tiers. Based on the experience gained in scientific literature on the typology of cultures, we can see that students from different countries can be grouped based on two main criteria: Geographic and Mental/Cultural. Detailed recommendations are given for host universities wishing to develop an adaptive socio-cultural and educational environment.

Keywords: culture, multilevel culture model, cross-cultural competence, international students, barriers to intercultural adaptation, typology of cultures, cultural clusters.

* Corresponding author
E-mail addresses: YPTen@fa.ru (Y.P. Ten), LVPrikhodko@fa.ru (L.V. Prikhodko), ASLinnikov@fa.ru (A.S. Linnikov)

1. Introduction

1.1. The relevance of the problem

Changes in socio-political, trade, economic, scientific and technical trends all over the world have led to an increased interest in cooperation between foreign countries in a variety of areas. These international relations are built on the principles of modernism (the primacy of knowledge, learning and innovation), pluralism (recognizing the plurality of codification of different norms and values) and tolerance (respect for differences), which contribute to mutual understanding and ability to solve international problems, which are of particularly important. Education is the socio-cultural institution through which representatives of different peoples can enrich their lives and professional experiences in a different socio-cultural and educational environment, thus acquiring and developing cross-cultural competence (Li, 2020).

Today's world of international economies and businesses, as well as the increased need to solve global problems (pandemics, environmental crisis, man-made disasters, etc.) has led experts to use cross-cultural competences to analyze phenomena and processes, both national and international, in a more objective and systematic way. Cross-cultural competence is "a multilevel and multidimensional process through which providers acquire capacities and create opportunities that enable them to operate effectively across different working contexts (i.e., intrapersonal, interpersonal, organizational, and community)" (Garrido et al., 2019: 91).

Cross-cultural competence is an important quality that helps politicians, businessmen, scientists, doctors, engineers, economists, lawyers, and environmentalists from around the world achieve a better understanding of the common challenges facing humanity. It is already a fact that the process of globalization has led to the expansion and deepening of international contacts and interactions between countries in science and education. Students find the educational experience and research opportunities in foreign universities more and more attractive.

These international experiences show that the most effective strategy for achieving successful international cooperation is integration: preserving one's own socio-cultural identity while gaining knowledge and borrowing progressive innovative achievements in science, culture and education from other countries so as to further develop one's own society.

This exportation of education fits the universal model of intercultural communication: one of the parties is the host country, i.e. the subject of communication, which accepts international students who in turn are the subjects of a different socio-cultural system. International students face intercultural communication issues in their host countries, which affects to some extent the effectiveness of the host university's education.

In intercultural communication models for communication between two cultures, it is first necessary to choose a code system – verbal and non-verbal (i.e. language, forms and means of non-verbal communication). Second, the degree of cultural distance must be defined (understanding the similarities and differences between the host culture and the culture of international students). Third, learning models should be adapted to the mental and cultural peculiarities of international students. Finally, international students must adapt to the host countries social and cultural norms.

The clustering of international students by culture is necessary for scientists, experts, and educators in higher education to best understand the potential societal and cultural problems international students face in their host countries, as well as to prevent unnecessary risk and conflicts. Additionally, the authors of this article believe that clustering students by cultural, linguistic, and religious values and traditions will help universities create an adaptive socio-cultural and educational environment.

1.2. The objective and tasks of the research

The objective of the study is to create a method of international students clustering by various means so as to best formulate recommendations for creating an adaptive socio-cultural and educational environment at the university.

In accordance with the set objective, the following scientific tasks of the research are:

– clarify the concept of "culture" in order to analyze culture as a multi-level system;

– formulate a method of international students clustering by different countries, regions, languages, religions;

– develop, by means of regression analysis methods, indicators of the specifics of international students' perception of the process of studying and staying in Russia, measured by

ordinal scales: the degrees of socio-cultural adaptation, learning adaptation, and expressed external locus of control in the process of studying.

2. Materials and methods

2.1. Theoretical and empirical methods

The study uses concepts, categories, approaches and methods from social philosophy, cultural anthropology, sociology, the theory of intercultural communication and cross-cultural management. The complexity of the issue under study determines the authors' decision to use the method of system and structural analysis of culture and its types. To give an idea of the degree of cultural differences between representatives of different social communities, a comparative method is used. Cluster analysis presupposes division of the studied totality into groups uniting objects with characteristic general similarity in relation to each other and common differences in relation to objects included into other groups.

As part of the research, a sociological survey of foreign citizens who are students at Moscow regional universities for the 2019–2020 academic year was conducted. The survey was focused on identifying certain parameters for clustering the students. It was based on analysis of the data gathered from international students studying at the higher educational institutions (HEIs) located in Moscow region of Russia. Moscow region being a capital region with the high level of HEI's concentration traditionally attracts international students from diverse countries and cultures. Moscow region is one of the top priorities among the most preferable study destination for international students in Russia. Moscow HEIs become an alma mater for more than 34 % of international students studying in Russia (Belyakov, 2016: 11).

The sample of respondents within the conducted sociological survey was 262 international students and it has been considered as reliable for the Moscow region.

The survey was conducted in the form of an electronic survey using SurveyMonkey, an online survey software product. The questionnaire consisted of questions aimed at identifying cultural and attitudinal values of respondents, as well as revealing cross-cultural problems faced by the students during their studies in Russian universities. To maximize audience coverage, respondents could choose either the Russian or English versions of the survey. Respondents ranged from 18 to 30 years old, with 57 % of respondents being male and 43 % female.

The authors used statistical methods within the framework of regression analysis for the study. The obtained regressions were set using SPSS Statistics 24.0 program. Regression analysis made it possible to reveal correlation relations between indicators such as the degree of socio-cultural adaptation, learning adaptation, and degree of external locus of control of international students. In addition, the use of linear regression values, which is, in fact, an extrapolation graph, provided the development of a probabilistic scenario of such indicator as the level of international students' learning adaptation, depending on the level of their socio-cultural adaptation.

The present article based on conducted research provides the recommendations regarding the developing of adaptive academic environment for international students for the HEIs located in the Moscow region of Russia and useful insights for academic society on the whole.

3. Results

3.1. Clarifying the basic concepts

It is important to analyze the concept of culture as a multilevel system in order to assess the current state and identify key issues for further research on the peculiarities of cultural adaptation of students to the host foreign [for them] socio-cultural and scientific-educational environment.

Culture includes patterns of thinking and behavior, common meanings, and meanings that members of one society attribute to different phenomena, natural or artificial. It also includes artifacts, skills, abilities, and technologies passed down from generation to generation or transmitted to other cultures in the process of intercultural communication.

Culture is a highly complex, structural education composed of various components (knowledge, notions, ideas, ideals, values, norms, symbols, patterns and technologies). From the point of view of the system and structural approach, culture is a complete multilevel system. Thus, in 1960 K. Oberg (Oberg, 1960) proposed a model of culture as an iceberg consisting of "visible and invisible parts" (Selfridge, Sokolik, 1975). E.H. Schein proposed an additional dimension of culture, which reflects the level of its visibility, from the most visible to the least visible element of culture

(from artifacts, further to the "proclaimed values" to the comprehension of "basic concepts") (Shejn, 2002).

These models emphasize the importance of exploring culture as a set of components, with the comprehension of these components possible by studying both the external manifestations of the culture as well as its foundations.

Culture is a construct that includes four main levels: individual, organizational, national and global. It is important to clearly indicate the level of analysis when it comes to culture, rather than assuming that the cultural aspects at one level will be universally applicable to all other levels. For example, G. Hofstede believed that work-related values (as a measure of culture) should be assessed at the national level, since the same values may not be applicable in an individual context (Hofstede, 1980).

Therefore, it would be false to declare that every Chinese student is a collectivist because he or she is from Chinese culture. The fact is that a culture and an individual from that culture are two different concepts (Kwantes, Glazer, 2017). This can be illustrated by other research models of culture (Schwartz, 1999), in which the number of socio-cultural dimensions varies according to the level of assessment (global, national, organizational or individual level).

A multi-level culture model defines the boundaries within which bottom-up processes can become higher-level constructs. The relationship between top-down and bottom-up processes suggests that the macro level of culture influences the micro level of individual self-assessment (Erez, Gati, 2004). Thus, the structural-system approach allows culture to be presented as a complex structural formation consisting of various components (knowledge, notions, ideas, ideals, beliefs, values, norms, symbols, and patterns). During intercultural communication, the subject understands a different culture based on his or her initial ideas about the external level of said culture. Thus, international students attending universities at the beginning stage of intercultural communication first make contact with the socio-cultural system receiving them; in this case it is Russian culture and society. Language barriers play an important role for universities seeking to adapt their strategies (Goken, 2017). The survey conducted by the authors touches on this: To the question "When reading textbooks and books in Russian, what do you usually use?" 51.14 % of international students chose the answer "electronic assistant", 8.52 % – "dictionary", 5.11 % asked for help from friends, and 35.23 % read fluently. It should be noted that, as a rule, knowledge of Russian language among international students is not yet connected with a deep understanding of hidden "background knowledge".

It should be noted here that the ability to overcome various barriers (language, psychological, social, behavioral, etc.) during intercultural communication is determined by the degree of differences between the subjects.

The empirical studies confirm that lower degree of cultural differences contributes to more effective communications. The result of students' intercultural competencies sociological study (Dagbaeva et al., 2020) shows, for example, that positive correlation is observed in the construction of social ties between Russian and Mongolian students rather than Chinese because of the cultural closeness of Mongolian and Buryatian cultures (Republic of Buryatia, region of the Russian Federation).

To overcome communication barriers, subjects should expand and develop cross-cultural competence. At the same time, cross-cultural competence implies the development of knowledge and understanding of someone else's culture over time, with the goal of eventually reaching a profound level. Without a doubt, knowledge of only the verbal language of the host society is not enough to "immerse" one's self in the new culture.

In this respect, the university administration and educators play an important role, and must themselves have cross-cultural competence as it pertains to the peculiarities of communication with international students, so as to most effectively address difficulties and problems should they arise. Attention should be paid to the results from the survey questions, "Which type of adaptation was the most difficult for you?" 48 % of respondents chose "academic" (new language of study, university requirements and volume of study load); 24 % – "physiological" (life and climate), and 28 % – "socio-cultural" (change of living conditions and quality of life, new traditions, customs, rules of conduct and laws). Interestingly, 15 % of international students surveyed have difficulty understanding the non-verbal language of Russians, and 36 % admitted that they sometimes have difficulty interpreting non-verbal behavior in Russians.

Therefore, the issue of studying both national and cultural specifics as they relate to a culture's mentality is an important one and demands the attention of higher education institutes who host international students. In this regard, the most fruitful and promising method is the comparative analysis of differences between students from different cultures, as well as the comparative analysis of different national mentality programs (in G. Hofstede's terminology) and the study of their "junction", which will make it possible to identify the commonalities and differences between the cultures in question.

To achieve the goals and objectives of this study, it is necessary to place international students and their cultures into groups. In this section, the authors have chosen the method of cluster analysis.

A cultural cluster is a separate group of nations, which are in close proximity to each other and have similar history, religion, economic development and cultural factors. Clusters are the originally chosen variable, but it is too simplistic to say that all nations in a cluster are the same. Moreover, within each nation, individuals differ to the extent that they accept the dominant cultural way of doing things. E. Hall (1976), G. Hofstede (1980), R.D. Lewis (1999), R. Ingelhart (2018), A. Shoham & I. Alon (2010) and others have made a significant contribution to the development of cluster analysis in scientific literature. Thus, the researchers from the "GLOBLE" project, which summarized data from 62 countries, concluded that the clusters are unique regional clusters representing different groups: English, Northern Europe, German Europe, Latin Europe, Eastern Europe, Latin America, Middle East, Sub-Saharan Africa, South Asia, Confucian Asia (Chhokar et al., 2007).

While many researchers focus on the differences between cultures, in the context of our study we have identified the inevitability of the formation of the upper tier of global culture as a consequence of human development, as a kind of urgent "response" to the challenges of globalization. Therefore, we consider it necessary to take into account that if the vector of development of modern cultures is oriented to the values of "survival" (in R. Ingelhart's terminology) in the conditions of increasing threat of world disasters of different nature – from ecology to pandemic, then the attention of scientists should be concentrated on the search of universally significant ideals, principles, norms and values. In other words, a humanistic approach should be developed that, in the typology of cultures, focuses not only on the fundamental differences in the cultures and mentalities of students at higher education institutions, but also on the problem of their adaptation to the foreign cultural social environment of their host country. Hence, the scientific relevance of helping foreigners adapt better. Here it is possible to choose two directions – either to concentrate our attention on the process by which international students adapt to the large differences of Russian culture or to go the other way – to look for forms and ways of adapting in the context of forming the upper "tier" of world culture as an area of generally significant ideas, ideals, knowledge, norms and values.

3.2. The results of survey

We have placed international students studying at Russian universities in a variety of clusters, based on the results of the authors' survey. Thus, the results for the question: "What civilization do you consider yourself to be a part of?" indicate that international students have an awareness of their cultural and civilization identity. Only slightly more than 6 % found it difficult to choose a cultural identity. This confirms the hypothesis of the study regarding the need to choose two fundamental criteria for the classification of cultures – geographical feature and mentality. The importance of geographical criteria became apparent in the responses to the question: "I identify myself as:" with Chinese receiving 23.53 % of responses, followed by Central Asian (11.27 %); Southeast Asian (5.39 %); North African and Middle Eastern (4.90 %); Central African (2.94 %); South African (5.88 %), and European (9.80 %). Undoubtedly, the mental feature (commonality of historical and cultural ties) and the language of identification appeared when choosing the identification link with the English-speaking cultures – 4.4%, French – 6.86 %, Spanish – 4.90 %, Russian – 13.73 %, as here not only the language, but also a certain worldview is evident in the culture of these countries, united in a broader context – the civilization type. The following data should not be disregarded. For the question "What symbol do you primarily associate Russia with (choose no more than 3 variants)" the following results were obtained: 53.43 % of respondents named Russian winter as the main symbol of Russia. This confirms the authors' hypothesis that it is necessary to choose a geographical criteria for typologizing cultures,

as the geographical location of the country of international students is closely related to its climatic characteristics. Moreover, 60 % of respondents answered the question "It is difficult to live in Russia because:" with "Long winters and few sunny days per year" (Figure 1).

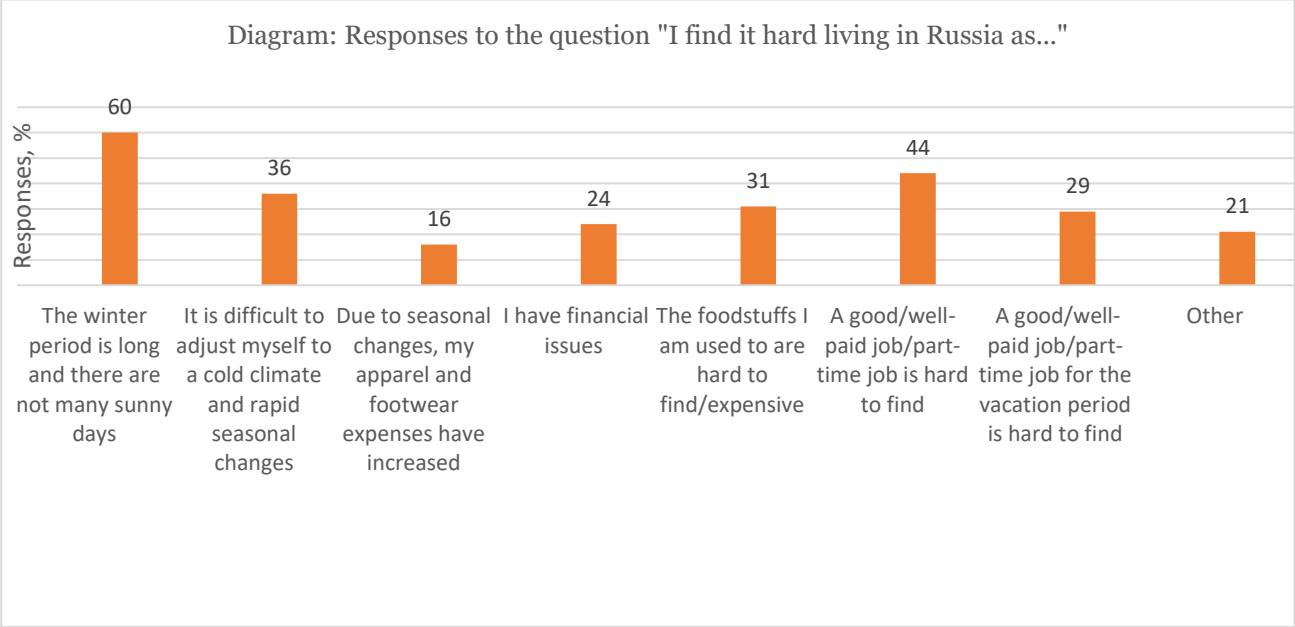


Fig. 1. Survey results (1)

There were 158 responses to the question "What helps you to reach an understanding with other people? (choose no more than 2 answer)". The overwhelming majority of respondents answered "language" – 80 %, "common region of residence" (part of the continent, for example, South-West Asia, North Africa, CIS countries, etc.) – 14 %, "common religion" – 5 %, "nationality" – 11 %, and "common culture" – 25 % (Figure 2).

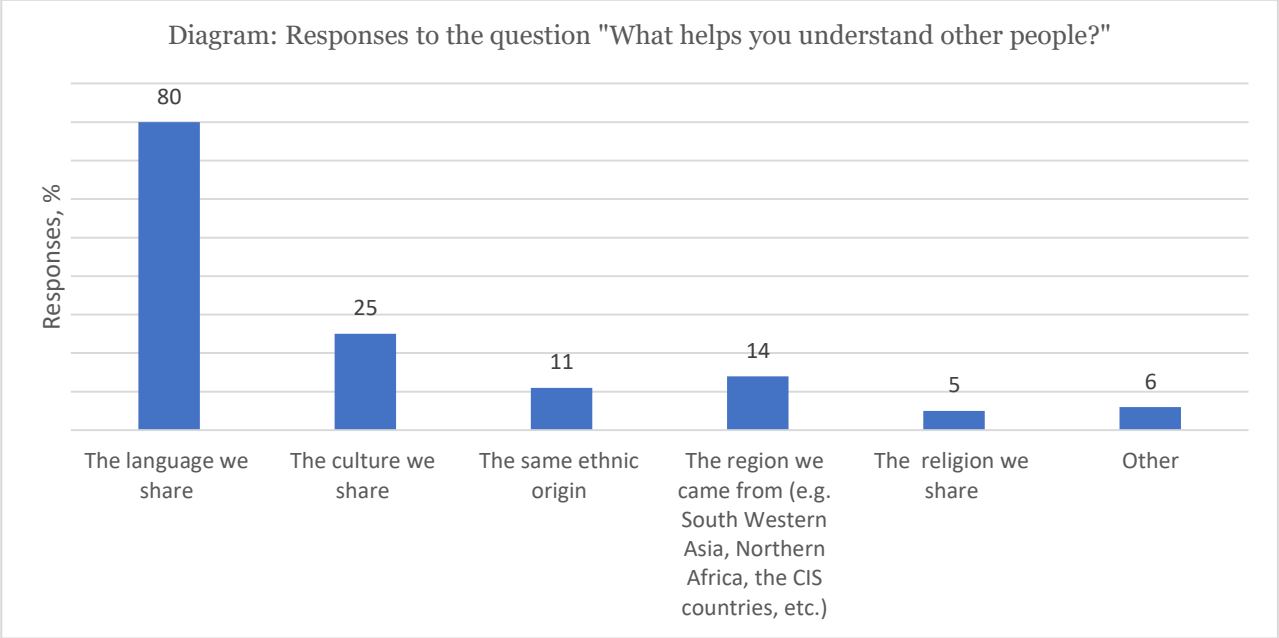


Fig. 2. Survey results (2)

It is known that religion is one of the prevailing factors in the classification of countries and cultures. It is noteworthy that the majority of Chinese students consider themselves atheists, which is due to the policy of freedom of religion pursued by the People's Republic of China. Evidence that religion plays an important role in identifying students can be found in the following survey data: for example, 9.80 % of the students identified as Muslim, 17 % Orthodox, 4 % Catholic, 2 % Protestants, 0.5 % Confucian, 25 % Buddhist, and 10 % Jewish. It is noteworthy that 186 people were interviewed, but 204 responses were received. This indicates that a number of students who have cross-cultural influences from other religions. It is important to emphasize that the religious factor should be taken into account when implementing plans to aid international students in their adaption to the host country's educational environment.

It is interesting to compare the student's choice of the language when receiving professional information, as seen in the answers to the survey question regarding international student's speeches during the seminar and practical classes. It is known that the language, culture and mentality are inextricably linked; therefore, when adapting teaching, it is necessary to form cross-cultural competence by introducing didactic units on Russian history, culture, politics, and traditions into the program. It is recommended to use digital communication as a means to expand and deepen intercultural communication (Braslauskas, 2020).

The result of the authors' survey showed that only 47 % of respondents rarely experienced language difficulties when speaking in class. Almost 40 % of international students rarely speak during class as they have difficulty expressing themselves in Russian, and 8 % do not even understand the questions. According to the survey results, 51 % of respondents use electronic translators for academic and household communications, and only 35 % are fluent in reading information in Russian. Given the repeatedly noted language barrier, the only effective way to reduce the gap in the quantity and quality of professional information received by Russian and international students may be to develop teaching and learning materials specifically adapted for foreigners.

The geography, ethno-cultural, linguistic, and religious diversity of countries is so great that it is extremely difficult to group students into clusters. Therefore, the geographic location, language, and religion serve as barriers to intercultural communication, and as starting points for the following classification groups (Tables 1-3).

Table 1 shows the results of the culture cluster analysis based on geographical criteria

Table 1. Classification of countries by geographical criteria as a factor affecting cultural characteristics

№	Cluster name	Countries
1	Western Europe	United Kingdom, Denmark, Germany, Ireland, Spain, Italy, Netherlands, France, Greece
	Eastern Europe	Bulgaria, Latvia, Lithuania, Poland, Serbia, Croatia, Montenegro, Estonia, Belarus, Moldova
2	Near East	Algeria, Egypt, Morocco, Iran, Syria, Somalia, Turkey, Israel
3	Caucuses	Abkhazia, Azerbaijan, Armenia, Georgia
4	Africa	Congo, Cameroon, Zambia, Botswana, Benin, Nigeria, Niger
5	South-East Asia	Afghanistan, Bangladesh, China, Vietnam, South Korea, India
6	Central Asia	Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Uzbekistan
7	North America	USA, Canada, Mexico
8	South America	Argentina, Venezuela, Colombia, Peru, Ecuador

Most commonly geographic location significantly influences the choice of host country for higher education. Countries in close proximity to each other have close economic and trade contacts, as well as a history of traditions and socio-cultural exchange.

Table 2 shows the results of the culture cluster analysis based on language criteria

Table 2. Classification of countries by language as a factor affecting cultural characteristics

№	Cluster name	Countries
1	English language	United Kingdom, USA, Bangladesh, India, Nigeria, Zambia, Botswana
2	French language	France, Congo, Djibouti
3	Spanish language	Spain, Argentina, Mexico, Venezuela, Colombia, Peru, Ecuador
4.	Arabic language	Algeria, Morocco, Egypt, Syria
5.	Chinese languages	China
6.	Indian languages	India
7.	Vietnamese language	Vietnam
8.	Korean language	South Korea

Table 2 groups countries by language, which can and should be further expanded. It should be noted here that, although language leaves a mark on the worldview of its speakers, it is still recognized as the main barrier to cross-cultural communication. Meanwhile, the development of innovative information and communication technologies leads to a decrease in the impact of this barrier (Ten, 2019). The fact that knowledge of foreign languages is essential for the successful career of future graduates also plays a big role in minimizing the language barrier. Due to the fact that English and Chinese are the leading languages in business communications, the introduction of these languages to Russian students will help to develop a wider cross-cultural language competence.

Table 3 demonstrates the results of the culture cluster analysis based on religion criteria.

Table 3. Classification of countries by religion as a factor affecting cultural characteristics

№	Cluster name	Countries
1	Orthodox	Russia, Belarus, Serbia, Greece, and others
2	Western Christian	France, Italy, Germany, USA, United Kingdom, Poland and others
3	Islam	Iran, Iraq, Jordan, Syria, Algeria, Egypt, and others
4	Buddhist	Mongolia, Laos, India, China, and others
5	Atheist	China
6	National Religions	Israel, India, Japan, and others

The criteria of classifying cultures by mentality has been correctly identified, indicating that the main barriers are features of culture (customs, traditions, holidays, etc.) – 21 %, moral norms (other notions of good and evil, right and wrong behavior) – 20 %, mentality peculiarities – 25 %, Russian humor – 15 %; and legal norms (laws, rules of public behavior in the city and university, transport, museum, etc.) – 20 %. The fact that almost 27 % of respondents consider non-verbal behavior a significant barrier indicates the need to include a section on non-verbal aspects of culture in the educational programs of students (Figure 3).

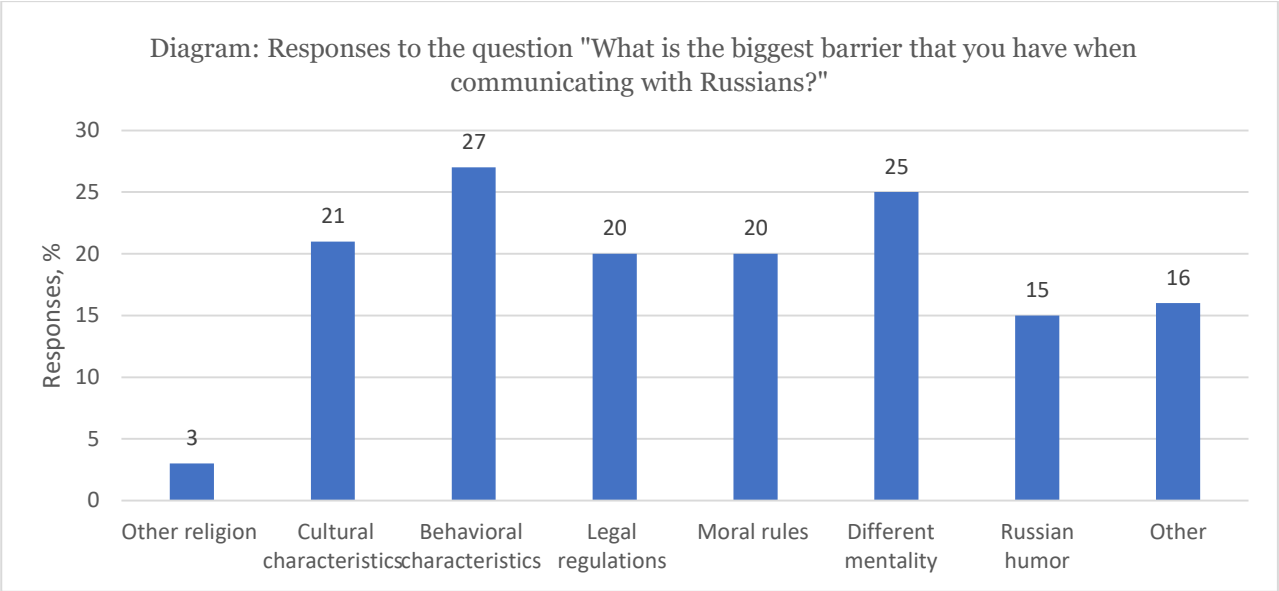


Fig. 3. Survey results (3)

It is important to mention that Russia due to its unique geographical location as well as intensive centuries-old contacts and ties with the cultures of Europe, Asia and the Middle East could be defined as a distinctive cultural cluster itself. The Russian mentality could be characterized by a high degree of tolerance, respect for cultural and religious diversity, and a high receptibility of cultural adoptions and this should be considered as additional competitive advantage in terms of attracting international students. It is represented by Figure 4.

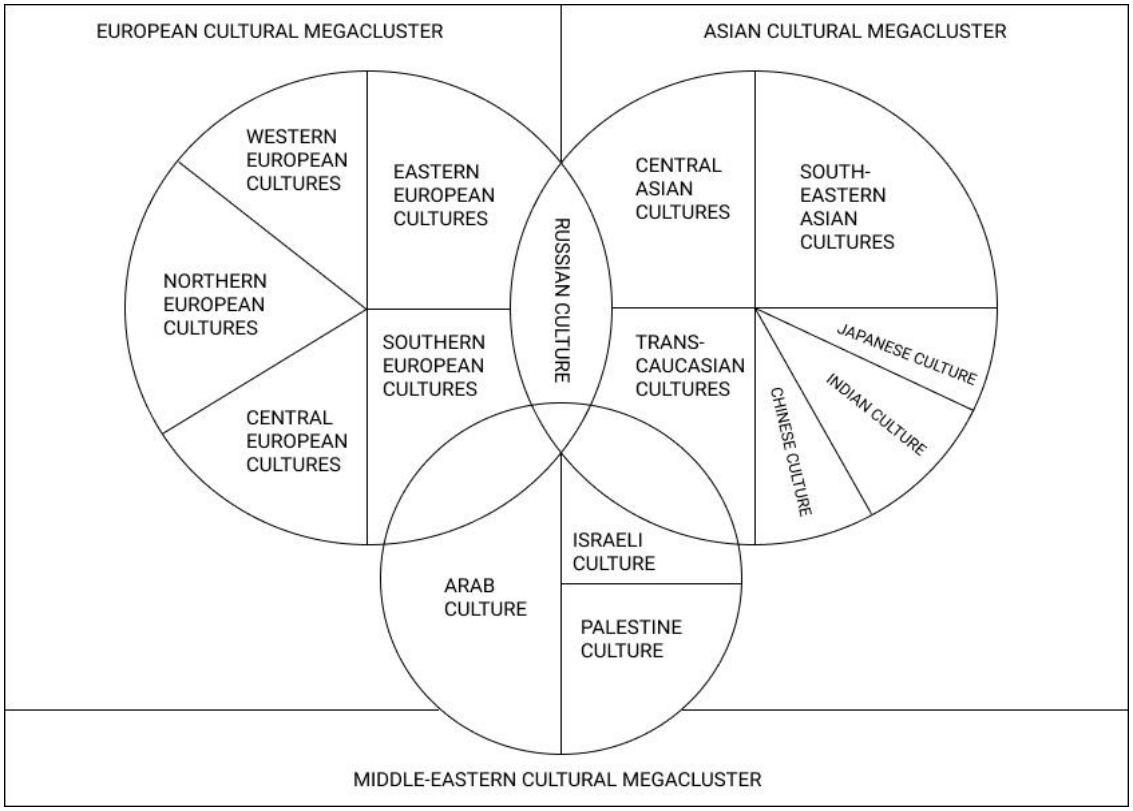


Fig. 4. Culture clusters convergence

It is interesting to study the analysis of respondents' answers to the question "What kind of food do you usually eat in Russia?", as it shows that the majority of respondents prefer "traditional food of their country" (33.33 %), while 24.51 % eat fast food, and 28.92 % eat Russian national cuisine.

In this regard, educational institutions should be encouraged to make adjustments to student cafeteria menus, as is the practice in a number of leading universities, which focus on a high degree of internationalization of their activities. Many students who identify as Confucian or Buddhist (25.49 % of respondents) are vegetarians. The potential growth of Muslim students points to the need to take Islamic norms into account for the cafeteria and buffet menus.

Certainly, the identified clusters do not completely solve the problem of clustering international students by culture, but the conclusions and results obtained allow us to make a number of practical recommendations for higher education. In order to help international students adapt to the host socio-cultural and educational environment of higher education institutions, ideally each higher education institution would choose a different type of strategy – global, global-local or local to facilitate the international student's adaption. Factors such as the number of international students, their level of proficiency in English or the language of the host country, as well as their religious life, culinary preferences, morals, and etiquette should be considered.

3.3. Regression analysis

In order to develop practical recommendations regarding the adaptation of international students to the socio-cultural and educational space of their host country, the authors developed indicators for features of international students' perceptions regarding the learning and living processes necessary for staying in Russia, measured by the following degrees: socio-cultural adaptation, learning adaptation, and the degree of external locus of control. These indicated low levels of self-discipline and an orientation towards social stimuli and external motivation. Regression dependencies were revealed based on the analysis of international student respondents' answers identifying problems related to their adaptation to legal, religious, and socio-cultural norms and traditions of Russian society, peculiarities of the organization of educational process in Russian universities, and domestic issues.

Figure 5 shows a linear regression establishing the dependence of international students' learning adaptation on the level of their socio-cultural adaptation.

The location of the linear regression indicates the direct influence of the socio-cultural adaptation level on the international students' learning adaptation. A quite significant level of connectivity between the mentioned attributes is confirmed by Pearson correlation coefficient, equal to 0.747. Thus, the higher the adaptability of international students to moral and legal norms of the Russian society, the higher their academic performance and adaptability to the learning system.

The linear regression shown in Figure 5 allows us to hypothesize the development of such dependent variables as international students' learning adaption on the basis of changes in the values of independent variable – their socio-cultural adaptation. This forecast can be formulated via a basic probability scenario, which establishes the dependence of changes in one attribute on the dynamics of changes in another attribute. Thus, the increase of academic performance and learning adaptability of international students is possible and most probable when universities create favorable conditions for socio-cultural integration, and internalization of Russian traditions, values, and norms.

Figure 6 shows a linear regression, reflecting the dependence of international students' learning adaption on the degree of their external locus of control in the learning process.

According to the obtained data of the linear regression, there is an inverse relationship between the attributes under consideration. It means that the more expressed the external locus of control in international students, the lower their level of learning adaptation. The Pearson correlation coefficient is -0.181.

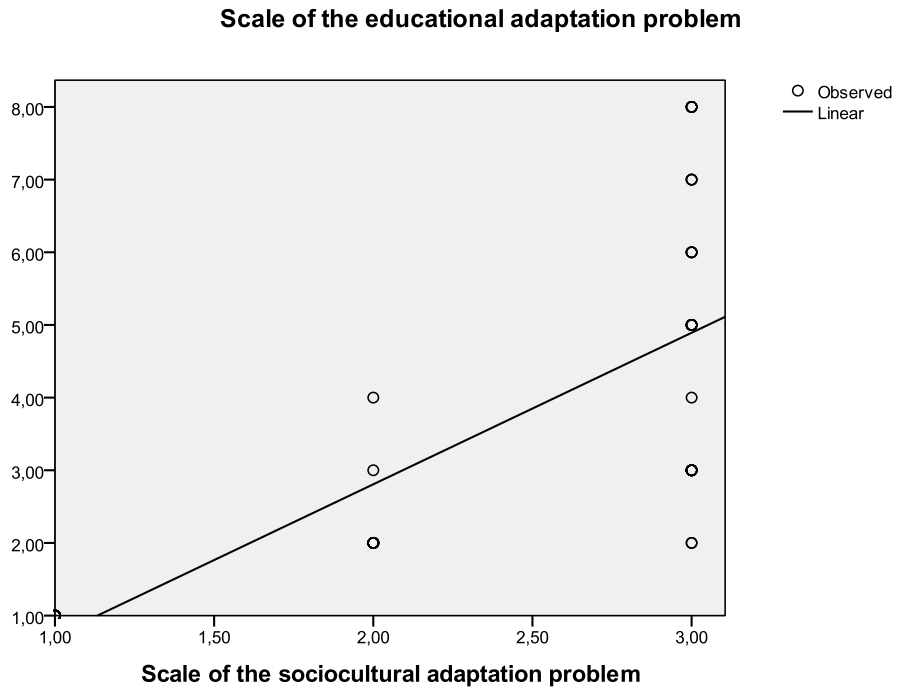


Fig. 5. Linear regression, establishing the dependence of international students' learning adaptation on the level of their socio-cultural adaptation

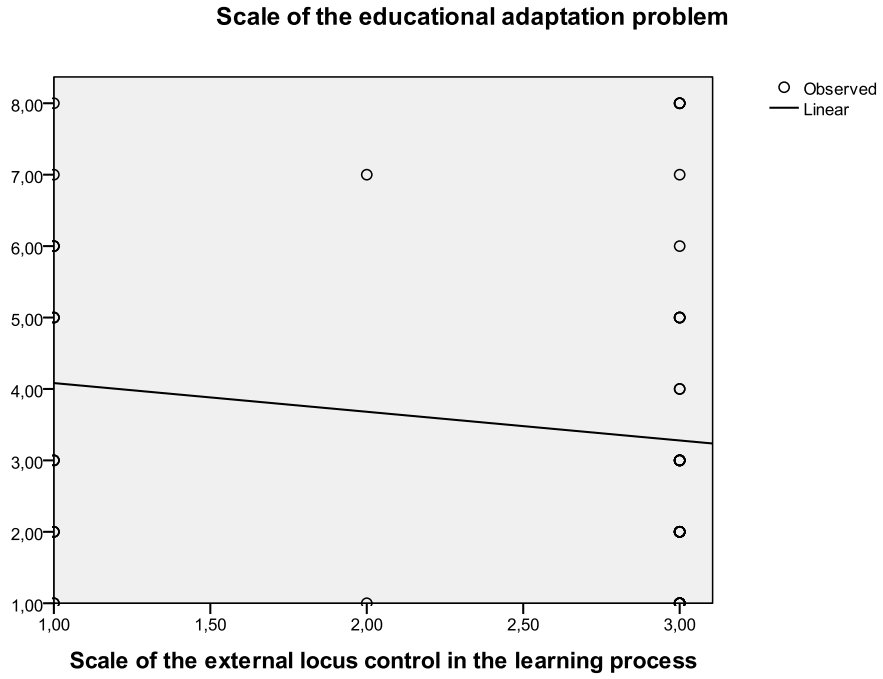


Fig. 6. Linear regression establishing the dependence international student's learning adaption on the degree of their external locus of control in t he learning process*

* The degree of expression of the external locus of control in the learning process in international students was measured on the following scale: "1 to 1.5" on the horizontal axis means the predominance of internal

The applied aspect of the identified dependence indicates the need to create conditions for the international students to adapt their learning, allowing them to exercise their personal responsibility. They must also be able to reject the idea of failure as inadequate and excessive requirements for mastering professional competencies, as opposed to a consequence of their low level of preparation.

The results of the regression analysis conducted by the authors confirm the need to develop and implement an intensive orientation program (briefing) for newly arrived international students at the educational organization. The intensive orientation program for newly arriving international students should be organized for all students, regardless of the forms of their admission and training, regardless of the country of arrival. It is aimed at helping an international student adapt to the initial stage of studying in a Russian university. The model program, in the authors' opinion, should include the following main blocks:

1) Information about the country and city of residence during study (geographic, climate, and ethno-cultural information, regulatory framework governing the rules and regulations of training and migration registration of foreigners, including visas; the rules of settling into a dormitory; medical care; social benefits, etc.).

2) University life (student dress code and rules of attending classes; system of university progress control; rules of living in a dorm; academic calendar; student council and self-government bodies of international students; library and information resources; sports and healthy lifestyle; food at the university; tuition and dormitory payments).

3) Useful contacts and links (It seems useful to have a check-list for international students after their arrival in Russia, to help them keep track of all the information).

4. Conclusion

The multilevel model of culture will allow us to form a model of intercultural communication, where subjects are able to interact at different levels. Within this model it is possible to develop an individual approach to training and adaptation of international students in the context of the receiving foreign national culture. This approach is in turn integrated into the concept of globalization, and the effectiveness of student's communication is possible through the introduction and use of innovative information and communication technologies. With regard to the adaptation of international students to the host university's educational environment, this means not only the use of innovative educational technologies (organizational level of culture), but also the development of an individual creative program (Braslauskas, 2020) for the student (individual level) with their maximum involvement in the process of cognition of the host culture (national level). A systematic approach is important for the adaptation of international students in the environment of the host university, as this involves students not only in the scientific and educational process, but also in the process of deep acquaintance with the features of the culture of the host society.

5. Recommendations

Taking into account the need to introduce the latest methods and technologies of adapted education in a foreign cultural environment into the practice of teaching international students, the most promising and effective criteria for classification is the geographical criteria. We have found that it is geographical, historical, and political factors that most significantly affect international student's choice of receiving education in Moscow region in particular and in Russia in general. Cultural and ideological criteria were also helpful in identifying the peculiarities of the mentality of international students (in this case, mentality is interpreted as the worldview,

locus of control in the learning process over external (failure is perceived as a result of one's own unpreparedness, insufficient efforts to master professional competences); "from 1,5 to 2,5" on the horizontal axis means the balance between the internal and external locus of control in the learning process (failure is perceived as the result of mutual influence of one's own unpreparedness, insufficient efforts to master professional competences and partly inadequate and excessive requirements of the teaching staff for mastering professional competences) "from 2.5 to 3" on the horizontal axis means the dominance of external locus of control in the learning process (failure to succeed is perceived as due to excessive requirements of the university for mastering professional competencies). The scale for measuring the expression of the problem of international students' ability to adapt their learning is shown in the footnote on pp. 2 and 3.

assessment of the surrounding reality by a certain socio-national community, formed under the influence of religion, socio-political history, spiritual practices, traditions and customs).

Final recommendation: when developing a strategy to attract international students to post-Soviet countries, universities should be guided by geography, since, as a rule, countries with common borders or geographical proximity often have a certain degree of cultural proximity. Even if post-Soviet cultures have increased the degree of cultural distance during the development of post-Soviet history, historical traditions as well as economic and trade activities mean that they often find themselves obliged to reestablish international cooperation that was lost in recent decades. As the practice of economic integration in the context of globalization shows, countries are forced to seek opportunities to exchange or attract resources, either because of their limited resources or because of the development of trends that bring the world economies closer and make them more interdependent. Here, too, the cultural and philosophical criteria is being updated. According to the results of a sociological survey conducted in this study, 20 % of respondents have problems with communication and understanding other students and 16 % of respondents have problems with teachers, while 20 % of respondents believe that the problems are easily solved. This indicates that Russians are fairly tolerant of other cultures and find ways to communicate effectively with people from other cultures quite easily.

The most effective method of overcoming barriers and cultural shock for international students is forming intercultural competencies and flexible skills of both the foreign citizens as well as Russian students and, most importantly, university staff, including scientific, pedagogical and administrative staff. For this purpose, it is important for educational organizations to use culturally centered methods to emphasize: communicating with people from different cultures, understanding the characteristics of one's own culture and language, and being able to adapt when meeting a different culture, not only linguistically, but also to the non-linguistic norms of behavior.

Scope of application of the results: international, educational, scientific, project activities of Russian educational organizations.

Recommendations for the implementation of results: creation of a full-fledged environment for international students within the framework of intercultural adaptation ecosystem of an educational organization.

Cost-effectiveness: improving intercultural competencies and competitive advantages of Russian educational organizations for exporting education.

The practical importance of the study is due to the need for a thorough systemic training on intercultural communication and cross-cultural competencies for students in foreign socio-cultural environments.

References

Belyakov, Krasnova, 2016 – *Belyakov, S.A., Krasnova, G.A.* (2016). Export of higher education: perspectives in Russia and worldwide. *University management: practice and analysis*. 106(6): 26-34.

Braslauskas, 2020 – *Braslauskas* (2020). Effective creative intercultural communication in the context of business interaction: theoretical and practical aspects. *Creativity studies*. 13(1): 199-215.

Chhokar et al. – *Chhokar, J.S., Brodbeck, F.C., House, R.J.* (2007). Culture and leadership across the world: the GLOBE book of in-depth studies of 25 societies. London: Routledge. 1200 p.

Dagbaeva, 2020 – *Dagbaeva, N.Zh., Darmaeva, S.N., Samoshkina, J.S., Tzybenova, S.G.* Components of Modern Students' Intercultural Competence: Comparative Analysis. *European Journal of Contemporary Education*. 9(1): 19-28.

Erez, Gati, 2004 – *Erez, M., Gati, E.* (2004). A dynamic, multi-level model of culture: from the micro level of the individual to the macro level of a global culture. *Applied Psychology: An International Review*. 53(4): 583-598.

Garrido et al., 2019 – *Garrido, R., Garcia-Ramirez, M., Balcazar, F.E.* (2019). Moving towards Community Cultural Competence. *International Journal of Intercultural Relations*. 73: 89-101. DOI: https://doi.org/10.1016/j.ijintrel.2019.09.002

Goken, 2017 – *Goken, G.* (2017). Clash of civilization and the impact of cultural differences on trade. *Journal of development economics*. 127: 449-458.

Hall, 1976. – *Hall, E.T.* (1976). Beyond culture. N.-Y.: Anchor press. 256 p.

Hofstede, 1980 – *Hofstede, G.* (1980). Culture's Consequences: International Differences in Work-Related Values. Beverly Hills. 328 p.

Inglehart, 2018 – *Inglehart, R.F.* (2018). Cultural evolution: people's motivations are changing and reshaping the world. N.-Y.: Cambridge University Press.

Lewis, 1999 – *Lewis, R.D.* (1999). Delovyye kul'tury v mezhdunarodnom biznese. Ot stolknoveniya k vzaimoponimaniyu [Business cultures in international business. From collision to understanding]. Per. s angl. T.A. Nestika. Moscow: Delo. 439 p. [in Russian]

Li, 2020 – *Li, M.* (2020). An examination of two major constructs of cross-cultural competence: cultural intelligence and intercultural competence. *Personality and individual differences*. 164. DOI: https://doi.org/10.1016/j.paid.2020.110105

Kwantes, Glazer, 2017 – *Kwantes, C.T., Glazer, S.* (2017). Culture, organizations, and work: Clarifying concepts. NY: Springer [Electronic resource]. URL: https://www.springer.com/gp/book/ 9783319476612#otherversion=9783319476629

Oberg, 1960 – *Oberg, K.* (1960). Culture Shock: adjustment to New Cultural Environments. *Practical Anthropology*. 7: 177-182.

Schwartz, 1999 – *Schwartz, S.H.* (1999). A theory of cultural values and some implications for work. *Applied Psychology: An International Review*. 48(1): 23–47.

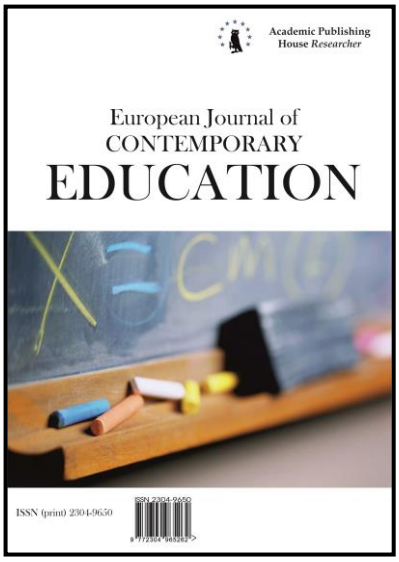
Selfridge, Sokolik, 1975 – *Selfridge, R.J., Sokolik, S.L.* (1975). A comprehensive view of organizational development. *MSU Business Topics*. 23(1): 46-61.

Shejn, 2002 – *Shejn, E.X.* (2002). Organizacionnaya kul'tura i liderstvo [Organizational culture and leadership]. Per. s angl. pod red. V.A. Spivaka. SPb: Piter. [in Russian]

Shoham, Alon, 2010 – *Shoham, A., Alon, I.* (2010) Changing cultural clusters: a research note. *Business and Globalisation*. 5(3): 328-342.

Ten, 2019. – *Ten Y.P.* (2019). The digitalization of economy as the "response" to the global change. *Journal of Hygienic Engineering and Design*. 29: 66-72.

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 173-186
DOI: 10.13187/ejced.2021.1.173
www.ejournal1.com



The Formation of Students' Personality at Peter the Great St. Petersburg Polytechnic University: Attitude to University and Attitude to Future Profession

Tatiana A. Baranova [a], Dmitriy A. Mokhorov [a], Aleksandra M. Kobicheva [a, *], Elena Yu. Tokareva [a]

[a] Institute of Humanities, Peter the Great Saint-Petersburg Polytechnic University, St. Petersburg, Russian Federation

Abstract

This paper aims to evaluate students' attitude to University and their future profession as well as determine the influence of the University on these indicators. For our research, we used qualitative and quantitative data. To collect the data, we conducted two surveys of students in 2018 and 2020 (N1 = 179; N2 = 198). Also, we carried out the Pearson correlation analysis. Results on students' survey showed that their attitude to the University and attitude to future profession improved during their education. According to the students' answers on open questions, the most influential factors are academic faculty and project activities of the University. The Pearson correlation analysis showed the positive influence of the University on the students' attitude to the future profession. This study can be useful for further research on the formation of students' personality, its components, and correlation between them. By identifying the influence of personality components on its development, it is possible to develop more individual skills to achieve personal, professional success. In our research, we attempted to combine and analyze different criteria of personal perception of University and future carrier, how it was changing during the learning process and how University could influence the students' attitude to the future profession.

Keywords: the formation of personality, higher education, attitude to a future profession, attitude to university, personal self-determination.

1. Introduction

Nowadays such important aspect as the formation of student's character becomes an essential task of any University. The creation of a student's character is a process of changes in the student's personality that occur for various reasons, leading to qualitative changes over time, which take shape in its features, qualities, properties comparable with the model of a graduate of a higher educational institution.

* Corresponding author
E-mail addresses: kobicheva92@gmail.com (A. M. Kobicheva)

A personality, like everything specifically human in the psyche, is formed and revealed in the course of active interaction with the external and objective environment, through the assimilation or appropriation by an individual of a socially developed experience. After all, as a result of this development, the formation of new motivations and needs, their transformation and subordination. It is impossible to achieve this by simple adaptation – these would be motives that are known, but not really working.

It includes the development of crucial skills for the 21st century specialist such as emotional intelligence, problem-solving skills, critical-thinking skills, teamwork, digital skills, etc. (Almazova et al., 2018; Baranova et al., 2019a). Moreover, the formation of students' personality contains the positive attitude to the future professional field and overall engagement of students during the educational process as well as understanding its importance (Evseeva et al., 2020; Baranova et al., 2020).

The formation of the future specialist's personality in higher education is a complex and multifaceted process, the success of which is ensured, first of all, by its organization and planning, creation of external and internal conditions for the development and intensive manifestation of the necessary qualities, enrichment of students' knowledge, skills and abilities.

The core objective of the modern University is to build the close connection with students, elaborate and organize efficient educational programs fostering the most favourable environment for students' personality development (Piskun et al., 2018). There are a lot of various ways to achieve this goal, for instance, the introduction of innovative project-based courses in the curricular, arrangement of professional and career forums and conferences, participation in international programs and internships, support of internal students' communities and organization of cultural events and concerts (Baranova et al., 2019b).

The result of professional training is an adequate attitude of the person to the profession, that is, the formed mechanisms of professional self-regulation and psychological readiness for work. A competent specialist is a specialist of a special class, capable of achieving the highest mastery as a result of realizing his natural potential, due to the harmonization of his individual psychophysiological innate capabilities with the requirements of the profession. A competent specialist makes maximum use of his personal qualities that contribute to success in work, and localizes those that counteract success.

Peter the Great St. Petersburg Polytechnic University does the best for its students so they have possibility not only gain professional knowledge and enhance professional skills but also form their own personality with personal opinion and ability to think critical on various issues. Through a variety of professional and social projects and events students expand their worldview and learn how to make right choices as well as solve everyday problems. At the same time the University teaches them to be socially responsible and be able to defend their position in life.

The primary purpose of this paper is to evaluate students' attitude to University and future profession as the substantial indicators of student's personality formation and their self-determination in life. Also, we would like to assess the influence of University on these indicators.

1.1. Literature review

Over the last few decades, a growing body of research has revealed the role of personality traits in influencing and shaping student behaviour in various disciplines (Costa, McCrae, 1992; Chamorro-Premuzic, Furnham, 2003; Furnham et al., 2003; McCrae, Costa, 2003; Komarraju, Karau, 2005; Komarraju et al., 2009).

A person can be defined as a sui generis reflection of factors affecting the emotions, thoughts and behaviour of a person (Schwartz, Bilsky, 1987; Razinkina et al., 2019; Pozdeeva et al., 2019). A person is constantly influenced by internal and external factors and consists of physical, intellectual, spiritual, general and trained abilities, instincts, emotions, desires, habits, way of thinking and any kind of behaviour such as perception and attention. In this regard, when evaluating a person's personality, it can be argued that a person reflects not only the features of such a person, but also the characteristics of society and groups of such a person and the entire human race at a certain level (Shalley et al., 2004; İrengün, Arıkboğa, 2015).

The Big Five model of personality (conscientiousness, neuroticism, extraversion, openness, and agreeableness) (Goldberg, 1992) has been revealed as a robust approach to conceptualizing and assessing personality traits (Kappe, van der Flier, 2010; Rizvanović, 2018). Among the five dimensions, good faith is the best predictor of academic success according to many researchers.

Conscientious students often have better academic results because they are characterized by an organized, disciplined, persistent, and accurate way of learning (Zhao, Seibert, 2006; Rosander, Bäckström, 2011; De Feyter et al., 2012). A meta-analysis showed that conscientiousness most strongly correlates with the performance of university students (O'Connor, Paunonen, 2007; Richardson et al., 2012; Vedel, 2014).

Compared with the above two personality traits, empirical evidence on the prognostic role of extraversion, openness, and pleasantness in academic performance is mixed (O'Connor, Paunonen, 2007). Trapmann, Hell, Hirn, and Schuler's (Trapmann et al., 2007) meta-analysis showed that these three traits were not related to academic performance at the university, while a Vedel's (Vedel, 2014) meta-analysis found that both openness and pleasantness indicators correlated mainly with students' average scores. Extraversion describes individuals who are social, assertive, and talkative (Komarraju et al., 2011; Da Costa et al., 2015). Many researchers have reported no or even negative correlation between extraversion and academic performance among university students (Rosander, Bäckström, 2011; Komarraju et al., 2011; De Feyter et al., 2012; Furnham et al., 2013; Poropat, 2009).

The behaviour and attitude of the person around his/her family, friends and classmates is essential. Life is the constant effort of a living being to adapt to his background with such behaviour and attitude (Jafri et al., 2016). Therefore, a person adapts through reactions to changes in his/her environment in this dynamic process with these behaviours and attitudes (Geçtan, 1995). University life is especially crucial in this process, because the late adolescent influences the environment, and in his / her university life, the environment affects the late adolescent (Kaufman et al., 2016).

The recent increase in demand for higher education worldwide, the globalization of the labour market and the ease of international movement have led to the emergence of a higher education market based on competition and the need to manage universities as brands (Ajzen, Fishbein, 1977; Gürol, Atsan, 2006; Zakharova et al., 2019). Universities had to position themselves as different and desirable brands and increase their image in the eyes of interested parties due to this competition (Chapleo, 2007; Chapleo, 2010; Schee, 2011). Students' loyalty to the university includes both a sense of community and a desire to continue relations with the university (Crosby et al., 1990; Sung, 2008). In their study, Hennig-Thurau et al. (Hennig-Thurau et al., 2001) found that a loyal student might continue to support his or her academic institution even after graduating (a) by providing financial support, such as donations or research projects; (b) through word-of-mouth promotion to other prospective students, and (c) by offering cooperation such as student placements or visiting lectures. The perceived work of the university will affect the affective assessment (attitude) of students to the university. Hence; The attitude to the department mediates the relationship between academic performance at the university: (1) academic performance in education, (2) academic performance of teachers, (3) academic performance, (4) career prospects of graduates, (5) general environment, (6) compatibility with students, (7) the physical environment and loyalty to the university: (a) commitment to the university, (b) a sense of community with the department, (c) a sense of community with the university.

Research on university branding has identified many different factors that determine a positive brand image, student satisfaction, and university success. Some of these studies and their results are as follows. LeBlanc and Nguyen (LeBlanc, Nguyen, 1999) conducted a study of university students and identified six different values that students gained from universities. These were functional values associated with future career development and good value obtained relative to tuition fees, symbolic values associated with reputation, social values associated with fellow students, epistemic values associated with acquiring knowledge and education, and finally, emotional values associated with self-realization.

Researches by Cuthbert (Cuthbert, 1996) and O'Neill and Palmer (O'Neill, Palmer, 2004) have shown that the driving force behind student satisfaction at the university is the learning process (course delivery mechanisms, quality of courses and teaching, interpersonal relationships, etc.), and the students were mainly concerned with the knowledge and confidence of the teachers, as well as the warm relations and empathy they gave. University appearance (architecture, campus) was also one of the factors that students considered, but comparatively less important for satisfaction.

On the other hand, research by McAlexander et al. (McAlexander et al., 2004) found that there are peripheral aspects and opportunities of the university that students consume, such as cafes and residential areas that have a significant impact on university assessments. Similarly, in their study, Duarte et al. (Duarte et al., 2010) found that the atmosphere of social life at a university was an important predictor of a positive university image as well as job opportunities. Ali-Choudhury et al. (Ali-Choudhury et al., 2009) created a 10-piece list of the university brand: educational identity, educational location, employment opportunities for graduates, visual imagery, general atmosphere, reputation, sports and social facilities, learning environment, course availability, and community connections. Finally, a study by Mainardes et al. (Mainardes et al., 2013; Volodarskaya et al., 2019) concluded that a university environment, motivating lessons and easy university bureaucracy were key expectations of university students.

2. Materials and methods

For our research, we have chosen students studied on the humanitarian, educational programs (linguistics, PR and advertising, law). We conducted two online surveys to evaluate students' attitude to University and future career.

Firstly, we surveyed the first-year bachelor students in the second semester of 2018. Students passed the survey in their accounts on the online educational platform of the University. The participation was voluntary. The response rate for the online survey was around 71,6 % (179 students finished the survey). In 2020 these students being on the 4th year of study undergone the same survey again. The response rate rose to 79,3 % (198 students completed the survey).

The surveys included two main categories – attitude to the University and attitude to a future profession, which consist of 12 items measured by Likert scale and two open questions (only for the second survey) – Table 1.

Table 1. Survey questions

№	Items	Type of data
Attitude to the University		
1	Are you ready to continue your studies at SPbPU?	quantitative
2	If you had to choose a university again, would you choose the university you are currently studying in again?	quantitative
3	Are you ready to recommend the university to others for study?	quantitative
4	Does the level of the educational process organization satisfy you?	quantitative
5	Do you consider studying at SPbPU as prestigious?	quantitative
6	Are you satisfied with the results of studying at the university?	quantitative
Attitude to the future profession		
1	Are you ready to study and develop in your speciality after graduation?	quantitative
2	If you had to choose a profession again, would you choose the speciality you are currently studying in again?	quantitative
3	Do you have a desire to work in your speciality after graduation?	quantitative
4	Are you ready to recommend this profession to others?	quantitative
5	Have your ideas about the chosen profession changed during your studies at the university?	quantitative
6	Do you think it will be easy for you to get a job in your specialty after graduation?	quantitative
Open questions on attitude to the University and the future profession		
1	What influenced you, your perception and attitude to the university mostly?	qualitative
2	What influenced you, your perception and attitude to the future profession mostly?	qualitative

Thus, the obtained data allowed us to make a qualitative and quantitative analysis of obtained results. The research questions are the following:

1) If the university influence students' attitude to the future profession?

2) If students' attitude to the University and their attitude to future profession are correlated?

For the analysis descriptive statistics and independent samples t-test were used.

3. Results

2.1. Online survey on attitude to the University

As we wrote before, we conducted two online surveys with a difference of 2.5 years for the same students to evaluate their attitude to University. The results of 6 items measured by 10 point Likert scale are presented in Figure 1.

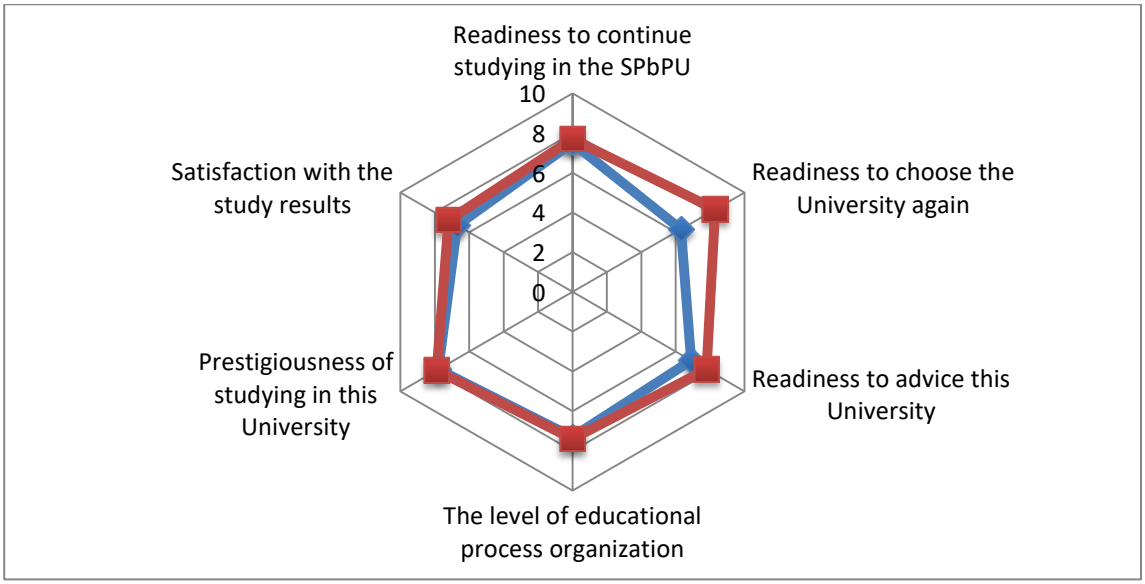


Fig. 1. Students' attitude to the University

According to the results obtained, we can note that students' attitude to University improved during 2.5 years of study. We conducted a t-value analysis of the results that are presented in the Table 2.

Table 2. Descriptive statistics (students' attitude to university indicators)

Items	Survey	Results (average mean)	SD	t-value
1. Readiness to continue studying in the SPbPU	2018	7,5	0,71	2,31*
	2020	7,7	0,77	
2. Readiness to choose the University again	2018	6,3	0,8	7,9 ***
	2020	8,3	0,79	
3. Readiness to advice the University	2018	6,9	1,01	6,42 ***
	2020	7,8	0,95	
4. The level of educational process organization	2018	7,3	0,87	1,89
	2020	7,4	0,88	
5. Prestigiousness of studying in the University	2018	7,8	0,94	1,91
	2020	7,9	0,9	
6. Satisfaction with the study results	2018	6,7	0,89	3,2**
	2020	7,2	1,07	

Note: * $p < 0,05$; ** $p < 0,01$; ***$p < 0,001$

The analysis showed that the most significant differences were in results of the following indicators – "Readiness to choose the University again" and "Readiness to advice this University". Due to t-value test the differences in such indicators, as "The level of educational process organization" and "Prestigiousness of studying in this University" were not significant.

In general, all indicators are quite high that shows the positive attitude to University. The significant difference in indicators means that University had a great influence on students during their study years.

Students answered open questions only during the second survey in 2020. On the open question "What influenced you, your perception and attitude to the University mostly?" students answered differently. Still, it was possible to determine the most frequent answers, which are indicated in Figure 2.

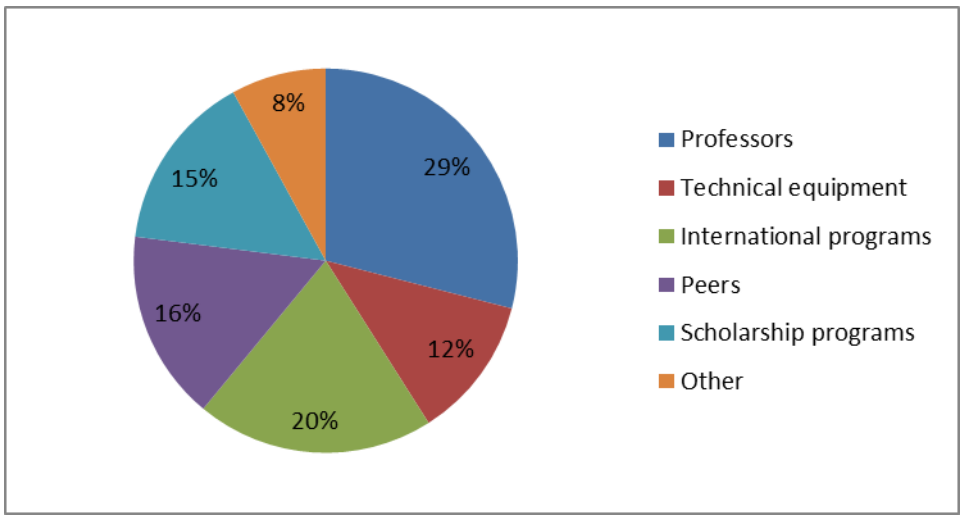


Fig. 2. The answers on the question "What influenced you, your perception and attitude to the university mostly?"

Among all the answers, we selected the five most common criteria: academic faculty, technical equipment of the university, the presence of international programs, student relationships, and various scholarship programs. Many students noted that the attitude towards the university is closely connected with professors. The attitude of professors to their disciplines/courses, their manner of teaching, lecturing and interest in the discipline forms the perception of not only the discipline but also the professor himself, who is the face of the university.

Answers on open question showed that some students believe that the attitude towards the university depends on the team in which the teaching takes place. The relationship with peers motivates students to attend university, creates an atmosphere in the university and affects students' development.

12 % of respondents indicated that the technical equipment of the university, modern devices in classrooms and timely restoration favourably affect the attitude towards the university: "it is always nice to study in a building with modern classrooms and use advanced technologies in the learning process."

Other students responded that international and scholarship programs influence attitude towards the university. Even when entering the university, these factors were decisive for such respondents. The university is the start of adulthood and allows students to choose their personal development path. Thus, it is important that the university can provide a wide range of opportunities for students. Many students are interested in international internships and double degrees. Other students seek grants and scholarships to develop their projects in parallel with their studies. Such opportunities have a beneficial effect on the attitude towards the university, and the desire to continue studying there.

Students noted that when choosing a university, they were guided by the availability of necessary educational programs, the university rating and accessibility for admission. However,

after three years of study, students realized that when they think about the university, they primarily remember the teachers. Students wishing to study abroad rank the university by the number of international programs, the prospects of obtaining a double diploma and foreign internships. The results obtained correlate with findings in the works of Cuthbert (Cuthbert, 1996) and O'Neill and Palmer (O'Neill, Palmer, 2004). Also, unlike many previously studied works (Almazova et al., 2018; Baranova et al., 2019; Sung, 2008; Crosby et al., 1990; Hennig-Thurau et al., 2001), the results of our study noted the importance of both the educational process and the appearance of the University.

One student noted: "My attitude towards the university has changed a lot over the last two years of study, because at the end of the 3rd year exciting disciplines appeared with excellent teachers who have practical experience in the field of my future speciality. So, not my favourite university became for me the best place to learn. "

The results of the study show that a positive attitude of teachers has a positive effect on student performance and development. This, in turn, clearly indicates that especially teachers overcome the boundaries of the classroom in the educational life of people, and it is obvious how effective they can be throughout the student's life. Some students said that teachers are the second most crucial factor in determining personality development after parents. We should not forget that children take an example to follow in the learning process. Therefore, perhaps the behaviour and attitude of teachers, with whom they spend most of their time besides their parents, affect the development of their personality and, therefore, whether they will be successful or not. Thus, it is teachers who are more likely to shape the student's attitude to the University.

2.2. Online survey on attitude to future profession

The choice of profession plays a significant role in shaping the personality of the student. However, this choice is one of the most difficult in human life. We can often characterize a person by his profession.

The survey on students' attitude to future profession included six items – "Readiness to study and develop in the professional field after graduation", "Readiness to continue working in the professional field", "Readiness to choose the same profession again", "Readiness to recommend this profession to others", "Ideas about future profession" and "Ease of getting a job in the professional field after graduation". The results are shown in Figure 3.

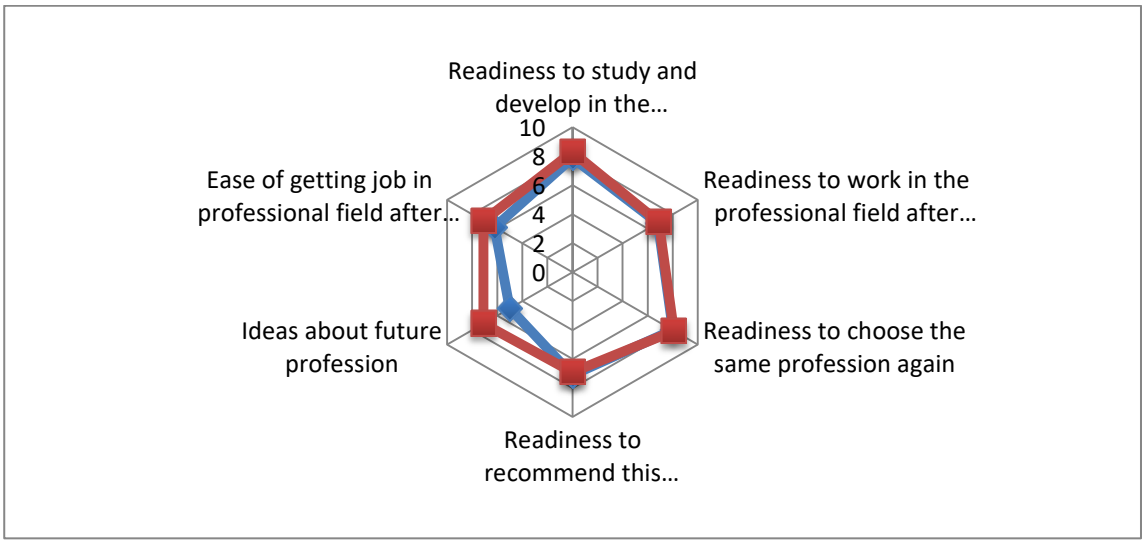


Fig. 3. Students' attitude to the future profession

All indicators have grown except for item "Readiness to recommend this profession to others". We can connect it with the fact that students became more aware about the future profession and answered the question more conscious.

We conducted a statistical analysis of survey results obtained in 2018 and in 2020 to identify significant differences in students' attitude to the future profession (Table 3).

Table 3. Descriptive statistics (students' attitude to university indicators)

Items	Survey	Results (average mean)	SD	t-value
1. Readiness to study and develop in the professional field after graduation	2018	7,9	1,07	3,1*
	2020	8,3	0,99	
2. Readiness to continue working in the professional field	2018	6,8	0,87	1,95
	2020	6,9	0,91	
3. Readiness to choose the same profession again	2018	8,0	1,11	1,87
	2020	8,1	0,95	
4. Readiness to recommend this profession to others	2018	7,1	1,17	2,17*
	2020	6,9	1,01	
5. Ideas about future profession	2018	5,0	0,92	7,94***
	2020	7,1	0,9	
6. Ease of getting a job in the professional field after graduation	2018	6,2	0,89	6,44***
	2020	7,1	0,87	

Note: * p < 0,05; ** p < 0,01; ***p < 0,001

According to the t-value test the difference between such indicators as "Ideas about future profession" and "Ease of getting job in professional field after graduation" were significant (the significance level was set to 0,001). These results can be explained by the fact that by the 4th year of study students have accumulated enough experience and knowledge that make them feel more confident about future profession.

The open question on attitude to future profession was the following "What influenced you, your perception and attitude to the future profession mostly?". The results are in Figure 4.

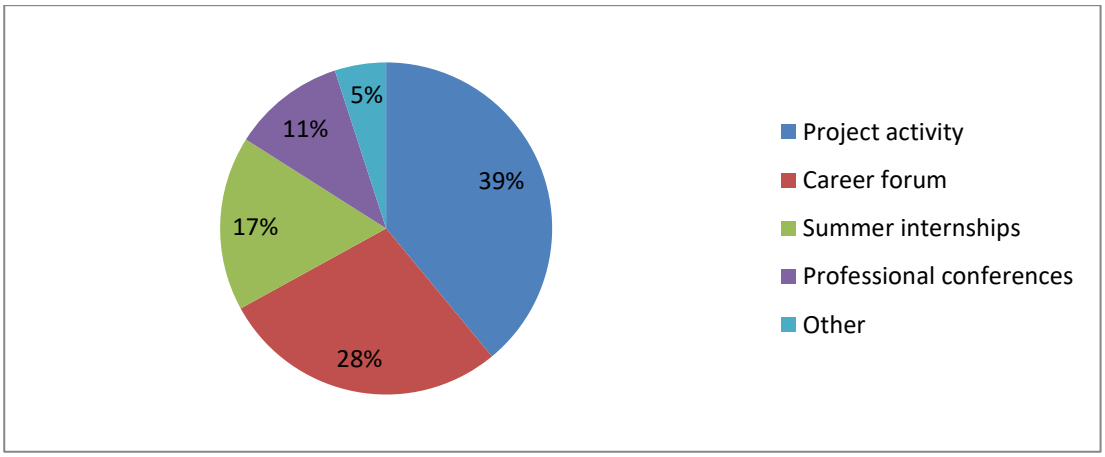


Fig. 4. The answers on the question "What influenced you, your perception and attitude to the future job mostly?"

Students' answers were divided into main categories, reflecting the impact of student learning at the university on their attitude to the future profession. Most students believe that project activities in the learning process contribute to a better understanding of the future profession, allows you to try yourself "in business".

According to the open question many respondents expressed confidence that participation in career forums and professional conferences allows them to communicate with representatives of the chosen profession and understand how people live after receiving this speciality, what kind of job, lifestyle and income they have. Participating in such events, students fall into the professional community, of which they will become a part in the future.

Career forums are trendy among students, as all students are in a hurry to find their first job, to try and feel how they will work after university. Not all students find employment opportunities there,

but many get acquainted with representatives of the chosen profession, find out the requirements for potential employees, and also study existing companies in the market, identifying large players and possibly acquiring a dream company where they would like to work after graduation.

Some respondents noted that summer internships at universities or partner companies allow them to try work in the professional field, understand how everything happens from the inside, decide on the final choice of a profession and gain useful, practical skills. Summer internships are also desirable as students hope to stay in the company following a course. Also, such an internship allows you to understand better what the work in the chosen speciality is, to apply the acquired knowledge, which also forms the perception of the future profession.

Students note that university studies have little to do with the future profession since most of the subjects studied contain a large amount of technical information that does not reflect the reality of future work. Therefore, all activities related to practical knowledge and skills are actively perceived by students and shape their attitude to the future profession. It explains the particular interest of students in project activities, various summer internships and career forums.

2 % of students surveyed noted the negative impact of the university on the perception of the future profession. Students point out that boring activities scare them away and make future work less attractive. Some students replied that they were faced with the desire to change their chosen profession and get an education in another speciality.

Having studied the early studies of other authors (De Feyter et al., 2012; Komarraju et al., 2011; Furnham et al., 2011; Poropat, 2009; Jafri et al., 2016), one can notice the distinctive features of the perception of the future profession among students in Russia: focus on quick employment, interest in career forums, conferences and labor communities.

2.3. Correlation analysis

To answer the second research question, we implemented the Pearson correlation investigation of students' attitude to University and their future profession. We implemented the analysis based on the second survey data (students' attitude to the University and the future profession results). The correlation analysis shows the interdependence between these two critical groups of factors that reflect the level of the students' personality formation. Our main goal was to confirm the influence of university and students' attitude to it on students' attitude to the future profession. The results of the correlation analysis are reflected in Table 4.

Table 4. Correlation analysis of students' attitude to the University and the future profession

	Students' attitude to future profession						
Students' attitude to the University		Readiness to study and develop in the professional field after graduation	Readiness to continue working in the professional field	Readiness to choose the same profession again	Readiness to recommend this profession to others	Ideas about future profession	Ease of getting a job in the professional field after graduation
	Readiness to continue studying in the SPbPU	0,63***	0,17	0,30**	0,61***	0,21*	0,66***
	Readiness to choose the University again	0,33**	0,20*	0,27*	0,32**	0,09	0,52***
	Readiness to advice the University	0,34**	0,28*	0,19	0,4***	0,15	0,39**
	The level of educational process organization	0,42***	0,19	0,37**	0,39**	0,27*	0,24*

	Prestigiousness of studying in the University	0,31**	0,11	0,41***	0,51***	0,19	0,51***
	Satisfaction with the study results	0,44***	0,16	0,39**	0,34**	0,17	0,17

Note: * p < 0,05; ** p < 0,01; ***p < 0,001

According to the results gained the items have a positive correlation. The strongest relationship is between such indicators as "Readiness to continue studying in the SPbPU", "The level of educational process organization", "Satisfaction with the study results" and "Readiness to study and develop in the professional field after graduation". The relationship between "Readiness to choose the University again" and "Readiness to recommend this profession to others" as well as between "Prestigiousness of studying in the University" and "Readiness to continue working in the professional field" is quite weak. We can also note that items on "Readiness to study and develop in the professional field after graduation" and "Readiness to recommend this profession to others" are substantially influenced by all items on the attitude to the University. The obtained results confirm the influence of the University on students' attitude to the future profession.

4. Discussion

Practical experience allows us to argue that one of the main ways to manage the self-improvement of students of higher educational institutions is through targeted modelling and development of situations for independent cognitive activity. In these situations, students always face the need to actively expand and apply existing knowledge, skills and abilities to cope with conditions that require from them manifestations of professionally essential qualities.

Our study is devoted to assessing the attitude of students to the Peter the Great St. Petersburg Polytechnic University and the future profession, since these factors have a great influence on the formation of the personality of young people. It can be concluded:

1. The analysis showed that during the training, the attitude of students to the University and their chosen profession increased. This is primarily due to the fact that students are becoming more familiar with the aspects of the profession.

2. Qualitative data in the form of answers to open questions allowed us to better understand the students' attitude to the educational institution, their expectations in the field of their future career. The study revealed that the teaching staff has the greatest influence on the perception of the university and the formation of attitude towards the educational institution. This is due to the fact that communication with teachers takes most of the students' time. Teachers pass on their knowledge and their experience and become an example for students. Talking about the university, students primarily remember the teachers. After all, the level of professional training of a student, his knowledge and attitude to the university depends on the teacher.

3. The formation of attitude towards future professions is a more complex issue. There is a wide variety of points of view that determine the most influential factors. Students of the Polytechnic University highlight primarily project activities. This is due to the fact that only by trying to work on a project, you can evaluate activities close to real professional conditions and understand the attitude towards a future profession.

As in many studies in this field, our work indicates factors of the students' personality formation. Researchers have recently pointed out the wide range of criteria that influence on person, its behaviour and attitude to life (Chamorro-Premuzic, Furnham, 2003; Trapmann et al., 2007; Geçtan, 1995). The Big Five model of personality (Goldberg, 1992) laid the foundation for our study. Studies (Kappe, van der Flier, 2010; Rizvanović, 2018) on the correlation of this model with the academic achievements of students are the basis for studying the student's personality.

Unlike some other researches (Komarraju et al., 2011; Furnham et al., 2013; Poropat, 2009), we have identified several factors that seem to us the most influential. We did our research in stages, studying the factors separately. At the moment, in our past studies, we have already studied students' engagement, the development of crucial skills such as problem-solving skills, critical-thinking skills, team work, digital skills, etc. (Almazova et al., 2018; Baranova et al., 2019a). Our

paper is devoted to study students' attitude to University, future profession and how these factors influence on students' personality. Our study is characterized by a correlation between students' attitude to the University and the future job.

However, even when researchers use the same methodology (i.e., surveys), there is variation in how students' personality is defined. For example, some of the researchers focus primarily on behaviours such as effort, homework, and attendance. In contrast, other studies include items related to emotional dimensions such as relationships with teachers and accurate way of learning. In our study we made an attempt to combine and analyse different criteria of personal perception of University and future carrier, how it was changing during the learning process and how University could influence the students' attitude to future profession.

According to the gained results, we can affirm that students' personality is significantly impacted by University, in particular on students' perceptions of their future profession. Moreover, students' attitude to the University and their attitude to the future profession are correlated, so it can be concluded that the University should carefully build the communication with students during the whole education period as it contributes to the formation of students' personality. Moreover, the experiment confirms the fact that Peter the Great St. Petersburg Polytechnic University created favourable conditions within the educational process for the successful formation and development of the student's personal qualities.

The theoretical work of other scholars in this field has been a useful resource for planning and designing, and we expect that our study will provide something of value for future researchers, too. Of course, there are some limitations in our study, as it does not take into account an influence on the choice of University and future profession such factors as parental recommendations, the availability of financial opportunities to study at the desired university and the prestige of the profession.

In our further research we are going to evaluate students' academic and psychological resilience as another component of students' personality.

5. Conclusion

It can be concluded:

1. The analysis showed that during the training, the attitude of students to the University and their chosen profession increased. This is primarily due to the fact that students are becoming more familiar with the aspects of the profession.

2. Qualitative data in the form of answers to open questions allowed us to better understand the students' attitude to the educational institution, their expectations in the field of their future career. The study revealed that the teaching staff has the greatest influence on the perception of the university and the formation of attitude towards the educational institution. This is due to the fact that communication with teachers takes most of the students' time. Teachers pass on their knowledge and their experience and become an example for students. Talking about the university, students primarily remember the teachers. After all, the level of professional training of a student, his knowledge and attitude to the university depends on the teacher.

3. The formation of attitude towards future professions is a more complex issue. There is a wide variety of points of view that determine the most influential factors. Students of the Polytechnic University highlight primarily project activities. This is due to the fact that only by trying to work on a project, you can evaluate activities close to real professional conditions and understand the attitude towards a future profession.

References

Ajzen, Fishbein, 1977 – *Ajzen, I., Fishbein, M.* (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*. 84(5): 888-918. DOI: https://doi.org/10.1037/0033-2909.84.5.888

Ali-Choudhury et al., 2009 – *Ali-Choudhury, R., Bennett, R., Savani, S.* (2009). University marketing directors' view on the components of a university brand. *Public Nonprofit Mark*. 6(11): 11-33.

Almazova et al., 2018 – *Almazova, N., Andreeva, S., Khalyapina, L.* (2018). The integration of online and offline education in the system of students' preparation for global academic mobility. In D.A. Alexandrov, Y. Kabanov, O. Koltsova, A.V. Boukhanovsky, & A.V. Chugunov (Eds.)

Proceedings of the 3rd International Conference on Digital Transformation and Global Society. *Communications in Computer and Information Science*. 859: 162-174. Springer: Cham, Switzerland.

Baranova et al., 2019a – *Baranova, T.A., Kobicheva, A.M., Tokareva, E.Y.* (2019). Does CLIL work for Russian higher school students? The comprehensive analysis of experience in St-Petersburg Peter the Great Polytechnic University. In ICIET 2019: *Proceedings of the 2019 7th International Conference on Information and Education*. 140-145. Association for Computing Machinery. DOI: 10.1145/3323771.3323779

Baranova et al., 2019b – *Baranova, T.A., Tokareva, E.Y., Kobicheva, A.M., Olkhovik, N.G.* (2019). Effects of an integrated learning approach on students' outcomes in St. Petersburg Polytechnic University. In ICDTE 2019: 2019 The 3rd International Conference on Digital Technology in Education. *ACM International Conference Proceeding Series*. 77-81. Association for Computing Machinery. DOI: 10.1145/3369199.3369245

Baranova et al., 2020 – *Baranova, T., Kobicheva, A., Olkhovik, N., Tokareva, E.* (2020). Analysis of the communication competence dynamics in integrated learning. In: Anikina Z. (eds) Integrating Engineering Education and Humanities for Global Intercultural Perspectives. IEEHGIP 2020. *Lecture Notes in Networks and Systems*, vol 131. Springer, Cham. DOI: 10.1007/978-3-030-47415-7_45

Chamorro-Premuzic, Furnham, 2003 – *Chamorro-Premuzic, T., Furnham, A.* (2003). Personality traits and academic examination performance. *European Journal of Personality*. 17: 237-250.

Chapleo, 2007 – *Chapleo, C.* (2007). Barriers to brand building in UK universities?. *Int. J. Nonprofit Volunt. Sect. Mark*. 12: 23-32. DOI: 10.1002/nvsm.271

Chapleo, 2010 – *Chapleo, C.* (2010). What defines 'successful' university brands? *International Journal of Public Sector Management*. 23(2): 169-183.

Costa, McCrae, 1992 – *Costa, P.T., Jr., McCrae, R.R.* (1992). NEO PI-R: Professional manual: Revised NEO PI-R and NEO-FFI. 1992, Odesa, FL: Psychological Assessment Resources.

Crosby et al., 1990 – *Crosby, L., Evans, K., Cowles, D.* (1990). Relationship quality in services selling: an interpersonal influence perspective. *Journal of Marketing*. 54(3): 68-81. DOI: 10.2307/1251817

Cuthbert, 1996 – *Cuthbert, P.F.* (1996). Managing service quality in HE: is SERVQUAL the answer? Part 2. *Managing Service Quality*. 6(3): 31-35.

Da Costa et al., 2015 – *Da Costa, S., Páez, D., Sánchez, F., Garaigordobil, M., Gondim, S.* (2015). Personal factors of creativity: A second order meta-analysis. *Revista de Psicología Del Trabajo y de Las Organizaciones*. 31(3): 165-173. DOI: 10.1016/j.rpto.2015.06.002

De Feyter et al., 2012 – *De Feyter, T., Caers, R., Vigna, C., Berings, D.* (2012). Unraveling the impact of the Big Five personality traits on academic performance: The moderating and mediating effects of self-efficacy and academic motivation. *Learning and Individual Differences*. 22(4): 439-448. DOI: 10.1016/j.lindif.2012.03.013

Duarte et al., 2010 – *Duarte, P.O., Alves, H., Raposo, M.B.* (2010). Understanding university image: a structural equation model approach. *International Review on Public and Nonprofit Marketing*. 7: 21-36. DOI: https://doi.org/10.1007/s12208-009-0042-9

Evseeva et al., 2020 – *Evseeva, L.I., Shipunova, O.D., Pozdeeva, E.G., Trostinskaya, I.R., Evseev, V.V.* (2020). Digital learning as a factor of professional competitive growth. In T., Antipova, & A. Rocha (Eds.), Digital Science 2019. *Advances in Intelligent Systems and Computing*. *WorldCIST'20*. 1114: 241-251. Springer. DOI: https://doi.org/10.1007/978-3-030-37737-3_22

Furnham et al., 2003 – *Furnham, A., Chamorro-Premuzic, T., McDougall, F.* (2003). Personality, cognitive ability, and beliefs about intelligence as predictors of academic performance. *Learning and Individual Differences*. 14: 49-66.

Furnham et al., 2013 – *Furnham, A., Nuygards, S., Chamorro-Premuzic, T.* (2013). Personality, assessment methods and academic performance. *Instructional Science*. 41(5): 975-987. DOI: 10.1007/s11251-012-9259-9

Geçtan, 1995 – *Geçtan, E.* (1995). Psikodinamik psikiyatri ve normaldışı davranışlar. Remzi Kitap Evi, İstanbul.

Goldberg, 1992 – *Goldberg, L.R.* (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment*. 4(1): 26-42. DOI: 10.1037//1040-3590.4.1.26

Gürol, Atsan, 2006 – *Gürol, Y., Atsan, N.* (2006). Entrepreneurial characteristics amongst university students: Some insights for entrepreneurship education and training in Turkey. *Education + Training*. 48(1): 25-38. DOI: https://doi.org/10.1108/00400910610645716

Hennig-Thurau et al., 2001 – *Hennig-Thurau, T., Langer, M. F., Hansen, U.* (2001). Modeling and managing student loyalty: an approach based on the concept of relationship quality. *Journal of Service Research*. 3(4): 331-344. DOI: https://doi.org/10.1177/109467050134006

İrengün, Arıkboğa, 2015 – *İrengün, O., Arıkboğa, Ş.* (2015). The effect of personality traits on social entrepreneurship intentions: a field research. *Procedia – Social and Behavioral Sciences*. 195: 1186-1195. DOI: 10.1016/j.sbspro.2015.06.172

Jafri et al., 2016 – *Jafri, M.H., Dem, C., Choden, S.* (2016). Emotional intelligence and employee creativity: moderating role of proactive personality and organizational climate. *Business Perspectives and Research*. 4(1): 54-66. DOI: https://doi.org/10.1177/2278533715605435

Kappe, van der Flier, 2010 – *Kappe, R., van der Flier, H.* (2010). Using multiple and specific criteria to assess the predictive validity of the Big Five personality factors on academic performance. *Journal of Research in Personality*. 44(1): 142-145. DOI: 10.1016/j.jrp.2009.11.002

Kaufman et al., 2016 – *Kaufman, S.B., Quilty, L.C., Grazioplene, R.G., Hirsh, J.B., Gray, J.R., Peterson, J.B., DeYoung, C.G.* (2016). Openness, intellect, and creativity. *J Pers*. 84: 248-258. DOI: 10.1111/jopy.12156

Komarraju, Karau, 2005 – *Komarraju, M., Karau, S.J.* (2005). The relationship between the big five personality traits and academic motivation. *Personality and Individual Differences*. 39: 557-567. DOI: http://dx.doi.org/10.1016/j.paid.2005.02.013

Komarraju et al., 2009 – *Komarraju, M., Karau, S.J., Schmeck, R.R.* (2009). Role of the Big Five personality traits in predicting college students' academic motivation and achievement. *Learning and Individual Differences*. 19(1): 47-52. DOI: http://dx.doi.org/10.1016/j.lindif.2008.07.001

Komarraju et al., 2011 – *Komarraju, M., Karau, S.J., Schmeck, R.R., Avdic, A.* (2011). The Big Five personality traits, learning styles, and academic achievement. *Personality and Individual Differences*. 51(4): 472-477. DOI: 10.1016/j.paid.2011.04.019

LeBlanc, Nguyen, 1999 – *LeBlanc, G., Nguyen, N.* (1999). Listening to the customer's voice: examining perceived service value among business college students. *International Journal of Educational Management*. 13(4): 187-198.

Mainardes et al., 2013 – *Mainardes, E., Alves, H., Raposo, M.* (2013). Portuguese Public University student satisfaction: a stakeholder theory-based approach. *Tertiary Education & Management*. 19(4): 353-372.

McAlexander et al., 2004 – *McAlexander, J.H., Koenig, H.F., ve Schouten, J.W.* (2004). Building a university brand community: the long-term impact of shared experiences. *Journal of Marketing for Higher Education*. 14(2): 61-79.

McCrae, Costa, 2003 – *McCrae, R.R., Costa, P.T.* (2003). Personality in adulthood: A five-factor theory perspective (2nd ed.). New York: Guilford Press.

O'Connor, Paunonen, 2007 – *O'Connor, M.C., Paunonen, S.V.* (2007). Big Five personality predictors of post-secondary academic performance. *Personality and Individual Differences*. 43(5): 971-990. DOI: 10.1016/j.paid.2007.03.017

O'Neill, Palmer, 2004 – *O'Neill, M. A., Palmer, A.* (2004). Importance-performance analysis: a useful tool for directing continuous quality improvement in higher education. *Quality Assurance in Education*. 12(1): 39-52.

Piskun et al., 2018 – *Piskun, O.E., Ababkova, M.Y., Leontyeva, V.L.* (2018). Biological feedback method to facilitate academic progress. *Teoriya i Praktika Fizicheskoy Kultury – Theory and practice of physical culture*. 10: 45-47. DOI: 2-s2.0-85054062411

Poropat, 2009 – *Poropat, A.E.* (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin*. 135(2): 322-338. DOI: 10.1037/a0014996

Pozdeeva et al., 2019 – *Pozdeeva, E.G., Shipunova, O.D., Evseeva, L.I.* (2019). Social assessment of innovations and professional responsibility of future engineers. *IOP Conference Series: Earth and Environmental Science*. 337: 012049. DOI: https://doi.org/10.1088/1755-1315/337/1/012049

Razinkina et al., 2019 – *Razinkina, E., Pankova, L., Trostinskaya, I., Pozdeeva, E., Evseeva, L., Tanova, A.* (2019). The problem of influence of the educational environment on students' managerial competence. *E3S Web of Conferences*. 110: 02097. DOI: https://doi.org/10.1051/e3sconf/201911002097

Richardson et al., 2012 – *Richardson, M., Abraham, C., Bond, R.* (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin*. 138(2): 353-387. DOI: 10.1037/a0026838

Rizvanović, 2018 – *Rizvanović, N.* (2018). Motivation and personality in language aptitude. In S.M. Reiterer (Ed.). Exploring language aptitude: *Views from psychology, the language sciences, and cognitive neuroscience*. 101-116. Springer. DOI: 10.1007/978-3-319-91917-1_6

Rosander, Bäckström, 2011 – *Rosander, P., Bäckström, M., Stenberg, G.* (2011). Personality traits and general intelligence as predictors of academic performance: A structural equation modelling approach. *Learning and Individual Differences*. 21(5): 590-596. DOI: 10.1016/j.lindif.2011.04.004

Schee, 2011 – *Schee, B.A.V.* (2011). Students as consumers: programming for brand loyalty. *Services Marketing Quarterly*. 32(1): 32-43.

Schwartz, Bilsky, 1987 – *Schwartz, S. H., Bilsky, W.* (1987). Toward a universal psychological structure of human values. *Journal of Personality and Social Psychology*. 53(3): 550-562. DOI: https://doi.org/10.1037/0022-3514.53.3.550

Shalley et al., 2004 – *Shalley, C. E., Zhou, J., Oldham, G. R.* (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management*. 30(6): 933–958. DOI: 10.1016/j.jm.2004.06.007

Sung, 2008 – *Sung, M.Y.* (2008). Toward the model of university image: the influence of brand personality, external prestige, and reputation. *Journal of Public Relations Research*. 20(4): 357-376.

Trapmann et al., 2007 – *Trapmann, S., Hell, B., Hirn, J.O.W., Schuler, H.* (2007). Meta-analysis of the relationship between the Big Five and academic success at university. *Zeitschrift für Psychologie – Journal of Psychology*. 215(2): 132-151.

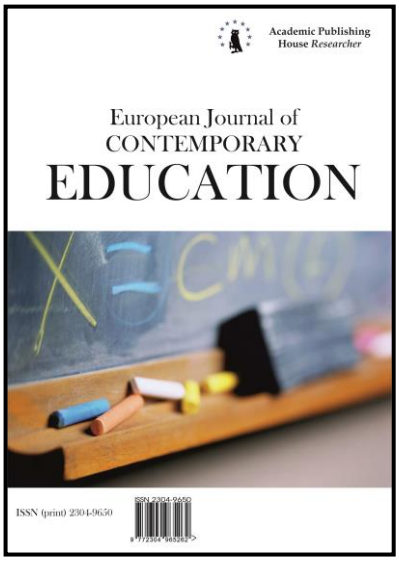
Vedel, 2014 – *Vedel, A.* (2014). The Big Five and tertiary academic performance: A systematic review and meta-analysis. *Personality and Individual Differences*. 71: 66-76. DOI: 10.1016/j.paid.2014.07.01

Volodarskaya et al., 2019 – *Volodarskaya, E.B., Grishina A.S., Pechinskaya, L.I.* (2019). Virtual Learning Environment in Lexical Skills Development for Active Vocabulary Expansion in Non-Language Students Who Learn English. *2019 12th International Conference on Developments in eSystems Engineering (DeSE)*, Kazan, Russia, pp. 388-392.

Zakharova et al., 2019 – *Zakharova, I., Kobicheva, A., Rozova, N.* (2019). Results analysis of Russian students' participation in the online international educational project X-Culture. *Education Science*. 9: 168. DOI: https://doi.org/10.3390/educsci9030168

Zhao, Seibert, 2006 – *Zhao, H., Seibert, S.E.* (2006). The Big Five personality dimensions and entrepreneurial status: A meta-analytical review. *Journal of Applied Psychology*. 91(2): 259-271. DOI: https://doi.org/10.1037/0021-9010.91.2.259

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 187-201
DOI: 10.13187/ejced.2021.1.187
www.ejournal1.com



Innovative Work Activity of Science Teachers: the Pathway from New Ideas Generating to Sharing

Palmira Pečiuliauskienė [a, *], Lina Kaminskienė [a]

[a] Vytautas Magnus University, Education Academy, Kaunas, Republic of Lithuania

Abstract

The study addresses the phenomenon of science teachers' innovative work activities referring to Rogers' Diffusion theory of innovation (RDI) based on four countries (Sweden, Norway, Lithuania, Italy) TIMSS 2015 data set. The countries were chosen according to different criteria: 1–years of teaching; 2 – gender; 3 – hours spent for professional development. According to RDI, the innovation process consists of five stages: Knowledge, Persuasion, Decision, Implementation, and Confirmation. Different innovative work activities occur at different stages of innovation process: to generate, to champion, to apply, to promote, and to share new ideas. The aim of the article is to reveal the internal structure of innovative work activity of science teachers, highlighting the associations of innovative work activities on each other. TIMSS 2015 the instrument for science teachers allowed carrying out empirical analysis of science teachers' innovative work activities. All variables of our interest in innovative work activities of science teachers were directly observable. Taking this into account a path analysis was used. According to the findings of the path analysis all innovative work activities of science teachers directly and positively influence each other. We argue that new idea generation activity of science teachers directly and indirectly influences new ideas sharing activity. The direct effect of new idea generating activity on new idea sharing activity is stronger than the indirect effect.

Keywords: innovative work behavior, innovative work activity, science teacher, science education.

1. Introduction

Innovation is a distinctive feature of a creative society (Florida, 2002; Obeng, 2019). Humans with the abilities for innovation are able to create new products, to compete in the economy sector (Obeng, 2019; Wisetsat, Nuangchalerm, 2019). Educational institutions are part of a creative society: teachers are key actors in educating students for an innovation-driven society. Teachers

* Corresponding author
E-mail addresses: palmira.peciuliauskiene@vdu.lt (P. Pečiuliauskienė)

must not only be able to apply innovation in the educational process but also be able to develop students' innovative work abilities (Klaeijsen et al., 2018; Wisetsat, Nuangchalerm, 2019). Science teachers play an important role in this process, because "Innovation in science education is less a characteristic of a particular period in time than a normal and continuing process" (Layton, 1986: 9).

Innovation in science education manifests itself in two ways: curriculum content and teaching methods (Adams et al., 2018). In the light of science education reforms (NRC, 1996; NRC, 2000; NRC, 2012) there have been growing calls for innovation associated with teaching methods. Innovation in science education has focused on scientific inquiry, discovery, and constructivist approaches (Furtak, Kunter, 2012). Oyelekan et al. (2017) define innovative teaching as a form of guided discovery in which the teachers attempt to lead students to discuss, discover, and verbalize new knowledge. The implementation of constructivist approaches in science education depends on the innovative work behavior of science teachers (Adams et al., 2018).

Rogers' Diffusion theory (Rogers, 2003) of innovation process helps to understand the structure of innovative work activity of science teachers. According to Rogers' Diffusion of innovations theory (RDI), the innovation process is composed of five stages: Knowledge, Persuasion, Decision, Implementation, and Confirmation (Rogers, 2003). The different innovative work activities occur at different stages: new ideas generating activity (Knowledge, Persuasion, Decision stage), and new ideas implementation activity (Implementation stage, Confirmation stage). It follows from RDI that innovative work activity is a complex and multi-dimensional construct (Scott, Bruce, 1994). Seeking to improve and manage the innovative work activity of science teachers, it is necessary to understand its internal structure and to anticipate the interrelationship of its structural components.

An analysis of the scientific literature on the innovative work activity of science teachers from the view of RDI revealed that the innovative activity of science teachers is manifested by the interest in innovation while searching for information about innovations (Exner, 2014), the application of new learning methods (Akhter, Fatima, 2016; Etkina et al., 2010; Lowe et al., 2013; Okada et al., 2015; Okada, 2016; Riga et al., 2017), and the dissemination of the application of innovations in education (Okada et al., 2015; Train, Miyamoto, 2017). However, there is a lack of a systematic approach to science teachers' innovative work activity, and to the research about the internal relationship of innovative work activities.

The situation about innovations in science education is highlighted in the New Consortium Media (Adams et al., 2018), Measuring Innovation in Education monitoring (OECD, 2019). An innovation survey (Halász, 2018). OECD (2019) uses TIMSS 2015 (The Trends in International Mathematics and Science Study) data for secondary analysis of educational innovations in science education and presents the results of a longitudinal study about the implementation of innovations.

We aim to contribute to the field of educational innovations by analyzing innovative work activities of science teachers on the basis of RDI in order to reveal the internal structure of innovative work activity, from new ideas generation to their implementation and sharing. The aim of the article is to reveal the internal structure of innovative work activity of science teachers, highlighting the associations and influence of innovative work activities on each other.

2. Theoretical background

2.1. The concept of innovative work behavior and innovative work activity

The construct of innovative work activity is inseparable from the phenomenon of innovative work behavior. There are two approaches to innovation in the scientific literature: on the one hand, innovation is treated as a process, on the other hand – as a result (Messmann, Mulder, 2012). Innovative work behavior describes the role of individuals in the innovation process (West, Farr, 1989; West, Farr, 1990). Farr and Ford (1990) defined innovative work behavior as an individual's abilities to initiate new and useful ideas, processes, and to produce new products. Scholars described innovative work behavior as the development and implementation of new ideas to solve a particular problem or improve an existing situation in an activity (Messmann, Mulder, 2011, Messmann, Mulder, 2012; Scott, Bruce, 1994).

Innovative work behavior reflects a series of activities in which individuals generate novel ideas, solve practical problems at work and achieve positive effects innovation tasks. Scholars state, that innovative work behavior encompasses all physical and cognitive work activities of individuals

(Messmann, Mulder, 2014; Sun, Huang, 2019). An in-depth understanding of innovative work activity requires an analysis of innovative work behavior. Different models can be found in the scientific literature that describe the structure of the dimensions of innovative work behavior of individuals (De Jong, Den Hartog, 2010; Janssen, 2003; Kleysen, Street, 2001; Messmann, Mulder, 2012; Patterson, 2002; Rogers, 2003; Scott, Bruce, 1994; Serdyukov, 2017; Sun, Huang, 2019; Thurlings et al., 2015).

The analysis of the scientific literature highlighted a lot of innovative work behavior activities of individuals: the situation recognition (De Jong, Den Hartog, 2010; Messmann, Mulder, 2012); the problem recognition (Dorenbosch et al., 2005; Farr, Tran, 2008; Scott, Bruce, 1994); ideas generation (De Jong, Den Hartog, 2010; Dorenbosch et al., 2005; Farr, Tran, 2008; Kleysen, Street, 2001; Messmann, Mulder, 2012; Patterson, 2002; Scott, Bruce, 1994); ideas formulation (Farr and Tran, 2008; Patterson, 2002); ideas championing (Dorenbosch et al., 2005; Messmann, Mulder, 2012; Scott, Bruce, 1994); ideas implementation (De Jong, Den Hartog, 2010; Dorenbosch et al., 2005; Farr, Tran, 2008; Kleysen, Street, 2001; Messmann, Mulder, 2012; Patterson, 2002; Scott, Bruce, 1994); and new ideas reflection (Messmann, Mulder, 2012). Consequently, there is no unified, single approach to the innovative work activity. In the diversity of approaches of innovative work activity, general trends can be seen. Researchers usually distinguish two main innovative work activities – the generation and the implementation (realization) of new ideas (Gong et al., 2013; Kleysen, Street, 2001). However, only a small body of research has examined the associations between innovative work activities.

2.2. The concept of innovative work activity according to RDI

The process of innovation starts with the Knowledge stage (Rogers, 2003) (Figure 1). De Jong and Hartog (2010) argue that every innovation in the beginning has a trigger: "the discovery of an opportunity or some problem arising" (p. 24). Drucker (1985) described seven sources (triggers) of innovation from unexpected successes till changes in perception and new knowledge. The most important triggers in the activities of science teachers are gaps between "what is" and "what should be", changes in perception, and new knowledge. The possibilities of science teachers to play with these triggers depend on science teachers' idea exploration abilities.

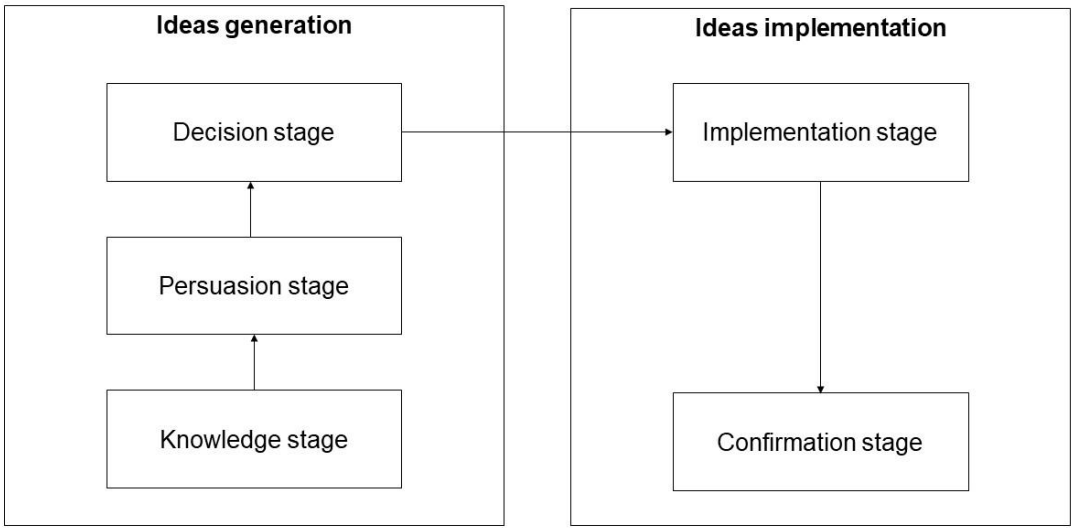


Fig. 1. The main stages of innovation process. The simplified Rogers (2003) model of Five Stages in the Innovation-Decision Process

According to RDI, the second stage of innovation is Persuasion (Figure 1). At the Persuasion stage "the formation of a favorable or unfavorable attitude toward an innovation does not always lead directly or indirectly to an adoption or rejection" (Rogers, 2003: 176). Rogers (2003) states that the Persuasion stage is more affective, the individuals are involved in communication with others (colleagues, peers) in order to get the individual's opinions and beliefs about the innovation.

At the Persuasion stage the new ideas generation abilities. The idea generation abilities require "kaleidoscopic thinking", as idea persuasion often involves rearranging already existing pieces into a new whole (De Jong, Hartog, 2010). The communication channels with other individuals help develop "kaleidoscopic thinking", and new idea generating abilities (Rogers, 2003).

The Decision stage is third in the innovation process (Figure 1). A further implementation of innovation depends on this stage: "full use of an innovation as the best course of action available," or rejection of innovation – "not to adopt an innovation" (Rogers, 2003: 177). It should be noted that the order of the knowledge-persuasion-decision stages may be different: knowledge-decision-persuasion (Rogers, 2003). Ideas championing abilities of individuals become relevant at this stage. Scholars state that championing includes finding support and building enthusiasm and confidence about the success of the innovation (Howell et al., 2005). In this step, the degree of uncertainty rests on new ideas, and social reinforcement from other colleagues is needed. To reduce the level of uncertainty the teachers visit another classroom to learn more about teaching, seeking to see how innovation works. Sherry (1997) states that "While information about a new innovation is usually available from outside experts and scientific evaluations, teachers usually seek it from trusted friends and colleagues whose subjective opinions of a new innovation are most convincing" (Sherry, 1997: 70).

New ideas need to be implemented. According to RDI, the fourth stage of the innovation process is the implementation of ideas in practice (Figure 1). The implementation of new ideas makes innovation a part of traditional work processes (Kleysen, Street, 2001). The ability to implement new ideas manifests itself by the developing new products or work processes, testing, and modifying them (Kanter, 1988).

At the new ideas' implementation stage "some degree of uncertainty is involved in diffusion" (Rogers, 2003: 6). This uncertainty disappears at the confirmation stage of innovation (Figure 1). At this stage individuals share information about implementation of new ideas and seek supportive messages that confirm innovations. "Thus, attitudes become more crucial at the confirmation stage. Depending on the support for adoption of the innovation and the attitude of the individual, later adoption or discontinuance happens during this stage" (Sahin, 2006: 17). The shared new information becomes the trigger for new innovations and the resource of knowledge.

2.3. Science teachers' innovative work activity

An analysis of the literature shows that researchers discuss the application of innovations in science education (Laudonia et al., 2018; Leeuwis, Aarts, 2016; Mestrinho, Cavadas, 2018; Ng et al., 2019). Scholars analyze the role of science teachers' self-efficacy in innovation (Dede et al., 2017); highlight the influence of communication on innovation of science education (Eilks et al., 2010); look for the implementation of responsible research and innovation (RRI) in science education (Bayram-Jacobs, 2015; Heras, Berrens, 2020; Ocada, 2016; Okada, Sherborne, 2018; Ruiz-Mallén et al., 2020); discuss science education and ICT innovation (Rusek et al., 2017); analyze innovative thinking of science teachers (Wisetsat, Nuangchalerm, 2019); and argue about innovative strategies in science teaching (Oyelekan et al., 2017). Analyzing the research findings on the application of innovations in the educational practice of science subjects, it has to be stated that researchers are more often interested in the external side of innovations – the application of innovations. It should be noted that there is a lack of research on internal side of innovations – the innovative work activities of science teachers, the associations between innovative work activities.

2.4. Research questions and Hypothesis

The international TIMSS 2015 study provides an opportunity to investigate the expression of innovative work activities of science teachers, and to determine the associations of different activities of science teachers' in science education. We developed five hypotheses (H_n) on the basis on the theoretical concepts:

H_1: Science teachers' activity to generate new ideas positively and directly affects science teachers' activity championing new ideas.

H_2: Science teachers' activity to champion new ideas positively and directly affects the activity to apply new ideas.

H_3: Science teachers' activity to apply new ideas positively and directly affects the activity to promote new ideas.

H_4: Science teachers' activity to promote new ideas positively and directly affects science teachers' activity to share new ideas.

H_5: Science teachers' activity to generate new ideas positively and directly affects science teachers' activity to share new ideas.

3. Methodology and methods

3.1. Instrument of research

TIMSS 2015 secondary data analysis was performed according to the theoretical model of science teachers' innovative work activities using the AMOS (Analysis of Moment Structures) software. TIMSS 2015 Instrument for science teachers allowed carrying out empirical analysis of science teachers' innovative work activities. We selected two complex questions from the TIMSS 2015 questionnaire corresponding to RDI theory: the question about science teachers' work activities and communication (BTBG 09A-BTBG 09G); the question about teaching activities in the classroom (BTBG 14A-BTBG 14G). We performed exploratory factor analysis (EFA) with Varimax (orthogonal) rotation (see Appendix). Factorability of science teachers' innovative work behavior was examined. The Kaiser-Meyer-Olkin test (KMO-test) revealed sampling adequacy. It was disclosed that (KMO = 0.883 <.05) for observed variables. Intercorrelation was checked by using Bartlett's test of (χ^2 (91) = 4260.403, p < .05). A principal component analysis (PCA) of science teachers' work activities yielded into three factors explaining a total of 55.54 % of the variance for the entire set of variables. The first factor was labelled innovative work activity due to the high loadings by the items about innovative work activities. This first factor explained 33.78 % of the variance. The factor Innovative work activity encompasses the questions about science teachers innovative work activities (BTBG 09E; BTBG 09D; BTBG 14F; BTBG 14G; BTBG 09C) (Table 1).

Table 1. Science teachers' innovative work activity: question content from TIMSS 2015

Innovative work activity	Question code	Question content from TIMSS 2015
Generation of new ideas	BTBG09E	Work together to try out new ideas
Championing of new ideas	BTBG09D	Visit another classroom to learn more about teaching
Applying of new ideas	BTBG14F	Ask students to decide their own problem-solving procedures
Promotion of new ideas	BTBG14G	Encourage students to express their ideas in class
Confirmation and sharing new ideas	BTBG09C	Share what I have learned about my teaching experiences

3.2. Sample and normality data

We tested the Path analysis model (Figure 2) using TIMSS 2015 data from four countries (Norway, Sweden, Lithuania, Italy). The countries were chosen according to different criteria: 1– years of teaching; 2 – gender; 3 – hours spent for professional development.

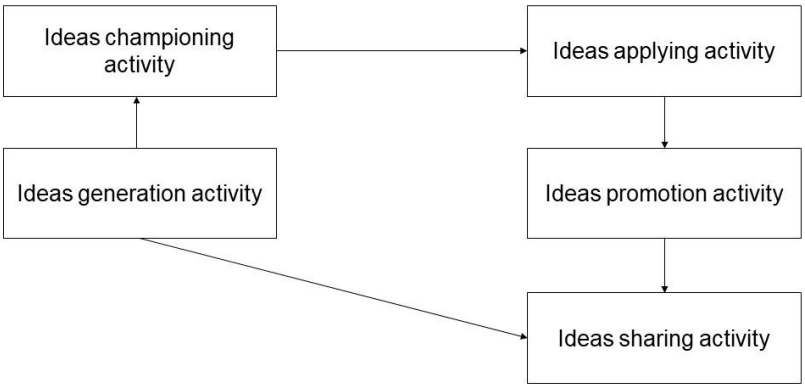


Fig. 2. Path analysis framework of science teachers' innovative work activities.

All variables of our interest in innovative work activities of science teachers are directly observable (Table 1). Taking this into account a path analysis was used. The strength of a path analysis lies in its ability to decompose the relationships among variables and to test the credibility of a theoretical perspective. A model of path analysis was developed (Figure 2) based on RDI.

We have chosen two countries each where the data of science teachers are similar according to the first (years of teaching) and the second (gender) criterion. The first group was Sweden and Norway, the second group – Italy and Lithuania (Table 2). Professional development (PD) hours of science teachers were similar in the first group of countries (Sweden and Norway), but they were diametrically opposite in Lithuania (Table 2).

Table 2. The years been teaching, the gender, and the professional development hours of science teachers

	Italy	Norway	Lithuania	Sweden
Years been teaching				
Mean	22.69	12.13	24.54	12.92
Median	24.00	10.00	25.00	12.00
Gender				
Male	21.8	44.7	12.7	40.7
Female	76.7	55.3	87.3	59.3
PD hours in two years				
None	35.0	57.4	2.9	33.5
Less than 6 hours	24.3	19.5	7.3	27.0
6–15 hours	21.4	10.5	31.5	22.5
16–35 hours	11.2	4.7	30.3	7.2
More than 35 hours	7.8	7.4	28.0	9.7

The normality of questions data (Table 1) was checked using values of asymmetry (skewness and kurtosis) (Table 3). The values for asymmetry (skewness and kurtosis) between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George, Mallery, 2010).

Preliminary results of the data normality from different countries showed that the data did not meet the conditions of normality well. Using box plots exceptions were investigated and such data were removed. The normality of data was rechecked after removal of exceptions. Asymmetry

coefficients indicate that the data satisfies the condition of normality (Table 3). Samples differ in size from country to country (Table 3). The smallest sample size is from Norway, the largest – from Lithuania. The removal of exceptions did not much change the samples size. For example, the original Norwegian database contained 195 subjects: after removing exceptions – 190 subjects (Table 3).

Table 3. Normality of science teachers' innovative work activities data: asymmetry coefficients test

		Question code (BTBS)				
Country/ sample size	Asymmetry coefficients	BTBG09E	BTBG09D	BTBG14F	BTBG14G	BTBG09C
		Generate	Develop	Applying	Promote	Share
Italy/ 206	Skewness	-.447	-1.426	.646	1.271	-.118
	Kurtosis	-.235	1.334	-.983	.159	-.613
Lithuania/ 945	Skewness	-.649	-.617	-.491	1.488	-.262
	Kurtosis	.468	.942	-.526	1.231	-.521
Sweden/ 617	Skewness	-.263	-.633	-.445	.658	.184
	Kurtosis	-.633	-.607	-.435	-.933	.746
Norway/190	Skewness	-.370	-.807	-.782	.220	.181
	Kurtosis	.140	-.401	-.223	-.794	.892

3.3. The fitness of data for path analysis

The model contains the following variables: observed, exogenous variable is the activity to generate new ideas; observed, endogenous variables are the activities to champion, to apply, to promote, and to share new ideas.

We used numerous goodness-of-fit indicators to assess a model of science teachers' innovative work behavior (Table 4). Those values indicate a good fit between the model and observed data from different countries.

Table 4. The fitness of items of science teachers' innovative work activities

Country		Absolute fit index			Relative fit index		
		χ2/df	RMSEA	GFI	IFI	TLI	CFI
Italy	Assumed model	1.585	.000	.877	.993	.982	.993
	Acceptance value	1-5	<.08	>.80	>.90	>.90	>.90
Lithuania	Assumed model	0.784	.079	.994	.992	.962	.992
	Acceptance value	1-5	<.08	>.80	>.90	>.90	>.90
Norway	Assumed model	1.481	.037	.877	.999	.992	.999
	Acceptance value	1-5	<.08	>.80	>.90	>.90	>.90
Sweden	Assumed model	3.797	.067	.901	.986	.953	.986
	Acceptance value	1-5	<.08	>.80	>.90	>.90	>.90

4. Results

In this study, we tried to reveal the internal structure of science teachers' innovative work activity. We were interested in how much the innovative work activities of science teachers are

affected by each other and what are the direct and indirect effects of science teachers' new ideas generation activity on teachers' new idea sharing activity.

The results of multiple regression analysis were described using unstandardized and standardized coefficients (Tables 5–8). The unstandardized beta (*B*) represents the value of predictor variable and the dependent variable. The standardized regression coefficient (β) indicates relationships according to the order of variables in terms of their significance: new ideas generation and new idea championing; new ideas championing and new ideas applying; new ideas applying and new ideas promoting, new ideas promoting and new ideas sharing, new ideas generations and new ideas sharing. The probability level (p) tells whether or not an independent variable significantly predicts the dependent variable (Tables 5–8).

The findings of our quantitative study (p value) on the basis of TIMSS 2015 data from Italy (Table 5) revealed that science teachers' activity to generate new ideas directly and positively affects the activity to champion new ideas (B = .303), (R^2 = .156, p < .01); the activity to apply new ideas affects science teachers' activity to promote new ideas (B = .405), (R^2 = .188, p < .01); Science teachers' activity to generate new ideas directly affects science teachers' activity to share new ideas (B = .614), (R^2 = .369, p < .01). The greatest value of R^2 is at H_5 hypothesis (Table 5). This means that 36.9 % of science teachers' activity to share new ideas was influenced by science teachers' activity to generate new ideas in teaching science. The remaining 63.1 % changes are influenced by other factors.

Table 5. The paths' coefficients and statistical significance of science teachers' innovative work activities: on TIMSS 2015 data from Italy

Hypothesis	Paths	B	S.E.	β	p	R^2	Results
H1. Science teachers' activity to generate new ideas affects science teachers' activity to champion new ideas.	BTBG09E → **BTBG09D**	.303	.049	.395	***	.156	Support
H2. Science teachers' activity to champion new ideas affects science teachers' activity to apply new ideas.	BTBG09D→ **BTBG14F**	.018	.083	.029	.633	.001	Not support
H3. Science teachers' activity to apply new ideas affects science teachers' activity to promote new ideas.	BTBG14F→ **BTBG14G**	.405	.059	.434	***	.188	Support
H4. Science teachers' activity to promote new ideas affects science teachers' activity to share new ideas.	BTBG14G→ **BTBG09C**	.157	.064	.101	.052	.019	Not support
H5. Science teachers' activity to generate new ideas affects science teachers' activity to share new ideas.	BTBG09E→ **BTBG09C**	.614	.054	.609	***	.369	Support

The data of TIMSS 2015 from Lithuania (Table 6) revealed that science teachers' activity to generate new ideas also directly and positively affects the activity to champion new ideas (B = .596), (R^2 = .374, p < .01), Science teachers' activity to generate new ideas directly and positively affects science teachers' activity to share new ideas (B = .469), (R^2 = .223, p < .01). The probability level (p) tells that in testing hypothesis H_2, H_3, H_4 an independent variable significantly predicts the dependent variable, but values of R^2 are very small and vary from 4.7 %

to 6.8% (Table 6). R^2 indicate that there was no predictable meaningful effect on dependent variables: activity to apply new ideas; activity to promote new ideas; activity to share new ideas.

Table 7 shows the results of multiple regression analyses of innovative work activities of science teachers from Sweden. TIMSS 2015 data from Sweden confirmed the previous tendency from Italy and Lithuania: the science teachers' generation of new ideas directly and positively affects the activity to champion new ideas (B = .346), (R^2 = .215, p < .01); Science teachers' activity to generate new ideas affects science teachers' activity to share new ideas (B = .585), (R^2 = .412, *p* < .01) (Table 7).

Table 6. The paths' coefficients and statistical significance of science teachers' innovative work activities: on TIMSS 2015 data from Lithuania

Hypothesis	Paths	B	S.E.	β	p	R^2	Results
H1. Science teachers' activity to generate new ideas affects science teachers' activity to champion new ideas.	BTBG09E → **BTBG09D**	.596	.025	.612	***	.374	Support
H2. Science teachers' activity to champion new ideas affects science teachers' activity to apply new ideas.	BTBG09D→ **BTBG14F**	.250	.038	.217	***	.047	Support
H3. Science teachers' activity to apply new ideas affects science teachers' activity to promote new ideas.	BTBG14F→ **BTBG14G**	.207	.025	.260	.005	.068	Support
H4. Science teachers' activity to promote new ideas affects science teachers' activity to share new ideas.	BTBG14G→ **BTBG09C**	.127	.032	.112	***	.049	Support
H5. Science teachers' activity to generate new ideas affects science teachers' activity to share new ideas.	BTBG09E→ **BTBG09C**	.469	.030	.455	***	.223	Support

Table 7. The paths' coefficients and statistical significance of science teachers' innovative work activities: on TIMSS 2015 data from Sweden

Hypothesis	Paths	B	SE	β	p	R^2	Results
H1. Science teachers' activity to generate new ideas affects science teachers' activity to champion new ideas.	BTBG09E→ **BTBG09D**	.346	.027	.463	***	.215	Support
H2. Science teachers' activity to champion new ideas affects science teachers' activity to apply new ideas.	BTBG09D→ **BTBG14F**	.215	.047	.181	***	.032	Support
H3. Science teachers' activity to apply new ideas affects science teachers' activity to promote new ideas.	BTBG14F→ **BTBG14G**	.342	.036	.345	***	.124	Support
H4. Science teachers' activity to promote new ideas affects science teachers' activity to share new ideas.	BTBG14G→ **BTBG09C**	.145	.034	.133	***	.040	Support

H5. Science teachers' activity to generate new ideas affects science teachers' activity to share new ideas.	BTBG09E→ **BTBG09C**	.585	.024	.624	***	.412	Support

According to small square multiple correlation R^2 values, there was no meaningful relation between science teachers' activity to champion new ideas and science teachers' activity to apply new ideas R^2 = .032; science teachers' activity to apply new ideas and science teachers' activity to promote new ideas R^2 = .124; science teachers' activity to promote new ideas and science teachers' activity to share new ideas R^2 = .040 (Table 7).

The findings on the basis of TIMSS 2015 data from Norway confirmed that science teachers' generation of new ideas directly and positively affects the activity to champion new ideas (B = .381), (R^2 = .196, p < .01); Science teachers' activity to generate new ideas directly affects science teachers' activity to share new ideas (B = .573), (R^2 = .314, p < .01) (Table 8).

Table 8. The paths' coefficients and statistical significance of science teachers' innovative work activities: on TIMSS 2015 data from Norway

Hypothesis	Paths	B	SE	β	p	R^2	Results
H1. Science teachers' activity to generate new ideas affects science teachers' activity to champion new ideas.	BTBG09E → **BTBG09D**	.381	.060	.420	***	.196	Support
H2. Science teachers' activity to champion new ideas affects science teachers' activity to apply new ideas.	BTBG09D→ **BTBG14F**	.274	.083	.233	***	.054	Support
H3. Science teachers' activity to apply new ideas affects science teachers' activity to promote new ideas.	BTBG14F→ **BTBG14G**	.473	.071	.435	***	.109	Support
H4. Science teachers' activity to promote new ideas affects science teachers' activity to share new ideas.	BTBG14G→ **BTBG09C**	.118	.031	.131	.028	.024	Support
H5. Science teachers' activity to generate new ideas affects science teachers' activity to share new ideas.	BTBG09E→ **BTBG09C**	.573	.062	.549	***	.314	Support

We were especially interested in the direct and indirect effect of new ideas generation activity on new ideas sharing activity (Table 9). On the one hand, we hypothesized that new ideas generation activity directly affects new ideas sharing activity (H_5). On the other hand, we hypothesized that the relationship between new ideas generation activity and new ideas sharing activity was mediated, and has an indirect effect on new ideas sharing, by others' activities (Figure 2).

Table 9. Results from Path analysis: Effect of new ideas generation activity on new ideas sharing activity

Country	Effect	β	B	SE	R^2
Italy	Direct	.603	.595	.054	.375
	Indirect	.001	.000		
	Total	.604	.595		
Lithuania	Direct	.455	.469	.030	.223

	Indirect	.004	.004		
	Total	.459	.473		
Sweden	Direct	.624	.585	.029	.412
	Indirect	.004	.004		
	Total	.628	.589		
Norway	Direct	.549	.573	.062	.325
	Indirect	.006	.006		
	Total	.555	.579		

The data of different countries (Italy, Lithuania, Sweden, Norway) show that the direct effect on new ideas sharing activity is stronger than the indirect effect (Table 9), despite the similarities and differences between the science teachers according to the chosen criteria (the years of teaching; the gender; hours spent for professional development).

According to the findings, there was a statistically significant direct and positive effect of all innovative work activities on each other. It can be argued that the activity of science teachers to generate new ideas determines the activity to champion new ideas (β varies from .395 to .612); the ability to champion new ideas determines the activity of science teachers to apply new ideas in practice (β varies from .181 to .233); the activity to apply new ideas determines the activity to promote a new idea (β varies from .260 to .434); the activity to promote new ideas determines the activity to confirm new ideas by sharing new information (β varies from .112 to .133); the ability to generate new ideas determines the activity to confirm new ideas by sharing new information (β varies from .455 to .624); (Tables 5, 6, 7, 8).

Summarizing the results of the TIMSS 2015 study on the innovative behavior of science teachers in different countries (Italy, Lithuania, Sweden, Norway), it should be noted that a path analysis results support well the hypotheses H_1, H_5. According to probability level (p), other hypotheses (H_2, H_3, H_4) also were confirmed (except H_2, H_4 on Italy data), but square multiple correlation R^2 values are very small. This is quite low, so predictions from the regression equation are not fairly reliable.

5. Discussion

In this study, on the basis of Rogers Diffusion theory (2003), we tried to reveal the structure of science teachers' innovative work activity and to define how much the innovative work activities affect each other. We selected countries whose teachers differed by the years of teaching (Norway, Lithuania), by hours spent for continuous professional development (Lithuania, Italy, Norway, Sweeden). However, the pathways analysis of innovative work activity did not reveal statistically significant differences in the analyzed countries. Our research has shown how one innovative work activity is associated with another according to RDI theory and encourages further research, highlighting the links between the years of teaching, the gender, and the innovative work activities of science teachers. Our study was conducted with databases of countries where the duration of professional development of science teachers was different (for example Lithuania and Norway). However, the results of the path analysis of the innovative work activities of science teachers in those countries do not differ. This encourages a new look at the duration and the content of professional development. The research results allow to stipulate that less emphasis should be placed on the duration of professional development and pay more attention to the content of innovative work activities and the associations between them in professional training of science teachers.

Consequently, there were direct and indirect effects of new ideas generation on new ideas sharing activity of science teachers. Results from a path analysis revealed the stronger role of direct effect of new ideas generation activity on new ideas sharing activity (Table 9). This result has a theoretical background from the Amabile (1983) componential theory which states that a person's production of new ideas is influenced by the person's creativity, domain-relevant knowledge, a person's perceived value of engaging in the task itself. The dissemination of new ideas takes place through communication and depends on science teachers' creativity, and also on domain-related knowledge. Communication fosters creative thinking which causes the ability to generate new ideas (Harris, de Bruin, 2018). This result has an educational background from brainstorming, collaborative creativity sessions, group creativity (Paulus et al., 2012). According to Baruah and

Paulus (2019), "group creativity combines cognitive processing and group members build on each other's ideas to generate more and better ideas" (p. 157).

Innovative teachers' work activity is associated with innovative thinking (Wisetsat, Nuangchalerm, 2019). We observe the above-mentioned aspects of innovative thinking in RDI theory: exploration (interpret) of new ideas, generation (generate) of new ideas, championing (collaborate, reflect) of new ideas, and implementation (represent, evaluate) of new ideas. Wisetsat and Nuangchalerm (2019) analyzed the innovative thinking of Thai pre-service teachers through multi-educational innovations and revealed 6 steps for promoting the innovative thinking of pre-service teachers: setting goals, brainstorming, innovation design, reflection, teaching, and evaluation. It would be useful to explore teachers' innovative work activities at each step of innovative thinking.

We believe that other trends could emerge in the study of innovative work activities by teachers of other subjects according to the RDI-based model. Hence, future researchers should focus on innovative work activities of other subject teachers. In addition, the abilities of innovative work activities can be determined not only by the subject, but also by the teachers' relationship with ICT. Rogers (2003) uses the term innovation as a synonym for technology. Yeh et al. (2015) distinguished three groups of teachers according to their proficiency in using ICT: technology-infusive (TI), technology transitional (TR), and planning and design (PD). Rusek et al. (2017) state that "the TI teachers were more student-centered, whereas the TR teachers were more teacher-centered. The PD teachers were proficient in planning and designing but expressed lower evenness in their answers than TI and TR" (p. 510). It would be valuable to study the structure of innovative work activities of TI teachers, TR teachers, and PD teachers, revealing the peculiarities of innovative work activities according to RDI theory.

A pathway analysis can be applied to study the teachers' innovative work activities according to the classification of innovation adopters proposed by Rogers (2003): innovators, early adopters, early majority, late majority, and laggards. It would be useful to examine what are the innovative work activities (new ideas generation, championing, applying, promoting, and dissemination) of teachers from different innovation adopters' groups.

Rusek et al. (2017) compared Rogers' (2003) innovation adopters' model with Yeh et al. (2015) teachers' proficiency using information and communication technology (ICT) model: "innovators (comparable with PD-teachers), early adopters, early majority, late majority, laggards (comparable with TI-teachers)". Rusek et al. (2017) analyzed how ICT is used in chemistry education and revealed that Innovators represent 23 % of the pre-service chemistry teachers, only 3 % of respondents are laggards – the most traditional, conservative group. It is appropriate to study the internal structure of innovative work activity of science teachers from diametrically opposite groups: Innovators and Laggards group.

We analyzed science teachers' innovative work activities. "Particularly, one distinctive issue for science education is the uniqueness of conducting experiments in the laboratory" (Ng et al., 2019: 2911). Ng et al. (2019) investigate a case promoting science education in innovative ways by the view of experimental pedagogy on the basis of three theories: experiential learning (Kolb, 1984), pedagogical innovation (Walder, 2014), and innovative practice model (Nicolaides, 2012). These theories emphasize the innovative work activities of science teachers. However, they do not examine the internal structure of innovative work activity of science teachers. Our study encourages researchers to look at the application of innovations in science education through an internal structure of innovative work activity of science teachers at different models of experimental pedagogy: experiential learning, pedagogical innovation, and innovative practice model.

Our research has some limitations. The first limitation concerns the study samples: the samples of science teachers in the countries (Italy, Lithuania, Sweden, Norway) varied widely. However, this difference had no statistically significant effect on the final result. We relied on valid and reliable TIMSS 2015 research questions about science teachers' innovative work activities (Table 1). It would be appropriate to conduct research on the innovative work activities of science teachers using other research instruments.

6. Conclusion

The current study has attempted to adapt RDI in science education. According to RDI, innovative work behavior of science teachers manifests itself in the following activities: new ideas

exploration, generation, championing, implementation and confirmation.

We analyzed innovative work activities of science teachers on the basis of TIMSS 2015 data from Italy, Lithuania, Sweden, Norway. The highest standardized coefficients were detected analyzing the influence of new ideas generation activity on new ideas championing ability and analyzing the influence of new ideas generation activity on new ideas sharing activity. The direct effect of new idea generating ability on new idea sharing ability is stronger than the indirect effect.

Our study complements a theoretical proposition on how the innovative work activities of teachers are related to the facets of idea generation and implementation covering both the generation and implementation of new ideas.

References

Adams et al., 2018 – *Adams, J., Avraamidou, L., Bayram Jacobs, D., Boujaoude, S.B., Bryan, L., Christodoulou, A., Couso, D., Danielsson, A. T., Dillon, J., Evagorou, M., Goedhart, M., Kang, N-H., Kaya, E., Kayumova, S., Larsson, J., Martin, S. N., Martinez-Chico, M., Marzàbal, A., Savelsbergh, E. R., Zembal-Saul, C.* (2018). The role of science education in a changing world. Lorentz Center Leiden.

Akhter, Fatima, 2016 – *Akhter, N., Fatima, Q.* (2016). Teachers' and students' perceptions of autonomy using inquiry-based learning in initial the teacher education. *Journal of Research & Reflections in Education (JRRE)*. 10(1): 1-15.

Amabile, 1983 – *Amabile, T.* (1983). The social psychology of creativity: A componential conceptualisation. *Journal of Personality and Social Psychology*. 45: 357-76.

Baruah, Paulus, 2019 – *Baruah, J., Paulus, P.B.* (2019). Collaborative Creativity and Innovation in Education. In C.A. Mullen (Ed.). Creativity Under Duress in Education? (pp. 155-177). Springer International Publishin. DOI: https://doi.org/10.1007/978-3-319-90272-2_9

Bayram-Jacobs, 2015 – *Bayram-Jacobs, D.* (2015). Responsible Research and Innovation: What is it? How to Integrate in Science Education. *Presented at International Congress on Education for the Future: Issues and Challenges (ICEFIC 2015) Conference, Ankara University, 13–15 May 201, Ankara, Turkey.*

De Jong, Den Hartog, 2010 – *De Jong, J., Den Hartog, D.* (2010). Measuring innovative work behaviour. *Creativity and Innovation Management*. 19(1): 23-36.

Drucker, 1985 – *Drucker, P.F.* (1985). Innovation and Entrepreneurship: Practice and Principles. New York: Harper and Row.

Furtak, Kunter, 2012 – *Furtak, E.M., Kunter, M.* (2012). Effects of autonomy-supportive teaching on student learning and motivation. *Journal of Experimental Education*. 80(3): 284-316. DOI: 10.1080/00220973.2011.573019

George, Mallery, 2010 – *George, D., Mallery, M.* (2010). SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update (10a ed.). Boston: Pearson.

Gong et al., 2013 – *Gong, Y., Zhou, J., Chang, S.* (2013). Core knowledge employee creativity and firm performance: The moderating role of riskiness orientation, firm size, and realized absorptive capacity. *Personnel Psychology*. 66: 443-82.

Halász, 2018 – *Halász, G.* (2018). Measuring innovation in education: The outcomes of a national education sector innovation survey. *European Journal of Education*. 1-17. DOI: https://doi.org/10.1111/ejed.12299

Harris, Bruin, 2018 – *Harris, A., de Bruin, L.R.* (2018). Secondary school creativity, teacher practice and STEAM education: An international study. *J Educ Change*. 19: 153-179. DOI: https://doi.org/10.1007/s10833-017-9311-2

Howell et al., 2005 – *Howell, J.M., Shea, C.M., Higgins, C.A.* (2005). Champions of Product Innovations: Defining, Developing, and Validating a Measure of Champion Behavior. *Journal of Business Venturing*. 20: 641-61.

Janssen, 2003 – *Janssen, O.* (2003). Innovative behavior and job involvement at the price of conflict and less satisfactory relations with co-workers. *Journal of Occupational and Organizational Psychology*. 76: 347-364. DOI: 10.1348/096317903769647210

Kanter, 1988 – *Kanter, R.M.* (1988). When a Thousand Flowers Bloom: Structural, Collective and Social Conditions for Innovation in Organization. *Research in Organizational Behavior*. 10: 169-211.

Klaeijsen et al., 2018 – *Klaeijsen, A., Vermeulen, M., Martens, R.* (2018). Teachers' innovative behaviour: The importance of basic psychological need satisfaction, intrinsic motivation, and occupational self-efficacy. *Scandinavian Journal of Educational Research*. 62(5): 769-782.

Kleysen, Street, 2001 – *Kleysen, R.F., Street, C.T.* (2001). Toward a multi-dimensional measure of individual innovative behavior. *Journal of Intellectual Capital*. 2(3): 284-296.

National Research Council, 1996 – National Research Council (NRC). (1996). National science education standards. Washington, DC: National Academy Press.

National Research Council, 2000 – National Research Council (NRC). (2000). Inquiry and the national science education standards: a guide for teaching and learning. Washington, DC: National Academy Press.

National Research Council, 2012 – National Research Council. (2012). A framework for K-12 science education: Practices, crosscutting concepts, and core ideas. Washington, DC: The National Academies Press.

Ng et al., 2019 – *Ng, Y.F., Chan, K.K., Lei, H., Mok, P., Leung, S.Y.* (2019). Pedagogy and innovation in science education: A case study of an experiential learning science undergraduate course. *The European Journal of Social & Behavioural Sciences*. 25(2): 2910-2926. DOI: 10.15405/ejsbs.254

Nicolaides, 2012 – *Nicolaides, A.* (2012). Innovative teaching and learning methodologies for higher education institutions. *Educational research*. 3(8): 620-626.

Obeng, 2019 – *Obeng, B.A.* (2019). Strategic networking and small firm growth in an emerging economy. *Journal of Small Business and Enterprise Development*. 26(1): 43-66.

OECD, 2019 – OECD (2019). Measuring Innovation in Education: A New Perspective. OECD Publishing, Paris. OECD Publishing, Paris/Eurostat, Luxembourg. DOI: https://doi.org/10.1787/9789264304604-en

Okada, 2016 – *Okada, A.* (Ed.). (2016). Engaging Science: Innovative Teaching for responsible citizenship. Milton Keynes: The Open University – Knowledge Media Institute.

Okada, Sherborne, 2018 – *Okada, A., Sherborne, T.* (2018). Equipping the Next Generation for Responsible Research and Innovation with Open Educational Resources, Open Courses, Open Communities and Open Schooling: An Impact Case Study in Brazil. *Journal of Interactive Media in Education*. (1): 18. DOI: http://doi.org/10.5334/jime.482

Okada et al., 2015 – *Okada, A., Young, G., Sanders, J.* (2015). Fostering Communities of Practices for teachers' professional development integrating OER and MOOC, EC-TEL. *The 10th European Conference on Technology Enhanced Learning*.

Oyelekan et al., 2017 – *Oyelekan, O.S., Igbokwe, E.F., Olorundare, A.S.* (2017). Science Teachers' Utilization of Innovative Strategies for Teaching Senior School Science in Ilorin, Nigeria. *Malaysian Online Journal of Educational Sciences*. 5(2): 49-65.

Paulus et al., 2012 – *Paulus, P.B., Dzindolet, M.T., Kohn, N.W.* (2012). Collaborative creativity-group creativity and team innovation. In M. D. Mumford (Ed.), Handbook of organizational creativity (pp. 327-357). New York, NY: Elsevier.

Parlakyildiz, 2015 – *Parlakyildiz, B.* (2015). In science and maths education, the portfolio implementations of prospective preschool teachers. *American Journal of Educational Research*. 3(10): 1243-1252.

Patterson, 2002 – *Patterson, F.* (2002). Great Minds Don't Think Alike? Person-level Predictors of Innovation at Work. In C. L. Cooper, I. T. Robertson (Eds.). *International Review of Industrial and Organizational Psychology*. 17: 115-144. Manchester: John Wiley and Sons.

Riga et al., 2017 – *Riga, F., Winterbottom, M., Harris, E., Newby, L.* (2017). Inquiry-Based Science Education. In: Taber K.S., Akpan B. (eds) Science Education. New Directions in Mathematics and Science Education. Sense Publishers, Rotterdam.

Rogers, 2003 – *Rogers, E.M.* (2003). Diffusion of innovations (5th ed.). New York: Free Press.

Ruiz-Mallén et al., 2020 – *Ruiz-Mallén, I., Heras, M., Berrens, K.* (2020). Responsible research and innovation in science education: insights from evaluating the impact of using digital media and arts-based methods on RRI values. *Research in Science & Technological Education*. 1-32. DOI: 10.1080/02635143.2020.1763289

Rusek et al., 2017 – *Rusek, M., Stárková, D., Chytrý, V., Bílek, M.* (2017). Adoption of ICT innovations by secondary school teachers and pre-service teachers within chemistry education. *Journal of Baltic Science Education*. 16(4): 510-523.

Sahin, 2006 – *Sahin, I.* (2006). Detailed review of Rogers' diffusion of innovations theory and educational technology-related studies based on rogers' theory. *The Turkish Online Journal of Educational Technology*. 5(2): 14-23.

Scott, Bruce, 1994 – *Scott, S.G., Bruce, R.A.* (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*. 37(3): 580-607.

Serdyukov, 2017 – *Serdyukov, P.* (2017). Innovation in education: what works, what doesn't, and what to do about it? *Journal of Research in Innovative Teaching & Learning*. 10(1): 4-33. DOI: https://doi.org/10.1108/JRIT-10-2016-0007

Sherry, 1997 – *Sherry, L.* (1997). The boulder valley internet project: Lessons learned. *The (Technological Horizons in Education) Journal*. 25(2): 68-73.

Sun, Huang, 2019 – *Sun, Y., Huang, J.* (2019). Psychological capital and innovative behavior: Mediating effect of psychological safety. *Social Behavior and Personality: An International Journal*. 47(9): 1-7. DOI: n10.2224/sbp.8204

Thurlings et al., 2015 – *Thurlings, M., Evers, A., Vermeulen, M.* (2015). Towards a model of explaining teachers' innovative behaviour: A literature review. *Review of Educational Research*. 85: 430-471. DOI: 10.3102/0034654314557949

Train, Miyamoto, 2017 – *Train, T.L., Miyamoto, Y.J.* (2017). Encouraging Science Communication in an Undergraduate Curriculum Improves Students' Perceptions and Confidence. *Journal of College Science Teaching*. 46: 76-83.

Walder, 2014 – *Walder, A.M.* (2014). The concept of pedagogical innovation in higher education. *Education Journal*. 3(3): 195-202. DOI: https://dx.doi.org/10.11648/j.edu.20140303.22

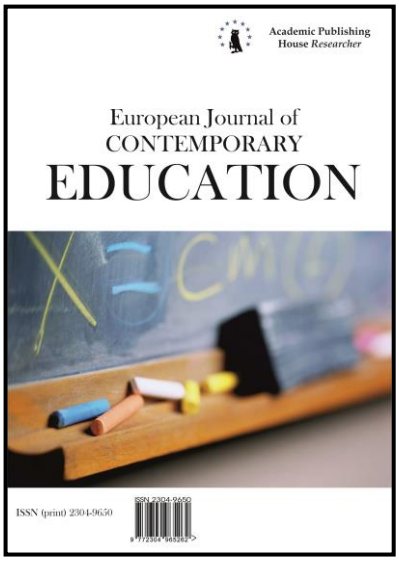
West, Farr, 1989 – *West, M.A., Farr, J.L.* (1989). Innovation at work: Psychological perspectives. *Social Behaviour*. 4: 15-30.

West, Farr, 1990 – *West, M.A., Farr, J.L.* (1990). Innovation at Work. In M. A. West, J.L. Farr (Eds.). Innovation and Creativity at Work: Psychological and Organizational Strategies (pp. 3–13). New York: John Wiley and Sons.

Wisetsat, Nuangchalerm, 2019 – *Wisetsat, C., Nuangchalerm, P.* (2019). Enhancing innovative thinking of Thai pre-service teachers through multi-educational innovations. *Journal for the Education of Gifted Young Scientists*. 7(2): 215-235. DOI: 10.17478/jegys.570748

Yeh et al., 2015 – *Yeh, Y.F., Lin, T.C., Hsu, Y.S., Wu, H.K., Hwang, F.K.* (2015). Science Teachers' Proficiency Levels and Patterns of TPACK in a Practical Context. *Journal of Science Education and Technology*. 24(1): 78-90.

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 202-210
DOI: 10.13187/ejced.2021.1.202
www.ejournal1.com



The History of Education

Cooperation Pedagogy by K.N. Ventzel

Alexander P. Abramov [a, *]

[a] Southwest State University, Russian Federation

Abstract

The article theoretically interpreted and empirically proved the consistency of the methodology of cooperation of Konstantin Nikolaevich Ventzel, who became one of the consistent supporters of free education and training. On the basis of his own pedagogical experiments at the Yasnaya Polyana school, Tula province, using the approaches and educational methods of L.N. Tolstoy in the 60-70s of the 19th century K.N. Ventzel created his own theory of cooperation pedagogy and free education. The result of such innovations is a "living person" – a vessel of the greatest quantity and the highest quality. It is on the basis of cooperation between a teacher and a student that a harmonious personality is built, whose modal qualities are morality, unity of thoughts and feelings, love of freedom, and creativity, independence, the ability to work collectively, humanity and philanthropy. The creation of such a person is the ultimate goal of cooperation pedagogy. K.N. Ventzel's pedagogical innovations on the formation of a community of educators and pupils, teachers and students can act as the fundamental principles of the pedagogical process, both in Russia and in other countries of the world. The concept of cooperation currently meets the interests of society and the social basis of the Russian people.

Keywords: K.N. Ventzel, pedagogy, cooperation, freedom, creativity.

1. Introduction

Socio-cultural, socio-economic, technological and other challenges of our time actualize the problem of creating qualitatively new teaching forms and models at all levels of education with a focus on accessibility, openness, cooperation between educators and students. In turn, the changes taking place against their background have made the tasks and presented new requirements for the teacher (mentor).

* Corresponding author
E-mail addresses: abramov_ap@inbox.ru (A.P. Abramov)

The contradiction between the objective need to modernize all levels of Russian education, in accordance with the requirements of the XXI century and the lack of a clear strategy of its reform, presupposing the preservation of the best traditions of Russian education accumulated over the centuries, predetermined the need for scientific understanding of the ideas and concepts of outstanding Russian theorists and educators-practitioners who laid the foundation of the world's best education. One of these innovators was the supporter and developer of the concept of cooperation and free education, Russian and Soviet teacher Konstantin Nikolaevich Ventzel (1857–1947), whose ideas are relevant, in demand and need more in-depth study.

The analysis of the latest publications on the problem is presented here. The issues of transformation of all levels of education in accordance with the principles of cooperation can be found both in the author's works (Abramov et al., 2019) and in the works of other famous Russian scientists, such as E.N. Astafieva (Astafieva, 2016), S.N. Blinova (Blinova, 2020), M.A. Goncharov (Goncharov, Shkurov, 2017), Yu.M. Druzhnikov (Druzhnikov, 1996), G.B. Kornetov (Kornetov, 2017), N.V. Maminova (Maminova, 2019), Yu.V. Musica (Musica, 2018), E.Yu. Petryaeva (Petryaeva, 2017), I.P. Smirnov (Smirnov, 2020), O.E. Chuikov (Chuikov et al., 2018). Practical methods are presented by empirical studies of foreign teachers, such as R. Hun Ping Cheung (Hun Ping Cheung, 2018), D.S. Safarova (Safarova, 2020; Schmerse, 2020), E. Sjølie E., S. Francisco & L. Langelotz (Sjølie et al., 2019).

2. Materials and methods

We use the scientific works of K.N. Ventzel, works of Russian and foreign researchers devoted to the activities of the teacher as the main information sources. They contain specific practices of using various forms and methods of cooperation. Comparative analysis of pedagogical research in the second decade of the 21st century made it possible to form a theoretical basis for research, structure and generalize the data obtained.

The retrospective and the possibilities of reproducing the forms of cooperation pedagogy are considered through the interdisciplinary prism of Russian history, pedagogy and psychology.

The use of general scientific research methods: systematization, comparison, collation and generalization of data, made it possible to characterize the conceptual provisions of the cooperation pedagogy by K.N. Ventzel in the context of determining their scientific and socio-pedagogical significance.

3. Discussion

Since the second half of the nineteenth century, the pedagogical community, theorists and practitioners have been in an active search for effective educational models that could be used as a basis for teaching and educating the younger generation.

In the story “Cadet Monastery” by N.S. Leskov, we find a description of the training and educational practices of that time on the example of the cadet corps of imperial Russia. The characters in this story are the director of the corps Persky, the manciple Bobrov and the corps doctor Zelensky. They are presented as an ideal image, "moral norm" of a teacher and educator, whose main principle is cooperation. “The examples of such educators are reflected in the souls and imprinted on the heart, because without an example that elevates feelings, there can be no education” (Leskov, 1989). It is no coincidence that, having its own socio-cultural specifics, the model of cadet education has been recognized and is recognized as the most successful at the present time (Abramov et al., 2017).

At the beginning of the 20th century, the concept of upbringing became the leitmotif of the cooperation pedagogy. There is individuality of the student with his inner world, needs and interests in the center of cooperation pedagogy. It is reflected in the works by A.V. Lunacharsky (Lunacharsky, 1922), A.S. Makarenko (Yanovskaya, 1993), M.M. Rubinstein (Rubinstein, 1921), S.T. Shatsky (Chuikov et al., 2018), V.N. Soroki-Rosinsky (Abramov et al., 2019).

Historical and pedagogical excursus into the cooperation pedagogy is conducted by N.V. Maminova. The author quite reasonably notes that the innovative teachers of the first third of the twentieth century have considered the community of educators and pupils as a principle of the pedagogical process and as a condition for the formation of morally valuable guidelines for students (Maminova, 2019).

The ideas of Ventzel were actualized in the post-Soviet period, when there was an urgent need to restructure all levels of Russian education. The analysis of educational cooperation strategies is presented by L.K. Grebenkina and N.A. Kopylova during this period (Grebenkina, Kopylova, 2010).

In her works E.Yu. Petryaeva has presented e-learning methods based on the analysis of innovative directions in the development of cooperation pedagogy in a digital environment (Petryaeva, 2017).

G.B. Kornetov has made a significant contribution to the study of the pedagogical system of cooperation. He has defined the theory of K.N. Ventzel, as the most promising, since modern society, against the background of the development of sciences, increasingly needs the pedagogy of cooperation and methods of free education (Kornetov, 2017).

In turn, M.A. Goncharov and A. Yu. Shkurov have defined the approach in line with the pedagogy of open cooperation not only as a historical and pedagogical one, but also as one that has prospects in the model of a socially active school (Goncharov, Shkurov, 2017).

The special role of the teacher in the formation of students' creative abilities on the basis of cooperation methods is empirically proved by E.N. Astafieva (Astafieva, 2016).

Possible prospects for the application of the theory of free education, which was popular among the pedagogical community at the beginning of the last century, are given by I.P. Smirnov, conducting a comparative analysis of the main provisions of the cooperation pedagogy with modern regulatory documents in this area (Fundamentals of State Youth Policy, Strategy for the Development of Education in the Russian Federation for the period until 2025) and real practice of education. Based on the works of K.N. Ventzel, the author has shown different, often polarizing views on the problem, which is still at the epicenter of scientific and pedagogical discussions (Smirnov, 2020).

D.S. Safarova has disclosed the foundations of cooperation pedagogy, defined its role in increasing the efficiency of the educational system and national education in schools of Uzbekistan in her research. Referring to the works of thinkers of the East, the author has emphasized that the success of educational activities is inextricably linked with the actions of mudarris (the one who conducts the lessons), ustozov (mentor) and murabbi (educator), who build their teaching practices on the principles of cooperation (Safarova, 2020).

The consistency of K.N. Ventzel, his methods and models of cooperation between educators and students are repeatedly confirmed by the highly rated scientific publications of foreign scientists (from the Scopus and Web of Science databases). Studying the behavior of preschool children, researchers in Hong Kong have concluded that children with a teacher-centered approach display more creative thinking than children with an isolation-centered approach. It turns out that learning has a sociocultural specificity (Hun Ping Cheung, 2018).

Researchers from Norway, Sweden and Australia focus on the training of teachers who should have the ability to create a communicative learning space of joint cooperation, depending on the mental specifics of the learners (Sjølie et al., 2019). The need to create and maintain an educational cooperation environment at all levels of education is confirmed by the results of a longitudinal study of the following children (n = 554 from 3 years old in preschool age to 8 years old in the second grade) conducted by German scientists. Pupils who have the skills to work together with adult educators and preschool mentors have better academic and behavioral outcomes (Schmerse, 2020).

The experience of Finland is also noteworthy, where one of the main principles of cooperation pedagogy is "equality of":

– schools (no elite or not prestigious);
– all subjects (in-depth study of some subjects at the expense of others is not welcome);
– parents by profession and social status (questions of teachers, questionnaires concerning the place of work of parents are prohibited);
– students (there is no "sorting" of their abilities or career preferences);
– education of healthy children and those with disabilities;
– teachers (regardless of the subject they teach);
– rights of adult (teacher, parent) and child (the principle of "respect for the student").

The pedagogical concept of cooperation has become widespread in the West.

4. Results

At present, supporters of the traditional Soviet school believe that children are allowed a lot, and pedagogical polemics come down to a discussion of children's rights. At the same time, even before the October Revolution of 1917, the concept of free education by K.N. Ventzel appeared, suggesting the introduction of an approach that is called cooperation pedagogy now. Ventzel's concept of free upbringing is based on humanistic principles, when the child is perceived as the center of the Universe with his own unique talents and inclinations (Blinova, 2020).

Cooperation pedagogy was the most widespread after the revolution of 1905–1907, the basis of which was the concept of "free education".

In the cooperation pedagogy and theories of free education there are some ideas of the French educator J.J. Rousseau, who was one of the first to announce the natural strategy of upbringing and education of children. These ideas were further developed by E. Kay in Sweden, by S. Fore and P. Robin in France, by M. Montessori in Italy, by John Dewey in the USA, and by the anarchist P. Kropotkin in Russia. To this day, preschool institutions adhere to these pedagogical methods in the United States. The undoubted merit of K.N. Venzel is to create his own Russian version of cooperation pedagogy. As Y.M. Druzhnikov has noted, it was Ventzel who not only outlined the prospects for its development, but also the projection of a person in the future society, which educated him proceeding not from his own needs, but from the needs of the individual (Druzhnikov, 1996).

Actively criticizing the old educational system, resenting the school policy of imperial Russia, K.N. Ventzel, like other supporters of the theory of "free education", tried to oppose it with the positive ideal of the new school. Denying any form of violence against the child's personality, Ventzel believed that learning should be subordinated to the development of personality (Ventzel, 1911).

The ideal of new system of free education by K.N. Ventzel complements the theoretical and practical searches of Russian teachers at the turn of the XIX–XX centuries. Ventzel devoted his entire long life to creative search, trying to escape from the era of the old school, not a perfect upbringing system, reproducing an absolutely enslaved child-slave. According to the teacher, children are the best creatures on earth ("swelling flower buds", "spiritual individual scent"). In this regard, it is of great interest Ventzel's judgment that a child is not yet a person, an individual must be raised from a child. "Man subsequently arises from a child" (Ventzel, 1923).

At the beginning of the 20th century, K.N. Ventzel tried to apply his theoretical principles of cooperation pedagogy based on a specific educational institution – the House of the Free Child (House of Labor, Temple of Life), which would be attended by children aged 3 to 13 years. These institutions did not have a curriculum, training programs, and there was no classroom system. Only such an educational space, according to the theorist, was able to ensure the transition from old forms of exploitation to a society of a new type, which should be based on freedom of labor and creativity. According to K.N. Ventzel "Homes of the Free Child" could solve such a social issue best of all. Children freely united into mobile age groups according to their interests and, communicating (in every possible way cooperating) with their peers and with adults, acquired the necessary knowledge and work skills. Workshops were supposed to become the center for obtaining such skills. A special role was assigned to parents who replaced teachers. Ventzel organized a library, a toy museum, a reference bureau, a laboratory, a natural history study, and a parent club. Thus, a unique community of parents and children was formed. Such a society of children, parents, and teachers was opposed to the state school. Almost a century later parents, both in Russia and in the West, are increasingly trying to make friends with their children and that is an interesting analogy.

K.N. Ventzel tried to create its own alternative to the old school in practice, not accepting it as the main organized subject of education and upbringing of the younger generation of the new Russia.

The teacher sincerely believed that only individualization in teaching could lead to the best results. In an effort to develop the creative skills of children in every possible way, sincerely loving students, he unnecessarily idealized and overestimated their abilities and experience.

In a way, the Houses of the Free Child became the prototype of the Soviet Houses of Children's Creativity.

In order for children to study diligently, it is necessary to have their desire and the main goal of K.N. Ventzel is to instill such a desire in them.

Trying to convince the pedagogical community of the consistency of their ideas, K.N. Ventzel outlined the principles of free upbringing in his report "Free education and family" at the All-Russian Congress on Family Education in 1913:

– concept of free education is based on the principle of diversity of education: how many children, so many systems of education;

– education is not a deliberate formation of a child in accordance with an ideal, but a process of liberating creative forces in a child;

– highest goal of education is the development of creative individuality;

– individuality does not stand in conflict with the public and culture, but, on the contrary, true society and true culture are associated with the development of individuality;

– child's initiative is important, its active character;

– it is necessary to contact the child with nature;

– development of mental activity and will is in the foreground, without which education will not be harmonious;

– education should lead to the ability to set goals and strive to achieve them;

– basis of education is free creative productive labor;

– child needs assistance in developing personal morality and personal religion. All teaching of this or that code of morality must be rejected (Ventzel, 1912–1913).

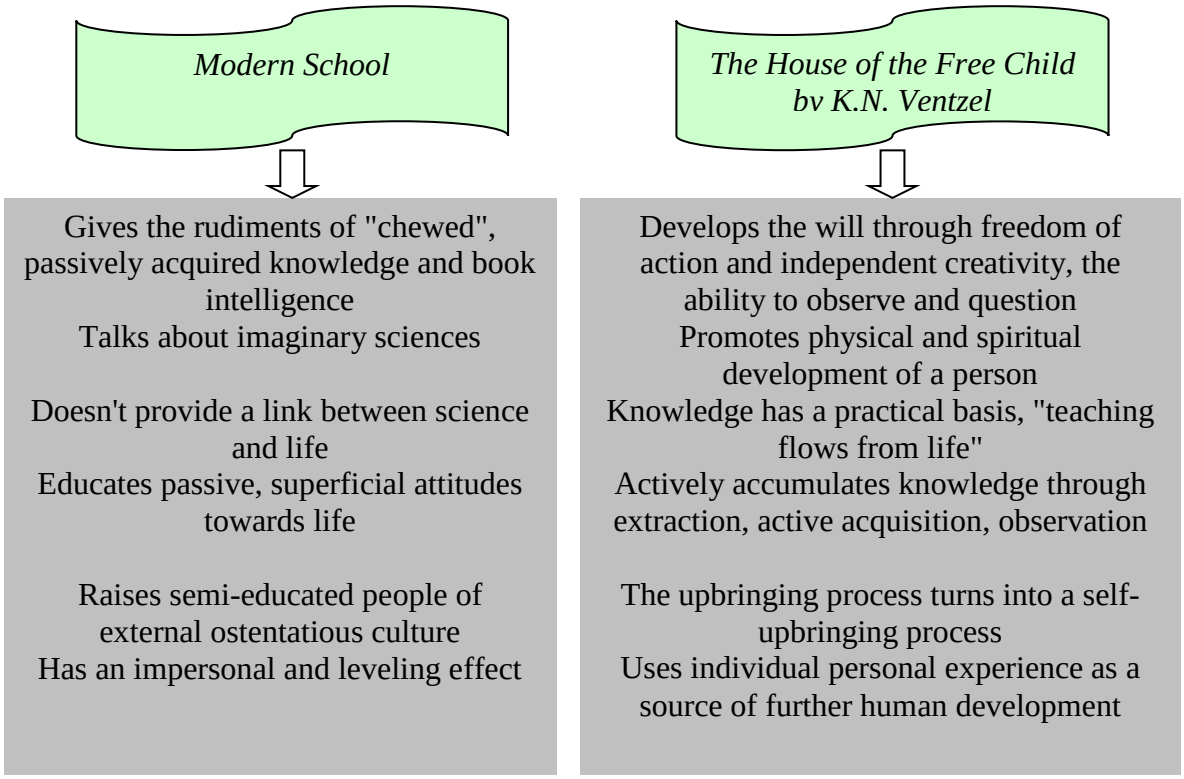


Fig. 1. Differences between Modern school and The House of the Free Child by K.N. Ventzel

K.N. Ventzel had a dissenting opinion regarding the pressure of adults on the world of children. It would seem that, desiring good, parents cannot always positively influence their children, hindering creative development. He is against violence against the personality of a child, his will, against strict supervision and the way they think, against formalism in teaching. Therefore, there can be no uniform requirements in the matter of education. At the same time freedom is not permissiveness in the theory of cooperation. The new school according to Ventzel should also be guided by the principles of freedom. It should be aimed at developing a free personality, and not at educating a slave and an obedient performer. A special role is assigned to the teacher, who should act as a guide. He is not a dictator, but an organizer, a first assistant or, in today's language, a communicator who helps the student to determine the choice of real goals and ways to achieve them.

From an early age, K.N. Ventzel tried to form a creative attitude to everyday things in children, thereby doing what is now called problem learning: to set a goal, find a way to fulfill it and analyze it. Drawing some analogy with today, the researcher of the historical and pedagogical heritage of Ventzel Yu.V. Musica highlights several fundamental differences between the modern school and the House of the Free Child (see Figure 1) (Musica, 2018).

At the same time, K.N. Ventzel, not doubting the certain influence of society on a person, brought into question the need for the absolute power of society over an individual during his childhood and early childhood.

The educational system according to K.N. Ventzel takes into account the nature of each individual, since it exists for children, and not vice versa.

Not recognizing any form of violence against the person, Venzel, nevertheless, accepted the events of 1917 and the Bolshevik ideas, since even before the revolution they promised to create the school as a "free association of students." At that time, as if knowing in advance about the millions of homeless children who would appear in the next decade, he appealed to all peoples of the planet with the "Declaration of the Rights of the Child" (Ventzel, 1918). According to Yu.M. Druzhnikov, this concept appears to be more significant than the one adopted by the UN half a century later (Druzhnikov, 1996).

K.N. Ventzel came up with the idea of creating a model of an educational institution for preschool children, which he called an "ideal kindergarten." Already at this initial educational level, he singled out “two equal units”: on the one hand – the educator, on the other – children.

Ideal kindergarten is a pedagogical community, which, according to K.N. Ventzel as follows:

– “a small business unit, a labor association, in the construction and life of which children take the most active part (self-service work, making manuals and toys, caring for plants, animals, agricultural labor, etc.);

– a place of happiness, joy and freedom (a place for meeting all social, scientific, aesthetic, moral and other needs of the child);

– a place of the full and harmonious life of the child” (Ventzel, 1923).

According to Ventzel, "free upbringing" of children does not imply the development of programs, plans and schedules. All classes are conducted according to the intention of the children themselves. In the activities of the educator, improvisation and creativity should be present, while the children themselves become creators – “little artists”. The task of the teacher is to help children improve themselves and find on their own better forms for the embodiment of beauty.

In the Soviet period, the ideas of cooperation pedagogy were only partially realized in the first years of Soviet power. And they were gradually consigned to oblivion. Criticism of Soviet teachers boiled down to the fact that defending the idea of school autonomy from the state is not acceptable, since the new social conditions contribute to the creative self-realization of the individual and free labor in any way. Experimental teachers of that time, including K.N. Ventzel, were accused of anarchism, left and right deviations.

In his works K.N. Ventzel questioned "How can a person behave in the conditions of the X state? Is there a chance to remain a person?". And he answered “Everything depends on the person himself, how he builds his life trajectory – to be a slave or a free person”. At the same time, the teacher identifies three types of "people-slaves":

– those who substitute their will for ambition, lust for power, voluptuousness, cowardice and fear;

– people obsessed with this or that idea;

– people who subordinated their will to the will of another person, state, nationality, party, class.

The main instruments of enslavement are the state, family, party, trade union, and public organizations. Any collective reproduces such types of relationships as automatism leading to slavery, and creative activity as a path to spiritual freedom. The beginning that is stronger wins. It is in childhood, according to Ventzel, that a free personality or a future overt or secret slave is formed.

As a result of the practical development of his ideas and methods, K.N. Ventzel reached the following general conclusions that form the basis of cooperation pedagogy:

1) The educational institution must be adapted to the living conditions of the child and his personality.

2) Productive labor is closely related to education and upbringing. Productive child labor has practical, educational, developmental, spiritual, and educational goals. Through work, the child

works on himself, develops the necessary character traits that allow him to lead himself, teaches him to do without adults, and fosters internal discipline.

3) Education should be aimed at the release of the child. “Freedom is the ability to do everything that does not harm the physical and spiritual development of the child and does not harm other people. There should be no more boundaries. ”Society and teachers are only voluntary helpers for children.

4) The highest authority for a person and society is the authority of the unwritten law, which is the same for everyone. Communication can be educational only if it obeys the highest authority, that is, the law, which is the main one. The law is the true authority that constitutes the soul of the form of communication of people with each other.

5) The educational system is created by the efforts of all subjects of pedagogical activity (see Figure 2).

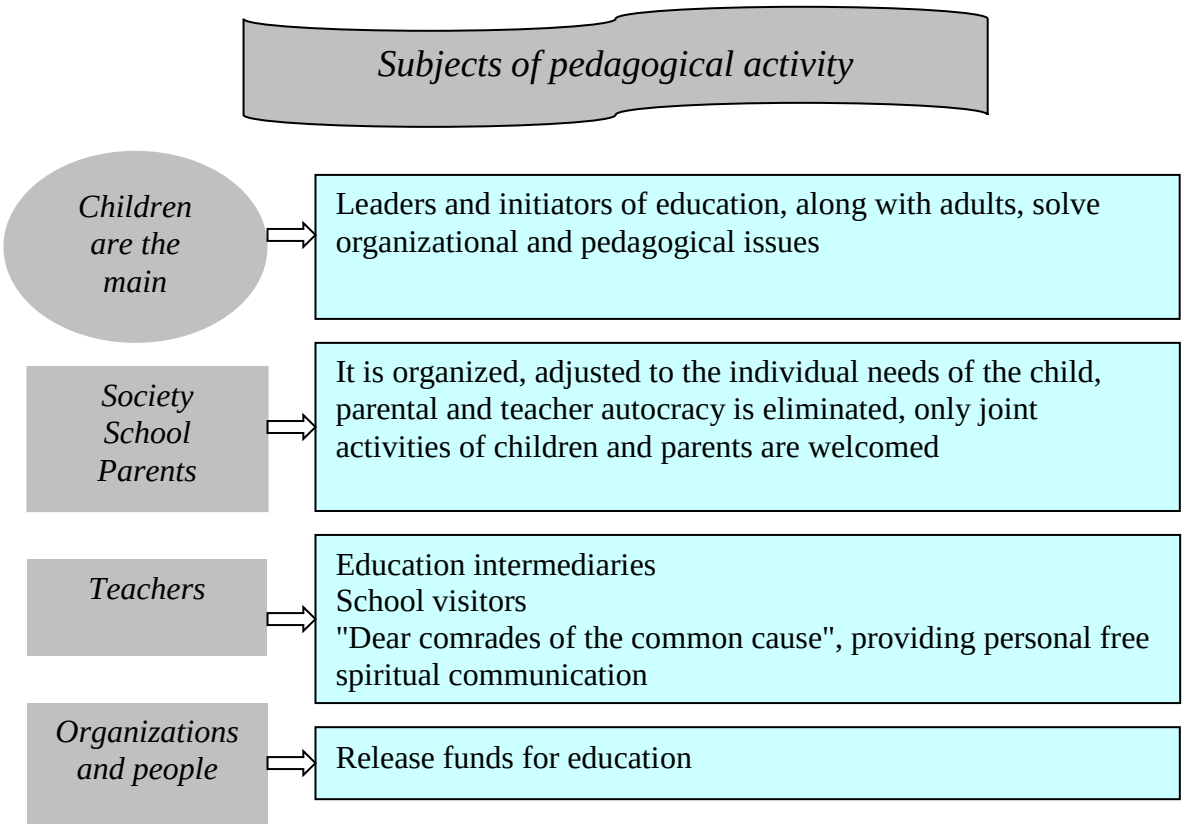


Fig. 2. Subjects of pedagogical activity

K.N. Ventzel proclaimed the cult of the human person. He defined the child as the savior of humanity, who would be given “the opportunity to develop freely and comprehensively and become a creative person who feels his kinship and unity with humanity and the world” (Druzhnikov, 1996).

Ventzel's mandate is still relevant to those who want to follow the path of creativity and liberation from the chains of invisible slavery successfully:

– hold on to supreme Self, eternal and immortal;
– listen only to the voice of free creative consciousness;
– direct your spiritual gaze to the most ideal, the most sublime (Kornetov, 2013).

Reflecting on freedom, K.N. Ventzel identified three stages:

– freeing the child (pedagogical task),
– liberation of oneself (ethical task);
– liberation of society (political task).

Undoubtedly, Ventzel's merit is that he has offered the new community to transform the family on the basis of equal rights for children and parents, advocated the creation of the

International Union for the Struggle for the Rights of the Child and tried to condemn political education as a form of violence against the future generation by the authorities.

At the same time, certain provisions of Ventzel's ideas are quite contradictory, since he is trying to transform life itself through school.

In turn, the teacher's thesis about trust in future generations inspires optimism: “For its moral progress, humanity needs the greatest possible number of individual free creators of a new independent original morality and the smallest possible number of representatives of “herd morality” (Ventzel, 1923).

5. Conclusion

In pedagogical historiography, the educational and training systems of Russian scientists are recognized as one of the best.

The theory of cooperation and free learning by K.N. Ventzel should not be recognized as part of the "pedagogical pantheon", without any doubt. We can find ideas for solving the problems facing modern social reality there.

K.N. Ventzel’s pedagogical innovations on the formation of a community of educators and pupils, teachers and students can act as the fundamental principles of the pedagogical process both in Russia and in other countries of the world. The concept of cooperation currently meets the interests of society and the social basis of the Russian people. Ventzel's message to all teachers is also quite relevant: "to provide the young generation with the opportunity not to fall into a state of "invisible slavery" and not to become a slave inside, in the realm of the spirit, having the appearance of a completely free person from the outside."

References

Abramov et al., 2017 – *Abramov, A.P., Chuikov, O.E., Gavrikov, F.A., Ludwig, S.D.* (2017). Socio-cultural dimension of military education in modern Russia. *European Journal of Contemporary Education*. 6(2): 189-195.

Abramov et al., 2019 – *Abramov, A.P, Chuikov, O.E., Pyaseckaya, E.N., Svechnikov, V.A.* (2017). Educational System of Victor N. Soroka-Rosinsky: from Coercion to Voluntariness. *European Journal of Contemporary Education*. 8(1): 254-261.

Astafieva, 2016 – *Astafieva, E.N.* (2016). Historical and pedagogical context of the theory and practice of modern education. *Academia. Moscow Region Pedagogical Journal*. 4: 56-68.

Blinova, 2020 – *Blinova, S.N.* (2020). Pedagogika vzaimodeistviya. Vzaimodeistvie i sotrudnichestvo mezhdu uchenikom i uchitelem kak osnovnoi faktor razvitiya lichnosti rebenka [Interaction pedagogy. Interaction and cooperation between a student and a teacher as the main factor in the development of a child's personality]. *Nauchnyi aspect*. 4 (3): 501-508. [in Russian]

Chuikov et al., 2018 – *Chuikov, O.E., Abramov, A.P., Zulfugarzade, T.E.* (2018). Organization of pupil government in teaching activities of Stanislav Shatskii (through the example of Rural Summer School-Colony "The Invigorating Life"). *European Journal of Contemporary Education*. 7(2): 436-444.

Druzhnikov, 1996 – *Druzhnikov, Yu.M.* (1996). Yavnaya i tainaya zhizn' Konstantina Venttselya [The explicit and secret life of Konstantin Wentzel]. *Voprosy filosofii*. 4: 106-126. [in Russian]

Goncharov, Shkurov, 2017 – *Goncharov, M.A., Shkurov, A.Yu.* (2017). Gosudarstvenno-obshchestvennoe upravlenie obrazovatel'noi organizatsiei i model' sotsial'no aktivnoi shkoly: otkrytaya pedagogika sotrudnichestva [State-public management of an educational organization and the model of a socially active school: open pedagogy of cooperation]. *Nauka i shkola*. 3: 59-67. [in Russian]

Grebenkina, Kopylova, 2010 – *Grebenkina, L.K., Kopylova, N.A.* (2010). Pedagogika sotrudnichestva: vchera, segodnya, zavtra (teoriya, opyt) [Pedagogy of cooperation: yesterday, today, tomorrow (theory, experience)]: Ryazan': Ryazanskii gosudarstvennyi universitet im. S.A. Esenina. 220 p. [in Russian]

Hun Ping Cheung, 2018 – *Hun Ping Cheung, R.* (2018). Play-based creativity-fostering practices: the effects of different pedagogical approaches on the development of children’s creative thinking behaviours in a Chinese preschool classroom. *Pedagogy, Culture & Society*. 26(4): 511-527.

Kornetov, 2013 – *Kornetov, G.B.* (2013). Istoriya pedagogiki segodnya [History of pedagogy today]. *Psikhologo-pedagogicheskii poisk*. 3: 136-144. [in Russian]

Kornetov, 2017 – *Kornetov, G.B.* (2017). N. Venttsel' – vydayushchiisya predstavitel' svobodnogo obrazovaniya v Rossii [K.N. Ventzel is an outstanding representative of free education in Russia]. *Psikhologo-pedagogicheskii poisk*. 3(43): 94-124. [in Russian]

Leskov, 1989 – *Leskov, N.S.* (1989). Pravedniki. Kadetskii monastyr': Sobr. sochineniya v 12 tomakh [The righteous. Cadet monastery: Collected Works in 12 volumes]. M.: Pravda. Vol. 2: 46-78. [in Russian]

Lunacharsky, 1922 – *Lunacharsky, A.V.* (1922). Kakaya shkola nuzhna proletarskomu gosudarstvu? [What school does the proletarian state need?]. *Vestnik obrazovaniya*. 10: 1-29. [in Russian]

Maminova, 2019 – *Maminova, N.V.* (2019). Pedagogika kooperatsii v pervoi treti XX veka v Rossii [Pedagogy of cooperation in the first third of the twentieth century in Russia]. *Sovremennoe nauchnoe znanie: teoriya, metodologiya, praktika: Sbornik nauchnykh trudov po materialam VII Mezhdunarodnoi nauchno-prakticheskoi konferentsii (Smolensk, 15 fevralya 2019 g.). Mezhdunarodnyi nauchno-informatsionnyi tsentr "Naukosfera"*: 18-20. [in Russian]

Musica, 2018 – *Musica. Yu.V.* (2018). Teoriya svobodnogo shkol'nogo prosveshcheniya pod upravleniem K. N. Venttsel' [Theory of the free school of education by K.N. Ventzel]. *Vestnik Khabarovskogo gosudarstvennogo universiteta ekonomiki i prava*. 3: 121-129. [in Russian]

Rubinstein, 1921 – *Rubinstein, M.M.* (1921). Foundations of the labor school. Chita: Type. DVSPS. 96 p.

Petryaeva, 2017 – *Petryaeva, E.Yu.* (2017). Vektory razvitiya elektronnogo obucheniya: pedagogika sotrudnichestva i tsifrovaya sreda [E-learning development vectors: collaboration pedagogy and the digital environment]. *Uspekhi sovremennoi nauki i obrazovaniya*. 1(2): 51-56. [in Russian]

Safarova, 2020 – *Safarova, D.S.* (2020). Pedagogika sotrudnichestva i razvitiya obrazovaniya [Pedagogy of cooperation and educational development]. *Evropeiskaya nauka*. 2-2(51): 71-72. [in Russian]

Schmerse, 2020 – *Schmerse D.* (2020). Preschool Quality Effects on Learning Behavior and Later Achievement in Germany: Moderation by Socioeconomic Status. *Child Development*. 91(6): 2237-2254.

Smirnov, 2020 – *Smirnov, I.P.* (2020). Svobodnoe vospitanie: utopiya ili predskazanie? (K.N. Venttsel') [Free parenting: utopia or prediction? (K.N. Venttsel')]. *Kazanskii pedagogicheskii zhurnal*. 4(141): 7-18. [in Russian]

Sjølie et al., 2019 – *Sjølie, E., Francisco, S., Langelotz, L.* (2019). Communicative learning spaces and learning to become a teacher. *Pedagogy, Culture & Society*. 27(3): 365-382.

Ventzel, 1911 – *Ventzel, K.N.* (1911). Etika i pedagogika tvorcheskoi lichnosti (problema nravstvennosti i vospitaniya v svete teorii svobodnogo garmonicheskogo razvitiya zhizni i soznaniya) [Ethics and pedagogy of creative personality (the problem of morality and education in the light of the theory of free harmonic development of life and consciousness)]. M.: knigoizd-vo K.I. Tikhomirova. 388 p. [in Russian]

Ventzel, 1923 – *Ventzel, K.N.* (1923). Teoriya svobodnogo vospitaniya i ideal'nyi detskii sad. [Free parenting theory and the ideal kindergarten]. 3rd ed. Pg.; M.: Voice of Labor. 102 p. [in Russian]

Ventzel, 1923 – *Ventzel, K.N.* (1923). Osvobozhdenie rebenka [Liberation of the child]. M.: Zemlya i fabrika. 20 p. [in Russian]

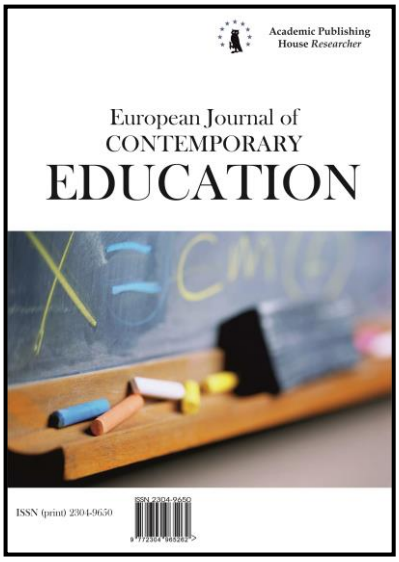
Ventzel, 1923 – *Ventzel, K.N.* (1923). Novye puti vospitaniya i obrazovaniya detei [New ways of raising and educating children]. M.: Zemlya i fabrika. 149 p. [in Russian]

Ventzel, 1912–1913 – *Ventzel, K.N.* (1912–1913). Besplatnoe obrazovanie i sem'ya [Free education and family]. *Free education*. 1: 44-61. [in Russian]

Ventzel, 1918 – *Ventzel, K.N.* (1918). Provozglashenie deklaratsii prav rebenka [Proclamation of the declaration of the rights of the child]. *Besplatnoe obrazovanie i besplatnaya trudovaya shkola*. 1-3: 69-78. [in Russian]

Yanovskaya, 1993 – *Yanovskaya, M.G.* (1993). Pedagogika sotrudnichestva: 20-e gody [Pedagogy of cooperation: the 20s]. *Pedagogika*. 4: 101-103. [in Russian]

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 211-218
DOI: 10.13187/ejced.2021.1.211
www.ejournal1.com



The System of Public Education in Terek Oblast in the Period 1860–1917. Part 2

Aleksandr A. Cherkasov [a, b, c, *], Sergei N. Bratanovskii [d, e], Marina A. Ponomareva [f], Ludmila G. Zimovets [g]

[a] Cherkas Global University (International Network Center for Fundamental and Applied Research), Washington, USA
[b] Volgograd State University, Volgograd, Russian Federation
[c] American Historical Association, Washington, USA
[d] Plekhanov Russian University of Economics, Moscow, Russian Federation
[e] Institute of State and Law of RAS, Moscow, Russian Federation
[f] Financial University under the Government of the Russian Federation, Moscow, Russian Federation
[g] Sochi State University, Sochi, Russian Federation

Abstract

This work examines the system of public education in Terek Oblast in the period 1860–1917. The present part covers the period 1901–1917.

The key source used in putting this work together is the annual Reports on Educational Institutions in the Caucasus Educational District, which provide data on the region's schools run by the Ministry of Public Education. Methodologically, wide use was made of the statistical method to identify a set of distinctive characteristics of the development of the system of public education in Terek Oblast in the period. To achieve the study's objectives, use was also made of general research methods such as analysis and synthesis, concretization, and summarization. Of special mention is the use in this study of the historical-situational method.

The authors' conclusion is that between 1900 and 1917 the system of public education in Terek Oblast was in a period of dynamic development. The number of ministerial educational institutions in the region rose 3.3 times, from 182 to 609. Secondary educational institutions abounded in towns and large populated localities across the region. At the same time, there was a sharp increase in the quality and number of lower educational institutions, some of which were reorganized from four-year urban schools into six-year higher primary schools. The region became home to a teacher's seminary and a teacher's institute, as facilities for the training of teachers. By the

* Corresponding author
E-mail addresses: a.cherkasov@incfar.net (A.A. Cherkasov)

start of World War I, school was attended in Terek Oblast by nearly 55 % of all its school-age children, which, given the large number of mountaineers in the region, was quite a substantial figure.

Keywords: public education, Terek Oblast, period 1860–1917, Caucasus Educational District, Russian Empire.

1. Introduction

Terek Oblast was established in 1860, the year following the capture of Imam Shamil and the end of the Caucasian War. As of 1883, Terek Oblast was composed of six towns (Vladikavkaz, Pyatigorsk, Georgiyevsk, Mozdok, Grozny, and Kizlyar). The region was divided into the following eight okrugs: Vladikavkaz, Nalchik, Pyatigorsk, Grozny, Kizlyar, Khasavyurt, Vedeno, and Argun). The mountaineers accounted for 62 % of the region's population (approx. 392,000), the Cossacks – 21 % (approx. 136,000), and representatives of other social groups – 15 % (approx. 96,000) (Spisok naselennykh mest..., 1885: I-II). In the period under review, along with the development of its system of civil administration, the region also witnessed the rapid development of its system of public education, which by the year 1900 numbered 182 educational institutions across the three major levels – secondary, lower, and primary. The present part of the work reviews the development of the system of public education in Terek Oblast in the period 1901–1917.

2. Materials and methods

The key source used in putting this work together is the annual Reports on Educational Institutions in the Caucasus Educational District, which provide data on the region's schools run by the Ministry of Public Education (Otchet, 1901; Otchet, 1905; Otchet, 1908; Otchet, 1909; Otchet, 1910; Otchet, 1911; Otchet, 1912; Otchet, 1913; Otchet, 1914; Otchet, 1915). Use was also made of documents from the Russian State Historical Archive (Saint Petersburg, Russia).

Methodologically, wide use was made of the statistical method to identify a set of distinctive characteristics of the development of the system of public education in Terek Oblast in the period 1901–1917. To achieve the study's objectives, use was also made of general research methods such as analysis and synthesis, concretization, and summarization. The use of the analysis method helped establish that the Ministry of Public Education did not factor in the data on the region's schools under the Ecclesiastical Department when drawing up the statistics on school-age children in all educational institutions in the region. Of special mention is the use in this study of the historical-situational method.

3. Discussion

When it comes to the extent to which the issue has been investigated, it is to be noted straightaway that during the period under review Terek Oblast was part of the Caucasus Educational District. At different times, the Caucasus Educational District has been the subject of research more than once. For instance, an attempt to investigate the history of public education in the Caucasus was made in 2016 by N.A. Shevchenko (Shevchenko et al., 2016). T.A. Magsumov has explored a similar subject, with a focus on the 1850s (Magsumov et al., 2018). O.V. Natolochnaya has investigated the operation of mountain schools in the Caucasus and the system of public education in Stavropol Governorate (Natolochnaya et al., 2018; Natolochnaya et al., 2018a). The above-mentioned T.A. Magsumov has explored the system of public education in Kars Oblast (Magsumov et al., 2020; Magsumov et al., 2020a), and V.S. Molchanova has researched the system of public education in Kuban Oblast (Molchanova et al., 2019; Molchanova et al., 2019a; Molchanova et al., 2020). A.A. Cherkasov has investigated similar processes in Black Sea Governorate (Cherkasov et al., 2020), and A.A. Mamadaliev – in Tiflis Governorate (Magsumov et al., 2020; Magsumov et al., 2020a). Thus, in recent years researchers have expressed keen interest in investigating the development of the system of public education in the Caucasus, with the filling in of gaps in the study of this process helping obtain an integrated picture of public education in the pre-revolution Caucasus.

4. Results

As in other regions of the Russian Empire, the system of public education in Terek Oblast was divided into the following three key levels: secondary, lower, and primary.

Secondary education

Secondary education in Terek Oblast was represented by male and female gymnasia and progymnasia, as well as real schools for boys. The region entered the year 1900 with three secondary educational institutions for boys and as many for girls (Cherkasov et al., 2020b: 965).

As early as 1902, on December 20, the town of Grozny became home to a female progymnasium. The institution was transformed into a female gymnasium as early as 1905 (Otchet, 1915: 304).

On July 1, 1904, Grozny became home to a real school as well (Otchet, 1915: 140)

On September 5, 1905, Vladikavkaz became home to a female progymnasium, which on August 20, 1912, was reorganized into Vladikavkaz's second female gymnasium (Otchet, 1915: 304).

In 1905, Pyatigorsk's male progymnasium was reorganized into a male gymnasium (Otchet, 1915: 40).

On August 20, 1906, the town of Georgiyevsk became home to a female progymnasium, which on September 1, 1909, was reorganized into a gymnasium (Otchet, 1915: 304).

In 1908, the government began to put into effect its program for the introduction of compulsory primary education. This provided a significant spur to the process of creation of both primary and secondary educational institutions, including institutions focused on the training of primary school teachers.

Specifically, on July 1, 1908, the town of Georgiyevsk became home to a real school (Otchet, 1915: 140), and as early as July 6, 1908, Vladikavkaz became home to its second real school (Otchet, 1915: 140).

On July 1, 1909, the town of Mozdok also became home to a real school (Otchet, 1915: 140).

On September 27, 1910, Terek Oblast became home to its first teacher's seminary (Otchet, 1915: 224).

On August 1, 1911, a female progymnasium opened up in Mineralnye Vody as well. It was reorganized into a female gymnasium on July 1, 1913 (Otchet, 1915: 304).

On August 8, 1912, the town of Mineralnye Vody became home to a real school (Otchet, 1915: 140).

On August 13, 1912, Kizlyar became home to a female progymnasium (Otchet, 1915: 306), and on September 1, 1914, when World War I was already under way, they established a female progymnasium in Grozny as well (Otchet, 1915: 305).

On September 1, 1912, a female gymnasium was also established in Mozdok (Otchet, 1915: 304).

On July 1, 1913, the year they celebrated the 300th anniversary of the House of Romanov, Vladikavkaz became home to Terek Oblast's first teacher's institute (Otchet, 1915: 224).

On July 1, 1914, the town of Kizlyar became home to a male progymnasium (Otchet, 1915: 42)

Table 1 displays the data on the region's secondary educational institutions under the Ministry of Public Education and their student body in the period 1900–1914.

Table 1. Numbers of secondary educational institutions under the Ministry of Public Education and students in them in Terek Oblast in the period 1900–1914 (Otchet, 1901: 6, 54, 109, 135, 166, 208; Otchet, 1905: 50, 131, 204-205; Otchet, 1908: 2-3, 75, 120-121; Otchet, 1909: 2-3, 77, 124-125; Otchet, 1910: 2-3, 77, 124-125; Otchet, 1911: 58-59, 77, 158, 188-189; Otchet, 1912: 2-3, 77, 158-159, 234; Otchet, 1913: 3, 64, 148, 209; Otchet, 1914: 3, 64, 149, 173, 175; Otchet, 1915: 2, 3, 123, 212, 258, 260)

Year	Gymnasia		Progymnasia		Real schools	Teacher's institutes and seminaries	Total	Number of students		
	Male	Female	Male	Female				Boys	Girls	Total
1900	1	2	1	1	1	-	6	1,296	1,114	2,410
1904	2	2	-	2	2	-	8	1,650	1,568	3,218
1907	2	3	-	3	2	-	10	2,025	2,233	4,258

1908	3	5	-	2	4	-	14	2,148	2,292	4,440
1909	3	5	-	1	5	-	14	2,490	2,144	4,634
1910	3	6	-	1	5	1	16	2,759	2,386	5,145
1911	3	6	-	2	5	1	17	2,966	2,679	5,645
1912	3	6	-	4	6	1	20	3,220	2,781	6,001
1913	3	7	1	3	6	2	21	3,423	2,982	6,405
1914	3	8	1	3	6	2	22	3,239	3,224	6,463

As evidenced in Table 1, the number of secondary educational institutions in the region rose more than 3.5 times, with the number of real schools rising 6 times in the period. There was a nearly three-fold increase in the number of students in this group of educational institutions. With that said, there also were established in the region educational institutions for the training of primary school teachers (a seminary and a teacher's institute). As regards the gender balance, there was an equal ratio of boys and girls in the region's educational institutions almost throughout the period under review.

Lower education

Lower education in Terek Oblast was represented by urban, tradesman's specialized, mountain, and tradesman's schools. By 1900, the region's lower education system numbered 11 educational institutions (six urban schools, three mountain schools, one tradesman's specialized school, and one tradesman's school).

The development of the region's lower education system resumed only after the end of the First Russian Revolution. On September 1, 1907, the region became home to an urban school in the stanitsa of Chervlennaya (Otchet, 1915: 528).

On July 1, 1908, Grozny became home to Terek Oblast's first and only Mariinsky female school (Otchet, 1911: 272).

The year 1911 marked the start of the all-Russian process of creation of higher primary schools with a six-year program of study. Normally, such schools were created by way of reorganization of four-year urban schools, albeit there were exceptions. On September 1, 1911, they opened up a higher primary school in the stanitsa of Arkhonskaya (Otchet, 1915: 526), and as early as September 1, 1912, a higher primary school was established in the stanitsa of Kalinovskaya as well (Otchet, 1915: 526).

On January 1, 1914, all at once seven higher primary schools opened up in Terek Oblast by way of reorganization: the Grozny, Kizlyar, Mariinsky, Mozdok, Prokhladny, Sleptsovskaya, and Kislovodsk schools (Otchet, 1915: 526-528). On September 1, 1914, they established a higher primary school in Khasavyurt (Otchet, 1915: 528). On October 1, 1914, they established the Ardon higher primary school (Otchet, 1915: 526).

As regards urban schools, on July 1, 1913, they established a model urban school at the Vladikavkaz teacher's institute (Otchet, 1915: 530). The facility was, among other things, oriented toward the practical training and retraining of primary school teachers.

The region witnessed the establishment of additional tradesman's schools as well. On September 8, 1904, they opened up a lower tradesman's school in Grozny. On October 23, 1913, a lower tradesman's school was established in the Georgiyevsk as well (Otchet, 1915: 716).

Table 2 displays the statistical data on the region's lower educational institutions in the period 1900–1914.

Table 2. Numbers of lower educational institutions and students in them in Terek Oblast in the period 1900–1914 (Otchet, 1901: 294, 348, 456, 486; Otchet, 1905: 345, 413, 482-483; Otchet, 1908: 227, 317, 394, 395; Otchet, 1909: 265-266, 271, 366, 406, Otchet, 1910: 264, 291-292, 297, 404-405, Otchet, 1911: 264, 292, 297, 404-405; Otchet, 1912: 264, 291-293, 297, 390-391, Otchet, 1913: 232, 250, 252, 255, 347, 390; Otchet, 1914: 286, 307, 309, 438-439, 484; Otchet, 1915: 433, 490, 492, 692-693, 780)

Year	Higher primary schools	Urban schools	Tradesman's specialized schools	Mountain schools	Tradesman's schools	Mariinsky schools	Female professional schools	Total	Number of students
1900	-	6	1	3	1	-	-	11	2,006
1904	-	9	1	3	2	-	-	15	2,369
1907	-	11	1	3	2	-	-	17	2,521
1908	-	11	1	3	2	1	-	18	2,770
1909	-	11	1	2	2	1	-	17	2,462
1910	-	14	1	2	2	1	-	20	3,017
1911	-	15	1	2	2	1	-	21	2,805
1912	1	15	1	2	2	1	2	24	2,401
1913	1	15	1	2	3	1	3	26	3,152
1914	13	3	1	2	3	1	3	26	2,872

As evidenced in Table 2, by 1914 the number of lower educational institutions in Terek Oblast rose 2.5 times, with the number of students in them increasing nearly 50 %. With that said, there was an improvement in the quality of educational institutions in this sector, half of which were accounted for by six-year higher primary schools. It is to be noted that in 1914 some of the region's higher primary schools had no girls in them (e.g., the schools in Mozdok and Kizlyar), while others had only a minimal number of girls in them (e.g., just one girl in the Arkhonskaya school and just three girls in the Kislovodsk school). This circumstance led the government to establish a Mariinsky school for girls in Grozny, as well as several professional female schools in other regions of Terek Oblast.

Primary education

Primary education in Terek Oblast was represented by a network of primary schools, which numbered more than 150 as early as 1900. The future figures for the primary education sector were influenced significantly by the nationwide program for the introduction of compulsory primary education, with the total number of schools doubling by as early as 1911.

Table 3 displays the statistical data on the region's primary educational institutions under the Ministry of Public Education and their student body in the period 1900–1914.

Table 3. Numbers of primary schools under the Ministry of Public Education and students in them in Terek Oblast in the period 1900–1914 (Otchet, 1901: 536; Otchet, 1905: 532, 562; Otchet, 1908: 350, 352; Otchet, 1909: 392, 394; Otchet, 1910: 390, 392; Otchet, 1911: 390, 392; Otchet, 1912: 448, 450; Otchet, 1913: 335, 336; Otchet, 1914: 427, 428; Otchet, 1915: 669, 672, 683)

Year	Number of schools	Number of students			Number of students per school
		Boys	Girls	Total	
1900	159	8,429	2,520	10,949	68.8
1904	195	11,043	3,475	14,518	74.4
1907	221	14,651	5,302	19,953	90.2

1908	222	15,071	5,483	20,554	92.5
1909	236	16,244	6,444	22,688	96.1
1910	266	17,343	7,183	24,526	92.2
1911	336	20,526	8,523	29,049	86.4
1912	343	21,767	9,809	31,576	92.0
1913	486	25,844	12,218	38,062	78.3
1914	561	27,515	13,290	40,805	72.7

As evidenced in Table 3, by 1914 the number of primary educational institutions in the region rose 3.5 times, with the number of students in them rising 4 times. This is testimony that the period under review was witnessing an increase in the number of students per school in the region. This was particularly the case up to 1909, when the average number of students per school was 96. However, subsequently there was a decline in this number as a consequence of the mass construction of new schools in the region. The effort was associated with the government's desire to ensure the sufficient number of school places in the region at the time of introduction of compulsory primary education. As regards the student gender balance, if in 1900 girls accounted for 23 % of the student body, in 1914 their number was now 32 %. Given the area's regional characteristics, it was quite a substantial figure.

Table 4 displays the statistical data on the entire public education sector in Terek Oblast in the period 1900–1914.

Table 4. Number of educational institutions in Terek Oblast in the period 1900–1914

Year	Secondary	Lower	Primary	Total
1900	6	11	159	182
1904	8	15	195	218
1907	10	17	221	248
1908	14	18	222	254
1909	14	17	236	267
1910	16	20	266	302
1911	17	21	336	374
1912	20	24	343	387
1913	21	26	486	533
1914	22	26	561	609

When analyzing the data in Table 4, it must be kept in mind that it covers only the region's educational institutions under the Ministry of Public Education, which were attended by 1914 by nearly 75% of all schoolchildren in the Russian Empire at the time. Indirectly, this was associated with the fact that in 1914 the region had in operation 161 parochial schools, with a combined enrollment of 11,312 students (Vsepoddanneishii otchet, 1916: 124-125). In the period 1900–1914, the number of educational institutions under the Ministry of Public Education in Terek Oblast rose 3.3 times, i.e. from 182 to 609.

Note that based on data from the Ministry of Public Education, as of January 1, 1915, Terek Oblast had 110,384 children of school age (from 8 to 11 years), with as many as 48,289 of these attending ministerial schools in the region by 1914 (RGIA. F. 733. Op. 207. D. 39. L. 3). Similar figures were obtained via the research reported in this paper (6,463 people in the region's secondary educational institutions, 2,872 people in its lower schools, and 40,805 people in its primary schools) – a combined enrollment of 50,140 students in the region's ministerial educational institutions. However, one also must keep in mind the figure of 11,312 students in the region's schools under the Ecclesiastical Department, which, combined with the ministerial student body, makes it 61,452 students, or 55.7% of all school-age children in the region.

On one hand, it is apparent that there still remained a lot of work to be done in the region's public education sector. However, one must take into account here the regional characteristics of Terek Oblast, where in the late 19th century the bulk of the population was made up of

mountaineers. In the climate of World War I, the region's directorate for public schools undertook work in the area of pedagogical personnel training and retraining and was getting ready for the introduction of compulsory primary education in its territory.

5. Conclusion

Between 1900 and 1917, the system of public education in Terek Oblast was in a period of dynamic development. The number of ministerial educational institutions in the region rose 3.3 times, from 182 to 609. Secondary educational institutions abounded in towns and large populated localities across the region. At the same time, there was a sharp increase in the quality and number of lower educational institutions, some of which were reorganized from four-year urban schools into six-year higher primary schools. The region became home to a teacher's seminary and a teacher's institute, as facilities for the training of teachers. By the start of World War I, school was attended in Terek Oblast by nearly 55% of all its school-age children, which, given the large number of mountaineers in the region, was quite a substantial figure.

References

Cherkasov et al., 2020 – *Cherkasov, A.A., Koroleva, L.A., Bratanovskii, S.N.* (2020). The System of Public Education on the Territory of the Black Sea Province in 1896–1917. Part 1. *Vestnik of Saint Petersburg University. History*. 65(3): 750-770.

Cherkasov et al., 2020a – *Cherkasov, A.A., Koroleva, L.A., Bratanovskii, S.N.* (2020). The System of Public Education on the Territory of the Black Sea Province in 1896–1917. Part 2. *Vestnik of Saint Petersburg University. History*. 65(4): 1067-1084.

Cherkasov et al., 2020b – *Cherkasov, A.A., Bratanovskii, S.N., Zimovets, L.G.* (2020). The System of Public Education in Terek Oblast in the Period 1860–1917. Part 1. *European Journal of Contemporary Education*. 9(4): 963-970.

Magsumov et al., 2018 – *Magsumov, T.A., Artemova, S.F., Ustinova, O.V., Vidishcheva, E.V.* (2018). Public education system in the Caucasus region in the 1850s: Unification and regulation of educational process. *European Journal of Contemporary Education*. 7(3): 598-607.

Magsumov et al., 2020 – *Magsumov, T.A., Korolev, A.A., Ponomareva, M.A., Zulfugarzade, T.E.* (2020). The System of Public Education in Kars Oblast in the Period 1878–1917. Part 1. *European Journal of Contemporary Education*. 9(1): 221-234.

Magsumov et al., 2020a – *Magsumov, T.A., Korolev, A.A., Ponomareva, M.A., Zulfugarzade, T.E.* (2020). The System of Public Education in Kars Oblast in the Period 1878–1917. Part 1. *European Journal of Contemporary Education*. 9(2): 459-472.

Mamadaliev et al., 2020 – *Mamadaliev, A.M., Karpukhin, D.V., Svechnikova, N.V., Médico, A.* (2020). The System of Public Education in Tiflis Governorate in the Period 1802–1917. Part 1. *European Journal of Contemporary Education*. 9(1): 235-247.

Mamadaliev et al., 2020a – *Mamadaliev, A.M., Karpukhin, D.V., Svechnikova, N.V., Médico, A.* (2020). The System of Public Education in Tiflis Governorate in the Period 1802–1917. Part 2. *Bylye Gody*. 56(2): 530-540.

Molchanova et al., 2019 – *Molchanova, V.S., Balanyuk, L.L., Vidishcheva, E.V., Potapova, I.I.* (2020). The Development of Primary Education on the Cossack Territories in 1803–1917 years (on the Example of the Kuban Region). Part 1. *Bylye Gody*. 53(3): 1049-1058.

Molchanova et al., 2019a – *Molchanova, V.S., Balanyuk, L.L., Vidishcheva, E.V., Potapova, I.I.* (2020). The Development of Primary Education on the Cossack Territories in 1803–1917 years (on the Example of the Kuban Region). Part 2. *Bylye Gody*. 54(2): 1524-1536.

Molchanova et al., 2020 – *Molchanova, V.S., Balanyuk, L.L., Vidishcheva, E.V., Potapova, I.I.* (2020). The Development of Primary Education on the Cossack Territories in 1803–1917 years (on the Example of the Kuban Region). Part 3. *Bylye Gody*. 55(1): 88-104.

Natolochnaya et al., 2018 – *Natolochnaya, O.V., Miku, N.V., Zulfugarzade, T.E., Médico, A.* (2018). Highland schools in the Caucasus: Historical background. *European Journal of Contemporary Education*. 7(3): 608-614.

Natolochnaya et al., 2018a – *Natolochnaya, O.V., Zimovets, L.G., Allalyev, R.M., Svechnikov, V.A.* (2020). The System of Public Education in Stavropol Governorate in the Period 1804–1917. Part 1. *European Journal of Contemporary Education*. 9(2): 473-480.

Otchet, 1901 – Otchet o sostoyanii uchebnykh zavedenii Kavkazskogo uchebnogo okruga za 1900 g. [Report on the status of educational institutions of the Caucasian educational district in 1900]. Tiflis, 1901. [in Russian]

Otchet, 1905 – Otchet o sostoyanii uchebnykh zavedenii Kavkazskogo uchebnogo okruga za 1904 g. [Report on the status of educational institutions of the Caucasian educational district in 1904]. Tiflis, 1905. [in Russian]

Otchet, 1908 – Otchet o sostoyanii uchebnykh zavedenii Kavkazskogo uchebnogo okruga za 1907 g. [Report on the status of educational institutions of the Caucasian educational district in 1907]. Tiflis, 1908. [in Russian]

Otchet, 1909 – Otchet o sostoyanii uchebnykh zavedenii Kavkazskogo uchebnogo okruga za 1908 g. [Report on the status of educational institutions of the Caucasian educational district in 1908]. Tiflis, 1909. [in Russian]

Otchet, 1910 – Otchet o sostoyanii uchebnykh zavedenii Kavkazskogo uchebnogo okruga za 1909 g. [Report on the state of educational institutions of the Caucasian educational district for 1909]. Tiflis, 1910. [in Russian]

Otchet, 1911 – Otchet o sostoyanii uchebnykh zavedenii Kavkazskogo uchebnogo okruga za 1910 g. [Report on the status of educational institutions of the Caucasian educational district for 1910]. Tiflis, 1911. [in Russian]

Otchet, 1912 – Otchet o sostoyanii uchebnykh zavedenii Kavkazskogo uchebnogo okruga za 1911 g. [Report on the state of educational institutions of the Caucasian educational district for 1911]. Tiflis, 1912. [in Russian]

Otchet, 1913 – Otchet o sostoyanii uchebnykh zavedenii Kavkazskogo uchebnogo okruga za 1912 g. [Report on the state of educational institutions of the Caucasian educational district for 1912]. Tiflis, 1913. [in Russian]

Otchet, 1914 – Otchet o sostoyanii uchebnykh zavedenii Kavkazskogo uchebnogo okruga za 1913 gg. [Report on the status of educational institutions of the Caucasian educational district for 1913]. Tiflis, 1914. [in Russian]

Otchet, 1915 – Otchet o sostoyanii uchebnykh zavedenii Kavkazskogo uchebnogo okruga za 1914 g. [Report on the state of educational institutions of the Caucasian educational district for 1914]. Tiflis, 1915. [in Russian]

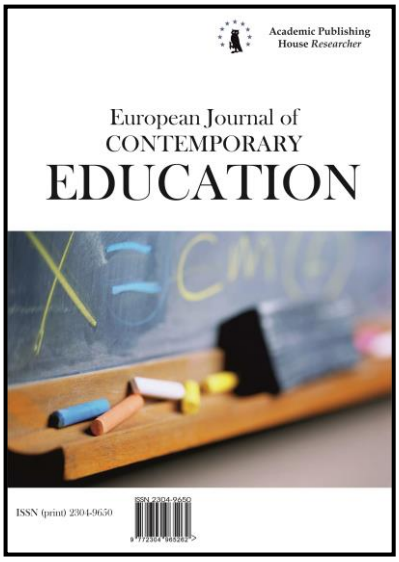
RGIA – Rossiiskii gosudarstvennyi istoricheskii arkhiv [Russian state historical archive]

Shevchenko et al., 2016 – *Shevchenko, N.A., Vidishcheva, E.V., Emelyanova, O.V.* (2016). The establishment of the system of public education in the Caucasus (1802-1917 years): The characteristic features. *Bylye Gody*. 40(2): 363-372.

Spisok naselennykh mest..., 1885 – Spisok naselennykh mest Terskoi oblasti po svedeniyam k 1 yanvarya 1883 g. [The list of settlements of the Terek region according to the January 1, 1883]. Vladikavkaz, 1885. [in Russian]

Vsepoddanneishii otchet, 1916 – Vsepoddanneishii otchet ober-prokurora svyateishego sinoda po vedomstvu pravoslavnogo ispovedaniya za 1914 g. [The most subordinate report of the chief prosecutor of the holy synod for the department of orthodox confession for 1914]. SPb., 1916. [in Russian]

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 219-230
DOI: 10.13187/ejced.2021.1.219
www.ejournal1.com



Transformations in Public Education in the Ukrainian State in 1918. Part 2

Sergey I. Degtyarev [a, b, *], Vladyslava M. Zavhorodnia [a], Lybov G. Polyakova [b, c, d]

[a] Sumy State University, Sumy, Ukraine
[b] Cherkas Global University (International Network Center for Fundamental and Applied Research), Washington, USA
[c] Volgograd State University, Volgograd, Russian Federation
[d] East European Historical Society, Russian Federation

Abstract

This paper continues the authors' analysis of the policy pursued by the government of the Ukrainian State in the area of public education in 1918. The primary focus in the work's second part is on the government's policy on preschool, primary, and secondary education.

The key sources employed in the work are materials from the period's periodical press, memoirs by contemporaries of the events, and published statutory enactments of the government of the Ukrainian State regulating policy on primary and secondary education.

It is in the year 1918 that the primary, secondary, and higher education systems in the Ukrainian State were formalized legally. The government was deeply aware of the decisive role of the public education system in the development and strengthening of Ukrainian statehood. The authors drew the conclusion that primary and secondary schools in the region enjoyed a high level of autonomy in terms of organization of the educational process at the time. The exception was that government policy actively facilitated the Ukrainization of the educational process – by way of introduction of instruction in the Ukrainian language and disciplines related to Ukrainian studies. This was a positive influence amid the formation of a young Ukrainian state. Despite a challenging military/political and economic situation, the government did manage to provide most of the region's educational facilities with all appropriate course materials. The government worked closely with local authorities and the public, which had a positive effect on the development of the systems of primary, secondary, and preschool education locally.

Keywords: Ukrainian Derzhava (State), Ministry of Public Education, Pavlo Skoropadsky, secondary education, primary schools, preschool education, zemstvo.

* Corresponding author
E-mail addresses: starsergo2014@gmail.com (S.I. Degtyarev)

1. Introduction

The process of the making of Ukrainian statehood has a long and very complex history. Without question, one of the more significant periods in this process was the Ukrainian Revolution of 1917–1921. A key outcome of this event was the formation of the Ukrainian State, headed by Hetman Pavlo Skoropadsky. During that time, Ukraine was in a very complicated military/political situation. Government policy in the Ukrainian State was often the object of criticism, both from its contemporaries and from later researchers. However, it must be acknowledged that it was quite an active policy focused on advancing state interests.

With that said, most researchers are convinced that the region's most systemic transformations were undertaken in the area of education. It is also worth taking into account that the Hetman's government had to build the region's public education system virtually from scratch. P. Skoropadsky, personally, was critical of the activity of his predecessors, the Central Rada government, with regard to education. He wrote in his memoirs that "the Central Rada did not open a single educational facility" (Skoropads'kii, 2016: 103). In 1918, the region became home to a branched network of institutions of preschool, primary, and secondary learning. It is these institutions, as well as institutions of higher learning, that were to play a key role in the making and strengthening of young Ukrainian statehood.

This part of the work focuses on government policy in the Ukrainian State in the area of organization and development of the systems of primary and secondary education. Some attention is also devoted to the organization of preschool education and the participation of local authorities and the public in the development of public education in Ukraine in 1918.

2. Materials and methods

As in the first part of the work, the authors drew upon memoirs by contemporaries of the events, relevant published statutory enactments of the government, and materials from the period's periodical press. These sources helped analyze government policy in Ukraine in the area of public education as a whole and preschool, primary, and secondary education in particular. The recollections of various public and political figures from the period of the Ukrainian Revolution of 1917–1921 provide a valuable insight into how members of the various strata of Ukrainian society perceived the transformations to the system of public education that took place in 1918. Traditionally, the more factually substantive sources will include materials from the periodical press and statutory enactments from a period. Sources of this kind were largely instrumental in helping assess the effectiveness of reforms to preschool, primary, and secondary education in Ukraine at the time.

In putting this work together, the authors employed both general research and special principles and methods of enquiry. The principles of historicism and objectivity enabled as objective an assessment of the issue under study as possible. It was possible to reconstruct the process of implementation of reforms to preschool, primary, and secondary education in the region thanks to the use of the historical/comparative, chronological, and formal/legal research methods. Of special significance was the use of the source-studies criticism method to establish the credibility of the sources drawn upon in the work.

3. Discussion

Up to now, there has been conducted a decent amount of research exploring various aspects of Ukrainian history in the Ukrainian State period, including the formation of the bureaucratic apparatus in the region (Hai-Nyzhnyk, 2004; Hyrych, 2016; Myronenko, 1996; Pyrih, 2009; Degtyarev, 2018; Kudlai, 2008; Rublov, Reient, 1999) and the foreign policy pursued by Hetman P. Skoropadsky at the time (Hedin 2012; Degtyarev, Zavhorodnia 2018; Degtyarev et al., 2019).

As noted earlier, the transformations in the area of public education initiated by Hetman P. Skoropadsky and the government of the Ukrainian State may be described as overall positive. This view is shared both by most contemporaries of the events and by most researchers (Shkilnyk, 2016; Degtyarev et al., 2020: 973).

Having said that, in historiography (above all, Ukrainian historiography) very little attention is devoted to reforms to the system of public education in the Ukrainian State in 1918. The subject appears to have been touched upon only fleetingly (Rublov, Reient, 1999: 141-142; Hurzhii, Reient, 2011: 197-200; Verstiuk, 2008).

Some of the related research has focused on certain aspects of the process of transforming the region's public education system in 1918, like the development of a network of institutions of secondary and higher learning, the recruitment and staffing of the teaching workforce in various universities, and lawmaking in the area of public education (Ostashko, 2018; Zavalniuk, 2008; Kudlai, 2008). A more integrated insight into the Ukrainian State's government policy on public education is provided in a study by D. Doroshenko (Doroshenko, 2002: 233-256).

The present work is a part of a more substantial study (Degtyarev et al., 2020) that is aimed at gaining as much insight as possible into the Ukrainian State's government policy on public education and activities aimed at organizing the educational process in various regions of Ukraine. This part of the study is focused on this kind of activities aimed at organizing preschool, primary, and secondary education in the region.

4. Results

Purview over preschool, primary, and secondary education in the region was exercised by the Departments of Secondary and Primary Education at the Ministry of Public Education in the Ukrainian State. Many of the activities aimed at reforming the above areas were often initiated by these two departments specifically.

At the local level, public education was overseen by gubernia and uyezd commissioners of public education, concerned with supervising the activity of institutions of primary and secondary learning. Part in this was also taken by local authorities and various non-governmental organizations. Specifically, each uyezd had in place special school commissions, which began to emerge back in 1917. The transformations in school education undertaken by the Hetman administration did not impact the activity of these bodies of authority. The school commissions oversaw all school matters in towns and uyezds, serving, in essence, as a supervisory body. The uyezd school commissions, which were answerable to zemstvo assemblies, enjoyed quite a high level of autonomy in their activity. These institutions made decisions respecting the opening of various types of schools in uyezds and regulated the number of teachers in them. The number of members in each uyezd school commission must have depended on the size of the actual uyezd and the number of educational institutions in it. As a rule, half of the membership was made up of delegates from among the teaching workforce. For instance, the Sumy uyezd school commission (Kharkov Governorate) consisted of 11 teachers elected at district congresses, six members of the zemstvo assembly, and one representative from each of the following categories: town government, clergy, rural schools, secondary school teachers, and out-of-school education instructors (Luch №34: 3).

Amid the rapid growth of its network of institutions of primary and secondary learning, the region increasingly found itself facing the workforce issue. It is to be noted that at the time of P. Skoropadsky's rise to power the region's primary school system was in a lamentable state. There even was a probability that school would not begin on time in the new school year. Many schools were experiencing a shortage of teachers. To compound the problem, many of the region's institutions of secondary learning were witnessing a strong antagonism between Russian and Ukrainian teachers. An attempt to open in Kiev four Ukrainian gymnasia was met with fierce resistance from pedagogues in Russian-language gymnasia that were already in operation in the capital. The problem reached the extent where the Hetman himself had to interfere. Eventually, the Ukrainian gymnasia were provided with buildings to house classrooms, and were able to commence operation (Skoropads'kii, 2016: 226-227).

The state was in need of a large number of teachers and educators, a workforce that was to be prepared in teacher's institutes and via special teacher training programs. Fast-track teacher training programs for the region's newly established Ukrainian educational institutions were also offered by ecclesiastical teacher's seminaries. Note that the region's ecclesiastical educational institutions (seminaries and ecclesiastical schools) were still run by the Ministry of Confessions at the time.

Pursuant to an ordinance adopted on August 1, 1918, the region's teacher's institutes were to admit persons who had completed a program of study in schools with an educational program recognized by the Minister of Public Education as sufficient for "allowing their students to enter a teacher's institute". The rule was to take effect starting in the 1918-1919 school year (Ukrains'ka derzhava, 2015a: 558).

In special cases, the Minister of Public Education reserved the right to appoint to the post of teacher in the region's higher primary schools males and females with the "title of rural school teacher or that of home tutor, as well as graduates of teacher's ecclesiastical seminaries" (Ukrains'ka derzhava, 2015a: 153).

Throughout Ukraine, there were organized numerous preparatory programs of study for future primary and secondary school teachers. Ukraine also had in operation a large number of Jewish and Polish schools, which, too, were taken care of by the state. In July, the government allocated 87.7 thousand karbovanets toward programs of study for teachers of Jewish schools and 112,000 karbovanets toward such programs for teachers of Polish schools in Kiev, Odessa, and Ekaterinoslav (Ukrains'ka derzhava, 2015a: 487, 503; Ukrains'ka derzhava, 2015b: 143, 144). Overall, the state had under its care 35 Jewish and 12 Polish gymnasia (Verstiuk, 2008: 151).

The government was taking measures to motivate potential future teachers to be serious about being a pedagogue, including by way of offering them scholarships. Note that a person on a state scholarship while attending a teacher's institute would have to work for a certain period of time as a teacher upon graduation from university (Ukrains'ka derzhava, 2015b: 170). In November 1918, the Minister of Education, V.P. Naumenko, proposed to exempt from military service former servicepeople who were either attending or teaching at an institution of secondary learning, as well as professorial-scholarship holders. However, the Council of Ministers agreed only to exempting former servicepeople attending an institution of secondary learning (Ukrains'ka derzhava, 2015a: 389).

The then-present military/political situation in Ukraine was affecting the staffing of educational institutions too. Specifically, following a pay raise for teachers the Deputy Minister of Internal Affairs, M.M. Voronovich, suggested the need to also impose stricter requirements on them. Note that it was proposed to set such requirements not only for the education level and moral qualities of teaching job candidates. It was also suggested that teaching positions should not be allowed to be filled by individuals with "a socialist frame of mind, for it is socialist propaganda that is to blame for the shambles the country is in". The Minister of Public Education, N.P. Vasilenko, responded to that by expressing his negative attitude toward any anti-state activity by pedagogues, noting, however, that he did not think it "is right to persecute people for their frame of mind or beliefs exclusively" (Ukrains'ka derzhava, 2015a: 165).

Besides, the Ukrainian State was much in need of pedagogical personnel who spoke and could teach in Ukrainian. The government was planning to introduce Ukrainian between 1918 and 1919 as a core subject in higher primary schools and in the curriculum for preparatory and first grade students in state gymnasia. This required training and retraining teaching staff and increasing the number of teachers with a confident command of the state language. In May, the government adopted a plan of compulsory six-month programs of study in Ukrainian studies to be completed by all public and secondary school teachers. There were three major types of program of study: lecturing, for secondary and higher primary school teachers, and for teachers of lower educational institutions. Such programs were in place in Kiev, Odessa, Kharkov, Poltava, and Ekaterinoslav. During the summer break of 1918, programs of this kind were attended by nearly 48,000 teachers. In Kholmshchyna, Podlachia, and Polesia (Ukrainian regions) alone, starting on June 15, 1918, the Ukrainian studies program was completed three times over and was attended by a combined 600 teachers (Ostashko, 2018: 194). The government covered all expenses associated with the cost of accommodation for program attenders, with each program attender paid 100 karbovanets a month for food expenses. Textbooks were provided for a part of the program. Lecturers were paid a state salary (Doroshenko, 2002: 239). A law adopted on June 2 provided for the allocation by the Ministry of Public Education of nearly 2.2 million karbovanets toward the programs (Ukrains'ka derzhava, 2015b: 103, 402-403).

Programs of study in Ukrainian studies for teachers were often organized by the governments of uyezds. For instance, in July a program of this kind was organized by the governments of the Kharkov and Valkovsky uyezds (Kharkov Governorate), drawing a combined 300 participants (Degtyarev, 2018: 42). Each time, the program commenced with a lecture on Ukrainian history by well-known professor G. Khotkevich. Participants also attended lectures on the Ukrainian language and the Ukrainian art of music (Zemske dilo №320b: 4).

In arranging such programs of study for teachers, the government was sometimes faced with issues of a political nature. A significant portion of the Ukrainian intelligentsia professed socialist views and did not regard the Hetman's government to be nationally oriented. Pedagogical

employees often took part in antigovernment campaigns. That said, there also were members of the local administrations with anti-Ukrainian views, who used every effort to thwart the creation of programs of study in Ukrainian studies, arguing that such programs could serve as a platform for antigovernment activity (Ostashko, 2018: 196). For instance, the head of the zemstvo government of Zmiev Uyezd, A. Ryadnov, invoked this concept to admit certain candidates and reject others at his discretion. As a consequence, the month-long program was attended by around 150 learners, instead of the expected 250–300 (Zemske dilo №332b: 4).

In June 1918, the Minister of Public Education, himself, complained that certain uyezd headmen interfered with the process of organizing the teacher programs, trying to thwart it by hindering the public education commissioners from performing their duties (Degtyarev, 2018: 33-34). This led the head of the Council of Ministers, F. Lizogub, to issue a special ordinance enjoining that members of the local administration treat the cause of organizing the teacher programs with a more benign attitude (Ostashko, 2018: 196).

At the time, the region had a vast network of institutions of primary and secondary learning, with the secondary education sector represented by secondary male and female comprehensive, vocational, and commercial schools, teacher's seminaries and institutes, and ecclesiastical seminaries.

Some of them were not even run by the Ministry of Public Education in the Ukrainian State (e.g., the afore-mentioned ecclesiastical teacher's seminaries). In June 1918, the government raised the issue of placing the region's gymnasia run by the military authorities under the purview of the Ministry of Public Education. Four female institutes previously run by the Office of the Institutions of Empress Maria were placed under the purview of the Ministry of Public Education as well (Ukrains'ka derzhava, 2015a: 473, 671).

In the summer of 1918, Kiev alone had in place as many as three state gymnasia now. By that time, there were 54 gymnasia in operation across Ukraine, with another 40 gymnasia and 10 schools established in fall. By the time of the fall of the Hetmanate, Ukraine had in operation close to 150 Ukrainian secondary schools (Ostashko, 2018: 193). On August 21 alone, the region became home to 50 secondary educational institutions – 40 gymnasia and 10 real schools. The government allocated 906,000 karbovanets toward the organization and upkeep of these facilities (Ukrains'ka derzhava, 2015a: 582). On August 26, an additional 400 thousand karbovanets was provided.

Close to the end of 1918, out of Ukraine's 838 gymnasia in operation at the time 161 were state schools, 409 were public schools, and 268 were private schools (Rublov, Reient, 1999: 142).

In August 1918, the government subsumed under the single category of lower primary schools all two-grade and one-grade rural schools, parochial schools, and a few other types of primary school. All teachers in these schools were to receive the same treatment in rights and pay (Ukrains'ka derzhava, 2015b: 214).

In addition, the region witnessed an active creation of vocationally oriented secondary educational institutions, both independent and at universities. In late August, they organized in Kiev a program of study in directing/instructing. The government backed the project, directing the Minister of Education to formalize it legally. In another example, Kharkov University had in place a precision mechanics workshop/school (Ukrains'ka derzhava, 2015a: 592, 715).

Certain educational institutions had so-called bursas (boarding schools) operating at them, which were under the purview of the Ministry of Public Education too. In October 1918 alone, the government allocated 20,000 karbovanets toward the upkeep of three boarding schools of this kind operating at gymnasia in Kiev. The Ministry also had purview over many orphanages where schooling was provided. The government spent significant funds on the upkeep of 24 orphanages in the area (nearly 130,000 karbovanets each month) (Ukrains'ka derzhava, 2015a: 642, 660).

Without question, reforms to primary and secondary education in the region were not confined to creating a branched network of educational institutions. The government was also pursuing a policy in the area of providing material support for the facilities and their staff, organizing a nationally oriented educational process, etc.

P. Skoropadsky's government was aware of the significance of developing the education sector. One of the resolutions of the Council of Ministers recognized the development of public education to be "a cornerstone issue in state-building". With that said, it was clear that it was not possible to achieve success in that area without "improving the material status of public teachers

and teachers of religion to enable them to dedicate themselves entirely to the critical objective of educating the rising generation" (Ukrains'ka derzhava, 2015a: 164).

The government allocated large amounts of money toward the upkeep of various educational institutions. These funds included pay for teachers and other staff in the schools. To provide for the upkeep of the region's lower and higher primary schools alone, the Ministry of Public Education needed in 1918 nearly 122 million karbovanets. The government did provide a significant portion of these funds. In some cases, only some of the required funding was provided. Specifically, the region's local authorities received 1.5 million karbovanets to fund the upkeep of higher primary schools, whereas the amount required at the time was 4.5 million karbovanets (Ukrains'ka derzhava, 2015a: 513-515).

In the short period that the Ukrainian State was in existence, the government issued a large number of statutory enactments regulating pay, various pay raises, and one-time allowances for pedagogical employees. For instance, on July 19 it was resolved to establish a salary of 1,800 karbovanets for public school teachers. Around the same time, the government upped the pay for personnel in higher primary schools. In August 1918, the government established salaries for teachers in lower schools (1,800 karbovanets) and teachers of religion (300 karbovanets). After every seven years of service, teachers became eligible for a raise of 120 karbovanets (Ukrains'ka derzhava, 2015a: 164; Ukrains'ka derzhava, 2015b: 214). In November, the government allocated 3 million karbovanets toward pay for personnel in the region's commercial schools. Officials at the Ministry of Public Education and the Ministry of Commerce suggested that funding should be increased to an amount where the government's share in the upkeep of commercial schools would be 60 %. In their view, this was important for spreading quality commercial education across the country. In the last days of the Hetmanate (November 30, 1918), the government provided the private gymnasium of Princess Volkonskaya with an allowance of 15,000 karbovanets and employees of the Ministry of Public Education with an emergency allowance of 100,000 karbovanets (Ukrains'ka derzhava, 2015a: 400-401, 684). Between late November and early December, the government adopted a draft law on establishing temporary staff in arts-and-crafts workshop/schools in the printing business. Some of the document's provisions dealt with issues of an everyday nature. For instance, alongside secondary school principals and secretaries, administrative staff and secretaries in workshop/schools became entitled to state-provided housing too. Where there was no such housing available at the school, an officer received an addition of 25 % to their pay (Ukrains'ka derzhava, 2015a: 698, 706).

Despite the Ukrainian government's best efforts to resolve the issue of material support for pedagogical employees, it was not always easily possible. Locally, the upkeep of educational institutions was to be handled by town and uyezd local authorities. To this end, these authorities received funding out of the state budget, including toward pay for pedagogues. Funds allocated toward the upkeep of educational institutions were first transferred to local authorities, which, in turn, then distributed the money as required. In this regard, the government more than once raised the issue of the need to have the Minister of Public Education keep control over the distribution of allocated funding by local authorities. Quite often, local authorities were even short of funding. For instance, teachers in the village of Kovichi in Valkovsky Uyezd (Kharkov Governorate) received their pay not from the uyezd zemstvo government but from a local cooperative partnership, which provided loans for some time. As a consequence, there were long delays in paying the teaching workforce, with salaries for July and August left unpaid altogether (Zemske dilo №329: 3).

Concurrently, the government tried to stimulate the region's talented or low-income students. Specifically, between July and August the government established 350 scholarships for low-income students of Ukrainian ethnicity in Ukrainian secondary comprehensive schools. For this purpose, the Ministry of Public Education received 77.5 thousand karbovanets. Each scholarship carried the name of one of 27 prominent Ukrainian public figures, scholars, writers, and composers, including Gregory Skovoroda, Taras Shevchenko, Nikolay Kostomarov, Ivan Franko, Mikhail Dragomanov, Lesya Ukrainka, Nikolay Lysenko, Vladimir Antonovich, and others (Ukrains'ka derzhava, 2015a: 539; Ukrains'ka derzhava, 2015b: 213).

In general, the provision of financial support for the education sector was one of the priority areas for government policy. Funding was needed to open educational institutions, erect new buildings or repair existing ones, provide the schools with textbooks, lab equipment and supplies, etc.

As early as May 1918, a sitting of the Council of Ministers saw the provision of funding for secondary educational institutions recognized as one of the issues needing to be resolved as soon as possible. For the region's schools already in operation during the period 1917-1918 alone, the government allocated on July 19 4.5 million karbovanets. Another 5 million was to be provided for the upkeep of schools slated for opening in the 1918-1919 school year. And that was on condition that there will be opened no more than 400 schools (on the basis of 12.5 thousand karbovanets per school). If the number of newly opened educational facilities were to exceed 400, the Council of Ministers empowered the Minister of Public Education to request additional funding for the schools' upkeep. In late July, an additional 600,000 karbovanets was allocated toward the needs of the region's state comprehensive secondary schools. In late August, funding was allocated for Kamenets-Podolsky Technical School (60,000 karbovanets), Kiev Polytechnic Institute (293.8 thousand karbovanets), Kiev Tradesman's School (11.8 thousand karbovanets), and Slavic Technical School (101.7 thousand karbovanets) (Ukrains'ka derzhava, 2015a: 26, 164, 539, 581-582). Decisions of this kind were made quite often. On September 2, the government raised the issue of the need to place under the state's care the male gymnasia evacuated to Ukraine – Vilna Gymnasium, Kovno Gymnasium, and Telshevsky Gymnasium. However, consideration of the proposal was postponed. The three institutions were sited in the towns Glukhov, Kharkov, and Korsun, respectively. In mid-October, the government did, finally, allocate some funding toward their upkeep – around 51,000 karbovanets (Ukrains'ka derzhava, 2015a: 602, 658).

Even some of the last decisions made with regard to the region's schools under the Ministry of Public Education dealt with the provision of funding for secondary schools (allocation of 183,000 karbovanets toward building maintenance and infrastructure development) and recruitment of staff in and provision of funding for vocational secondary technical and tradesman's schools (allocation of 2.3 million karbovanets) (Ukrains'ka derzhava, 2015a: 727).

No less attention was given to funding the region's primary school sector. Specifically, toward the upkeep of existing and the establishment of new higher primary schools the government transferred to the Ministry of Public Education 20.7 million karbovanets on August 6, 1918 (Ukrains'ka derzhava, 2015b: 212-213).

The Ministry of Public Education was always supportive of the local communities' initiatives with regard to the establishment of various educational institutions, although the bulk of the responsibility for implementing the search for buildings to house the schools and material support for them sat with local authorities. For instance, the zemstvo government of Lebedin Uyezd (Kharkov Governorate) obtained from the Ministry permission to establish in the village of Boromlya a mixed-type Ukrainian state gymnasium – on condition that the zemstvo and the local community provide it with a building and funding (Zemske dilo №330: 4).

Sometimes, there were issues related to a shortage of buildings to house gymnasia and other educational institutions and support for them (Zemske dilo №324: 4). For the most part, issues of this kind were to be handled by local authorities.

Some of the region's educational institutions were on the brink of being closed down. In the summer of 1918, this was the case with Sumy Real School (Kharkov Governorate). The Town Duma had not provided the school with appropriate material support (the school's upkeep required 56,000 karbovanets) (Luch №23: 3). In the end, the issue was resolved only partially. The real school received just 3,000 karbovanets from the Sumy Union of Cooperatives against security from the zemstvo.

To resolve in part the issue of providing buildings to house the educational institutions, on October 28 the government resolved to keep the buildings of school diocesan councils and their uyezd and district divisions (built wholly with diocesan funding and sited on church and monastery lands) that housed church/parochial schools in the ownership of the church but deliver temporary possession of them to the Ministry of Public Education (a term of no more than five years). Note, however, that the Ministry was not to assume temporary possession of buildings erected in church or monastery cemeteries, as well as church school buildings erected with willed money if such a school was founded in accordance with the intention of the testator (Ukrains'ka derzhava, 2015a: 674).

The government paid a significant amount of attention to the issue of providing the region's educational institutions with course literature. In the summer of 1918, the Minister of Education, N. Vasilenko, asserted that in the then-current market there were on offer a large number of coursebooks in the Ukrainian language for Ukrainian public schools. An even larger amount of

course literature was still in the press. This was enough to meet in full measure the needs of all schools in Ukraine (Ukrains'ka derzhava, 2015b: 179).

As early as June 1, the government approved a draft law to allocate 2 million karbovanets toward school textbooks. Two days later, the Ministry of Public Education received 1 million karbovanets for urgent educational needs. There were produced 1.62 million books for public schools and 345,000 books for secondary schools (Doroshenko, 2002: 254; Ukrains'ka derzhava, 2015a: 50, 52, 54). Many of the textbooks were printed abroad. For instance, in September the government expected the arrival in Ukraine of 30 train cars filled with textbooks for primary schools published in Vienna (Austria) (Zemske dilo №323: 4).

If in the region's higher educational institutions the educational process was largely regulated via government ordinances, its primary and secondary schools enjoyed greater autonomy in this area. For instance, in the region's workshop/schools the boards of trustees could make decisions as to setting the number of lectures on particular disciplines (Ukrains'ka derzhava, 2015a: 706). In drawing up the curriculum, a certain amount of consideration was given in many educational institutions to learning languages. For instance, even in an agricultural school in Vasilyevskaya Volost (Poltava Governorate) they introduced German to be taught alongside Ukrainian and Russian (Luch №30: 2). Admission to a secondary school was available only to those who had passed the entrance exams. However, due to a complicated military-political and economic situation in the Ukrainian State at the time, as early as May 13 the Ministry of Public Education resolved to postpone all entrance exams for admission to the preparatory and first grades of the region's secondary schools until fall, the reason being stated as "abnormal living conditions in Ukraine and a severe food crisis in major areas of the country" (Derzhavnyi visnyk №2: 1).

An issue that remained under the state's firm control was the Ukrainization of primary and secondary schools in the region, i.e. providing instruction in the Ukrainian language and teaching certain subjects related to the history, geography, language, and literature of Ukraine. The government of the Ukrainian State issued a whole set of ordinances on the compulsory learning of Ukrainian in all secondary male and female comprehensive, vocational, and commercial schools in the region (Zemske dilo №320: 3).

On July 23, the government approved an initiative of the Minister of Public Education on the compulsory teaching of a Ukrainian Studies course in all secondary educational institutions in the region. To this end, the government established permanent positions of teacher of Ukrainian studies (Ukrains'ka derzhava, 2015a: 176). The switching of all schools to instruction in Ukrainian was to be handled by the region's gubernia and uyezd zemstvo and town governments. The responsibility of monitoring the process sat with gubernia and uyezd education commissioners (Ukrains'ka derzhava, 2015b: 179).

On August 1, the government passed the Law on the Compulsory Learning of the Language, Literature, History, and Geography of Ukraine in All Secondary Schools (Ukrains'ka derzhava, 2015b: 201; Derzhavnyi visnyk №32: 1). The curriculum assigned to Ukrainian and Ukrainian literature classes no less than three hours a week in the first five grades and no less than two hours a week in sixth and seventh grades. In addition, the curricula of the last two grades assigned to Ukrainian history and Ukrainian geography two hours worth of instruction each. In this type of educational institutions, the government established a permanent position of teacher of Ukrainian and Ukrainian literature, with part-time positions of teacher of Ukrainian history and teacher of Ukrainian geography established as well (Ukrains'ka derzhava, 2015b: 201).

With the region's sector of so-called higher primary schools being most popular with the wider public, the government sought to switch, as fast and efficiently as possible, the entire educational process in all schools to Ukrainian. Special hope in this respect was pinned on the region's gubernia and uyezd zemstvo and town governments, as it is under their purview that all higher primary schools were locally.

The Ministry of Public Education proposed to introduce instruction in the Ukrainian language in all of the region's higher primary schools that began to teach Ukrainian in the 1917–1918 school year, as well as in the ones established in 1918 for Ukrainian children. Besides, there were plans to teach in Ukrainian all subjects in the first grades of schools where children of Ukrainian descent accounted for over 50 % of the student body. With that said, it was recommended that senior grades in such schools switch to instruction in the Ukrainian language "where physically possible" (Ukrains'ka derzhava, 2015b: 211-212).

The region's schools not switched to comprehensive instruction in the Ukrainian language were to teach subjects related to Ukrainian studies on a compulsory basis (e.g., Ukrainian, Ukrainian history, and Ukrainian geography).

Public education commissioners, i.e. the highest representatives of the educational authority locally, who were to monitor the process of creation of the national system of primary education, were expected to facilitate it in every way possible (Ukrains'ka derzhava, 2015b: 212).

The general public, too, took an active part in the development of the system of public education in the region. On May 10 and 11, Kiev hosted a congress of the Council of All-Ukrainian Teachers' Union. The key decisions made at the congress included the establishment in Kiev of the All-Ukrainian Teachers' House and the All-Ukrainian Teachers' Publishing Society and pledging of commitment to facilitating the development of a network of teacher associations in the region (Ostashko, 2018: 197; Vidrodzhennia №50). On August 3, the region saw the establishment of the Ukrainian partnership of Kholmshchyna, Podlachia, Polesia, and Western Volhynia. The organization was instantly joined by more than 100 people (Doroshenko, 2002: 239).

The transformations in the area of public education were met with a great deal of enthusiasm on the part of a significant portion of the Ukrainian public. The region witnessed the creation of various nongovernmental organizations and associations whose primary focus was on resolving pressing issues in school and higher education, preschool education, etc. The local authorities enlisted these societies in organizing various activities aimed at enhancing the education system (e.g., congresses of people's teachers). A congress of people's teachers was held in June in Sumy, an uyezd town in Kharkov Governorate. In addition to employees of educational institutions, the event was attended by representatives from zemstvo authorities, the Teachers' Union, the Prosvita partnership, and the Literacy Society. Presentations delivered at the congress focused on issues related to school management, the activity of professional teacher associations, improvement of pedagogues' cultural level, etc. (Luch №33: 3). The Prosvita partnership was particularly instrumental in helping bring to fruition the government's national policy in the area of public education, with its Lvov division actively engaged in educational work among Ukrainian teachers. Specifically, the institution conducted propaganda urging refusal to join Polish professional teacher associations and was engaged in putting together pedagogical programs of study (Torskyi, 1918: 2-3).

In that tough time, the authorities did not neglect the out-of-school and preschool education of children either. In rural areas, townships, and towns, they established night schools for teaching literacy, public libraries/reading rooms, clubs, choirs, excursions, etc. For children of preschool age, they organized kindergartens, playgrounds, and daycare facilities. All this was handled by the region's zemstvo and town governments. For instance, in the town of Sumy (Kharkov Governorate), playgrounds were organized by the local Women's Partnership with permission from the board of the Literacy Society (Luch №25: 3). Facilities of this kind could also be established by teachers' unions and other nongovernmental and professional associations. Note that some of the facilities were freely accessible to the public, while others required payment.

The Ministry of Education provided all-round support – it organized the training of specialists for out-of-school education and preschool education and shouldered half of the zemstvos' expenses for activities in that area. The Ministry also provided support for various education organizations and organized programs of study for instructors on out-of-school education and preschool education (Ukrains'ka derzhava, 2015b: 244-245). In early June 1918, they organized in Kiev a program of study in out-of-school education, provided under the guidance of Shchukayevsky and Yarmolenko. The program was taught by various representatives of the Ukrainian intelligentsia (Doroshenko, 2002: 238). Around the same time, 10,000 karbovanets was allocated toward the publication of a book entitled 'A Manual for Staff Involved with Out-of-School Education and Preschool Education' (Ukrains'ka derzhava, 2015a: 473). In July, Kharkov saw the first issue of the magazine 'Pozashkilna Osvita' ("out-of-school education"). It was the first print periodical devoted to the issue. It was published by the Cultural/Educational Bureau for United Corporate and Nongovernmental Organizations. The magazine was bi-lingual – it was published in Russian and Ukrainian (Zemske dilo №332a: 2).

In the last days before the fall of the Hetmanate, the Ministry of Public Education was still planning the holding of the Congress of Representatives of Zemstvos and Towns on Preschool and Out-of-School Education (Ukrains'ka derzhava, 2015a: 715).

5. Conclusion

During the period the Ukrainian State was in existence, from April 29 to December 14, 1918, the process of the formation of the public education system in the region was distinguished by high activity. The region's primary, secondary, and higher education systems were formalized legally. The government was deeply aware of the decisive role of the public education system in the development and strengthening of Ukrainian statehood. Hetman P. Skoropadsky, personally, stressed in one of his speeches the need to combat narrow national intolerance, spread across the education system (above all, at the higher education level) best practices from European and Russian scholars, and enrich Ukrainian culture (Zavalniuk, 2008: 207).

Ukrainian universities were being positioned as centers where national culture was concentrated. With that said, the school body for the region's institutions of higher learning was formed in its primary and secondary schools, which had a branched network. In terms of organizing the educational process, these institutions enjoyed quite a high level of autonomy. The exception was that government policy directly influenced the educational process – by way of introduction of instruction in the Ukrainian language and a number of disciplines related to Ukrainian studies. This, in the authors' view, may be regarded as a positive step, as a measure of this kind was quite needed amid the formation of a young nation state.

The degree to which government policy on primary and secondary education in the Ukrainian State was successful may be illustrated by the fact that, amid a highly complicated military/political and economic situation in the region at the time, the government did manage to provide most educational facilities with required course materials. The government worked closely with local authorities and the public, which had a positive effect on the development of the local systems of primary, secondary, and preschool education. There, however, did remain some issues that it was not possible to resolve overnight, like material support for the schools, lack of buildings to house classrooms, etc.

References

Degtyarev, 2018 – *Degtyarev, S.I.* (2018). Derzhavni instytutsii ta chynovnyky periodu hetmanatu P. Skoropadskoho (narys z istorii orhaniv vlady y upravlinnia Ukrainskoi Derzhavy 1918 r.): monohrafiia [State institutions and officials of the period of the Hetmanate of P. Skoropadsky (essay on the history of the bodies of power and administration of the Ukrainian State in 1918): monograph]. Sumy: Sumskyi derzhavnyi universytet. 168 p. [in Ukrainian]

Degtyarev, Zavhorodnia, 2018 – *Degtyarev, S.I., Zavhorodnia, V.M.* (2018). The Bessarabian Question in 1917-1918: the Relations of Romania, Bessarabia and Ukraine. *Bylye Gody*. 48(2): 872-879.

Degtyarev, Zavhorodnia, 2019 – *Degtyarev S.I., Zavhorodnia V.M.* Ukrainsko-rumyinskie diplomaticheskie i torgovo-ekonomicheskie otnosheniya na fone Bessarabskoy problemyi v 1918 g. *Rusin*. Vol.55. 2019. P. 169-191. doi: 10.17223/18572685/55/11

Degtyarev et al., 2020 – *Degtyarev, S.I., Zavhorodnia, V.M., Polyakova, L.G.* (2020). Transformations in the Field of public education of the Ukrainian State in 1918. Part 1. *European Journal of Contemporary Education*. 9(4): 971-983.

Derzhavnyi visnyk №2 – Derzhavnyi visnyk [State bulletin]. 1918. №2. [in Ukrainian]

Derzhavnyi visnyk №32 – Derzhavnyi visnyk [State bulletin]. 1918. №32. [in Ukrainian]

Doroshenko, 2002 – *Doroshenko, D.I.* (2002). Istoriya Ukraini, 1917-1923. V 2-kh tt.: Dokumental'no-naukove vidannya. T. II. Ukrains'ka Get'mans'ka Derzhava 1918 roku [History of Ukraine, 1917-1923. In 2 tt.: Documentary-scientific edition. T. II Ukrainian Hetman State 1918]. Kyiv: Tempora. [in Ukrainian]

Hai-Nyzhnyk, 2004 – *Hai-Nyzhnyk, P.* (2004). Vlasna kantseliariia Hetmana Skoropadskoho [Hetman Skoropadsky's Own Office]. *Kyivska starovyna*. 6: 41-52. [in Ukrainian]

Hedin, 2012 – *Hedin, M. (2012).* Ukrayins'ko-rumuns'ki vidnosyny naperedodni ta v period het'manuvannya Pavla Skoropads'koho [Ukrainian-Romanian relations before and during the Hetman Pavlo Skoropadsky]. *Visnyk KNLU. Seriya: Istoriya, ekonomika, filosofiya*. 17: 107-115. [in Ukrainian]

Hurzhii, Reient, 2011 – *Hurzhii, O.I., Reient, O.P.* (2011). Vid hetmana do hetmana: rid Skoropadskykh v istorii Ukrainy [From hetman to hetman: the Skoropadsky family in the history of Ukraine]. Kyiv-Sumy: Sumskyi derzhavnyi universytet. 228 p. [in Ukrainian]

Hyrych, 2016 – *Hyrych, I.* (2016). Derzhavnist, natsionalna ideia ta liudy hetmanskoi Ukrainy u spohadakh Pavla Skoropadskoho [Statehood, national idea and people of Hetman Ukraine in the memoirs of Pavel Skoropadsky]. *Skoropadskyi P.P. Spohady: kinets 1917 – hruden 1918*. Kyiv: Nash format. Pp. 377-453. [in Ukrainian].

Kudlai, 2008 – *Kudlai, O.B.* (2008). Zakonotvorcha diialnist ukrainskykh uriadiv doby hetmana P. Skoropadskoho v haluzi osvity i kultury (za materialamy hazety «Derzhavnyi Vistnyk») [Legislative activity of the Ukrainian governments of the era of Hetman P. Skoropadsky in the field of education and culture (according to the newspaper "Derzhavnyi Vistnyk")]. *Hetmanat Pavla Skoropadskoho: istoriia, postati, kontroversii*. Kyiv: Vyd-vo imeni Oleny Telihy. Pp. 239-246. [in Ukrainian]

Luch №23 – *Luch*. 1918. №23. [in Russian]

Luch №25 – *Luch*. 1918. №25. [in Russian]

Luch №30 – Sredniaia shkola v derevne [Secondary school in the village]. *Luch*. 1918. №30. [in Russian]

Luch №33 – Uezdnyiy s'ezd narodnyih uchiteley [County Congress of People's Teachers]. *Luch*. 1918. №33. [in Russian]

Luch №34 – Uezdnyiy s'ezd narodnyih uchiteley [County Congress of People's Teachers]. *Luch*. 1918. №34. [in Russian]

Myronenko, 1996 – *Myronenko, O.* (1996). Formuvannia natsionalnykh zemstv i miskykh dum v Ukrainskii derzhavi [Formation of national zemstvos and city dumas in the Ukrainian state]. *Mala entsyklopediia etnoderzhavoznavstva*. Kyiv: Dovira: Heneza. Pp. 428-431. [in Ukrainian]

Ostashko, 2018 – *Ostashko, T.* (2018). Diialnist Ukrainskoi Derzhavy v haluzi osvity, nauky i kultury [Activities of the Ukrainian State in the field of education, science and culture]. *Ukrainska Derzhava – zhorstki uroky. Pavlo Skoropadskyi. Pohliad cherez 100 rokiv*. Kharkiv: Klub simeinoho dozvillia. Pp. 187-212. [in Ukrainian]

Pyrih, 2009 – *Pyrih, R.* (2009). Derzhavna sluzhba v Hetmanati Pavla Skoropadskoho [Civil service in the Hetmanate of Pavlo Skoropadsky]. *Istoriia derzhavnoi sluzhby v Ukraini*: u 5 t. Kyiv: Nika-Tsentr. T. 1. Pp. 449-474. [in Ukrainian]

Rublov, Reient, 1999 – *Rublov, O.S., Reient, O.P.* (1999). Ukrainski vyzvolni zmahannia 1917-1921 rr. [Ukrainian liberation struggles of 1917-1921]. Kyiv: Vydavnychyi dim «Alternatyvy». 320 p. [in Ukrainian]

Shkilnyk, 2016 – *Shkilnyk, M.* (2016). Ukraina u borotbi za derzhavnist v 1917-1921 rr. Spomyny i rozdumy [Ukraine in the struggle for statehood in 1917-1921. Memories and reflections]. Kyiv. 512 p. [in Ukrainian]

Skoropads'kii, 2016 – *Skoropads'kii, P.P.* (2016). Spogadi: kinets' 1917 – gruden' 1918 [Memoirs: end of 1917 – December 1918]. Kyiv: Nash format. 480 p. [in Ukrainian]

Ukrains'ka derzhava, 2015a – Ukrains'ka derzhava (kviten'-gruden' 1918 roku). Dokumenti i materiali [Ukrainian state (April-December 1918). Documents and materials]. U dvokh tomakh, tr'okh chastinakh. T.1. K.: Tempora, 2015. XVIII+790 s. [in Ukrainian]

Ukrains'ka derzhava, 2015b – Ukrains'ka derzhava (kviten'-gruden' 1918 roku). Dokumenti i materiali [Ukrainian state (April-December 1918). Documents and materials]. U dvokh tomakh, tr'okh chastinakh. T.2. K.: Tempora, 2015. XX+412 s. [in Ukrainian]

Verstiuk, 2008 – *Verstiuk, V.F.* (2008). Sotsialno-politychna ta uriadova diialnist M.P. Vasylenka [Socio-political and governmental activities of M.P. Vasilenko]. *Hetmanat Pavla Skoropadskoho: istoriia, postati, kontroversii*. Kyiv: Vyd-vo imeni Oleny Telihy. Pp. 143-156. [in Ukrainian]

Vidrodzhennia №50 – Narada v spravi zizdu serednikh shkil [Conference about the high school convention]. *Vidrodzhennia*. №50. 1918. [in Ukrainian]

Zavalniuk, 2008 – *Zavalniuk, O.M.* (2008). Hetmanat Pavla Skoropadskoho: rozbudova natsionalnoi universytetskoi osvity [Hetmanate of Pavlo Skoropadsky: development of national university education]. *Hetmanat Pavla Skoropadskoho: istoriia, postati, kontroversii*. Kyiv: Vyd-vo imeni Oleny Telihy. Pp. 204-214. [in Ukrainian]

Zemske dilo №320a – Ukraynskyi yazik [Ukrainian language]. *Zemske dilo*. 1918. №320. [in Russian]

Zemske dilo №320b – Na kursakh ukrainoznavstva [In Ukrainian studies courses]. *Zemske dilo*. 1918. №320. [in Ukrainian]

Zemske dilo №323 – Pidruchnyky dlia pochatkovykh shkil [Textbooks for primary schools]. *Zemske dilo*. 1918. №323. [in Ukrainian]

Zemske dilo №324 – Zemske dilo. 1918. №324. [in Ukrainian]

Zemske dilo №329 – Zemske dilo. 1918. №329. [in Ukrainian]

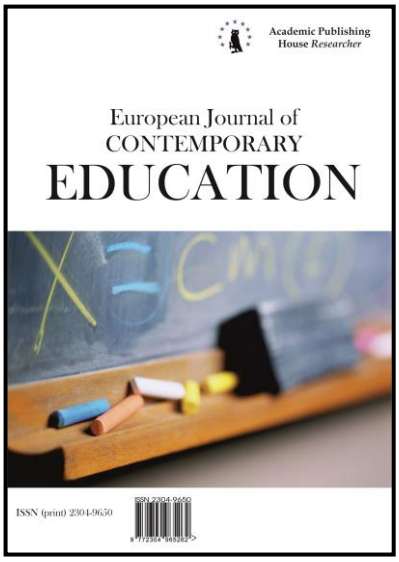
Zemske dilo №330 – Zemske dilo. 1918. №330. [in Ukrainian]

Zemske dilo №332a – *An*. Kulturne prydbannia [Cultural acquisition]. *Zemske dilo*. 1918. №332. [in Ukrainian]

Zemske dilo №332b – Zemske dilo. 1918. №332. [in Ukrainian]

Zemske dilo №352 – *Torskyi, V*. (1918). Ukrainska derzhavnist i nova rolia «Prosvit» [Ukrainian statehood and the new role of "Prosvita"]. *Zemske dilo*. №352. [in Ukrainian]

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 231-245
DOI: 10.13187/ejced.2021.1.231
www.ejournal1.com



Social Status of a Teacher in Ancient Rome

Dmytro V. Kudinov [a], Andrii E. Lebid [b, c, *], Natalia Teres [d], Natal'ya A. Shevchenko [c, e]

[a] Sumy Regional Institute of Postgraduate Studies, Sumy, Ukraine
[b] Sumy State University, Sumy, Ukraine
[c] Cherkas Global University (International Network Center for Fundamental and Applied Research), Washington, USA
[d] Taras Shevchenko National University of Kyiv, Kyiv, Ukraine
[e] Volgograd State University, Russian Federation

Abstract

The source base of the study consists of literary works of fiction and publicistic genre, letters of the Republic citizens and subjects of ancient Roman emperors, who bear witness of the attitude of contemporaries to the profession of a teacher, determine its prestige and social significance. This preconditioned the aim of the study to determine the social status of a Roman teacher. The authors claim that the latter depended on both formal and informal factors. However, personal level of professional achievements, attractive individual traits, morality, support from influential people were more important than belonging to a particular class of mentors or state regulation of education. The teacher's authority regulated his right to corporal punishment of students and influenced the amount of remuneration. The researchers believe, that a certain criterion to determine the prestige of the profession is the quantitative indicator of payment, as well as the regularity of its implementation. The teacher's wealth increased his place in the system of social relations and, conversely, was a consequence of patronage by the authorities. However, the incomes of most teachers remained low, which, in combination with other criteria of prestige of the job, allows to conditionally establish the status of a teacher at a level “below average”.

Keywords: ludi magister, grammarian, rethor, Ancient Rome, Republic, Empire, the Principate, the Dominate.

1. Introduction

Each epoch has its own peculiarities of public attitude to education and its residents. The specifics of social development, as well as the progress of pedagogical science determine the

* Corresponding author
E-mail addresses: a.lebid@socio.sumdu.edu.ua (A. Lebid)

particular nature of an educator mission, the set of professional requirements to him, and, finally, his moral code, which reflects the guidelines of the public. The independence of each stage of the ancient Roman school (elementary, grammatical, rhetorical) determined the subtle aspects of this issue. As Roman poet Lucius Apuleius metaphorically claimed, "the cups of the Muses" received different didactic content: the first – the cup of a reading teacher, a man of letters – lays the foundations; the second – the cup of grammarian – saturates with knowledge; the third – the cup of the rhetorician – arms with eloquence (Apuleius, 1959: 351–352). The necessity to "fill each of the cups" produced not only the inherent methods of teaching, but also defined complementary professional competencies, remuneration and the corresponding place in society, which, of course, did not escape the attention of contemporaries. The latter left us not only dry documents (unfortunately, mostly fragmentary), but also a vivid reflection of the images of teachers and their work in the form of compositions of various genres – both artistic and philosophical. Their combination within one study contributes to the objectification of knowledge about the ancient Roman school, its staff, the social place of educators of the antiquity, where modern education has taken roots. In fact, this idea determines the purpose of the publication – on the basis of scientific interpretation of literary sources to specify and generalize the place of teachers in ancient Roman society. Its fulfillment involves solving the following tasks: 1) to find out professional and moral requirements to teachers; 2) to define the limits of didactogeny acceptable in society – the "privileges" of Roman didactics; 3) to establish the level of teachers' remuneration. Such goal setting corresponds to both understanding of the concept of "social status" (the position of an individual (or a group of people) in the system of social connections and relations, due to the membership in a particular social community which determines its set of rights and responsibilities) and criteria relevant to the epoch: the prestige of the profession, socially determined significant professional qualities (responsibilities/requirements), rights and privileges, material security, lifestyle (Fudorova, 2009).

2. Materials and methods

The basis of the source base of the study are the works of poets, dramatists and writers of ancient Rome (the Latins and the Greeks) – Aulus Gellius, Ausonius, Sidonius Apollinaris, Apuleius, Arbiter, St. Basil the Great, Horace, Libanius, Lucian, Macrobius, Martial, Ovid, Plautus, Juvenal – contemporaries who reflected in their works various aspects of teaching activities, public attitudes to pedagogues and the content of their work, etc. The analysis of pieces of fiction is supplemented by the study of the works of the Church Fathers: Augustine of Hippo, St. Basil the Great, John Chrysostom, Gregory the Theologian, the epistle of Pliny the Younger and Seneca, speeches of Cicero, biographical essays by Plutarch and Suetonius, and rhetorical studies by Quintilian and Tacitus.

In solving the set tasks, the authors turned to the following research methods: general scientific methods – generalization and systematization, the ascent from the concrete to the abstract, analysis and synthesis; historical methods – system-functional analysis, diachronic method; pedagogical methods – obtaining of scientific information in order to establish regular connections, relationships, dependencies and construction of scientific theories; literary methods – cultural-historical, sociological, literary hermeneutics (metaphysical and normative components).

3. Discussion

The authors have a historical discussion with well-known researchers of ancient Rome and Roman Enlightenment in particular – Anna and Nicholas Bolgov, G. Boissier, L. Winniczuk, P. Guiraud, G. Zhurakovsky, L. Karsavin, H. Marrou, T. Mommsen, J. Paroz, M. Sergeyenko, T. Perfilova, E. Watts, J. Ussing, T. Ziegler, K. Schmidt. Some previous works of the article authors underpin current publication. (Kudinov, 2018; Kudinov, 2019; Kudinov, 2020a; Kudinov, 2020b; Kudinov et al., 2019).

Most of the scholars mentioned above set a fairly broad task in their researches – to give a full characteristics of the education system of ancient Rome (during its entire history or a later period of its existence). In particular, the narratives of Soviet scholars included semantic blocks of parental rights, care for preschoolers, family upbringing, organization of the educational process, evaluation of advanced pedagogical thought. The authors supported their positions and conclusions with the statements of contemporaries, consideration of the plots of literary works,

analysis of artistic images. The questions of the teaching profession prestige and material support were organically intertwined in the outline of the text (Zhurakovsky, 1940; Sergeyenko, 1964). It is noteworthy that the latter aspect causes the most controversy in the assessments of researchers – the consequence of the difference between the data which has survived to the present day.

Among modern authors in the context of the chosen topic, the works of the Russian researcher T. Perfilova deserve special attention. She not only specified the professional requirements for ancient Roman teachers and analysed the position of rhetoricians in the period of domination, but also tried to reproduce the very spirit of the Roman high school (Perfilova, 2002a; Perfilova, 2002b; Perfilova, 2003; Perfilova, 2004; Perfilova, 2005).

The problem of the social status of the teacher, "dissolved" in broad professional essays on the history of Roman education, still requires a separate study, focusing on the facts that would reveal it in different periods of the Roman past. We are sure that this area of research needs the widest coverage. This article briefly reflects the main positions of its authors.

4. Results

The place of a teacher in the social hierarchy of Ancient Rome is a question of both general nature, which depends on the understanding of the prestige of education and the teaching profession on the whole, and specific one, depending on the level of schooling where the mentor worked – elementary (trivial), grammar or rhetorical school. Despite the fact that the first sip of "the cups of the muses" gave the keys to all subsequent knowledge, it was never highly valued in Rome. The profession of a teacher of the first stage (ludi magister, primus magister, schola magister) did not gain prestige and was generally equated with the work of a craftsman, in which G. Zhurakovsky was inclined to see the parents imitating the prevailing mood in society (Zhurakovsky, 1940: 348). A teachers of a trivial school (ludus, ludus litterarum) sought out pupils themselves, which in conditions of fierce competition from similar ludi magisters did not always ensure success. In particular, the Roman poet Markus Valerius Martial (AD c. 40 – c. 104) ridiculed his aquaintance Munna, who "was used to teach only two students" (Martial, 1891: 651). The poet Publius Ovidius Naso (43 BC – AD 17) in "Fasti" called primary school teachers "a crowd without pay" and advised them to turn to Pallas to help in the search of students (Ovidius, 1874: 61).

Correspondingly, low social status of ludi magister was reflected in the professional level of the teaching staff of the trivial school. Tacitus tangentially noted in his speeches about the art of oratory that elementary school gives little to students, because here they "make no effort either to study the works of great writers, or to understand antiquities, or to know things and people, and past events" (Tacitus, 1969: 393). However, it would be wrong to accuse all ludi magisti of incompetence. An inscription on a tombstone found in Capua testifies to the well-deserved authority of the literacy teacher Furius Dionysius Filocalus (I BC) – he called himself an aurunc, was very intelligent, and most importantly, had high morals: was chaste in behavior with students, friendly to fellow citizens, and "didn't deny anything to anybody, didn't offend anyone" (Sergeyenko 1964: 174; Petrovskiy, 1962: 76).

The fleeting mentioning of "letter" schools teachers in literature contrasts with the wider interest in the figures of grammarians and rhetoricians – the main carriers of topical scientific knowledge, and sometimes the creators of ancient literature and science ("scholars with a wide range of interests, sometimes writers, almost always literary critics and lawmakers of taste", Sergeenko). Although the society tolerated to some extent the low knowledge of ludi magister, it was not so lenient towards the grammarian (grammaticus) and rhetor and made quite high demands on their knowledge (especially in literature), linguistic, communicative and mnemonic abilities, moral qualities and, finally, a clear public position. Obviously complementary to this is the astonishment of the poet Decimus Junius Juvenal (AD c. 60 – c. 127) with the erudition of a teacher known to him: "He has brought with him any character you please; grammarian, orator, geometrician; painter, trainer, or rope-dancer; augur, doctor or astrologer: All sciences a fasting monsieur knows, And bid him go to Hell, to Hell he goes!" (Juvenalis, 1885: 44). Hence we see one of the leading tasks of ancient pedagogy – "first of all we should develop the memory of children, because it is the treasury of the knowledge" (Pseudo-Plutarch, 1913: 17). Part of Quintilian's book The Art of Speaking in Public is devoted to the strengthening of memory. In particular, the author summarized the methods of memory improvement known to him.

Finally, Juvenal generalized the basic knowledge that allowed a grammarian to prove his qualifications: "he must never be at fault in his grammar; he must know all history, and have all the authorities at his finger-tips. If asked a chance question on his way to the baths, or to the establishment of Phoebus, he must at once tell you who was the nurse of Anchises, what was the name and birth-place of Anchemolus step-mother, to what age Acestes lived, how many flagons of Sicilian wine he presented to the Trojans" (Juvenalis, 1885: 137-138). The grammarian Sulpicius Appolinaris(AD II), a man of incredible knowledge of literature, was noted for his detailed and apt commentaries on literary works, reasonable interpretation of words, and composing of poetic paraphrase of Terence's plays (Aulus Gellius, 2007a: 126, 240, 348; Aulus Gellius, 2007b: 30, 69-73, 107-109, 227-228, 318-320, 369-370, 389-392; Pokrovskiy, 1942: 72). Erudition lurking in the studing out grammatical rules was a real weapon in the hands of a teacher, the key to his authority, which was not inferior to many educators of Roman high school and served as an argument in the confrontation between grammarians and rhetors. For a reason the grammarian Domitius the Mad (AD II) contrasted his mission to "the opponents": "But I will send you a book, in which you will find what you ask. For I, a grammarian, am inquiring into the conduct of life and manners, while you philosophers are nothing but mortualia, or 'winding sheets,' as Marcus Cato says" (Aulus Gellius, 2007b: 326). Even when the eminent grammarian was dying, his words still rang in the memory of his students, as in the poem on the death of Fespesius, where Gregory the Theologian on behalf of Attica asked: "Who now maintains the glory of my wisdom?" (Gregory the Theologian, 2007: 289).

Cicero also emphasized high requirements for the knowledge of middle school: "for just as if one who professed to teach grammar should speak with impropriety... such conduct has the worst appearance in these men, because they blunder in the very particular with which they profess that they are well acquainted" (Cicero, 1975: 251). The need for self-control without the right to make an unfortunate mistake was noted by the philosopher and statesman Lucius Anne Seneca (4–65): "A scholar will blush for shame, not if he makes a grammatical blunder intentionally, but if he makes it unintentionally" (Seneca, 1977: 231). An extensive list of professional requirements for grammarian can be found in Institutes of Oratory by the eminent Roman educator and rhetorician Marcus Fabius Quintilianus: mastery of the content of various works, of historical information and biographies of famous people, music theory, astronomy, philosophy (Quintilian, 1834a: 32). Getting into the essence of various sciences, grammarians took up the pen themselves. Thus, the grammarian and poet Publius Valerius Cato (I BC) was glorified as the "Latin siren"; Marcus Verrius Flaccus (c. 55 BC – AD 20) was an author of a number of grammatical works, including the first alphabetical dictionary in Latin De verborum significatu, parts of which have survived, historical and religious works; Quintus Remmius Palaemon (AD I) standardized Latin grammar of his time in the work Ars, which later more than one generation of middle school teachers relied on; Quintus Terentius Scaurus (AD II) left behind a treatise On Orthography, as well as a study On the mistakes of Ceselius. Of course, this list could be continued.

An exemplary teacher in the sense of intellectual versatility, according to the writer Gaius Suetonius Tranquillus (c. 70 – after 122), was the teacher of Gaius Julius Caesar, the grammarian Marcus Antonius Gnipho (I BC), who received a good education, had an exceptional memory, spoke Hellenic as freely as Latin, and in addition "had a kind and gentle soul" (Suetonius, 1993: 222). Libanius saw the recognition of the rhetorician's professionalism in his ability to "hold noble youth", in his students' success in public speaking and employment ("famous students pave the way for those who have not yet attended school"), and finally "in respect from them, from parents, from citizens, and newcomers", and in the amount of students. The latter depended, he clarified, not only on the professional level of the teacher, but also on the friendship with the authorities ("parents entrust their sons not because of their art of speech, but because of their influence") (Libanius, 1916: 14, 171, 474-475).

John Chrysostom outlined the criteria for teachers professional success (unconditionally to the level of education and its nature – secular or spiritual) through the achievements of students: "Every teacher, when he sees that a student firmly remembers previous lessons and actually proves the fruit of them, teaches him further knowledge with greater diligence" and, correspondingly, "when he does not notice in a student any fruit of his efforts, he mourns a lot, because he has worked in vain"; "When a teacher is glorious, then a student is obedient, then a student is confident in the success of his studying; when a teacher is willing, then he himself reaps the fruits of his

labor; then his student is diligent and appreciates the art of his teacher to such an extent that the learning with him is the most valuable to him"; "When a student sees vicious teachers, he becomes worse then they are, because he does not stop at the degree of corruption of his teacher" (John Chrysostom, 1898: 59, 88; John Chrysostom, 1901: 736; John Chrysostom, 1906: 946). Thus, the saint emphasized the responsibility of a teacher for the results of his work.

However, after the emphasis on the intellectual and moral virtues of youth mentors by their contemporaries one should not assume exclusively respectful attitude towards teachers. In the society of the late Republic and the Principate, where pleasure and money were sometimes valued above moral imperatives, a person even with exceptional knowledge, as a rule, did not evoke piety. According to the apt quotation of the Italian writer and popularizer of science Alberto Angela, middle and senior teachers "with rare exceptions, were perceived as a bookstore or a computer" (Angela). The grammarian in literature had to master the facts, not to reproduce the main idea of the works. This is well demonstrated by the dialogue quoted by Aulus Gellius between the philosopher Favorinus and an anonymous grammarian, who flaunted the subtleties of the cancellation of words, but could not give a correct interpretation to them (Aulus Gellius, 2007a: 204-208).

Requests to rhetoricians deserve special attention. First of all, they were valued because of a wide knowledge of the sciences. Poet and rhetorician Decimus Magnus Ausonius (310–395) gratefully mentioned his very erudite rhetorical teacher Staphylius in Burdigala (Bordeaux): "As a grammarian you rivalled Scaurus and Probus; as a rhetorician, most ready; in history you knew all Livy and Herodotus. You knew every branch of learning and all the lore which Varro stored in his innumerable tomes. Your heart was golden, your tongue persuasive and your speech unflurried; no hesitating was there and yet no hurrying" (Ausonius, 1993: 46) [T. Perfilova according to the epitaphs of Ausonius, using the method of content analysis, built a whole hierarchy of professional requirements: 1) extensive scientific knowledge; 2) oratory talent; 3) excellent memory; 4) the ability to teach; 5) the ability to write poems and prose; 6) sharp mind, seriousness, impeccability of gestures (Perfilova, 2003)].

Macrobius in his Saturnalia introduces the image of the rhetorician Eusebius (AD V), an "outstanding rhetorician among the Greeks, a good connoisseur of Latin eloquent and educated man", who among intellectuals at banquet proceedings gives a lecture on expression of pathos based on Virgil's Aeneid (Macrobius, 2009: 21, 34, 100, 150-171, 299-301). In the satirical work Teacher of Rhetoric by the Greek writer Lucian (c. 120 – after 180) such valuable competences of a rhetorician as the knowledge of the works of "cold" Plato, "devoided of any charm" Demosthenes and "talker" Socrates and following "old masters" of oratory sound as the antitheses to ignorance. The fee for achieving the professionalism as a teacher is "work, sleepless nights, water instead of wine and perseverance" during a long time of training (according to Lucian, "whole Olympiads" – not less than eight years). The embodiment of diligent study and self-improvement are lovable images of philosophers and teachers of youth, such as the Athenian Demonax and the "leader" (perhaps his prototype was the same Demonax) – a true beacon of science (Lucian, 1987: 324–335, 368, 371). The Gaul-Roman poet Sidonius Apollinaris (430–486) assessed his friend the rhetorician Publius Csentius as an extremely educated man who, according to the poet's metaphor, was "embowered by by the nine Muses" (Late Roman, 1982: 557). The words of Quintilian, who longed to see the orator (and at the same time any rhetorician) as a sage, "perfect in all knowledge", can serve as a generalization of the above (Quintilian, 1834a: 52-59). Thus, throughout the period of the Empire, the requirements for a high level of knowledge and outlook of teachers did not change.

An important feature of respectful rhetoricians is the presence of a creative spark, which was occasionally emphasized by contemporaries. And this is not surprising, because making of recitations, development of svazorii and controversies, finding convincing means of persuasion and adverting to acting skills required a certain heuristics from the speaker. In addition, the rhetoricians themselves acted as authors of artistic and scientific works. Thus, Libanius glorified his contemporary rhetorician Diphilus (AD IV), who "introducing old poets to the souls of the youth, was a good poet himself" (Mir pozdney antichnosti, 2015: 39). Apologetic works were written by the "Christian Cicero" rhetorician Lucius Caecilius Firmianus Lactantius (c. 250 – c. 325) (Pomyalovskiy, 1902: 84-86).

Being a kind and polite person in itself was not considered in the ancient world as an integral quality of a teacher. Immorality could coexist side by side with a high professional credo. Nevertheless, as contemporaries emphasized, high moral character favorably shaded grammarians and rhetoricians, gave them status in combination with knowledge. Quintilian believed that a rhetorician should be an "honest" person who "under strict supervision could take care of pure morality in students" (Quintilian, 1834b: 83-84). Evidently, the rhetorician Antonius Iulianus (AD II) met this criterion. According to Aulus Gellius he was "very noble and pleasant" (Aulus Gellius, 2007a: 41). Ausonius recognized many teachers in Burdigala as true examples of morality and family values, such as the rhetorician Luciol, whom he called "a gentle friend, a good brother and a faithful husband, a devoted son and father". The poet described the young grammarian Acilius Glabrio as "a polite, kind, reserved and cheerful man" (Late Roman, 1982: 66-67, 80). Finally, Quintilian in a rhetoric teacher's professiogram made a special emphasize on the love and tolerance to children, compliance with the rule of the golden mean in behavior (Quintilian, 1834b: 84).

Naturally, a highly moral teacher had a positive effect on students. The poet Aulus Persius Flaccus (34–62) responded with gratitude to the moral guidance of his mentor Lucius Annaeus Cornutus, who managed "to correct my perverted nature" and "subdue the spirit to the mind" (Roman Satire, 1957: 108). Emperor Marcus Aurelius in Meditations summarized moral lessons learned from communication with his teachers: the philosopher Quintus Junius Rusticus gently directed the future emperor to "curing and correcting his temper"; the philosopher Apollonius of Chalcedon taught in the spirit of Stoicism to "never leave anything to a chance", to pursuit the reason; philosopher Sextus of Chaeronea advocated the ideas of conformity of life to nature, benevolence, care, steadfastness, restraint, prevention of irritation; the grammarian Alexander of Cotiaeum advised not to judge those who make mistakes; rhetor Marc Cornelius Fronto taught not to trust aristocracy, greedy by nature, and so on (Marcus Aurelius, 2018: 24–25). As an adult, Marcus Aurelius asked Fronto to direct his reading, and the addressee, in turn, took care that the emperor in the breaks between public affairs built mind and body (Strelnikova, 1967: 143).

Christian authors were not impressed by the "ridiculous" knowledge of the rhetoricians. Therefore, in their professional assessments, they placed emphasis, above all, on the moral qualities of teachers. Thus, Gregory the Theologian in a letter to the rhetorician Eudoxius complimented the latter (perhaps due to the fact that it was Eudoxia who had been chosen to teach Gregory's supervisee, juvenile Nikovul) by noting in him the presence of "the rules of life", "quiet and simple temper", "a fruitful and exalted soul that is easy to guess", as well as "morbidity and physical infirmity", which were to promote, according to Gregory, with reference to Plato, a tendency to philosophical reflection (Gregory the Theologian, 2007: 391).

Contemporaries who possessed pedagogical and psychological technics were perceived positively among contemporaries. The historian Eunapius emphasized the psychological abilities of Libanius ("to recognize the character of a man and the inclinations of his soul"), his ability to incarnate in various images, break the canons of rhetoric and sense of humor (his ability to pin on the correspondents is well observed in his letters). The students could also attribute to their authoritative teachers extraordinary ("divine") abilities. For example, the philosopher Iamblichus was said to possess the gift of clairvoyance, levitation, and could perform other miracles (Roman historians, 1997, 1997: 234-235, 282-283).

In general, socially significant moral and personal qualities of the teacher complemented the portrait of an exemplary grammarian or rhetorician, a professional in his field. However, according to the apt clarification of the Russian researcher of Roman education T. Perfilova, teaching ethics still did not turn into the "code of honor", due to which the phenomena of didactogeny and other types of professional deformation were widespread (Perfilova, 2005: 19). Complaints from contemporaries about dipoldism or neglect of teachers' responsibilities are strong evidence of this. Thus, teachers of rhetorical schools, who "invented various labyrinths of reasoning", came under sharp criticism from Lucian, who, by the way, was once a rhetorician himself. In the fantasy novel Icaromenippus or The Sky-man, they are somewhat grotesquely portrayed as people of double standards who "hide their vile way of life under a dignified appearance", despise people, and deceive young people. In fact, such mentors were "despicable people", hypocrites, actors by nature ("ready to play on stage for seven drachmas") and narcissistic brawlers; their main virtues were "ignorance, arrogance, combined with impudence and shamelessness", malicious "derision of anyone who makes speeches" (Lucian, 1987: 209-210, 364-375). Seneca was also very critical of the

intellectual abilities of ordinary grammarians, unable, in particular, to correctly understand the meaning of the poetry of Virgil (Seneca, 1977: 275). Virgil's example was also used by Macrobius to rebuke "uneducated grammarians" ("a grammarian is not allowed to know anything more than the interpretation of words") (Macrobius, 2009: 94). The low "degree of mental development" of ordinary grammarians of the Republic, who made frequent mistakes in translations from Hellenic, was noted by the modern historian T. Mommsen (Mommsen, 1997a: 204). Intellectuals could not tolerate another common flaw – flattery to students and their parents in order to gain personal benefit. The reverse side of the coin of this phenomenon was pointed out by the author of Distichs of Cato: "A flattering teacher harms his own pupil with his delights" (Late Roman, 1982: 412). Thus, the shaky authority of the teacher directly depended on his knowledge, skills and erudition, which to some extent served as the equivalent of payment for his work. In this sense, the disqualification of a teacher in Roman society was not so much the "inferiority of glory" as the absence of students and, consequently, his empty stomach.

To some extent, a teacher's authority depended on the "correctness" of corporal punishment (St. Basil the Great described schooling as follows: "Here is the fear that knows no rest! [A student – author] is lazy, takes beatings, spends sleepless nights…"). The latter in one case promoted the teacher, while in another dissipated the perception by both children and parents if the punishment was used unmotivatedly (Basil the Great, 2008: 642). In general, the use of rods or sticks by teachers was understood by society: The better the teacher, the more capable he is, the more anger and impatience he shows in his classes – Cicero justified the methods of physical influence (Guiraud, 1899: 90). Scenes of beatings or allusions to them abound in the works of Roman authors: "Sneaky rod is the scepter of teachers" (Martial, 1891: 651); "Thou coosnest boyes of sleepe, and dost betray them To Pedants, that with cruell lashes pay them" (Ovidius, 1999: 51), "Then, when from the hippodrome and school of exercise you had returned home, clad in your belted frock, upon a stool by your masters would you sit; and there, when you were reading your book, if you made a mistake in a single syllable, your skin would be made as spotted as your nurse's gown" (Plautus, 1987: 217). Orbilius, with the help of poets, became an embodiment of cruel treatment of students in the history of pedagogy ("Si quos Orbilius ferula scuticaque cecidit": "Orbilius beat with a ferula and a whip", Domitius Mars). He introduced military dicipline at school (orbilism), for which his eminent student Quintus Horatius Flaccus (65 BC – AD 8) called him "a bully" (plagosus) (Horace, 1982: 203).

The standardized practice of physical influence on students provoked protests and made leading teachers to search new ways to support discipline and motivation. Thus, Orbilius's former student, Marcus Verrius Flaccus, apparently mentally traumatized by beatings, replaced corporal punishment in his pedagogical activity with a system of competitions and rewards, thus basing educational activity on the principle of competition (Zhurakovsky, 1940: 359; Sergeyenko 1964: 175). Quintilian strongly rejected the appeal to "humiliating measures" stating that they only cause "habituation", depress the mood and isolate students (Quintilian, 1834a: 29-30). Finally, John Chrysostom instructed his followers that "the main task of a teacher is not to punish immediately, but to correct, and always to wait and be slow in punishment" (John Chrysostom, 1904: 650).

It is noteworthy that the Christianization of Roman society did not affect the right of teachers to use corporal punishment. Thus, Ausonius instructed his grandson-namesake not to be afraid of "dinning" knowledge in his head (Ausonius, 1993: 12). The Christian theologian Augustine of Hippo (354–430) admitted in Confessions that when he was lazy at school, he was beaten. Moreover, the elders approved of this "custom" and even the parents of the future father of the Church "continued to laugh at these beatings, my great and severe misfortune at the time" (Augustine, 2005: 17–18). John Chrysostom also treated the punishment at school with restraint, describing a typical picture: a child complained to his mother about having been punished by a teacher, and she instructed the child that "being afraid of the teacher is good for him" (John Chrysostom, 1896: 83).

Such notes partly formed misconceptions in the history of pedagogy about the strict discipline of the Roman school on the model of Spartan (Guiraud, 1899: 90-91; Pedagogical encyclopedia, 1929: 326). Obviously, fights at school between teachers and students were quite common and arose depending on local traditions of upbringing, the attitude of adults to corporal punishment of adolescents, the authority of the teacher and the extent of abusive behaviour. Of course, such situations illustrate the actual normalization of didactogeny (Kudinov, 2020a: 122).

A certain index of the prestige of the teaching profession was the remuneration, which depended not only on the recognition of a teacher's intelligence, but also on the type of school. In particular, the earnings of ludi magister were often smaller than the income of the average urban artisan. The entrance fee for a teacher during the Principate was only 1 as. No wonder Juvenal called the students those who "worships Minerva with a modest penny fee" (Juvenalis, 1885: 164). According to Libanius, a literacy teacher Optatus generally taught children for a payment in kind – a couple of loaves of bread "and other food that is added to them" (Libanius, 1914: 189). Unlike grammarians or rhetoricians, ludus teacher could not afford a chair (Libanius wrote "throne") – the sign of pedagogical authority – and were satisfied with stones under the buttocks (chamaididaskaloi – "teachers who sit on the ground") (Watts, 2019: 318). Home teachers were in a similar position. One of the heroes of Gaius Petronius Arbiter's The Banquet of Trimalchio told that one of his son's mentors, "not very educated but diligent", received payment during holidays and was satisfied with "whatever he was given" (Roman Satire, 1957: 139). This forced ludus teachers to look for additional earnings. In particular, the above-mentioned Furius Filocalus from Capua forged by drawing up wills (Sergeyenko, 1964: 174).

Grammarians and rhetoricians received much more for their work, but there was also a difference in the payment to these two categories: "And yet, small as the fee is – and it is smaller than the rhetor's wage – the pupil's unfeeling attendant nibbles off a bit of it for himself". Juvenal slandered the fact that in a year a grammar teacher earned as much as a rider who won in the circus only once. Accordingly, the poet concluded, in the world "there is nothing on which a father will not spend more money than on his son" (Juvenalis, 1885: 134, 136, 138). Moreover, students and their parents were often not kind enough to pay for their educational services in a timely manner and could even challenge a grammarian or rhetorician's claim for a monetary contribution (Roman Satire, 1957: 223).

During the Republic, the salaries of grammarians, especially the Greeks, were higher than under the rule of the emperors. In the first half of I BC "So high was the value, and so great were the rewards, of grammarians, that Lutatius Daphnides... – remarked Suetonius, – was purchased by Quintus Catullus for two hundred thousand sesterces, and shortly afterwards made a freedman; and that Lucius Apuleius, who was taken into the pay of Epicius Calvinus, a wealthy Roman knight, at the annual salary of ten thousand crowns, had many scholars". Due to his popularity among the Romans, the grammarian Gniphon, who never asked for the payment "but generally left it to the liberality of his scholarship" built his own house in the capital. However, the real example of wealth among grammarians was Palemon, who, according to Suetonius, "was so luxurious, that he took the bath many times in a day". His income annual income from school made 400 thousand sesterces [At that time, a modius of wheat wheat (8,704 liters of wheat) cost an average of 12 aces or 3 sesterces.], which corresponded to more than the average annual income of senators, although here he had to concede in payment to unscrupulous intermediaries ("the pupil's unfeeling attendant nibbles off a bit of it for himself; so too does the steward", Juvenal). He used the capital obtained by intellectual labor to acquire tailor's workshops and vineyards, which gave him no less wealth than his profession. Material wealth was also achieved by the Latin grammarian Publius Atilius, to whom the people's assembly of the citizens of Como awarded the title of decurion, "and who bequeathed his inheritance to the republic". Against this background, the situation of some failed grammarians, who in their old age sold property and dragged the lives of beggars, looked unattractive. In particular, the famous poet and grammarian Publius Valerius Cato, "did not find a guarantor", gave his villa to the creditors and huddled in a shabby hut. The above-mentioned Orbilius in his declining years lived in poverty (Petrovskiy, 1962: 101; Suetonius, 1993: 221-228; Winniczuk, 1988: 208). Complaints of insufficient pay were also heard in the late period of the Empire's existence: "Small wealth and silent fame" – reads a poetic obituary written by Ausonius – had Greek grammars in AD IV in schools in Burdigala (Ausonius, 1993: 40, 221).

However, both in the period of the late Republic and the Principality, the position of the grammatici in the conquered provinces, where the administration needed teachers as well as legionnaires for the civilization of the barbarians, was much better. Their social status and financial reward were an order of magnitude higher than that of middle-level teachers in the Apennines. Juvenal advised the professor of rhetoric to go to Gaul or Africa: "Better go to Gaul or to Africa, that nursing mother of lawyers, if you would make a living by your tongue" (Juvenalis, 1885: 131; Roman Satire, 1957: 276). It was in Gaul ("the promised land to school teaching and schooling",

T. Mommsen) where significant centers of education araised – Burdigala, Augustodun, Massilia, Lugdunum, Tolosa and others. In Africa, according to the teachings of Apuleius and Augustine the Blessed, Madavra and Carthage were strong centers of enlightenment (Mommsen, 1997b: 34-35, 539-540; Pomyalovskiy, 1902: 336).

This difference in earnings leads to an unambiguous answer about income level of grammars. M. Sergeenko in this case came to the conclusion of the "middle", which held most grammarians. The scientist's arguments are based on the calculation of the annual fee, multiplied by a speculatively large number of students (Sergeyenko 1964: 183). However, this can hardly be equated with the rule. The good luck of the grammarians was lustful and depended on the intensity of competition, patronage by the authorities, the costs they took, and, finally, regional features. Given the frequency of mentions of the insolvency of grammarians, it is possible to adjust the generalization of M. Sergeenko towards the position "below average". L. Winniczuk agrees with this (Winniczuk, 1988: 208).

Senior teachers were at the highest level of remuneration. Indeed, famous rhetoricians often became very wealthy people and could count on positions in the state apparatus. Lucian described successful Hellenic rhetoricians who could afford clothes made of precious fabrics ("Tarentum fabric"), a purple cloak, expensive shoes ("When is eloquence ever found beneath a shabby coat?", Juvenal) (Lucian, 1987: 370–371). Greek intellectuals, to whom the Roman nobility sent their children to study, were highly valued. In particular, thirsty for knowledge Cicero, together with his brother Quintus and friend Titus Pomponius Atticus, mastered his eloquence with the best rhetoricians and philosophers of Athens, Rhodes and Asia, which allowed the future consul to develop a "Rhodesian style of rhetoric". Gaius Julius Caesar also studied oratory at Molo of Rhodes (Plutarch, 1964: 160; Pokrovskiy, 1942: 152; Utchenko, 1972: 123). Accordingly, obtaining new competencies from Greek teachers cost a lot. Cicero's teacher, the Greek Diodotus, upon his death in 59 BC bequeathed 100,000 sesterces to a student, a sum largely accumulated by teaching (Boissier, 1880: 75). Herodes Atticus, a rhetorician and philosopher, became extremely wealthy due to contributions from students (one of whom was the future emperor Marcus Aurelius), which allowed him to spend a lot of money on architectural renovation of Athens and conducting games. Aulus Hellius recalled that he taught not only in Athens but also in his luxurious villa in the suburbs (Aulus Gellius, 2007a: 7, 29; Gibbon, 2008: 120-121). Libanius pointed to a share of rhetoricians who were rich not because of teaching, but due to judicial practice (Libanius, 1916: 13-14). The wealth of some rhetoricians was ensured not only by pedagogical activities, but also by an advantageous marriage, advocacy, and inheritance of real estate (Perfilova, 2003). However, the general ratio of wealthy and poor rhetoricians in AD I was not in favor of the former ("Nevertheless that fortunate man is rare – rarer than a white crow", Juvenal).

However, even among the rhetoricians there were poor people who were forced to sell their intellectual property or possessions to prevent poverty. Juvenal compared the rhetorician's earnings to a "tesserae for bread" – a token tesserae frumentariae issued by magistrates to poor citizens to receive a certain amount of bread or money from the treasury (Roman Satire, 1957: 224). At the same time, the poet's words can be interpreted differently, in the sense of the proverb "A bird in the hand is worth two in the bush": tessera was a small but stable social guarantee, while rhetorical delusion was a lustful path of gaining wealth. In fact, Cicero pointed out the same thing in his letter to his friend Lucius Papirus Paetus, who was in need. So Cicero urged the latter leave everything in Naples and immediately arrive in Rome, where he could get a "chair in a school", after which a "pillow" would appear, that is, a dining place (Cicero, 1950: 402). Juvenal and Cicero seem to hint at the obvious to their contemporaries – if you can not assert yourself in wealth in business, then become a teacher (grammarian or rhetorician); even though you do not get rich, you will not die of hunger.

The situation with payment of mentors improved when grammarians and rhetoricians received certain privileges from the state, in particular, obtained the rights of civil servants (during the reign of Titus Flavius Vespasian, AD 69–79) – they had the prospect of a career as a clerk ("If Fortune so choose, you will become a Consul from being a rhetor", Juvenal). In particular, Quintilian became the first rhetorician to receive a reward from the treasury of Vispasian. The position of the head of the department of Greek Rhetoric ("senior department") equated him with the status of the imperial librarian. Emperor Domitian entrusted him with the education of his sister Domitilla's grandchildren (Zhurakovsky, 1940: 404; Pokrovskiy, 1942: 346). In AD II there

were few rhetoricians on the state salary; it was given to the most prominent of them, such as Antonius Iulianus (Aulus Gellius, 2007b: 359). The peak of the Greek teacher's career in those times, T. Mommsen noted, was the position of secretary of the Greek department of the Imperial Chancellery (Mommsen, 1997b: 480). However, such promotion could be received by only the few. Most rhetoricians could hardly reach the income of a middle-ranking official. In one of his letters, Pliny the Younger speaks eloquently about bad luck of his ackaintance, who "went down turning from a senator into an exile, from a speaker (advocate – author) to a rhetorician" (Pliny, 1950: 111). An unattractive picture of the position of young teachers in the rhetorical school of the dominant era was painted by the famous rhetorician Libanius in one of his speeches to the citizens of Antioch: Antiochian rhetoricians live in rented apartments ("like shoe menders") or are forced to buy housing on credit, consider having many children as a punishment or avoid marriage because of the inability to support a family, have no slaves or own from one to three slaves [According to G. Kurbatov, the "middle class" of Antioch was satisfied with 10-15 slaves; artisans and butchers had from 1 to 3 slaves (Kurbatov, 1991: 71)], are in debt to bakers, to whom they later pay with their wives' jewels, "cursing their craft of rhetors" instead of having become farmers, civil servants or sailors. The reason was a violation of the salary payment by the municipality. Low wages are directly linked to the humiliation that rhetoricians resort to in order to improve their financial situation. Finally, the low image of the profession is complemented by the "arrogant disregard" with which officials address rhetoricians (Libanius, 1914: 221-224; Libanius, 1916: 172). The young Athenian rhetoricians Proeresius and Hephaestion until they became famous shared the same carpets on which they practices the profession (Roman historians, 1997: 270-271).

Fixed remuneration of rhetoricians depended on the stability of the state. Thus, during the reign of the Flavian dynasty, the rhetoricians of a number of educational institutions were assigned a fixed salary – approximately 100,000 sesterces each (for example, the annual salary of a centurion at that time was 13,500 sesterces). Conversely, after the empire had gone through a crisis in AD III, payment rate was reduced by several times. In particular, Emperor Gaius Aurelius Valerius Diocletianus (284–305) in 301 established a rhetorician's salary at 250 dinars, and the grammar maximum at 200 dinars per month per student, while a magister institutor literarum, a primary school teacher earned no more than 50 dinars, which in general was a meager sum, given the fall in the value of this coin eight times since the beginning of the rule of the statesman (Mommsen, 1997b: 480; Ussing, 1878: 102-103, 155). G. Zhurakovsky commented that such norms could only provide the "basic subsistence level" when considered together with additional monetary contributions of students (Zhurakovsky, 1940: 448).

The remuneration of the teachers of senior school was also affected by the state regulation of education. As far back as during the reign of the Antonine dynasty, municipal and state schools generously subsidized by the emperors began to appear alongside private educational institutions. From the second half of AD IV, the municipalization of education was replaced by the process of nationalization of grammar and rhetoric schools. Teachers were appointed to public schools by the monarch at the request of the decurions. At the same time, candidates for positions were examined (Zhurakovsky, 1940: 450, 456). The decrees of the emperors Gratian (375–383) and Theodosius the Great (379–395) determined the size of salaries and the number of departments in rhetoric schools. Thus, in the residence of Gratian in Augusta Treverorum (Trier) rhetoricians and grammars of Latin and Hellenics from AD 374 received res omnes quae ad victum pertinent ("everything necessary for nutrition") – respectively, 30, 20 and 12 annonae (annona – annual harvest of grain) of bread (in other cities the salary of rhetoricians did not exceed 24 annonae or 15 thousand sesterces) (Perfilova, 2002b; Zhurakovsky, 1940: 457; Ziegler, 1911: 21). In addition to a fixed fee, rhetoricians were not deprived of the opportunity to receive payments from students, which, according to Libanius, was done by the latter in confidence.

The paradox of the Dominate era was that the aggravation of the state crisis in AD IV was consistent with the improvement of teachers position in remote regions of the empire, especially it concerned grammarians and rhetoricians (and that is quite conditional – remember the remarks of Ausonius) (Gordievich, 1894: 13; Guiraud, 1899: 84-85). According to Karsavin, education remained the exclusive feature of a noblemen, and elevated them above the barbarians (Karsavin, 1910: 31). G. Zhurakovsky in the analysis of the causes of this phenomenon is more prosaic: high school in Gaul was a means of strengthening imperial power on the periphery, combined with strengthening of local administrative nomenclature (Zhurakovsky, 1940: 453-454). This certainly

distinguished rhetoricians as a privileged group, favoured by local nobility – alliances between teachers and daughters of the rich became commonplace. Thus, the financial situation of the Narbonne grammarian Martial changed when "noble Clarence, impressed" by Martial's "gift, gave him his daughter to wed" (Ausonius, 1993: 45; Boyko, 2005: 56; Perfilova, 2003). Some teachers could afford to hold symposia, as Ausonius pointed out ("Your table is so refined that it is useless to look for flaws") (Ausonius, 1993: 36; Late Roman, 1982: 65).

However, in the last century of the Western Roman Empire, higher education was declining. Under the conditions of the gradual collapse of the state and the onslaught of barbarians, education yielded to self-interest, religiosity and martialism. "Few people respect science", "the concepts and knowledge of ancestors are being lost", "the number of idle people has increased so much that if not for the few sages, we would be mourning the genuine Latin language" – such remarks of contemporaries testified to the crisis of classical ancient education (Karsavin, 1910: 31–33).

The historian Ammianus Marcellinus observed the crisis in education in the second half of AD IV. During the reign of Constantius II (337–361), he pointed out, for the rich science was replaced by entertainment: "a singer is invited instead of a philosopher, and an animator instead of a rhetorician". And only in some enclaves, where there was a strong position of paganism, such as in Alexandria, "the spirit of life is still raging in the teachers of science" (Ammianus, 2005: 18, 292). The decline of the rhetorical school took place under strong pressure from adherents of the state religion. It is not for nothing that Gregory the Theologian, in a letter to Gregory of Nyssa, rebuked him for his choice of teaching profession, which he also compared to a career of a gladiator or an actor and contrasted with the faith: "do you prefer to be called a rhetorician rather than a Christian?" (Gregory the Theologian, 2007: 313). As a result, the prestige of the profession of rhetoricians declined.

5. Conclusion

Ancient Roman literature remains the main treasury of sources for the study of educational processes and pedagogical profession during the Roman period of Antiquity. Addressing it allows us to recreate the portrait of an exemplary teacher and at the same time reveal the characteristic flaws of Roman teachers who were criticized by contemporary intellectuals. Finally, it reproduces a concretized idea of the prestige of the profession.

A distinctive feature of the professional CV of an ancient Roman teacher was an organic combination of requirements for the level of knowledge, pedagogical techniques, speech and morality. Noteworthy, the knowledge itself, judging by the accents placed in the works by contemporaries, was the main characteristic of the teacher. Probably the set of requirements for teachers of secondary and higher Roman schools can be represented as follows: a high level of mastery of educational material, erudition; free possession of literary Latin, devoided of solecisms and barbarisms, Hellenics (in the period of Dominate – in the form of the so-called Attic language); highly developed mnemonic abilities; the ability to maintain discipline, including through corporal punishment, but without abuse. The conditional right to punish depended to some extent on the intellectual authority of the mentor and the public consent to the use of physical force. Requirements for the morality of teachers varied depending on the spirit of the era. A clear civic position, adherence to conservative views on morality in the late period of the Republic gave way to liberalization, lenient attitude to "human weaknesses", which, in fact, caused some disappointment in the behavior of teachers by intellectuals. The depravity of young people by teachers was a frequent occurrence. However, pederasty did not become the norm of school life and was condemned by supporters of proper ethical and sexual education of the youth. An important indicator of the attitude to teachers in society's was remuneration, which was determined by a number of factors: 1) servicing a certain "bowl of muses" – literacy teachers traditionally occupied the lowest step in remuneration, while grammar and rhetoric teachers were paid better; 2) strengthening or weakening of the elite and state athorities attention to education (here the period of the late Republic and the early Dominatethe can be considered foreground epochs in remunerationcan); 3) regional elites' attitude to the education — as early as in the era of the principality attractive conditions for wages were created in Athens, Gaul, Africa, in some remote provinces; 4) favoring of certain teachers by the authorities and statesmen; 5) high professionalism or socially significant qualities of the teacher, which made him competitive in the market of educational services, provided a sufficient number of students.

Thus, the prestige of the teaching profession in ancient Rome was determined by the combination of formal (belonging to a certain level of education, state regulation of rights, privileges and remuneration of teachers) and informal factors (significant individual and professional traits, the authority of the teacher). The very presence of the title of grammarian or rhetorician by itself did not introduced the teacher to the rank of respected people. His authority was gained in the audience, in public speeches, in court, in disputes with colleagues, in correspondence and communication with influential people, by the ability to win the affection of students, parents and benefactors. Due to this, the income of teachers also fluctuated (even in times of domination with the established scale of remuneration, it differed due to the right to charge fees from students). Certain level of wealth achieved by a teacher consolidated the public perception of his life success. Since prosperity and recognition were achieved by a minority, this suggests that teachers, although it is difficult to imagine urban intellectual life, cultural environment and jurisprudence of ancient Rome without them, took the below average position on the ladder of social relations. Possession of material means of production, successful legal practice or a career of an official guaranteed higher earnings and were valued higher than knowledge. The place of intellectuals in the public life of the state as a whole remained secondary.

References

Ammianus, 2005 – *Ammianus Marcellinus* (2005). Rimskaya istoriya [Roman History]. Moscow, 631 p. [in Russian]

Apuleius, 1959 – *Apuleius, Lucius* (1959). The Apology. The Metamorphoses. Florida. Moscow, 434 p.

Augustine, 2005 – *Saint Augustine of Hippo* (2005). Confessions. Moscow, 544 p. [in Russian]

Aulus Gellius, 2007a – *Aulus Gellius* (2007). The Attic Nights. Books I–X. SPb., 480 p. [in Russian]

Aulus Gellius, 2007b – *Aulus Gellius* (2008). The Attic Nights. Books I–X. SPb., 448 p. [in Russian]

Ausonius, 1993 – *Ausonius Magnus* (1993). Stihotvoreniya [Poems]. Moscow, 356 p. [in Russian]

Basil the Great, 2008 – *Basil the Great* (2008). Tvoreniya: V 2 t. Tom pervyy: Dogmatiko-polemicheskiye tvoreniya. Ekzegeticheskiye sochineniya. Besedy [Six Days of Creation: in 2 Books. Book one: Dogmatic and Polemical Writings. Exegetical Works. Conversations]. Moscow, 750 p. [in Russian]

Boissier, 1880 – *Boissier, G.* (1880). Tsitseron i ego druzia: Ocherk rimskogo obshchestva vo vremena Tsezarya [Cicero and his Friends: A Study of Roman Society in the Time of Caesar]. Moscow, 340 p. [in Russian]

Boyko, 2005 – *Boyko, N.V.* (2005). Dve shkaly tsennostey Avsoniya [Two Scales of Values of Ausonius]. *Yaroslavskiy pedagogicheskiy vestnik*. 2: 54-59. [in Russian]

Cicero, 1950 – *Cicero, M.T.* (1950). Pisma Marka Tulliya Tsitserona k Attiku. blizkim. bratu Kvintu. M. Brutu [Letters of Marcus Tullius Cicero to Atticus, to Close Ones, to Brother Quintus, to M. Brutus]. Per. i komment. V. O. Gorenshteyna. Moscow-Leningrad. Vol. II. 501 p. [in Russian]

Cicero, 1975 – *Cicero, M. Tullius* (1975). Izbrannyye sochineniya [Selected Works]. Moscow, 454 p. [in Russian]

Fudorova, 2009 – *Fudorova, O.M.* (2009). Teorii sotsialnoho statusu: piznavalni mozhlyvosti i doslidnytski stratehii [The Theories of Social Status: Educational Opportunities and Research Strategies]. *Visnyk Kharkivskoho natsionalnoho universytetu imeni V.N. Karazina*. 881: 110-116. [in Russian]

Gibbon, 2008 – *Gibbon, E.* (2008). Istoriya upadka i razrusheniya Velikoy Rimskoy imperii: Zakat i padeniye Rimskoy imperii: V 7 t [The History of the Decline and Fall of the Roman Empire in 7 Volumes]. Moscow. Vol. 1. 640 p. [in Russian]

Gordievich, 1894 – *Gordievich, O.I.* (1894). Vyisshee obrazovanie v Rime vo vremena imperatorov: Rech, proiznesennaya na torzhestvennom akte Kollegii Pavla Galagana 1 oktyabrya 1893 g. vospitatelem i prepodavatelem grecheskogo yazyika O. Gordievichem [Higher Education in Rome under the Emperors: A Speech, Given on Solemn Convocation of Pavel Galagan College on

October 1, 1893 by Mentor and The Greek Language Teacher O. Gordievich]. Kyiv, 21 p. [in Russian]

Gregory the Theologian, 2007 – *Gregory the Theologian* (2007). Tvoreniya. Tom 2: Stikhotvoreniya. Pisma. Zaveshchaniye [The Writings. Vol. 2: Poems. Letters. Testament]. Moscow. Vol. 2. 666 p. [in Russian]

Guiraud, 1899 – *Guiraud, P.* (1899). Chastnaya i obschestvennaya zhizn rimlyan [Private and Public Life of the Romans]. SPb., VIII, 623 p.

Horace, 1982 – *Horatius, Q.F.* (1982). Tvory [Compositions]. Kyiv, 254 p. [in Ukrainian]

John Chrysostom, 1895 – *John Chrysostom* (1895). Tvoreniya svyatogo ottsa nashego Ioanna Zlatousta arkhiyepiskopa Konstantinopolskogo [The Works of Our Church Father and Archbishop of Constantinople Johm Chrysostom]. SPb. Vol. I. 883 p. [in Russian]

John Chrysostom, 1896 – *John Chrysostom* (1896). Tvoreniya svyatogo ottsa nashego Ioanna Zlatousta arkhiyepiskopa Konstantinopolskogo [The Works of Our Church Father and Archbishop of Constantinople Johm Chrysostom]. SPb. Vol. II. 979 p. [in Russian]

John Chrysostom, 1898 – *John Chrysostom* (1898). Tvoreniya svyatogo ottsa nashego Ioanna Zlatousta arkhiyepiskopa Konstantinopolskogo [The Works of Our Church Father and Archbishop of Constantinople Johm Chrysostom]. SPb. Vol. IV. 923 p. [in Russian]

John Chrysostom, 1901 – *John Chrysostom* (1901). Tvoreniya svyatogo ottsa nashego Ioanna Zlatousta arkhiyepiskopa Konstantinopolskogo [The Works of Our Church Father and Archbishop of Constantinople Johm Chrysostom]. SPb. Vol. VII. 912 p. [in Russian]

John Chrysostom, 1904 – *John Chrysostom* (1904). Tvoreniya svyatogo ottsa nashego Ioanna Zlatousta arkhiyepiskopa Konstantinopolskogo [The Works of Our Church Father and Archbishop of Constantinople Johm Chrysostom]. SPb. Vol. X. 992 p. [in Russian]

John Chrysostom, 1906 – *John Chrysostom* (1906). Tvoreniya svyatogo ottsa nashego Ioanna Zlatousta arkhiyepiskopa Konstantinopolskogo [The Works of Our Church Father and Archbishop of Constantinople Johm Chrysostom]. SPb. Vol. XII. 1587 p. [in Russian]

Juvenalis, 1885 – *Juvenalis, D.J.* (1885). Satiry [The Satires]. Moscow, 245 p. [in Russian]

Karsavin, 1910 – *Karsavin, L.P.* (1910). Magnaty kontsa rimskoy imperii [The Magnates of the Late Roman Empire]. 62 p. [in Russian]

Kudinov, 2018 – *Kudinov, D.* (2018). Osoblyvosti orhanizatsii ta funktsionuvannia systemy osvity Davnoho Rymu [The Peculiarities of Organization and Functioning of Educational System in Ancient Rome]. *Osvitni innovatsii: filosofiia, psykholohiia, pedahohika: zbirnyk naukovykh statei u dvokh chastynakh*. Chastyna 1. Sumy. Pp. 291-307. [in Ukrainian]

Kudinov, 2019 – *Kudinov, D.V.* (2019). Vykhovannia khloptsiv u Davnomu Rymi: sotsiokulturnyi vymir [Boys' Education in Ancient Rome: Sociocultural Aspects]. *Suspilno-politychni protsesy na ukrainskykh zemliakh: istoriia, problemy, perspektyvy: mater. VI Vseukr. nauk.-prakt. konf.* (Sumy, 19 kvitnia 2019 r.)]. Sumy. Pp. 72-90. [in Ukrainian]

Kudinov et al., 2019 – *Kudinov, D., Degtyarev, S., Polyakova, L., Gut, J.* (2019). Educational Process in Ancient Rome Schools. *European Journal of Contemporary Education*. 8(2): 425-426.

Kudinov, 2020a – *Kudinov, D.* (2020). Profesiini ta osobysti vymohy do uchyteliv serednoi ta vyshchoi lanok davnorymskoi shkoly: istoryko-pedahohichna interpretatsiia literaturnykh dzherel [Professional and Personal Requirements to Teachers of Middle and High School in Ancient Rome: Historical and Pedagogical Interpretations of Literature Sources. *Innovatsiini tekhnolohii rozvytku osobystisno-profesiinoi kompetentnosti pedahohiv v umovakh pisliadyplomnoi osvity: zbirnyk naukovykh statei u 3-kh chastynakh*. Sumy. Ch. 1. Pp. 117-124. [in Ukrainian]

Kudinov, 2020b – *Kudinov, D.* (2020). Do pytannia pro vykhovannia v Davnomu Rymi. Formuvannia hromadianskoi kultury v Novii ukrainskii shkoli: tradytsiini ta innovatsiini praktyky [On the Issue of Education in Ancient Rome]: *zbirnyk materialiv konferentsii*. Sumy. Pp. 142-148. [in Ukrainian]

Kurbatov, 1991 – *Kurbatov, G.* (1991). Rannevizantiyskiye portrety: K istorii obshchestvenno-politicheskoy mysli [Early Byzantine Portraits: On the History of Social and Political Thought]. Leningrad, 272 p. [in Russian]

Libanius, 1914 – *Libanius* (1914). Rechi [Speeches]. Kazan. Vol. 1. 522 p. [in Russian]

Libanius, 1916 – *Libanius* (1916). Rechi [Speeches]. Kazan. Vol. 2. 570 p. [in Russian]

Lucian, 1987 – *Lucian* (1987). Izbrannoye [Selected Writings]. Moscow, 624 p. [in Russian]

Macrobius, 2009 – *Macrobius* (2009). Saturnalii [Saturnalia]. Ekaterinburg, 372 p. [in Russian]

Marcus Aurelius, 2018 – *Marcus, A.* (2018). Naodyntsi z soboiu [Meditations]. Lviv, 184 p. [in Russian]

Martial, 1891 – *Martialis, M.V.* (1891). Epigrammyi [Epigrams]. Moscow, Part 2. [4], 933 p. [in Russian]

Mir pozdney antichnosti, 2015 – Mir pozdney antichnosti. Dokumenty i materialy. Vypusk 3: Pisma Libaniya v russkikh perevodakh [Letters of Libanius in Russian Translations]. Sost. A.M. Bolgovoy. N. N. Bolgova. Belgorod, 2015. 66 p. [in Russian]

Mommsen, 1997a – *Mommsen, T.* (1997). Istoriya Rima. V 4 tomah [The History of Rome. In 4 volumes]. Vol. 2. Rostov-on-Don, 640 p. [in Russian]

Mommsen, 1997b – *Mommsen, T.* (1997). Istoriya Rima. V 4 tomah [The History of Rome. In 4 volumes]. Vol. 4. Rostov-on-Don, 640 p. [in Russian]

Ovidius, 1874 – *Ovidius, P.N.* (1874). Sochineniya P. Ovidiya Nazona vse. kakiye do nas doshli. T. 3. Fasty; Pechalnyye stikhi; Pisma s beregov Ponta; Otryvki [Works of Ovidius, all Preserved to our Days, Vol. 3. Fasti; Sad Poems; Letters from Pontus Coast; Fragments]. Ovidiy. Nazon Publiy. Moscow: Izd. br. Salayevykh. 1874 (Tip. T. Ris). XXXX. 344 p. [in Russian]

Ovidius, 1999 – *Ovidius, P.N.* (1999). Liubovni elehii. Mystetstvo kokhannia. Skorbotni elehii [Love Elegies. The Art of Love. Sorrows]. Kyiv, 299 p. [in Russian]

Pedagogical encyclopedia, 1929 – Pedagogicheskaya entsiklopediya [Pedagogical Encyclopedia]. Moscow, 1929. Vol. 1.VIII p. 1158 ss. [in Russian]

Perfilova, 2002a – *Perfilova, T.B.* (2002). Literaturnoye naslediye Libaniya kak istochnik izucheniya vysshego obrazovaniya v vostochnykh provintsiyakh Rimskoy Imperii [Literary Heritage of Libanius as the Source of Study of High Education in Eastern Provinces of Roman Empire]. *Yaroslavskiy pedagogicheskiy vestnik.* 3(32). [in Russian]

Perfilova, 2002b – *Perfilova, T.B.* (2002). Organizatsiya uchebnoy deyatelnosti v grammaticheskikh i ritoricheskikh shkolakh Gallii v IV–V vv. [Organization of Educational Ectivity in Grammar and Rethoric Schools in Gaul in the 4th –5th centuries]. *Yaroslavskiy pedagogicheskiy vestnik.* 4(33). [in Russian]

Perfilova, 2003 – *Perfilova, T.B.* (2003). Vospominaniya Avzoniya i Apollinariya Sidoniya o prepodavatelyakh vysshikh shkol Gallii IV–V vv. [Memoirs of Ausonius and Sidonius Appolinaris about High School Teachers in the 4th – 5th century Gaul]. *Yaroslavskiy pedagogicheskiy vestnik,* 2(35). [in Russian]

Perfilova, 2004 – *Perfilova, T.B.* (2004). «Stranstvuyushchiye» sofisty v kulturnom prostranstve provintsii (na primere biografii Libaniya) ["Itenerant" Sophists in Cultural Space of the Provinces (on the example of Libanius). *Izvestiya Rossiyskogo gosudarstvennogo pedagogicheskogo universiteta im. A. I. Gertsena,* 7(4): 7-15. [in Russian]

Perfilova, 2005 – *Perfilova, T.B.* (2005). Vyssheye obrazovaniye v Rimskoy Imperii: Kulturologicheskiy aspekt [Higher Education in Roman Empire: Culturological Aspect]: avtoreferat dis. ... doktora istoricheskikh nauk: 24.00.01. Moscow. 42 p. [in Russian]

Petrovskiy, 1962 – *Petrovskiy, F.A.* (1962). Latinskiye epigraficheskiye stikhotvoreniya [Latin Epigraphic poems]. Moscow, 152 p. [in Russian]

Plautus, 1987 – *Plautus, T.M.* (1987). Komedii [Comedies]. Vol. 2. Moscow, 672 p. [in Russian]

Pliny, 1950 – *Pliny, G. C.S.* (1950). Pisma Pliniya Mladshego [The Letters of Pliny the Younger]. Moscow, 578 p. [in Russian]

Plutarch, 1964 – *Plutarch* (1964). Sravnitelnyie zhizneopisaniya: V treh tomah [Parallel Lives: in three volumes]. Vol. III. Moscow, 546 p. [in Russian]

Pokrovskiy, 1942 – *Pokrovskiy, M.M.* (1942). Istoriya rimskoy literatury [The History of Roman Literature]. Moscow-Leningrad, 410 p. [in Russian]

Pomyalovskiy, 1902 – *Pomyalovskiy, I.V.* (1902). Izbrannyye mesta iz latinskikh khristianskikh pisateley do VIII veka [Excerptum from Latin Christan Writers up to th 8th century]. SPb., 576 p. [in Russian]

Late Roman, 1982 – Pozdnyaya latinskaya poeziya [Late Roman Poetry]. Sostav. i vstup. statia M. Gasparova. Moscow, 1982. 719 p. [in Russian]

Pseudo-Plutarch, 1913 – *Pseudo-Plutarch* (1913). O vospitanii detey [On Child Rearing]. Varshava. [2]. 26 p. [in Russian]

Quintilian, 1834a – *Quintilian, M.F.* (1834). Dvenadtsat knig ritoricheskih nastavleniy [Institutes of Oratory in twelve volumes]. Part 1. Lib. 1. SPb. XI, 483 p. [in Russian]

Quintilian, 1834b – *Quintilian, M.F.* (1834). Dvenadtsat knig ritoricheskih nastavleniy [Institutes of Oratory in twelve volumes]. Part 1. Lib. 2. SPb. 174 p. [in Russian]

Roman Satire, 1957 – Rimskaya satira [Roman Satire]. Moscow, 1957. 315 p. [in Russian]

Roman historisians, 1997 – Rimskiye istoriki IV veka [Roman Historians of AD IV]. Moscow, 1997. 414 p. [in Russian]

Seneca, 1977 – *Seneca, L.A.* (1977). Nravstvennyie pisma k Lutsiliyu [Epistulae morales ad Lucilium]. Moscow, 383 p. [in Russian]

Sergeyenko, 1964 – *Sergeyenko, M.E.* (1964). Zhizn drevnego Rima [The Life of Ancient Rome]. Moscow – Leningrad, 336 p. [in Russian]

Strelnikova, 1967 – *Strelnikova, I.P.* (1967). Pisma Frontona [Fronto's Letters']. *Antichnaya epistolografiya: ocherki*. Moscow. Pp. 139-152.

Suetonius, 1993 – *Suetonius, G.T.* (1993). Zhizn dvenadtsati tsezarey [The Twelve Caesars]. Moscow, 368 p. [in Russian]

Tacitus, 1969 – *Tacitus, P.C.* (1969). Sochineniya: V 2 t. T. 1: Annalyi. Malyie proizvedeniya [Works: in 2 volumes. Vol. 1: Annales]. Leningrad, 444 p. [in Russian]

Ussing, 1878 – *Ussing, I.* (1878). Vospitanie i obuchenie u grekov i rimlyan [Upbringing and Education of the Greeks and the Romans]. SPb. XIV, 175 p. [in Russian]

Utchenko, 1972 – *Utchenko, S.L.* (1972). Tsitseron i ego vremya [Cicero and his Time]. Moscow. 390 p. [in Russian]

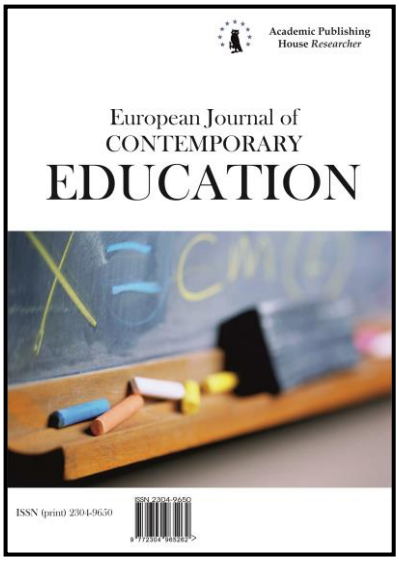
Watts, 2019 – *Watts E.* (2019). Obrazovaniye v pozdnei Antichnosti: obshcheniye, mysl i sotsializatsiya [Speaking, Thinking, and Socializing: Education in Late Entiquity]. *Hypothekai,* 3: 306–338. [in Russian]

Winniczuk, 1988 – *Winniczuk, L.* (1988). Lyudi, nravyi i obyichai Drevney Gretsii i Rima [People, Morals, Habits and Customs of Ancient Greece and Rome]. Moscow. 496 p. [in Russian]

Zhurakovsky, 1940 – *Zhurakovsky, G.E.* (1940). Ocherki po istorii antichnoy pedagogiki [Feature-stories on the History of Ancient Education]. Moscow. 472 p. [in Russian]

Ziegler, 1911 – *Ziegler, T.* (1911). Istoriya pedagogiki [The History of Education]. Spb.; Kyiv. [2], VIII, 501 p. [in Russian]

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 246-251
DOI: 10.13187/ejced.2021.1.246
www.ejournal1.com



Emergence of the Russian Public Education System in the Patriarchal Era (1593–1721)

Olga V. Natolochnaya [a, b, *], Ruslan M. Allalyev [c], Vladimir A. Svechnikov [d], Svetlana V. Petrova [e]

[a] Cherkas Global University (International Network Center for Fundamental and Applied Research), Washington, USA
[b] Volgograd State University, Russian Federation
[c] Peoples' Friendship University of Russia, Moscow, Russian Federation
[d] Plekhanov Russian University of Economics, Russian Federation
[e] Sochi State University, Russian Federation

Abstract

The paper explores the complicated path the emerging public education system took in the patriarchate period spanning from 1593 to 1721. It focuses on efforts to establish educational institutions in Russia and the role of the Orthodox Church as a protector of its flock from foreign religious influence.

The materials used include works on the history of the public education system, created in Pre-Petrine Russia. The methodology of the research was based on the principles of historicism, system analysis and objectivity. With the scarce number of sources, we also widely utilized the descriptive method to rebuild as a complete picture of events as possible to show how the public education system evolved in Russia in the period from 1593 to 1721.

As a summary, the authors point out that the emergence of public education in Russia's patriarchal period had distinctive features. According to the authors, these comprise attempts by the Orthodox Church to pioneer its own way in matters related to the preservation of the old world order. Maneuvering their way between Greeks and Latins, first centers of religious education in Russia suffered considerable harm, and the controversies caused the expulsion of the Likhud brothers from Moscow. In addition, as early as at the end of the patriarchal period, attempts were made to confer powers of a medieval inquisition on the Moscow Academy to combat dissent in the theological community.

Keywords: public education, patriarchal period, Russia, Tsar Fyodor, Likhud Brothers.

1. Introduction

* Corresponding author
E-mail addresses: incfar.natolochnaya@gmail.com (O.V. Natolochnaya)

The emergence of the public education system in Russia in the Pre-Petrine period is a cavalcade of tangled socio-economic upheavals and challenges, contextualized in a specific historical situation. On the one hand, all Christian teachings reckoned on the religious education of their own flock, and on the other hand, they went into fairly harsh competition to win the flock over. Pre-Petrine Russia, affected by the nearly total lack of pedagogical staff, had to engage scholars from other countries, and this was one of its major pain points throughout the entire patriarchate period.

2. Materials and methods

For materials, we reviewed works on the history of public education in Russia in the Pre-Petrine period, as well as the Law Code (Sobornoye Ulozheniye) of 1649. The methodology of the research was based on the principles of historicism, system analysis and objectivity. With the scarce number of sources, we also widely utilized the descriptive method to rebuild as complete picture of events as possible to show how the public education system evolved in Russia in the period from 1593 to 1721.

3. Discussion

The subject under review has quite extensive historiography. The major works include A. Gorsky's "On theological schools in Moscow in the 17th century" (Gorskii, 1845), as well as S.K. Smirnov's "History of the Moscow Slavic-Greek-Latin Academy" (Smirnov, 1855). 1854 saw the publication of N.A. Lavrovsky's thesis "On the ancient Russian schools" (Lavrovskii, 1854), later – I. Kupriyanov' article "Notes on the history of enlightenment in Russia" (Kupriyanov, 1862). Other works worthy of note are: Rudnev "On education in Russia in the 16th and 17th centuries" (Rudnev, 1855), I.Ye. Zabelin "Nature of early public education in Russia" (Zabelin, 1856), D.L. Mordovtsev "On Russian school books of the 17th century" (Mordovtsev, 1862).

4. Results

The Patriarchal See was established in Russia in 1593 (Gorskii, 1845: 151) and existed until its abolition by Emperor Peter the Great. In the late 16th and first half of the 17th centuries, no system of public education operated in Russia. According to the accounts of explorers who traveled to Russia in the early 17th century, "the Russian people knows neither schools nor universities. Some priests – it must be said few pursue the activity – instruct the youth in reading and writing" (Mirkovich, 1878: 3). Russia's one of the first schools was founded by Arseny the Greek and taught young people Greek and Latin. The event is estimated to take place in 1649. Until that time, children's education was provided informally by so-called learned people (*gramoteis*), and this experience was typical for many European and Russian regions (Mamadaliev et al., 2019; Cherkasov et al., 2019; Cherkasov et al., 2020). We should note that following the establishment of the Patriarchal See in Russia, attempts were almost immediately made to expand the education system. This was in part caused by the council of Eastern patriarchs who recommended to use every endeavor at a local level so that the Russian flock studied the Bible and Holy Scriptures. Acting on the patriarchs' advice, Boris Godunov, after he had been crowned tsar, decided to amplify the education system. He intended not only to introduce elementary schools, but also to create a university. As he faced the shortage of the teaching staff, to handle the issue, Boris Godunov sent 18 people to Europe to study various arts and languages, and additionally, invited German scholars. However, Boris Godunov's educational initiatives very quickly came into collision with the Orthodox Church – the church argued the invitation of European scholars would eventually disrupt the community of religion and consensus of opinion, which formed in Russian society. Boris Godunov had to take the priesthood's position into consideration.

The first documented establishment of a school took place in 1649. The school was patronized by Fyodor Mikhailovich Rtishchev and opened at the St. Andrew Monastery (Andreevsky Monastery) (Gorskii, 1845: 155). The school invited monks trained in Slavic and Greek grammar, rhetoric and philosophy as teachers. Epiphanius Slavinetsky (expert in Greek and Latin), Arseny Satanovsky, Damaskin Ptitsky, monk Isaiah and others were most renowned among the monks (Mirkovich, 1878: 8). However, the primary mission of the monks was not to "teach liberal arts" but translate the Bible into Slavonic. To enhance the efficiency of the work on translations, the monks were assigned to different monasteries, and the school was moved from the St. Andrew

Monastery to the Chudov Monastery. Epiphanius Slavinetsky was appointed rector of the school. The efforts of another devotee, Arseny the Greek, facilitated the introduction linguistics into the curriculum in Moscow. However, by the 1660s, both schools were in complete disarray, because a number of critics came forward who opposed the correction and reprinting of the books and accused the teaching staff of distorting ancient Orthodoxy (Gorskii, 1845: 158-159).

In 1665, the Spasskaya School was opened in Moscow by Symeon of Polotsk. It was aimed at educating young people of the Privy Prikaz (Prikaz tainyh del), i.e. the sovereign's own chancellery. Given the fact that the school did not enroll children, it delivered secondary education, at a minimum, rather than an elementary school curriculum. Students at the Spasskaya School were trained in poetics, rhetoric, and practiced composing verses and orations. Latin was one of the principal disciplines, while Greek was not studied at all. Nevertheless, the school did not last long as well and was closed down about 1672.

In 1679, Tsar Fyodor III Alekseevich established a Printing Greek School that was reorganized into an academy a few years later (Mirkovich, 1878: 17). The school enrolled 30 pupils from various social estates (Gorskii, 1845: 174). In its first years, the school was surrounded by fierce controversy concerning the risks of teaching Latin, as alien to Orthodox Russians and the benefits of Greek. The polemic arose not without reason... The point was that when it came to the project to open an academy in Moscow, a question immediately ensued where to recruit a sufficient number of teachers. Of course, Moscow had no required teachers. Inviting foreigners was fraught with danger as the latter could potentially implant an alien religion, and sending Russians abroad for training was also risky, because such students could, in turn, adopt a foreign religion.

We should understand that after the fall of the Byzantine Empire, Greek education degenerated into decline, and Greeks were forced in the 16th century to go to Latins in Venice, Padua and other places to receive education. These individuals, subsequently gave rise to a whole group of scholars (for example, Epiphanius Slavinetsky) in Left-Bank Ukraine, who took guidance from Latin education. As early as in the 17th century, the books received from Greece were regarded in Moscow as cautiously as books from Left-Bank Ukraine: Muscovites viewed their own translations of holy books as more accurate than Greek originals, especially in the form in which they were published in Venice, Rome, Paris and other places (Mirkovich, 1878: 32-33).

In other words, both Greeks and natives of Western Russia had little credibility among Muscovites in the second half of the 17th century. Naturally, Muscovy faced a dilemma – whom to choose as teachers? Who are better, or rather, who are worse of the foreigners? Greeks could offer only one advantage, meaning the authority of the Eastern patriarchs. The latter, as "pillars of Orthodoxy", constituted the supreme, albeit not absolute, authority in matters of faith at the time. As a result, preference was given to Greeks (Gorskii, 1845: 178).

But before the request was dispatched to the patriarchs to send teachers, a scholarly privilege (*privilegirovannaya gramota*) was issued for the academy (Mordovtsev, 1862: 44). The privilege was comprised of 18 clauses, and granted a broad range of rights and benefits to the academy. The academy syllabus was planned to include both secular and religious disciplines – from grammar, poetics, rhetoric, dialectics, rational, natural and moral philosophy, to theology (Gorskii, 1845: 180-181). In addition, courses of ecclesiastical and civil law were supposed to be delivered. The academy was organized inside the compound of the Zaikonospassky Monastery, in Kitay-gorod. Funding for the academy's teaching staff was provided by an entire group of church institutions, along with the Zaikonospassky Monastery, money was also allocated by the St. John the Theologian Monastery (Pereslavl-Ryazansky uezd), St.Andrew Monastery (Andreevsky Monastery on the Moscow River), Trinity Monastery of Stromyn (Stromynsky-Troitsky Monastery), St. Nicholas Monastery on the Peshnosha River (Peshnoshsky-Nikolaevsky Monastery), St. Boris and St. Gleb Monastery (Borisoglebsky Monastery), as well as Medvedeva Pustyn. Besides, the tsar granted from his own behalf income from the Vyshegorodskaya Palace Volost and nine waste plots of land. Moreover, private donations were also used (Mirkovich, 1878: 34).

A strict supervision system was put in place to keep an eye on the teaching staff. Only Orthodox Russians or Greeks could apply for a teaching position, but no Greeks were accepted otherwise than on the grounds of the testimony about their strong Orthodox faith, signed by the ecumenical patriarchs, and only after clear assurance was obtained that the applicant had no bent for heresies. Scientists from Left-Bank Ukraine and Lithuania were allowed to teach only if they

had passed an extremely rigorous selection procedure. New converts from other religions had no opportunity to join the academy.

The overseer and teachers should, as required by the privilege, kiss the cross (take an oath – Auth.) that they would deeply and unfailingly profess the Orthodox faith, guard and protect it from the invasion of all other faiths and heresies; in case of violation of the cross-kissing oath, the charter stipulated to punish oath-breakers by stripping them of ranks and titles, and in the case of blasphemy against the Orthodox faith – by burning without mercy (Mirkovich, 1878: 35).

The academy admitted orthodox students of all estates, ranks and ages. Only pious sciences were permitted to the curriculum, and the ones unauthorized by the church, such as "natural magic", were strictly prohibited; studies in the latter, as was ordained, entailed execution by burning at the stake for both teachers and students as magicians, without any mercy. Hiring teachers of foreign languages for work at home was also prohibited – children were required to send to the academy to study foreign languages.

All individuals, related to the academy, both the teaching staff and students, were transferred from the jurisdiction all other people were subject to. The academy was entitled to mete out justice independently. For example, if students ran up debts, the collection was cancelled until after the end of education not to interfere with learning process. All non-criminal offences of students were examined by academy teachers, while criminal cases were handed over to a civil court. If the overseer himself (rector – Auth.) was suspected of a crime, he was tried by teachers, and a teacher was tried by the overseer and other teachers (Gorskii, 1845: 183). Teachers could not seek other employment at their own discretion, and were awarded a pension for a long record of service at the academy. After graduation, the best students were excellently positioned to build a career as civil servants.

The academy also performed other important functions. All scientists who arrived from abroad to join the tsar's service had to take an exam at the academy and could be hired only upon approval. The teaching staff was also responsible to monitor that no doubters who put in question the Orthodox faith appeared in Moscow, that sceptics did not fuel strife and discord; all such persons were to be reported to the tsar. In addition, the teaching staff was put in charge of watching over that no one kept Polish, Latin, Lutheran and Calvinist heretical books, as well as magic, witchcraft, fortune-telling and other books outlawed by the church.

All those who abandoned their religions for sake of Orthodoxy were closely supervised by the teaching staff; they were registered on special lists. If it was found out that a recent convert did not devotedly follow it, the guilty were exiled to Siberia, and if they persisted in their old beliefs, they were burned. If any foreigner or a Russian was charged of committing blasphemy against the Orthodox faith, and the accusation of the academy court was just, the person was then sentenced to the death by burning. If any foreigner was previously of the Orthodox faith, and later, as they arrived in Russia, were baptized a Roman, Lutheran, Calvinist Christians or accepted some other faith, he was burned. Conversion from the Roman faith to Lutheranism was subject to exile to Siberia. All these provisions were enshrined in the privilege of the academy (Mirkovich, 1878: 36). As an important reminder, the sentence to death by fire for blasphemy against the Orthodox faith was fully copied from Article 1, Chapter 1 of the Law Code of 1649 (Sobornoe ulozhenie, 1961: 70).

The construction of a building was planned to be financed from the state budget.

Hence, the Moscow Academy was created for the benefit of the church to combat dissent in religious matters. The Moscow Academy, as envisioned by Tsar Fyodor, was a citadel built by the Orthodox Church in the face of the unavoidable clash with the heterodox West; this was not only a school, it was an inquisitional organization. It is also good to emphasize that the scholarly privilege was not a charter of the educational institution. Apparently, the privilege was formulated by Symeon of Polotsk; a combination of circumstances indicated this fact: the academy was supposed to be opened in the Zaikonospassky Monastery where Symeon lived (it was there where he ran a privy prikaz school, which, in all probability, was planned to be transformed into an academy). More over, the school's additional functions were more suitable for an operational investigative department than an educational institution.

Unluckily, August 25, 1680 saw the death of Symeon of Polotsk. Two years later, Tsar Fyodor Alekseevich also dies. The tsar's demise sparked off the Streltsy Uprising, and riots among dissenting sectarians, schismatics, occurred. The events hindered the opening of the academy (Gorskii, 1845: 185). When the time of troubles ended, first (in 1683) a disciple of Epiphanius, Karion Istomin, hierodeacon of the Chudov Monastery, and later (in 1685) a disciple of Symeon of

Polotsk, by the name of Medvedev, submitted their requests to Tsarevna Sophia to institute an academy as envisioned by Tsar Fyodor. However, their attempts were unsuccessful, and one explanation may be that at that time teachers from Greece was already expected to arrive, and before the arrival, opening an academy was considered premature.

A request for teachers from Greece was sent by Tsar Fyodor Alekseevich in 1681 and delivered to the Patriarchs of Constantinople, Alexandria and Antioch. In March 1683, two learned educators, brothers Ioannicus and Sophronius Likhud, arrived from Venice to Constantinople (Gorskii, 1845: 188). After they had spent 5 months preaching at the cathedral church and taken an examination, Patriarch Dionysius of Constantinople, with the consent of other patriarchs, recommended them to the Russian tsar. The Likhud brothers accepted the patriarchs' proposal and set out on the journey to Russia. On arrival in Moscow on March 6, 1685, they were taken to the Ambassadorial Prikaz (Posolsky prikaz) and were for two days interrogated on their reasons to visit Moscow, and on the third day they were invited by Tsars John and Peter and Tsarevna Sophia to a royal reception.

Specifically for educational purposes, a school was built at the Epiphany Monastery (Bogoyavlensky Monastery), and as soon as it was commissioned, the Greeks began instruction. The first students were five first grade pupils of the Printing School, soon two more students joined the group. However, the tight premises at the Epiphany Monastery were criticized by the Likhud brothers, who insisted on opening an academy in accordance with the scholarly privilege of Tsar Fyodor. The Moscow government could not afford the spending, and the initiative was put to life thanks to donations, including by Prince Vasily Vasilyevich Golitsyn. When the building was completed and inaugurated, the educational process began. As a result, the first higher theological educational institution was established.

All other students of the Printing School were transferred to the new building, and furthermore, over 40 boyar children were added to the number (Gorskii, 1845: 190), as well as members of the Moscow clergy. The debates on the principal language was renewed after the opening of the academy, but the Likhud brothers advocated the need for both languages. The academy's curriculum featured a fairly large range of disciplines, but the problem was that there were no respective manuals and guidebooks at all, and the brothers had to first write the guidebooks and then introduce the corresponding discipline. The first class – grammar – was opened in 1687, later followed by classes in poetics, rhetoric, logic and physics. The instruction language for grammar and poetics was Greek, while rhetoric, logic and physics were taught both in Greek and Latin. The students demonstrated such considerable advances that they completed the study of the subjects in three years, could speak the languages fluently and even translated several books into Slavonic.

The Likhud brothers took no time to rest as they were eager to cover the entire academic program, so they published manuals and guidebooks one by one with no intervals. Even when he was on a visit to Venice, where went in 1688, Ioannicus wrote guidebooks on psychology and physics. Overall, the period from 1686 to 1693 saw the publication of 6 manuals and guidebooks. To ensure a quicker and better understanding of dialectical techniques by students, the Likhud brothers arranged training disputations that were typically held on Sundays and holidays. The academy introduced and practiced a peer support process, when senior grade students helped younger ones, and this explains the significant success of the academy.

The Likhuds had access to the tsar's library, and the academy itself also had a library housing 603 copies of manuscripts and printed books in Greek, Latin, German and Polish. Despite all their rigorous efforts, the Likhud brothers finished only half of the academic program. After that they were removed from the academy and sent to serve exile to the Hypatian Monastery in Kostroma in the early 1700s (Gorskii, 1845: 195). However, their hard work was not fruitless; in 1706, Metropolitan Job of Novgorod and Staraya Russa petitioned and obtained permission to invite them to Novgorod to organize a school. As early as in the first year of the school's operation, they opened a Latin class there. Meanwhile, Moscow was increasingly affected by a shortage of learned scholars, and as a result first Sophronius, and later Ioannicus was transferred to Moscow. However, Ioannicus died as early as August 7, 1717, at the age of 84. He was buried in the undercroft of the Zaikonospassky Monastery.

In the meantime, Sophronius continued both with his teaching efforts and non-educational activities. One of his key non-educational activities was revising biblical texts of the Old Testament

books. Sophronius was engaged in this project from 1712 to 1723, and in 1723 his was elevated to the rank of archimandrite and appointed administrator of a Ryazan monastery in recognition of his services. Sophronius died on July 15, 1730, at the age of 78 (Mirkovich, 1878: 60). In 1721 the central administration of the Russian church was handed over to the Holy Synod, which marked the end of the patriarchal period.

5. Conclusion

As a summary, we would like to point out that the emergence of public education in Russia's patriarchal period had distinctive features. In our opinion, these comprise attempts by the Orthodox Church to pioneer its own way in matters related to the preservation of the old world order. Maneuvering their way between Greeks and Latins, first centers of religious education in Russia suffered considerable harm, which made the expulsion of the Likhud Brothers from Moscow inevitable. In addition, as early as at the end of the patriarchate period, attempts were made to confer powers of a medieval inquisition on the Moscow Academy to combat dissent in the theological community.

References

Cherkasov et al., 2019 – *Cherkasov, A.A., Bratanovskii, S.N., Koroleva, L.A., Zimovets, L.G.* (2019). Development of school education in the Vologda governorate (1725-1917). Part 1. *European Journal of Contemporary Education*. 8(1): 208-214.

Cherkasov et al., 2020 – *Cherkasov, A.A., Bratanovskii, S.N., Koroleva, L.A.* (2020). The Public Education System in Voronezh Governorate in the Period 1703–1917. Part 1. *European Journal of Contemporary Education*. 9(1): 202-211.

Gorskii, 1845 – *Gorskii, A.* (1845). O dukhovnykh uchilishchakh v Moskve, v XVII stoletii [On theological schools in Moscow, in the 17th century]. Pribavleniya k Tvoreniyam sv. Ottsov. Ch. 3. Kn. 2. Pp. 147-197. [in Russian]

Kupriyanov, 1862 – *Kupriyanov, I.* (1862). Zametki dlya istorii prosveshcheniya v Rossii [Notes for the history of education in Russia]. *Sankt-Peterburgskie vedomosti*. 163. [in Russian]

Lavrovskii, 1854 – *Lavrovskii, N.A.* (1854). O drevne-russkikh uchilishchakh [About ancient Russian schools]. Khar'kov. [in Russian]

Mamadaliev et al., 2019 – *Mamadaliev, A.M., Svechnikova, N.V., Miku, N.V., Médico, A.* (2019). The German System of Public Education in the Period between the 15th and Early 20th Centuries. Part 1. *European Journal of Contemporary Education*. 8(2): 445-453.

Mirkovich, 1878 – *Mirkovich, G.* (1878). O shkolakh i prosveshchenii v patriarshii period [About schools and education in the patriarchal period]. *ZhMNP*. 7: 1-62. [in Russian]

Mordovtsev, 1862 – *Mordovtsev, D.L.* (1862). O russkikh shkol'nykh knigakh XVII veka [About Russian school books of the 17th century]. Moskva, 1862. [in Russian]

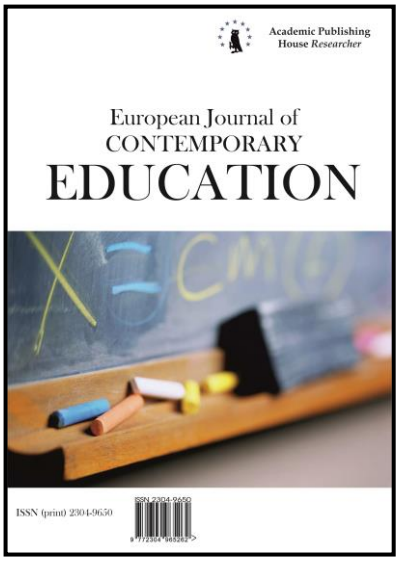
Rudnev, 1855 – *Rudnev* (1855). O vospitanii v Rossii v XVI i XVII vekakh [About education in Russia in the XVI and XVII centuries]. *Biblioteka dlya chteniya*. 8. [in Russian]

Smirnov, 1855 – *Smirnov, S.K.* (1855). Istoriya Moskovskoi slavyano-greko-latinskoi akademii [The history of the Moscow slavic-greek-latin academy]. Moskva. [in Russian]

Sobornoe ulozhenie, 1961 – Sobornoe ulozhenie 1649 g. Moskva, 1961. [in Russian]

Zabelin, 1856 – *Zabelin, I.E.* (1856). Kharakter drevne-narodnogo obrazovaniya v Rossii [The nature of the ancient public education in Russia]. *Otechestvennye zapiski*. 3. [in Russian]

Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2021, 10(1): 252-269
DOI: 10.13187/ejced.2021.1.252
www.ejournal1.com



On the History of the Pedagogical Thought in South Russia: Pedagogical Views of Major Pedagogues at the Novocherkassk Gymnasium in the 19th century. Part IV

Artyom Yu. Peretyatko [a, b, *], Teymur E. Zulfugarzade [c]

[a] Cherkas Global University (International Network Center for Fundamental and Applied Research), Washington, USA
[b] Volgograd State University, Volgograd, Russian Federation
[c] Russian Economic University named after G.V. Plekhanov, Moscow, Russian Federation

Abstract

Recent years have witnessed the publication of a variety of scholarly papers highlighting region-specific peculiarities of education in the Russian Empire. However, they tend to focus on statistical information regarding the number of schools, the number of students, etc. Therefore, theoretical and pedagogical views and unique features of the methodological work done by major provincial teachers remain poorly researched. The paper discusses the case study of the Novocherkassk Gymnasium that was the most prominent scientific and educational center in the Don region in the 19th century and that boasted a teaching personnel of renowned local figures. Remarkably, the material on the actual pedagogical process in the gymnasium was already collected before 1917, mainly in the initiative to celebrate the facility's centenary, and as many appropriate documents lacked, much attention was paid to gathering information from former gymnasium students. As a result, the knowledge of real teaching practices used in the gymnasium is based both on official documents and on oral, often critical, accounts by contemporaries of its teachers, and the group of teachers include persons who played an important role in the Don history.

The third part of the paper analyzes the crisis at the turn of the 1870–1880s, when the Novocherkassk Gymnasium ceased to exist in its initial form. This was the outcome of the conflict between teachers with opposing pedagogical views. In respond to the snowballing problems with the discipline among students, the gymnasium's teaching staff splintered into two groups. The first one was led by gymnasium inspector M.K. Kalmykov, a prominent Don educator and author of a textbook on Russian literature. This group rallied local community support and believed that discipline issues should be addressed by engaging students in extracurricular activities. The leader of the second one was D.F. Shcheglov, the gymnasium's new director and author of works on the

* Corresponding author
E-mail addresses: ArtPeretatko@yandex.ru (A.Yu. Peretyatko)

history of social doctrines, who came to the Don Host Oblast from another region. His supporters insisted only on punitive measures intended to teach children to be "serious". The conflict ended when both groups discredited each other and most their members were dismissed, which ultimately destroyed the gymnasium's authority as the most important cultural, research and educational center of the Don Host.

Keywords: history of pedagogy, teaching methods, historical pedagogical views, Novocherkassk Gymnasium, S.S. Kalmykov, D.F. Shcheglov.

1. Introduction

In 1907, the Don Host's regional printing house published a substantial book by priest I.P. Artinskii, which described the history of the Novocherkassk Gymnasium. The author specifically emphasized in the preface that "the word 'gymnasium' in the title of the treatise is also defined using the adjective 'military', in addition to the attribute 'Novocherkassk'" (Artinskii, 1907: V). Indeed, the Novocherkassk Gymnasium was a center of thought first for the Land and later for the Oblast of the Don Host over many years, and its graduates and teachers included the majority of Don academics, writers and public figures of the 19th century. It is hardly surprising that for the gymnasium's 100th anniversary in 1905, the local authorities made efforts to uncover and structure materials on the history of the institution. It early became clear that only few such materials survived: the gymnasium archive was damaged in fire in 1858, later its files and records were actively sold out by negligent employees, and most gymnasium directors failed to keep systematic records of their activities (Artinskii, 1907: IV). In this situation, the pedagogical council decided to ask I.P. Artinskii to help find information on the gymnasium's past, and to this end, the latter contacted Don historians and local lore experts, many of whom once were students at the institution (Artinskii, 1907: IV). The outcome of the request was Artinskii's book that was, therefore, based not only on official information, but also on the accounts provided by former students of the Novocherkassk Gymnasium.

We should say that I.P. Artinskii was not the first person whom the lack of sources on the history of the Don education prompted to use eyewitness accounts, the "oral history", as defined by modern terminology. In 1859, a small book "Essays of the Don" by A.G. Filonov, which brought to light interesting facts from the past and present of the Don Cossacks in a somewhat haphazard manner. The last of the essays was entitled "Educational Institutions on the Don (from 1790 to 1807)" and was grounded, among other things, in the "unwritten accounts" given by several old men, of whom the author specifically singled out Esaul M.O. Nazarov, who in 1790 was accepted into the Don Principal Public School, later re-organized into the Novocherkassk Gymnasium (Filonov, 1859: 151-152).

So, we can now benefit from a fascinating first-hand source of information on the Don Host's most important educational facility of the 19th century, a center of the intellectual life of the Don Cossacks. We thought it might be valuable to systematize the available evidence of how influential figures in the Don history carried on their teaching practice in the Novocherkassk Gymnasium and what theoretical pedagogical views they conveyed. It is also noteworthy that, as we will see below, for all its major role in the region, the Novocherkassk Gymnasium was rather an ordinary provincial school for the Russian Empire, and, moreover, the one that was chronically underfunded. With our research, we will be able to take a glance at famous Don figures from an unexpected angle by reviewing their pedagogical talents, as well as to better understand what methodology served as a basis for the learning process in the Russian province of the last century.

A relevant note should be made here that historians have become markedly more interested in recent years in studying the region-specific features of pre-revolutionary education in Russia. Articles and article series on the education system development in the Vilna Governorate (Natolochnaya et al., 2019a; Natolochnaya et al., 2019b), Vologda Governorate (Cherkasov et al., 2019a; Cherkasov et al., 2019b; Cherkasov et al., 2019c; Cherkasov et al., 2019d), and in the Caucasus (Shevchenko et al., 2016) have been published in recent years. Researchers are also striving to identify features of the primary education system in the Cossack territories (Molchanova et al., 2019a; Molchanova et al., 2019b; Molchanova et al., 2020). On the other hand, the experience of individual provincial pedagogues, which was greatly appreciated by contemporaries, has received only cursory learned attention so far. However, the large number of outstanding

graduates of the Novocherkassk Gymnasium shows that the experience deserves careful examination, at the very least.

2. Materials and methods

In the fourth part of our paper, we will speak about the major crisis that evolved in the Novocherkassk Gymnasium from 1870 to 1880, the crisis engendered by a conflict between its teachers who adhered to differing pedagogical views. Although the publication activity of gymnasium teachers dropped visibly at the time as compared to the previous period, the leader of one of the opposing groups, M.K. Kalmykov, authored a very non-typical textbook on Russian literature (Kalmykov, 1880). His adversary, D.F. Shcheglov, in fact published a book that achieved certain popularity across Russia – "History of social systems from ancient times to the present day," and although it largely focused on history and philosophy, rather than pedagogy, it still discussed the issues of school education (Shcheglov, 1870; Shcheglov, 1889). Thanks to the books, we can develop very accurate insights into the general pedagogical views of the Novocherkassk Gymnasium teachers in the period under review.

As for the specific teaching practices that were predominantly used in the gymnasium at the time, the most reliable source here is, of course, the book by I.P. Artinskii, who personally met with eyewitnesses of the years (Artinskii, 1907). However, much more information can be uncovered in the short novel by A.I. Kosorotov "Tower of Babel. History of one gymnasium" (Kosorotov, 1900), dedicated to the events under review. Unfortunately, this is a work of fiction, although it was appreciated by I.P. Artinskii for its credibility. As a result, individual statements it ascribed to the Don teachers can be inaccurate, and some of the events are hyperbolized. Nevertheless, all significant events, described by A.I. Kosorotov, can be verified in other sources, and he himself studied in the gymnasium at the time under review.

By using the historical comparative method to compare the sources with each other and with a number of other materials of minor significance, by resorting to the historical descriptive method to trace events depicted in them and by extensively applying the historical biographical method, we will try to understand what general pedagogical theories and specific pedagogical practices brought about the sharpest conflict between Novocherkassk teachers from 1870 to 1880.

3. Discussion

The difficulties the Novocherkassk Gymnasium encountered in 1870 were not linked solely to criticism from above and disastrous performance of some of its graduates at university admission exams. The group of young teachers who just began their career in the gymnasium, once again started to show mediators of new ideas, who did not see eye to eye with S.S. Robush. A.I. Kosorotov defined them as opponents of the "barbarity" that pervaded classrooms, as "people who shared their antipathy to the patriarchal order and poor civility of students" (Kosorotov, 1900: 67-68). One of the teachers was even involved in a direct conflict with the director, and we should have a closer look on the episode.

As a reminder, D.F. Shcheglov, who later headed the Novocherkassk gymnasium, singled out a certain "Mister Polyakov" in the teaching staff as the only person who made efforts to stop the spread of revolutionary literature in the student dormitory apartment (Shcheglov, 2010: 5). However, most other authors, who wrote about the gymnasium, did not mention the "Mister Polyakov" either in a positive or a negative context. The reasons are revealed in I.P. Artinskii's work: even this monumental piece of work contains only few references to the name of "Polyakov I.G., a child in a family the Don Host company officer," and the biographies of the gymnasium staff point out that he was unable to pass the exam for "a teacher qualification" even after sixteen years of teaching mathematics (Artinskii, 1907: 328). I.G. Polyakov had neither outstanding students nor serious research works, gymnasium students could not evoke good memories of him, and therefore no one, except the notorious D.F. Shcheglov, felt any need to remember the teacher after his dismissal.

Nevertheless, I.G. Polyakov who might arouse anger among both students and colleagues, appeared to be rather a prominent figure in the Novocherkassk Gymnasium in the 1870s. He was extensively described by A.I. Kosorotov in his "Tower of Babel," where he was introduced under the name of "mathematics teacher Gavril Ivanovich Korolev" (Kosorotov, 1900: 68). This serves as another confirmation that A.I. Kosorotov short novel deserves our credit as a source on the history of the Novocherkassk Gymnasium because the pedagogical ideals of G.I. Korolev/I.G. Polyakov,

which it highlights, are fully consistent with information from other sources. A former student of the Novocherkassk Gymnasium wrote the following about his mentor: “Gavrila Korolev was an ardent supporter of the toughest possible police control and went more frequently by the nickname “Radical” than by his own name. He knew of the nickname, had much pride of it, and often would say to his students with a businesslike frown, adjusting his gold glasses: “You are not mistaken, yes, you are not mistaken: in my stance towards vices, I am indeed a rrradical!...”. His favorite sport was hanging around outside at night and spying on gymnasium students” (Kosorotov, 1900: 68). The author may seem to somewhat caricature the portrait, but it explains well why I.G. Polyakov managed to uncover some sedition in the shared student apartment (that, by the way, was established by S.S. Robush for poor students), while, for example, I.P. Artinskii said the dwelling provided “the desired correspondence between the requirements and needs of student life” (Artinskii, 1907: 214-216). It should come as no surprise that I.G. Polyakov provoked unconcealed vexation in S.S. Robush, who covered minor misdemeanors of students. D.F. Shcheglov even wrote about the “persecution of the teacher” orchestrated by the Jewish director (Shcheglov, 2010: 5). More details of their conflict are provided by A.I. Kosorotov. In his interpretation, “Radical” received threats of beating from unknown persons unless he stopped spying on gymnasium students, but the self-confident and strong teacher not only remained undismayed, but also demonstrated his own muscles to his older students, claiming that such threats were just “ridiculous” (Kosorotov, 1900: 68). However, the teacher was indeed beaten on the same night, and after that he ran to the director to complain about the incident (Kosorotov, 1900: 69). But to the math teacher's insistent appeals that he “suffered for the truth,” and it was then necessary to “find and punish the culprits,” the head of the gymnasium only recommended “to leave it at that without action,” and in addition hinted that “Radical” “had already got enough from pupils of what <he > deserved” (Kosorotov, 1900: 69). We should emphasize the fact that this description belongs to a former gymnasium student who had no liking for I.G. Polyakov at all. But even the portrait makes it clear that Novocherkassk gymnasium students openly beat the teacher, who tried to maintain strict control over their “barbarous” behaviors, and the affair was hushed up by S.S. Robush. No matter how I.G. Polyakov's personality was assessed, the incident was ugly, and showed signs of much trouble in the future, as the group of those supporting new pedagogical views grew.

One factor made the situation in the Novocherkassk Gymnasium a totally confused tangle – for the first time in the school's history, supporters of change in the educational process had diverge pedagogical views. A.I. Kosorotov wrote: young teachers, opponents of “patriarchy” in relations and “barbarity” of students, “completely disagreed with each other on the methods to fight the evil" (Kosorotov, 1900: 68). The writer contrasted the rude and physically strong “Radical” with a certain teacher of the Russian language, K.S. Vetkin, with hair “always neatly slicked” and “insinuating manners,” “whose manner to speak was insinuating as well,” and who, “contrary to the habit of all patriarchs, always was on formal terms even with the youngest pupils” (Kosorotov, 1900: 69). The name concealed a teacher of the Russian language, M.K. Kalmykov, another character with a significant role in the history of Don, who worked in the Novocherkassk Gymnasium. Like many his colleagues, he was a prominent local historian, the author of the books “Cherkassk and the Don Host in 1802, as described by De-Romano” (Cherkassk i Voysko Donskoye v 1802 godu, po opisaniyu De-Romano) (Kalmykov, 1896) and “Facts about the Kochetovsky dialect" (Svedeniy o kochetovskom govore) (Kalmykov, 1898). Present-day authors also refer to the works, but, unfortunately, without providing any review of either their features or the personality of their creator (Voskoboinikov, 2009: 566-574). For contemporaries, M.K. Kalmykov was above all a pedagogue. Although he did not achieve such appreciation in this field as S.S. Robush, A.A. Radonezhskii or A.G. Filonov, he was within the memory of his students for a long time, and I.P. Artinskii gives the following very indicative testimonial of the person: “The personality of the “idealistic” pedagogue, M.K. Kalmykov, merits special attention. <...>. Born and received education on the Don (graduated from the Novocherkassk Gymnasium with a gold medal in 1865), M.K. devoted all his wealth of vigor and talents to his home land, and he gained consolation in return – of enjoying the favor, like few teachers, both of his students and of the local society” (Artinskii, 1907: 234).

It was the term “idealism” and its derivatives that dominated almost all reminiscences of M.K. Kalmykov, provided by students. The most negative recollections belong to A.I. Kosorotov, and are very emphatic: “In the teachers' council, he repeatedly spoke about the need to take some

special measures to alleviate the established setup. Each measure was more idealistic than the last. He most often called for immediate and broad introduction of arts of all kinds with public competitions and prizes for the best" (Kosorotov, 1900: 70). Much more sympathy for the teacher of Russian literature was shown by A.I. Petrovskii, future Don Host deputy to the State Duma of the Russian Empire: "His attitudes towards students, devoid of any sweet talk and sentimentality, were permeated with love and looked more like attitudes of an older friend rather than a boss. I remember him often calling us "lads"... <...>. Lack of dryness, encyclopedic erudition, which enabled M.K. to touch on all sorts of issues – of morals, everyday matters, economy – in his explanations on what they read, made his lectures true to life and interesting" (Petrovskii, 1902: 3). Despite this, even A.I. Petrovskii admitted that M.K. Kalmykov could cry in front of his students and, with tears in his eyes, read them the poems by V.A. Zhukovsky that "eternity – to vows, respect – to honor," in hope the lines would produce moral impact (Petrovskii, 1902: 3).

Our discussion of M.K. Kalmykov's pedagogical views would be incomplete without a brief analysis of the Russian literature textbook he wrote (Kalmykov, 1898). A.I. Petrovskii had the highest regard of the textbook, considering "brevity, clarity and simplicity" to be its "undoubted and major merits," generally characteristic of M.K. Kalmykov (Petrovskii, 1902: 3-4). Although we, in principle, agree with the statements, we should note that based on a set of parameters, M.K. Kalmykov's textbook demonstrated a reversion in the progress of the Don pedagogical thought, a lapse from the views of A.A. Radonezhskii and A.G. Filonov to the views of I.Ya. Zolotarev and A.G. Oridovsky. First, the textbook contained elements of the scholasticism that Don teachers of 1850–1860 struggled to root out, and what is more, the elements were included on the initiative of M.K. Kalmykov. For example, the entire introductory chapter in the new literature textbook was devoted to "Experimental psychology and logic," which was not specified by the ministerial program (Kalmykov, 1898: I). Meanwhile, "psychology" was interpreted by the author in a very odd way: he began its description with the statement that "a person consists of a body and a soul," and "our body is a sensible object, while the soul is invisible and intangible" (Kalmykov, 1898: 1). Further, children were asked to memorize that, as the body consists of organs, the soul consists of "psychic forces," which "are the following": "memory, imagination, mind, inner feelings, ability to desire and will" (Kalmykov, 1898: 1). We cannot but recall the reasoning by A.A. Radonezhskii that it was wrong to start teaching a subject with a dry and abstract theory, that children only grew to hate school if, instead of true-to-life and interesting knowledge, they were "shown abstruse hieroglyphs" (Radonezhskii, 1861: 101-102). Regrettably, M.K. Kalmykov was engrossed in scholasticism in the worst sense of the term – instead of, for example, introducing children into some psychological notions with illustrations from literary works, he philosophized on the differences between imagination in general and fantasy as the highest form of imagination, on the differences between religious, moral and aesthetic feeling, on the differences between ideas and concepts and on many other equally subtle and ambiguous differences (Kalmykov, 1898: 2-10). The textbook's literary part proper also included scholastic digressions of unclear value – e.g. the section on elegies inexplicably provided a general classification of people into those in whom "reason prevails over heart" ("such people, of course, are incapable of being lyrical poets"), those in whom "reason and heart were equally developed" (A.S. Pushkin), those in who "heart prevails over reason" (V.A. Zhukovsky) and people with "weak reason" and "weak religious feeling" (M.Yu. Lermontov) (Kalmykov, 1880: 86-87). M.K. Kalmykov offered no explanation at all why at literature lessons children should learn by heart the information that had nothing to do with literature. For this reason, although M.K. Kalmykov's textbook was really concise and written in plain language, it was excessively scholastic, and the author's abstract, sometimes incorrect theorizing was uppermost in the book, sidelining the history of literature and analysis of specific texts. In terms of more general issues, when you read the textbook, it gives you the impression that M.K. Kalmykov shared early pedagogical views of A.G. Oridovsky, and, instead of trying to develop lessons that met the demands of the time and student needs, he counted on an abstract "good education" that would "protect the soul from harmful influences" (Kalmykov, 1880: 2). The teacher gave no clear description of this "good education," but judging from everything we know about him it is apparent that the arts and humanities, especially literature, should be at the heart of in such upbringing. It is likely that sentimental and sensitive M.K. Kalmykov hoped that introducing pupils into the arts would cause the same effect on them as it did on him, and they would philosophize

over the pages of books on morality, ethics, types of personality and other universal human issues, while improving themselves and overcoming their "barbarity".

So, we can conclude that, unlike previous decades, when educator generations changed in the 1870s, pedagogical views of Novocherkassk teachers were now divided not into two, but into three camps. The majority still supported S.S. Robush's "patriarchal" pedagogy which assumed a robust "family atmosphere" in schools. However, some of the young teachers realized that it was just this form of pedagogy that gave birth to the student "barbarity," and engendered the rudeness and unwillingness to develop in many pupils, who understood that the administration would do its best not to expel them from the Novocherkassk Gymnasium as long as there was the least chance to retain a child. In these situation, some teachers began to advocate the need for change by ultimately tightening discipline and imposing "police control" over gymnasium students. But the splinter group did not include any significant figures, and, in fact, those, who supported the position, were treated almost as outcasts in Novocherkassk society, persecuted by S.S. Robush from above. Other young teachers, on the other hand, sought to cure the "barbarity" by developing students and showing them respect as individuals. This group of teachers was led by "idealistic pedagogue" M.K. Kalmykov, a distinguished author of textbooks, and later of books of local history. Unfortunately, his pedagogical talent was not as great as that of the Novocherkassk teachers of the late 1850s. M.K. Kalmykov advanced no solid plan to combat the "barbarity," and the information known about him makes us doubtful if he was at all capable of devising such a plan. Apparently, M.K. Kalmykov himself considered himself a person whose heart predominated over reason, he idealized such people, and as a consequence, was unable to efficiently systematize information even in a school textbook on a subject he taught for many years. The young teacher claimed broad generalizations and indefinite philosophizing, but in practice they turned out to be scholasticism and abstract theorizing, completely disconnected from reality. Another story, cited by A.I. Kosorotov is indicative in this respect. Even under the old administration, the teacher of Russian literature made an attempt to organize a dancing party with students invited from a women's gymnasium, hoping that "a feminine society appeases a man to the greatest extent" (Kosorotov, 1900: 70). "You're getting overwhelmed. It is already difficult to cope with these people without that," one of the senior teachers answered him. (Kosorotov, 1900: 70). These words proved to be prophetic as the Novocherkassk Gymnasium was ruined not only by supporters of police measures, but also, just as much, by "idealistic teachers" led by M.K. Kalmykov.

However, in the 1870s, even such a veteran educator as S.S. Robush exercised increasingly less and less control over the situation in the gymnasium. This does not mean that his efforts in these years yielded nothing – for example, the Novocherkassk Gymnasium finally obtained its own building in 1875 (Artinskii, 1907: 272-277), and several years earlier, the facility adopted such attributes of an up-to-date school as school record books and backpacks (Artinskii, 1907: 265). And still, S.S. Robush, who once spoke ironically of the fact that in the era of Nicholas 1, officials were more "preoccupied with collar insignias on the uniforms of gymnasium students" than with the spread of education on the Don, probably did not feel very comfortable to work in the changing conditions (Robush, 1863: 125). Pedantic administrative control by the authorities of the educational district and the Ministry of Public Education, which became considerably weaker in the late 1850–1860s, was tightened again (Artinskii, 1907: 265). And it became quite clear by 1876 that the problems with knowledge levels and discipline of gymnasium students, revealed in 1870, did not improve at all, but even worsened. Once again, a group of Novocherkassk Gymnasium graduates failed at admission exams to a higher educational institution, this time to the Institute of Transport Engineers; the quality of teaching of the essential subject in the gymnasium – ancient languages – was criticized by the authorities of the Kharkov Educational District; finally, two gymnasium students were proved guilty of theft (Artinskii, 1907: 281). Another major incident occurred in the same year, which was also prophetic for the future gymnasium – a teacher of ancient languages, I.O. Urban, was forced to leave Novocherkassk after "an actual threat from students" (Artinskii, 1907: 281). We should say, I.O. Urban was one of the most odious educators in South Russia. He was sacked from several gymnasiums under threat of physical violence until he settled down in Taganrog. P.P. Filevsky, the historiographer of the Taganrog Gymnasium, being a man of fairly conservative views, characterized I.O. Urban as follows: "He as if made it his duty to identify politically disloyal young people, and since he had the gift of seeing through a student, he almost always guessed right and pursued them without mercy" (Filevskii, 1906: 31). However,

irrespective of I.O. Urban's personal traits, the short period of his teaching in the Novocherkassk Gymnasium came as a warning sign. It manifestly showed that I.G. Polyakov, who demanded "the toughest possible police control" over gymnasium students, had now those near him at work who shared his position. And gymnasium students, spoiled by S.S. Robush's indulgent attitude towards their "barbarity," were ready to fight against such teachers using the most brutal methods, perhaps inspired by the beating of I.G. Polyakov they got away with.

As a result, the teaching staff in the Novocherkassk Gymnasium was greatly revised in the 1876–1878s, and in 1878, S.S. Robush left the school as well (Artinskii, 1907: 282). According to I.P. Artinskii, the staff revision was a mistake: "Robush's successor, as a consequence, had to maintain educational and disciplinary work in the Novocherkassk Gymnasium, with few exceptions, in cooperation with "new" teachers, who had little knowledge of the local conditions, customs and traditions, little knowledge of the established practices in the local gymnasium. And doesn't it explain why Robush's time is described by his contemporaries as the bright times of "patriarchalism" in the gymnasium, while the times of his closest successors left a painful recollection of the disorder to the same contemporaries, even described by the general name "Tower of Babel"? (Artinskii, 1907: 282). We can see the term "Tower of Babel" was used not only by A.I. Kosorotov to define the events in the Novocherkassk Gymnasium at the turn between the 1870s and 1880s. The latter, however, suggested a slightly different, i.e. more detailed periodization of its history – in his opinion, a "patriarchal" period was followed by a "scandalous" period, which in turn was followed by a period of "revelations and outcomes" (Kosorotov, 1900: 59-60). The former gymnasium student apparently applied the "Tower of Babel" to the last two periods. A.I. Kosorotov also had different ideas about the root causes of the Novocherkassk Gymnasium's troubles – he believed they were brought about both by the resignation of many old teachers, and by the extremely inadequate choice of the new director and inspector for the gymnasium.

The position of the new director was given to I.V. Kansky, a Czech by birth, and a middle-aged man who had no faintest notion of the real Don background (Artinskii, 1907: 282). I.G. Fesenkov portrayed him as being a "kind," "simple," "frank," and "honest" administrator "with an excellent memory and rational mind" (Artinskii, 1907: 282-283). And here A.I. Kosorotov's opinion diverges from the accounts of more knowledgeable people for the first time: in the "Tower of Babel", the foreigner (Pole), S.K. Malyavsky, who replaced S.S. Robush, is depicted as a sugary, envious and not very clever schemer (however, the character of S.K. Malyavsky has some traits of the gymnasium's next director, V.Yu. Khoroshevsky, who we will subject of our discussion below) (Kosorotov, 1900: 72, 83-84). Nevertheless, this contradiction between I.G. Fesenkov and A.I. Kosorotov can be easily explained – as the latter was a student, not a gymnasium teacher, he hardly had close personal relations with the director, and described his image, preserved in the Novocherkassk society, rather than his real personality. Meanwhile, I.V. Kansky found himself in the situation of immense complexity from the very beginning. He openly acknowledged the effects of the very "barbarity" in gymnasium students, which S.S. Robush tolerated. According to the new director, all pupils in the Novocherkassk Gymnasium were deficient in "self-control, an acquired habit for appropriate work without breaks," but demonstrated "rudeness, disrespect, a tendency to evade student duties, absences at lessons, which were indulged by the family to some extend, appetite for pleasure" (Artinskii, 1907: 284). I.V. Kansky did not try to point the accusing finger at his predecessor or immediately switch to harsh measures, but still began to improve discipline and expelled the most underachieving students – the action that, as we remember, S.S. Robush made efforts to completely avoid. This position eventually damaged the director's reputation, who, to make things worse, was immediately drawn into conflict both with the local community and with teachers who took a stand against such actions. I.P. Artinskii provides examples of "insinuations" targeted against I.P. Kansky in the local and even in the metropolitan press, while the pedagogical council accused him of squandering state funds to install lighting fixtures in the gymnasium-owned apartment, and the critics were led by the second person in the gymnasium, its inspector, who said that the director "should at no times use a single nail of the gymnasium, apart from the room he occupies" (Artinskii, 1907: 283-285). To briefly summarize I.P. Kansky's activities, we would like to cite the words of D.F. Shcheglov: "His successor (S.S. Robush's) was instructed to remedy the gymnasium that desperately needed improvement. Students drank to excess, brawled, instilled fear in neighbors and in city ladies and were indulged in philosophical and political liberalism. Mr. Robush's successor did not reject the entrusted task, but they

pelted stones at his apartment, shot twice at his windows, and after a year and a half he was transferred to another city" (Shcheglov, 2010: 5).

The situation of I.P. Kansky and the next two directors was greatly complicated by the fact that their main adversary in the issue of measures taken to restore order in the gymnasium was its inspector. Amid the general change of teacher generations in 1878, the position was taken by M.K. Kalmykov (Artinskii, 1907: 282). This was the worst choice that could ever be: at pedagogical councils, the "idealistic teacher" not only confronted the directors on trifles, but also "mounted the most vehement agitation against all measures" of a punitive nature, proposed by the administration to "raise the teaching and education quality in the gymnasium" (Artinskii, 1907: 293). I.P. Artinskii, who appeared to be openly sympathetic to M.K. Kalmykov, explained that "two people" got along in the Don teacher – an excellent educator and a very weak administrator (Artinskii, 1907: 292-293). However, A.I. Kosorotov's interpretation seems to be more reasonable to us. The latter believed that K.S. Vetkin/M.K. Kalmykov in the position of the gymnasium inspector tried quite consistently to address problems with the discipline among students, but adopted a very peculiar method.

One episode is very illustrative in this regard. It excellently brings forward the discrepant pedagogical practices of those who supported the "police control" over students and "idealistic teachers." We have already mentioned the issue of illegal literature distributed in student apartments, the issue uncovered by I.G. Polyakov and ignored S.S. Robush. Here's how A.I. Kosorotov described the views of the new gymnasium inspector in this regard: "He opened a conversation that a lot of self-made handwritten magazines with obscene poems and caricatures of teachers had begun to circulate recently between gymnasium students, that this evil was very dangerous, that methods of combating it should be very subtle, because it was impossible to get rid of underground literature with primitive repressive measures. <...>. He took it into his head to publish an annual collection of articles, stories and poems written exclusively by gymnasium students, but with the stringent requirement that no one caught with underground literature would be admitted into the collection's staff" (Kosorotov, 1900: 83-84). The plan was initially crowned with remarkable success, and gymnasium students, inspired by the opportunity to see their works printed, lost interest in underground literature (Kosorotov, 1900: 84-85). However, opponents of the "idealistic teachers", in particular, "Radical", did not hail the success. On the contrary, they perceived it as an obstacle to the normal educational process, a distraction for children, who were not eager to gain new knowledge as they were, from regular studies (Kosorotov, 1900: 89). It is unlikely that A.I. Kosorotov accurately quotes "Radical," but the latter quite probably did say something of the kind: "Children are given fire and a knife and suffer burns and cuts as a result... <...>. Philosophers, deciding the fate of mankind, still hardly out of swaddling-clothes... I genuinely feel sorry for you, playthings of wicked sages" (Kosorotov, 1900: 103-104).

Indeed, in 1880, the "Gymnasium collection" (Gimnazicheskii sbornik) was published, which featured the works of Novocherkassk Gymnasium students (Gimnazicheskii sbornik, 1880). I.P. Artinsky rated it very high and considered it to virtually the only encouraging event in the history of the gymnasium in this period (Artinskii, 1907: 286-287). In fact, unfortunately, we can hardly agree with the assessment as more than two-thirds of this small (less than 100 pages) book were "chrestomathies," verbatim extracts and short paraphrases of the works of famous authors (Gimnazicheskii sbornik, 1880: 23-68). We will not analyze the literary attempts included in the collection, but as for research works, they were hopelessly shoddy. For example, the preface to the "chrestomathy" on V.G. Belinsky's ideas provided neither a biography of the outstanding critic, nor a general essence of his ideas, nor any description of the environment in which he created his works. Instead, the author, a gymnasium student N. Turkin, fell into pompous and abstract praise, reminiscent of instances from the first half of the 19th century: "Each expression, each word of his (V.G. Belinsky's) is filled with fire, excitement, hot breath of life, which convey them an ineffable potency that involuntarily vanquishes you. So does a bright sun ray, joyfully sparkling in the air, on the blue waters of the river, on the leaves of trees, reflected like diamonds in dew drops, and creating everywhere colors, glints, elusive tints, impart to nature beauty, brilliance, liveliness and an irresistible power of charm" (Gimnazicheskii sbornik, 1880: 24). This once again convinces us that M.K. Kalmykov, who was the editor of the book, had a very peculiar taste, and he, unlike the teachers of the late 1850–1860s, who advocated "conscious," interesting and true-to-life elements in education, was drawn to abstract embellishments.

So, after his appointment as a gymnasium inspector, M.K. Kalmykov pursued a totally consistent policy that logically resulted from his general pedagogical views. As he saw the acute problems with the discipline among children, he made efforts to handle them not by means of a somewhat idealistic "good education" rather than imposing "police control." School teachers and administrations were supposed to distract gymnasium students from pranks, hooliganism, and even from forbidden literature with the help of arts and sciences by offering them more engrossing activities. These ideas have still retained their popularity in pedagogy, but, no matter how efficient they generally were, M.K. Kalmykov was doomed to a complete failure because his actions were confused, had not link with real life and were opposed by part of the teachers. Perhaps the greatest mistake the inspector of the Novocherkassk Gymnasium made was that he counted on incentive measures to maintain discipline without introducing any punitive measures at all, and what was worse he fought against the gymnasium directors, who suggested such measures, apparently believing that they destroyed trust between teachers and students.

As for the directors, I.P. Kansky resigned from his position in 1880, and his successor, V.Yu. Khoroshevsky concluded that the situation in the gymnasium continued to deteriorate. As it was earlier the case with the A.G. Popov's and I. Ya. Zolotarev's retirement, a weak director who took the place of a strong one, quickly lost control over the teachers, and this wreaked complete havoc on the educational process: "No information on the progress for each term of the academic year was submitted by the teachers to the director; grades in class registers failed to properly and clearly reflect the student performance. Pupils were moved up next senior grades in a very original basis – promotion was granted not only to those who had 2.5 or 2.25 grades in one or two main subjects, but even to those with a straight two" (two is the second lowest grade in the Russian grade system. – Translator's note) (Artinskii, 1907: 286). Naturally, pupils, in turn, with such teachers "were little accustomed to order and had no adequate understanding of their student duties" (Artinskii, 1907: 286). However, V.Yu. Khoroshevsky stated the existence of problems, but was unable to put forward any conceptually new solutions to deal with them. Apparently, it was not by coincidence that A.I. Kosorotov combined him with I.P. Kansky in the character of "Pan Malyavsky" because their activities as heads of the Novocherkassk Gymnasium had much in common. For example, V.Yu. Khoroshevsky plainly repeated the key mistake of his predecessor – he allowed M.K. Kalmykov to organize all sorts of cultural events, retained him on the position of inspector, and seemed in general to seek support of the "idealistic teacher," but at the same time continued to severely punish gymnasium students who violated order and discipline. The respective measures became even more draconian. While in 1879, 6 students were expelled from the gymnasium, and all for "academic failure," in 1882, they expelled 90 students, most of them on grounds outside curriculum (Artinskii, 1907: 284, 289). As a consequence, V.Yu. Khoroshevsky obtained the same results as his predecessor – the new director faced rejection both by many teachers and the local society and conflicts with students and, eventually, was transferred to another region. "Mr. Robush's next successor went on with efforts to remedy the gymnasium; again stones were thrown at him; his glass windows were shattered more than once; he himself was beaten by hired Cossacks, and after a year and a half was transferred to another city," D.F. Shcheglov wrote (Shcheglov, 2010: 5).

Meanwhile, it, obviously, dawned on the administration in the Kharkov Educational District that the activity of "idealistic teachers" to restore order in the Novocherkassk Gymnasium not only was useless, but harmful. In this regard, the attempt to publish the second issue of the "Gymnasium Collection" elicited a characteristic reaction from the district authorities: V.Yu. Khoroshevsky, who submitted a corresponding request, was responded that an edition of the type would only magnify "excessive conceit and a falsely exaggerated idea of their strengths and abilities" in the already unruly gymnasium students (Artinskii, 1907: 287). However, we have seen, both the majority of teachers and the Novocherkassk society upheld M.K. Kalmykov's approach to reject punitive action against students in the Novocherkassk Gymnasium. So, the administration of the Kharkov Educational District risked taking extreme measures by finally opting for supporters of "police control" over students and even going to the length of an open confrontation with defenders of troublemakers in classes. The first decisive step in this direction was already taken in the time of V.Yu. Khoroshevsky. Although most Novocherkassk teachers, believing in the idea of education being an absolute value, objected to the reduction in the number of students in the gymnasium, in 1883 the director, contrary to the pedagogical council's opinion, filed a request to

close down one of the parallel classes to improve control over the remaining gymnasium students, and the request was granted (Artinskii, 1907: 290).

However, it was clear that the "soft-hearted" V.Yu. Khoroshevsky, as described be I.P. Artinskii, was not suitable for the role and was unable to meet with criticism from both teachers and local society and forcefully reorganize the Novocherkassk Gymnasium (Artinskii, 1907: 285). In addition, as we have shown, although he recognized the need for "police control," he shared the idea of cultural enlightenment of students. As a result, in 1883 he was replaced by D.F. Shcheglov, a man who quickly emerged the ideological leader of M.K. Kalmykov's opponents, and whom we repeatedly quoted above in various excerpts from his correspondence. He soon became a real monster in the eyes of most Novocherkassk students, teachers, townspeople and Cossacks. The sense of style and plausibility blatantly failed A.I. Kosorotov, when he described this director, and the resulting character was a kind of caricatured personification of political investigation and control at school. "He was a man of rare energy and incredible gut feeling for all sorts of 'search' – something like the famous detective Lecoq. Having found out about the liberal inclinations in the Razboinsk (Novocherkassk) Gymnasium and the helpless Pan Malyavsky unable to stop this incipient malignant movement, the Russian Lecoq himself suggested that they swap positions. 'My gymnasium is now toeing the line, and my job is done here,' he wrote to Malyavsky" (Kosorotov, 1900: 105). As a result, the "Russian Lecoq", "a man with a birdy surname" (slightly modified, as for all characters of the "Tower of Babel" – not D.F. Shcheglov, but I.E. Sorokin) was regarded by A.I. Kosorotov as some kind of fairytale personage who traveled to Russian gymnasiums and imposed a police regime there. The former gymnasium student also interpreted the pedagogical views of his director by attributing to him the following monologs: "I do not tolerate any misunderstanding, and therefore I say in advance what I require from you and what I forbid. My central point is as follows – you are boys and savages, and we are experienced and educated people. Another point logically follows from the above one – your opinions and judgments, as compared to our opinions and judgments, are not worth a button. Therefore, I require from a student that he: firstly, wear clean clothes, secondly, diligently do his homework, and, thirdly, do not talk. I will expel all talkers simply and quickly: get out of my gymnasium. No matter if the teacher is right or wrong – keep still! Because the main duty of a teacher is to order, and the main duty of the student to listen and obey" (Kosorotov, 1900: 109-110). But, it seems to us A.I. Kosorotov managed to reveal best of all not the disposition of the "Russian Lecoq" but his pedagogical views. There is a striking scene in the "Tower of Babel" when a gymnasium student, defending his right to walk and speak freely at break time, argues with the director that it is "intellectual development" that is most important in the gymnasium, and he will never be false to this statement. "The man with a birdy surname" in response objects that not "intellectual development," but "discipline is the foundation on which the gymnasium rests," and walking along in corridors and making noise at break time do not allow other students to prepare for their lessons (Kosorotov, 1900: 117-118). However biased they are, A.A. Kosorotov's numerous descriptions of "Russian Lecoq" are essential for the Don pedagogy history because other authors totally refrained from characterizing D.F. Shcheglov, and he appears in their works as some form of apophasis. Even I.P. Artinskii, who was well-disposed to the staff of the Novocherkassk Gymnasium, wrote nothing about the personality of D.F. Shcheglov, with only references pointing out that during the latter's term, a "suffocating atmosphere" reigned inside the gymnasium, and his short directorship left "vivid and abiding memories" (Artinskii, 1907: 290-292).

Nevertheless, D.F. Shcheglov had a very unconventional personality, for one thing. If not in the history of Russian pedagogy, his name is at least known in the history of the Russian social thought: he was the author of the monumental study "History of social systems from ancient times to the present day" (Shcheglov, 1870; Shcheglov, 1889). Printed reviews of the treatise were given, for example, by such authors as Nikolay N. Strakhov and Vladimir S. Solovyov (Solov'ev, b.g.; Strakhov, 1896). Despite the different views of the authors, they admitted that D.F. Shcheglov's work was unique to Russian literature in terms of the amount of information provided and was therefore quite useful at least for this reason (Solov'ev, b.g.: 318; Strakhov, 1896: 272). On the other hand, even a more favorably disposed review by N.N. Strakhov pointed out that D.F. Shcheglov proved to be a very odd researcher. Although the critic generally sympathized with the patriotic views of the author of the "History of social systems," he noted that Shcheglov went beyond the mark in his patriotism: "One might think that, in his opinion, everything not concordant with

patriots' feeling is for this very reason bound to be unacademic" (Strakhov, 1896: 263-264). V.S. Solovyov, in turn, not only sharply criticized many of D.F. Shcheglov's theoretical constructs, but also paid special attention to the latter's disapproval of fictional prose, which reached the extent of some strange hostility (Solov'ev, b.g.: 315-316). Indeed, D.F. Shcheglov wrote about the dreadful "corruption of society by literature," and it makes sense to cite his arguments in this regard, because they are directly connected to the topic of our paper (Shcheglov, 1889: 574). "The school youth, who formed several gloomy pages in our history, would undoubtedly have studied with no worry at school if it had not been implanted into them that there are several projects to bring a golden age down to earth, and that these projects can be easily put into being, and that only malice poses obstacles in the way. And they must be put into being in the interests of lower brethren, who live in unbearable conditions; that this mainly is the responsibility of young people, who are the best hope and pride of a country" (Shcheglov, 1889: 576-577).

The above excerpt suggests that ideologically D.F. Shcheglov was an entity foreign to the Novocherkassk pedagogical community. With all the differences in the ideas of his predecessors, all of them – from M.K. Kalmykov to I.Ya. Zolotarev, from A.G. Oridovsky to S.S. Robush – considered education to be the greatest value no matter what various forms it took. For D.F. Shcheglov, such a value, apparently, was patriotism, and, consequently, education could be both useful, if aimed to strengthen it, and harmful as it "corrupted" young people. In particular, the Novocherkassk Gymnasium director turned against not only literary works in the school curriculum, but also against the works of "pragmatist historians," accusing some of them, for example, N.I. Kostomarov, of eliminating in children the feeling of love for their Motherland: "Kostomarov subjected everything in Russian history, which has an incontestable right to be respected by true Russians, to real desecration, beginning with first princes, who are just bandits and robbers for him" (Shcheglov, 1889: 569).

So, while the "History of social systems from ancient times to the present day" largely shed light to D.F. Shcheglov's philosophical and moral views, rather than his pedagogical ideas, his vision of ideals for school and teaching practices reveals itself in the letter to K.P. Pobedonostsev, which quoted more than once. According to D.F. Shcheglov's underlying pedagogical idea, it was the school, along with literature and life, that drew Russia into the most dangerous "political disturbances" and "mental disturbances," and only through the school is it possible to put these disturbances to end (Shcheglov, 2010: 4). To achieve this, it was essential that educational institutions across Russia totally redefined their focus, "so that pupils and students studied sciences in earnest, so that they were brought up in the spirit of religion and patriotism" (Shcheglov, 2010: 4). With this basis, D.F. Shcheglov singled out two controversies in the gymnasium education of the time. The first, and, oddly enough, lesser one, he believed, was that "the Law of God and Russian language are categorized as secondary subjects," and that "there are a whole array of other details instilling into students that both Russia and the Orthodox faith are something secondary" (Shcheglov, 2010: 4). But the major issue, as defined by D.F. Shcheglov, was the fact that "today's school is not at all strive willing to graduate earnest people," they might be even "cosmopolitans," but "capable of looking at things earnestly" (Shcheglov, 2010: 4). Unfortunately, the teacher did not provide any explanation for the concept of "earnestness," which clearly had a fundamental meaning for him, but it seemed to imply discipline, diligence, respect for the authorities and the preference for "sciences" over literature, hated by D.F. Shcheglov, and arts in general. From our point of view, with all the narrowness of the pedagogical ideal, it could be very beneficial for the Novocherkassk Gymnasium in the 1880s, whose students just lacked the above qualities. As a matter of fact, it would be appropriate here to describe the pedagogical ideal of G.I. Korolev/I.G. Polyakov in more detail, as interpreted by A.I. Kosorotov, an ideal close to the one of D.F. Shcheglov. The "Tower of Babel" cites the following words of the strict "Radical," addressed to a pupil repeatedly punished for poor discipline: "I am encouraging Golyashkin (another student) because I feel sorry for him. I am persecuting you because I love you. Golyashkin has no talents, you are very – very! – gifted. 'Whomsoever much is given, of him shall be much required.' It is my duty to persecute you until you achieve what you are able to, but do not wish to achieve" (Kosorotov, 1900: 233). Therefore, it would be wrong to argue that supporters of "police control" over students did not love children, but this love had peculiar manifestations, not through encouraging a "family atmosphere" in the gymnasium or through the commitment to "properly bring up" children by means of arts and humanities, but through severity and "earnestness,"

in oconstant punishments, which were expected to help gymnasium students grasp curriculum material as deeply as possible.

Accordingly, D.F. Shcheglov's appointment as a director of the Novocherkassk Gymnasium was by no means an absurd move propelled by the desire of the "Russian Lecoq" to impose strict order everywhere. On the contrary, the Novocherkassk Gymnasium of the period was actually in desperate need for a leader to whom "discipline" would be more important than "intellectual development," for a forceful sort of person firmly convinced in his truth of his cause, a director, prepared to stand by teachers who had similar views, but at the same time was capable to cunning and compromise. Alas, D.F. Shcheglov did not possess just the latter traits.

He himself, in his letter to K.P. Pobedonostsev, when describing his managerial activities in charge of the Novocherkassk Gymnasium, very laconically wrote that "he continued the work of his two predecessors, and, according to the (written) confession of the lord appointed ataman, did it with considerable success" (Shcheglov, 2010: 4). D.F. Shcheglov's reluctance to go into specifics is quite understandable – the result activities of the new director yielded appeared to be opposite to expectations. D.F. Shcheglov's reports To Kharkov brimmed with accusations against gymnasium students: "To one teacher, a fifth-grade student insolently spoke with an almost explicit threat; to another, several students who received low marks, shouted the insulting nickname given to him while he was leaving the classroom," (Artinskii, 1907: 291); "I has been told that we should not hang maps and thermometers in classrooms, because the maps will be torn, and the thermometers will be broken or stolen in a few days" (Artinskii, 1907: 291); "Two teachers received anonymous letters threatening that they would be killed if they continued to give pupils bad marks" (Artinskii, 1907: 291); "There was a big scandal caused by drunk students" (Artinskii, 1907: 292); "Fourth grade pupils constantly drank vodka, visited brothels" (Artinskii, 1907: 292). Retaliating to this behavior, D.F. Shcheglov increased the number of expulsions from the gymnasium – 90 students expelled in 1882 were a fantastic figure for the time of S.S. Robush, in 1883, 139 students were forced to leave, and in 1884 – 142 (and again most of them on grounds outside curriculum) (Artinskii, 1907: 292). Those who remained, apparently, felt disgruntled and behaved even more outrageously. D.F. Shcheglov tried to spy on them, but failed to organize observation efficiently, and efforts to encourage whistle-blowing in the student environment produced seemed to a negative effect – the director even wrote with indignation to the district authorities that "the students' persistence in covering culprits of all kinds of wrongdoings is remarkable" (Artinskii, 1907: 292). Both I.P. Artinskii's book and A.I. Kosorotov's book and even D.F. Shcheglov's own letter to K.P. Pobedonostsev make it clear that the new head of the Novocherkassk Gymnasium only relied on force, hoping to break the "barbarity' and any independence of gymnasium students in general only through fear and intimidation. He took no steps to explain the importance of order and discipline and convince children that it was necessary to adopt and maintain them. Even A.P. Pyatnitsky, who replaced him as a director at the gymnasium, was struck how primitive and weak measures of educational influence were, whose effectiveness his predecessor counted on: "For example, for all misdemeanors in 1884, one type of punishment was administered (except for expulsion) – keeping students after the classes in the gymnasium for a more or less prolonged period. The detention itself was executed in a short form that did not provide for any remonstrating, or persuading, or putting to shame: all the latter was considered redundant. Extant records in old conduct sheets, with few exceptions, fully confirm this" (Artinskii, 1907: 297). And this, augmented with the fierce opposition against the new director, which, of course, was mounted by the very popular M.K. Kalmykov, resulted into the situation where the students, punished and expelled from the gymnasium, were envisaged as martyrs by themselves and by the local community, and D.F. Shcheglov – the very monster depicted by A.I. Kosorotov.

However, gymnasium students, portrayed even in the "Tower of Babel's" interpretation, were not angels at all. Here is how this chronicle novel describes the day on the eve of the ultimate catastrophe: "From the very morning all gymnasium students, both of senior and junior (especially senior) grades, just got out of hand, as they say. One incident was followed by another incident – now in one class, now in another, now in the corridor, now in the teachers' room. In one class, they made such noxious fumes by burning some rubber thing that they had to open windows. <...>. In another class, they gave a caterwaul concert for the Czech. They set fire to a blackboard here, the whole group walked in pairs along the corridor at break time there. <...>. Finally, it ended with a really outrageous incident – a seventh-grader smashed his fist in the warder's face" (Kosorotov,

1900: 215). But, instead of admitting their actually established guilt, angry children tried to stage a demonstration and march to the director in a huge crowd, demanding forgiveness for the offender (Kosorotov, 1900: 215). As a result, they were locked in the school assembly hall, threatened with punishment and detained almost until night (Kosorotov, 1900: 215-216). It is hard to say how D.F. Shcheglov would have dealt with the instigators of the commotion, but he did not have time to thoroughly go into the matter and identify perpetrators, because an explosion in the truest sense of the word rocked the Novocherkassk Gymnasium.

"My apartment was blown up; the explosion cracked a stone wall, shattered windows, broke several articles of furniture, broke several dishes. Afterwards, my wife suffered two consecutive miscarriages and lay in bed for about ten months," D.F. Shcheglov complained in his letter to K.P. Pobedonostsev (Shcheglov, 2010: 5). I.P. Artinskii dryly and rather unsympathetically stated that "there was a big row at the time when an attempt was made to blast the director's apartment and gymnasium" (Artinskii, 1907: 292). A.I. Kosorotov also wrote about a "terrible explosion" in the director's apartment (Kosorotov, 1900: 217-218). Perhaps it was impossible to think out a more perfect symbol of the failure the pedagogical ideas of Novocherkassk teachers underwent in the 1870–1880s – students attempted to assassinate their director and in addition damaged the gymnasium's building. Even worse, from our point of view, the explosion at D.F. Shcheglov's apartment in 1884 marked the end of an epoch when the Novocherkassk Gymnasium was a true center of the Don culture and pedagogy, and its teaching staff regularly boasted prominent Don scientists and public figures.

However, it might seem at the first glance that the Novocherkassk society simply vanquished unpopular supporters of "police control" over students in debate. Indeed, the excessively big scandal cost M.K. Kalmykov his position of gymnasium inspector, and he was forced to leave the job, but remained there as a teacher (Artinskii, 1907: 292-293). However, these were the only sanctions that followed after the attempted bombing of D.F. Shcheglov. Instead the most notorious director was unequivocally hinted that even Don officials were in sympathy the bombers. D.F. Shcheglov complained that after the explosion, teachers and parents told him that another batch of explosives had disappeared from nearby mines, that Novocherkassk dwellers were somehow involved in the assassination of Alexander II, and the local authorities simply ignored the panicking director's appeals for protection (Shcheglov, 2010: 5). Moreover, one of the Don's most influential people, the regional marshal of nobility, D.I. Orlov, sent his version of the events to the Ministry of Public Education, following which D.F. Shcheglov was discharged from the post for "excessive suspiciousness and indiscretion" (Shcheglov, 2010: 5).

But amid the struggle, both groups of young Don teachers – supporters of "police control" over students and "idealistic teachers" – were defeated and tarnished their reputation. M.K. Kalmykov no longer wrote textbooks and remained an ordinary teacher of Russian language until his retirement in 1900 (Artinskii, 1907: 321). As we have shown, he left very controversial recollections on the Don – his pedagogical talent as a teacher of the Russian language was recognized by all his contemporaries, but his activity as an inspector of the Novocherkassk Gymnasium was unanimously condemned (it is indicative that A.I. Petrovsky did not mention this biographical page at all in his very favorable article about his teacher). I.G. Polyakov was fired against his will in 1886 when the gymnasium's new administration suddenly "remembered" the fact that he never passed the teacher qualification exam (Artinskii, 1907: 328). This formal non-compliance was only an excuse, but the Novocherkassk society actually did not forgive "Radical" for backing up the odious D.F. Shcheglov. The latter wrote about this with anger: "Locals, seeing that the Ministry of Public Education is pliant, have begun to address other similar requests to it, and the authorities removed another teacher from the service, an excellent mathematician, a remarkable person precisely because he least of all connived at any liberal escapades of students, or liberal methods of teachers, that very Mr. Polyakov, who, ten years ago, revealed revolutionary propaganda in a student apartment, spread in the form of foreign editions, such as Vperyod, Nabat, etc." (Shcheglov, 2010: 7). The "scandalous" period in the history of the Novocherkassk Gymnasium drew to an end as did the "patriarchal" period before it. The time came for the period of "revelations and outcomes," which we would call the era of some triumph of typical, average teachers over bright personalities and talents.

The appointment to head the Novocherkassk gymnasium was given to A.P. Pyatnitsky. Being an undeniably honest person and educator, he, apparently, was not a particularly striking

character. A.P. Pyatnitsky pursued no active research, journalistic or literary lines of activity; on the other hand, his staying on the Don was only an episode in his career (he worked in Samara earlier, and later in Tomsk) (Artinskii, 1907: 312). In fact, only his work at the Imperial Tomsk University came in sight of present day researchers, and was somewhat highlighted in the paper by A.O. Stepanov and S.F. Fominykh "Through the pages of the penal book: the system of punishments and the practice of students' resistance to disciplinary supervision at the Imperial Tomsk University (1893–1899)" (Po stranitsam shtrafnoy knigi: sistema nakazaniy i praktiki soprotivleniya studenchestva distsiplinarnomu nadzoru v Imperatorskom Tomskom Universitete (1893–1899 gg.)) (Stepanov, Fominykh, 2019). According to them, A.P. Pyatnitsky hid "honest intentions and the faculty for compassion" behind the "appearance of an uncompromising guardian of order" (Stepanov, Fominykh, 2019: 191). A.I. Kosorotov completely failed to create any convincing image of "A.S. Bogolyubsky," who followed after "the man with the birdy surname." But his interpretation as well hints at some double nature in the new director of the Novocherkassk Gymnasium, some contrast between appearance and true nature: "Despite its seeming ordinariness, his appearance is not easy to describe at all. Medium height, dark blond hair, average forehead, nose and chin – rather passport-like, common marks. And at the same time, he emanated some astonishing originality" (Kosorotov, 1900: 243).

Perhaps A.P. Pyatnitsky's originality and duality, stressed by several contemporaries, were engendered by the fact that the new director of the Novocherkassk Gymnasium, being a good-hearted person by character, had no pedagogical creed of his own and acted as a consistent and efficient performer of exceptionally tough government policies on education. It is curious in this regard that I.P. Artinskii portrayed A.P. Pyatnitsky as a "person of the system" who carried on his activity in a "systematic and planned manner" (Artinskii, 1907: 312). In addition, he shaped his environment of people with similar traits. For example, instead of the vibrant M.K. Kalmykov, he appointed A.P. Nikolsky as an inspector. He was the second teacher of the Russian language and a person that did not merit any characterization in I.P. Artinskii's book at all (Artinskii, 1907: 317). A.I. Kosorotov depicted "second teacher of the Russian language P.A. Belyankin," who became an inspector under the new head of the gymnasium, as "the most inconspicuous and characterless person" (Kosorotov, 1900: 246). The gymnasium's teaching staff gradually lost its individuality; a growing number of changes took place in the team, and figures with a significant role in the Don history no longer came to teach there (Artinskii, 1907: 299). The result was a substantial contradiction that immediately arose between A.P. Pyatnitsky's pedagogical declarations and his actual activities. For example, it appears he won the trust of the local community by placing the biggest share of blame for the gymnasium accident not on students, but on "such a high turnover of persons whose responsibilities were solely to manage pedagogical and educative work," i.e. on a continuous change of directors (Artinskii, 1907: 396). In addition, as we have already seen, he dismissed the odious I.G. Polyakov. However, after he had demonstrated these somewhat liberal attitudes, in practice A.P. Pyatnitsky continued the policy of D.F. Shcheglov. It was he who succeeded in establishing a functional process of watching gymnasium students, and, interestingly, he maintained it not out of his own zeal, but on the initiative of the district and military authorities (Artinskii, 1907: 294-296); mass expulsions of gymnasium students continued (103 students were expelled in 1886, and 136 in 1887) (Artinskii, 1907: 299); attendance of services at the gymnasium church was now a compulsory routine (Artinskii, 1907: 298). A.I. Kosorotov envisaged the new director as a "fox" who insinuated himself into students' confidence by initially refraining from tough measures, and then effectively expelled the unreliable from the gymnasium, even if they cleverly disguised themselves (Kosorotov, 1900: 242-362). But even in his picture, the director looks as if he acts rather forcedly, in an openly conformist way, and not because he believes in severe punishments as a productive method to teach children to be "earnest." For example, when he had get hold of the main troublemaker among senior students, who sympathized with nihilists, the new head of the gymnasium promises not to expel him in return for exemplary behavior (Kosorotov, 1900: 319-320). Nevertheless, in the end, the director, "with tears in his eyes," throws out the young man, because one of the gymnasium graduates was involved in the assassination attempt on the emperor, and now he had to demonstrate to the authorities the combat against sedition (Kosorotov, 1900: 241-248).

Thus, in the middle of the 1880s, the situation started to change dramatically in the Novocherkassk Gymnasium. The agents of clearly distinguished pedagogical paradigms and prominent

Don figures gave way to ordinary teachers, and the gymnasium finally lost its status of a unique, "military" educational institution. It was hardly the blame of A.P. Pyatnitsky – on the contrary, he managed to revive a normal pedagogical process almost destroyed earlier in the gymnasium. However, shortly after his appointment, large cities, Rostov-On-Don and Taganrog, were integrated into the Don Host Oblast in 1887 and brought in famous educational institutions with their rich history. On the other hand, new cultural and research centers – a local statistical committee, newspaper offices, etc. – began to emerge on the Don from the middle of the 19th century. In these circumstances, the new director made, probably, a totally right decision to restore a conventional, standard gymnasium, rather than a center of the Don's academic and pedagogical life. This renewed gymnasium notched its own achievements and successes (for example, A.F. Losev, an eminent Russian philosopher studied there in the early 20th century), but the era of the military gymnasium, where first Don researchers, major public figures and educators worked as teachers and played a significant role in developing Don pedagogy, passed into oblivion beyond retrieve.

4. Conclusion

The period from the end of the 1870s to the beginning of the 1880s was a very eventful and challenging time for the Novocherkassk Gymnasium, a time when it irrevocably lost its status as a primary research, cultural and educational center of the Don Host. Although S.S. Robush continued to run the gymnasium until 1878, the "golden age" of the school's history, associated with his name, had already became a page in the past. Despite the director's latest achievements, such as the construction of a gymnasium building, and the facility's unimpeachable authority in the local community, the issue of students' "barbarity," inflicted in many respects by S.S. Robush's pedagogical views, had profoundly deteriorated by the time. One teacher was beaten, another teacher received threats, theft was practiced by gymnasium students and similar incidents marred its reputation.

In this context, the issue of the "barbarity" and finding solutions for it became a focus of attention for a new generation of teachers. In other conditions, such teachers might be able to formulate a more integral system or even several systems of general pedagogical ideas and specific teaching practices. However, this possibility was precluded by a phenomenon unprecedented in Don education – a real conflict flared up between supporters of various methods of establishing discipline in the student environment, and it bore no resemblance to respectful discussions on pedagogical topics at the turn of the 1850–1860s.

Initially, the conflict started between S.S. Robush and supporters of "police control" over students. The latter included no important figures, and while the old director remained at the helm, they were in the position of outcasts from the Novocherkassk society, subjected to threats and even beatings. However, after S.S. Robush retired, with directors appointed from outside, this camp step by step strengthened their position as the situation in the gymnasium became increasingly tense. As a result, the next director, D.F. Shcheglov, in fact, found himself to be a leader and theorist of those among Don teachers who advocated strict discipline, and we use his works as a basis to reconstruct their general pedagogical views.

1) For D.F. Shcheglov, key values in education were patriotism, Orthodox faith and, especially, "earnestness" – a term he never decoded, which apparently embraced discipline, diligence in work, respect for the authorities and love for studies.

2) While earlier Don pedagogy postulated education to be good at all times, D.F. Shcheglov argued that many gymnasiums in the Russian Empire became hotbeds of "corruption," and they did not cultivate the qualities, outlined in the previous paragraph, but, on the contrary, destroyed them.

3) Proceeding from the above, it was necessary to foster in students not "intellectual development," first of all, but "discipline" as the pre-requisite quality required to become a good citizen of the Russian Empire.

We believe these general pedagogical views had the right to exist in principle, and, if efficiently implemented, they might have brought much benefit to the Novocherkassk Gymnasium, where students, in the end of S.S. Robush's directorship, "were little accustomed to order and had no adequate understanding of their student duties." It was implementation that became the stumbling block for further progression. Neither the community of Don teachers who advocated "police control" over students, nor the new gymnasium directors had a single leading teacher with suitable practical competencies. Meanwhile, the Novocherkassk society, which held its gymnasium in respect, was unwilling to see it change and meet initial attempts to tighten discipline

with a very negative reaction. And, in the end, D.F. Shcheglov and his followers found no other way out as to respond to such resistance with massive expulsions of students and harsh punishments, without even thinking of setting up some semblance of educative work so that children could accept new values not out of fear, but by understanding their advantages.

The major opposition to toughened discipline was represented not even by old teachers, but by other part of the youth, whose leader was an "idealistic teacher," M.K. Kalmykov, appointed as inspector of the gymnasium. M.K. Kalmykov was the last prominent Don teacher, whose work was inseparably linked with the Novocherkassk Gymnasium. Unfortunately, his pedagogical talent was much more modest comparing to his predecessors, especially in terms of material systematization. For this reason, it is impossible to clearly structure his general pedagogical views. It is apparent, however, that the best means of ensuring discipline, according to M.K. Kalmykov, was "good education" that implied arousing in students' interest in various arts, above of all, in literature.

However, it turned out that he was completely unable to make his idea of "good education" work. Main obstacles were his disconnectedness from real life and inclination to somewhat abstract and scholastic philosophizing. As early as before D.F. Shcheglov took office as director of the Novocherkassk Gymnasium, M.K. Kalmykov was allowed to organize a range of cultural events, which, he expected, were supposed to distract gymnasium students from hooliganism and improve their discipline. In practice, however, no such transformation took place. On the contrary, M.K. Kalmykov faced accusations that his activities were ruinous to discipline, distracted children from classes and contributed to their false conceit. After D.F. Shcheglov's appointment, M.K. Kalmykov went into fierce opposition to the new director, inciting the local society and students against him.

The fateful denouement ensued in late 1884, when an attempt was made to blow up D.F. Shcheglov's apartment, located in the gymnasium building. Subsequent events starkly illustrated that supporters of "police control" over students completely compromised themselves by their own actions, even in the eyes of the authorities – perpetrators were never found, D.F. Shcheglov was transferred from Novocherkassk, and his supporters from among the teachers were dismissed. Their adversaries, in turn, i.e. supporters of the "idealistic teacher" M.K. Kalmykov, were almost equally compromised – part of moral responsibility for what had happened was laid on the latter, he was removed from the position of inspector, and even his contemporaries who appreciated him severely criticized his activities in this capacity. In the end, the fight between the two camps of Don teachers mutually discredited their ideas and led to the crisis of the gymnasium itself. Its new director, A.P. Pyatnitsky, placed his bet not on idea-driven pedagogues and Don researchers, but on ordinary teachers, and he himself seemed to have no explicit pedagogical creed. The Novocherkassk Gymnasium now prioritized "people of the system" who carried out the instructions of their superiors and did not try to pursue their own educational policy. The gymnasium's further successes showed that the decision was justified, but the role of the school in the life of the Don Host sharply fell in importance.

***

Summarizing the above, we can draw several general conclusions on the pedagogical experience of the Novocherkassk Gymnasium in the 1800–1880s and the reasons for its rise in this time.

1) Until the 1880s, the Novocherkassk Gymnasium retained its relative independence from the higher authorities. For example, even at this time, teachers could in fact, contrary to established Russian rules, promote children with bad marks in key subjects to the next grade.

2) Thanks to this, the gymnasium could operate as a "military" school, an educational institution that served the Don Host needs. The status was even officially documented in the 1830–1860s, and the gymnasium curriculum offered special courses not available in other gymnasiums of the Empire.

3) The gymnasium experienced chronic underfunding for a long time and even did not have its own building. In these conditions, its employees had to choose other job options. On the other hand, because of this peculiarity, the gymnasium staff usually consisted of teachers from Don Cossacks or very young teachers at the start of their careers.

4) With the interplay of all these factors, the gymnasium regularly had to frame its own combination of pedagogical theories and practices, tailoring national trends in education to the needs of the Don. The process fell to the lot of the director and a limited number of the best teachers. The resulting solutions they synthesized from pedagogical ideas and implemented were

not innovative, if taken in the country-wide scale, and were never suitable to address all problems, but helped use available resources to the best advantage. Such synthesis was successfully brought into reality in three instances:

a) The 1800s. A.G. Popov and A.G. Oridovsky. Teaching was built on the idea of the unconditional benefit of arts and sciences for children, which was not elaborated but enabled a gymnasium with a very weak pedagogical methodology to gain a foothold on the Don land by means of propaganda.

b) The 1830s. I.Ya. Zolotarev. Teaching gradually switched to the idea that arts and sciences should have practical applications. Relying on this idea, the gymnasium attracted first Don researchers and writers and finally emerged as a major cultural and research center of the Don Host.

c) Late 1850s – early 1860s. S.S. Robush, A.A. Radonezhskii, A.G. Filonov. A return to the concept of the unconditional benefit of arts and sciences for children took place, but at a higher practical level, refined with the idea of a "family atmosphere" and "true-to-life," interesting lessons, required in schools. The gymnasium becomes the Don Host's educational center training teachers for rural schools.

5) Therefore, the gymnasium's autonomy and its focus on regional interests allowed it to maintain for a long time a very peculiar situation on the Don – the gymnasium, far from being a model of performance, by creating a right set of general pedagogical ideas and specific teaching practices used by its teachers, commanded respect of the population and performed important social functions.

6) However, such a rewarding result was largely obtained by luck, because with each change of pedagogical ideas a strong and respected leader appeared to inspire most of the young teachers. When in the late 1870s, the gymnasium faced the need for a new synthesis of pedagogical ideas in line with the changed conditions, there was no such leader, and the supporters of change splintered and came into conflict with each other. The outcome was a complete pedagogical collapse of the gymnasium and an attempt to assassinate its director, following which a new head, assigned from outside, reorganized it into an educational institution conventional for the Empire.

References

Artinskii, 1907 – *Artinskii, I.P.* (1907). Ocherk istorii Novocherkasskoi voiskovoi gimnazii [Essay on the history of the Novocherkassk military gymnasium]. Novocherkassk, 469 p. [in Russian]

Cherkasov et al., 2019a – *Cherkasov, A.A., Bratanovskii, S.N., Koroleva, L.A., Zimovets, L.G.* (2019). Development of school education in the Vologda governorate (1725-1917). Part 1. *European Journal of Contemporary Education*. 8(1): 208-214.

Cherkasov et al., 2019b – *Cherkasov, A.A., Bratanovskii, S.N., Koroleva, L.A., Zimovets, L.G.* (2019). Development of school education in the Vologda governorate (1725-1917). Part 2. *European Journal of Contemporary Education*. 8(2): 418-424.

Cherkasov et al., 2019c – *Cherkasov, A.A., Bratanovskii, S.N., Koroleva, L.A., Zimovets, L.G.* (2019). Development of school education in the Vologda governorate (1725-1917). Part 3. *European Journal of Contemporary Education*. 8(3): 627-637.

Cherkasov et al., 2019d – *Cherkasov, A.A., Bratanovskii, S.N., Koroleva, L.A., Zimovets, L.G.* (2019). Development of school education in the Vologda governorate (1725-1917). Part 4. *European Journal of Contemporary Education*. 8(4): 973-983.

Filevskii, 1906 – *Filevskii, P.P.* (1906). Ocherki iz proshlogo Taganrogskoi gimnazii Po sluchayu stoletnego yubileya gimnazii [Essays from the past of the Taganrog gymnasium On the occasion of the centenary of the gymnasium]. Taganrog, 53 p. [in Russian]

Gimnazicheskii sbornik, 1880 – Gimnazicheskii sbornik. Raboty vospitannikov novocherkasskoi gimnazii [Gymnasium collection. Works of pupils of the Novocherkassk gymnasium]. Novocherkassk, 75 p. [in Russian]

Kalmykov, 1880 – *Kalmykov, M.K.* (1880). Obshchii kurs slovesnosti [General course of literature]. Novocherkassk, 160 p. [in Russian]

Kalmykov, 1896 – *Kalmykov, M.K.* (1896). Cherkassk i Voisko Donskoe v 1802 godu, po opisaniyu De-Romano [Cherkassk and the Don Army in 1802, as described by De Romano]. Novocherkassk, 42 p. [in Russian]

Kalmykov, 1898 – *Kalmykov, M.K.* (1898). Svedeniya o kochetovskom govore (sobrannye v poselke-khutore Eshchaulove, Donskoi oblasti, 1-go Donskogo okruga, v yurte Kochetovskoi

stanitsy) [Information about the Kochetov dialect (collected in the village-khutor Eshchulov, Don region, 1st Don district, in the yurt of the Kochetov stanitsa)]. SPb., 20 p. [in Russian]

Kosorotov, 1900 – *Kosorotov, A.I.* (1900). Zabitaya kalitka; Vavilonskoe stolpotvorenie [Clogged gate; Babel]. M., 362 p. [in Russian]

Molchanova et al., 2019a – *Molchanova, V.S., Balanyuk, L.L., Vidishcheva, E.V., Potapova, I.I.* (2019). The Development of Primary Education on the Cossack Territories in 1803–1917 years (on the Example of the Kuban Region). Part 1. *Bylye Gody*. 53(3): 1049-1058.

Molchanova et al., 2019b – *Molchanova, V.S., Balanyuk, L.L., Vidishcheva, E.V., Potapova, I.I.* (2019). The Development of Primary Education on the Cossack Territories in 1803–1917 years (on the Example of the Kuban Region). Part 2. *Bylye Gody*. 54(4): 1524-1536.

Molchanova et al., 2020 – *Molchanova, V.S., Balanyuk, L.L., Vidishcheva, E.V., Potapova, I.I.* (2020). The Development of Primary Education on the Cossack Territories in 1803–1917 years (on the Example of the Kuban Region). Part 3. *Bylye Gody*. 55(1): 88-104.

Natolochnaya et al., 2019a – *Natolochnaya, O.V., Bulgarova, B.A., Voropaeva, Y.A., Volkov, A.N.* (2019). The History of the Public Education System in Vilna Governorate (the Second Half of the 19th and the Early 20th Centuries). Part 1. *European Journal of Contemporary Education*. 8(3): 655-664.

Natolochnaya et al., 2019b – *Natolochnaya, O.V., Bulgarova, B.A., Voropaeva, Y.A., Volkov, A.N.* (2019). The History of the Public Education System in Vilna Governorate (the Second Half of the 19th and the Early 20th Centuries). Part 2. *European Journal of Contemporary Education*. 8(4): 964-972.

Petrovskii, 1902 – *Petrovskii, A.I.* (1902). Pamyati idealista [In memory of an idealist]. *Donskaya rech'*. 248: 3-4. [in Russian]

Radonezhskii, 1861 – *Radonezhskii, A.A.* (1861). Pedagogicheskoe otdelenie pri gimnazii v Novocherkasske [Pedagogical department at the gymnasium in Novocherkassk]. *Zhurnal Ministerstva Narodnogo Prosveshcheniya*. Ch. CXI. Pp. 95-102. [in Russian]

Robush, 1863 – *Robush, S.S.* (1863). Zhelayut li donskie kazaki gramotnosti? [Do Don Cossacks want literacy?]. *Zhurnal Ministerstva Narodnogo Prosveshcheniya*. Ch. CXIX. Pp. 115-131. [in Russian]

Shcheglov, 1870 – *Shcheglov, D.F.* (1870). Istoriya sotsial'nykh sistem ot drevnosti do nashikh dnei [The history of social systems from antiquity to the present day]. T. I. SPb., 611 p. [in Russian]

Shcheglov, 1889 – *Shcheglov, D.F.* (1889). Istoriya sotsial'nykh sistem ot drevnosti do nashikh dnei [The history of social systems from antiquity to the present day]. T. II. SPb., 942 p. [in Russian]

Shcheglov, 2010 – *Shcheglov, D.F.* (2010). Grustnoe o proshlom [Sad about the past]. Pis'mo D. letter to K.P. Pobedonostsevu. Moskva. 10: 3-8. [in Russian]

Shevchenko et al., 2016 – *Shevchenko, N.A., Vidishcheva, E.V., Emelyanova, O.V.* (2016). The establishment of the system of public education in the Caucasus (1802-1917 years): The characteristic features. *Bylye Gody*. 40(2): 363-372.

Solov'ev, b.g. – *Solov'ev, V.S.* Retsenziya na knigu D. Shcheglova «Istoriya sotsial'nykh sistem» [Review of the book by D. Shcheglov "History of Social Systems"]. Sobranie sochinenii Vladimira Sergeevicha Solov'eva. Tom VI. SPb., b.g. Pp. 311-318. [in Russian]

Stepanov, Fominykh, 2019 – *Stepanov, A.O., Fominykh, S.F.* (2019). Po stranitsam shtrafnoi knigi: sistema nakazanii i praktiki soprotivleniya studenchestva distsiplinarnomu nadzoru v Imperatorskom Tomskom Universitete (1893-1899 gg.) [Through the pages of the penalty book: the system of punishments and practices of student resistance to disciplinary supervision at the Imperial Tomsk University (1893-1899)]. *Vestnik Tomskogo gosudarstvennogo universiteta*. 443: 184-197. [in Russian]

Strakhov, 1896 – *Strakhov, N.N.* (1896). Bor'ba s Zapadom v nashei literature [The fight against the West in our literature]. SPb. Pp. 256-272. [in Russian]

Voskoboinikov, 2009 – *Voskoboinikov, S.G.* (2009). Sotsial'no-ekonomicheskaya situatsiya i reformy nachala XIX veka na Donu [Socio-economic situation and reforms of the early 19th century on the Don]. *Vestnik Donskogo gosudarstvennogo tekhnicheskogo universiteta*. T. 9. 3(42): 566-574. [in Russian]