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Dr. Lazar Stošić

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Address: Prvi maj 18, 17500 Vranje, Serbia
Phone: +381 17 400 165, + 381 63 700 4281
https://urnio.org.rs/
E-mail: predsednik@urnio.org.rs

Don State Technical University
Address: Gagarin Square 1, Rostov-on-Don, Russia, 344000
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International Journal of Cognitive Research in Science, Engineering and Education

(IJCRSEE)

EDITORIAL

International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE) is an open access international peer-reviewed, open-access journal, which provides a platform for highlighting and discussing various cognitive science issues dealing with the problems of cognition (and its evolution) within some specific subject field - philosophical, psychological, linguistic, mathematical, psychogenetic, pedagogical, ergonomic. Editorial Board strives to provide a possibility for the scientists of different fields to publish the results of their research, technical and theoretical studies. IJCRSEE is multidisciplinary in approach, and will publish a great range of papers: reports of qualitative case studies, quantitative experiments and surveys, mixed method studies, action researches, meta-analyses, discussions of conceptual and methodological issues, etc. IJCRSEE publisher is The Association for the Development of Science, Engineering and Education, Vranje, co-pablisher is Don State Technical University, Russian Federation..

IJCRSEE particularly welcomes articles on the results of scientific research in various fields of cognitive science (psychology, artificial intelligence, linguistics, philosophy and neuroscience) catering for international and multidisciplinary audience. Readers include those in cognitive psychology, special education, education, adult education, educational psychology, school psychology, speech and language, and public policy.IJCRSEE has regular sections: Original Research, Review Articles, Studies and articles, Book Reviews, Case Studies, and is published three times a year. This journal provides an immediate open access to its contents, which makes research results available to the public based on the global exchange of knowledge. The journal also offers access to uncorrected and corrected proofs of articles before they are published.

The main aim of the Journal is to discuss global prospects and innovations concerning major issues of cognitive science, to publish new scientific results of cognitive science research, including the studies of cognitive processes, emotions, perception, memory, thinking, problem solving, planning, education and teaching, language and consciousness study, the results of studying man's cognitive development and the formation of basic cognitive skills in everyday life. The Journal seeks to stimulate the initiation of new research and ideas in cognitive science for the purpose of integration and interaction of international specialists in the development of cognitive science as interdisciplinary knowledge.

All articles are published in English and undergo a peer-review process.

The scope of IJCRSEE is focused on cognitive research both in topics covered as well as disciplinary perspective:

- Cognitive Research in Education
- Cognitive Pedagogics
- Cognitive Psychology
- Psycholinguistics
- Cognitive Linguistics
- Cognitive Culture Studies
- Cognitive Neurophysiology
- Cognitive Aspects: Sport Culture
- Cognitive Aspects: Methodology of Knowledge
- Text Processing and Cognitive Technologies
- Curriculum Development
- Development of Learning Environment

- Education Administration
- Educational Psychology
- Educational Technology
- Elementary Education
- Innovative Pedagogical Models
- Learning Systems Platforms
- Media Education
- Science Education
- Teaching and Learning TechnologiesI

JCRSEE has an international editorial board of eminent experts in their field from Russia, USA, Republic of Macedonia, Germany, Hong Kong, Greece, Serbia, Australia, United Kingdom, USA, Turkey, Nigeria, Bulgaria, Romania, Spain, Italy, Republic of Srpska, Croatia, Kingdom of Saudi Arabia (KSA), India, China, Thailand, Israel, Malaysia, Morocco, Jordan,, Iran... We are confident that IJCRSEE will attract a great number of editors, eminent scientists in the field. The selection will be based on the activities of the editors and their desire to contribute to the development of the journal.

IJCRSEE provides a platform for academics and scientists professionals to refer and discuss recent progress in the fields of their interests. Authors are encouraged to contribute articles which are not published or not under review in any other journal.

Each submitted manuscript is evaluated on the following basis: the originality of its contribution to the field of scholarly publishing, the soundness of its theory and methodology, the coherence of its analysis, its availability to readers (grammar and style). Normal turn-around time for the evaluation of manuscripts is one to two months from the date of receipt.

Submission of an original manuscript to the journal will be taken to mean that it represents original work not previously published, that is not being considered elsewhere for publication; that the author is willing to assign the copyright to the journal as per a contract that will be sent to the author just prior to the publication and, if accepted, it will be published in print and online and it will not be published elsewhere in the same form, for commercial purposes, in any language, without the consent of the publisher.

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The requirement for the submission of a paper implies that it has not been published before; that it is not under consideration for publication anywhere else; that its publication has been approved by all co-authors.

When considering submitting an article, the Editors have provided the following criteria to assist authors with preparing their submissions:

Originality – The author should ensure that the manuscript has not been previously published nor is being considered by another journal.

Plagiarism - Content should be properly referenced. Be sure to check the paper for possible accidental plagiarism. Some plagiarism checker websites include: http://www.ithenticate.com/, www.antiplagiat.ru, www.grammarly.com, www.plagtracker.com or www.duplichecker.com

Writing – Please write in good English (American or British usage is accepted, but not a mixture of these). For non-native English speakers, and perhaps even for some native English speakers, grammar, spelling, usage, and punctuation of the texts are very important for an effective presentation. Hence, manuscripts are expected to be written in a clear, cogent, and readily understandable by an international readership.

Manuscripts must be submitted online. Electronic submission reduces the editorial processing and reviewing time. As part of the submission process, authors are required to check off their submission compliance with all of the following items, and submissions may be returned to authors who do not adhere to the following guidelines:

The submission has not been previously published or presented to another journal for consideration (or an explanation has been provided in Comments to the Editor).

The submission file is in OpenOffice, Microsoft Word, RTF, or WordPerfect document file format.

Where available, DOIs and URLs for the references have been provided.

The text is single-spaced; uses a 12-point font; employs italics, rather than underlining (except with URL addresses); and all illustrations, figures, and tables are placed within the text at the appropriate points, rather than at the end.

The text adheres to the stylistic and bibliographic requirements outlined in the Author Guidelines.

If submitting to a peer-reviewed section of the journal, the instructions in Ensuring a Double Blind

Review have been followed.

A manuscript goes through the peer review process. Authors submit manuscripts to Editorial office via the online system. The acknowledgement letter should be sent to the author to confirm the receipt of the manuscript. The Chief Editor first reviews manuscripts. Chief Editor is assisted by Section Editors (could also be Co- or Associated Editors). The Editor assigns a Section Editor to see the manuscript through the complete review process and return it with a recommendation or decision. The manuscript is checked to see if it meets the scope of the Journal and its formal requirements. If it is incorrect or unsuitable, the author should be informed and the manuscript filed (or returned if requested) – direct rejection. Manuscripts that are not suitable for publication in the Journal are rejected. A Rejection letter is sent to the author stating the reason for rejection. If the manuscript conforms to the aims and scope of the Journal, and formally abides by the Instructions to Authors it is sent out for review. Depending on the type of paper, it could be accepted immediately for publication (invited Editorial, Book review etc) by the Chief Editor.

Check that the manuscript has been written and styled in accordance with the Journal style; that it carries an abstract (if applicable), keywords, correct reference system etc. and check that the correct blinding system has been used. If anything is missing ask the author to complete it before the manuscript is sent out for review.

The manuscript is sent out for review. The reviewer reads and evaluates the manuscript and eventually sends a review report to the Chief Editor. The time for review can be set to 2-6 weeks depending on the discipline (more time is usually given to papers in the humanities and social sciences). Make sure to provide the reviewer with clear instructions for the work, e.g. outlined in the form of a Review report or a number of questions to be considered.

Based on the reviewers' comments the Chief Editor makes a decision to:

- Accept the manuscript without further revision
- Accept after revision
- Ask authors to resubmit
- Reject

An acceptance letter is sent to the author and the final manuscript is forwarded to production. Sometimes, the authors are requested to revise in accordance with reviewers' comments and submit the updated version or their manuscript to the Chief Editor. The time for review can be set to 2-6 weeks depending on the discipline and type of additional data, information or argument required. The authors are requested to make substantial revisions to their manuscripts and resubmit for a new evaluation. A rejection letter is sent to the author and the manuscript is archived. Reviewers might be informed about the decision.

After review a manuscript goes to the Copy Editor who will correct the manuscript concerning the correct referencing system, confirmation with the journal style and layout. When Copy Editor finishes his/her work they send manuscripts to the Layout editor.

Layout Editor is responsible for structuring the original manuscript, including figures and tables, into an article, activating necessary links and preparing the manuscript in the various formats, in our case PDF and HTML format. When Layout Editor finishes his/her job they send manuscripts to Proof Editor.

Proof Editor confirms that the manuscript has gone through all the stages and can be published.

This issue has 9 articles (7 original researches and 2 review articles). Our future plan is to increase the number of quality research papers from all fields of science, engineering and education. The editors seek to publish articles from a wide variety of academic disciplines and substantive fields; they are looking forward to substantial improvement of educational processes and outcomes.

Editor in Chief
Assist. prof. Dr. Lazar Stošić, Research Associate

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Address: Prvi maj 18, 17500 Vranje, Serbia
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E-mail: editor@ijcrsee.com

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The Role of Action Research in Teachers' Professional Development

Jelena Osmanović Zajić[1*], *Anastasija Mamutović*[1], *Jelena Maksimović*[1]

[1]University of Niš, Faculty of philosophy, Serbia
e-mail: jelena.osmanovic.zajic@filfak.ni.ac.rs; anastasija.mamutovic@filfak.ni.ac.rs; jelena.maksimovic@filfak.ni.ac.rs

Abstract: The challenges of contemporary education and teaching profession have resulted in an increased demand for the appropriate professional advancement and practice-based research. The action research is an approach that encourages teachers to manage and control their own work. This research was conducted with the purpose of being primarily beneficial for primary and secondary school teachers. The empirical research presented in this paper was based on the factor analysis, by which the research factors were extracted, as well as on the examination of the teachers' attitudes towards methodological education, cognition and metacognition in teaching, reflexive practice, science education and lifelong learning in the context of the action research. The method used was descriptive together with the scaling technique and the five-level Likert scale (AISE) consisting of 29 items. The research was realized in 2020, and then retested in 2021. The number of 1021 teachers from the Republic of Serbia participated in this research. The research results showed statistically significant differences in the respondents' responses related to the independent research variables: education cycle, teaching experience and the number of professional development seminars attended. The significance of action researches is reflected in the fact that the problems are resolved by the teachers themselves, not the scholars or academics who are not directly involved in teaching. Therefore, this research contributes to a greater motivation and support of teachers to raise their classroom activities and accomplishments to the level of a scientific research.

Keywords: action research, reflexive practice, science education, lifelong learning, empirical research.

Introduction

Action researches, aimed at the improvement of the education practice, are based on solving complex problems in practice, a cooperation of all research participants, a contribution of the research results to both theory and practice, a clear projection of reflexive processes, participants' attitudes characterized by criticism and self-criticism, as well as an original and genuine accomplishment typical of all phases of the research process. Thus, they involve both action (change and improvement) and research (recognition of these actions, knowledge structure and change) and are connected to the problems arising from practice. They stimulate innovative solutions, encourage cooperation and team work, and are inspired by a teacher's intention of improving their own practice in their teaching a particular group of schoolchildren.

Action research presupposes the research of a problem in a systematic way through defining certain key questions, planning and projecting the research, collection, processing and analysis of the data, interpreting the data and drawing the conclusions that will provide answers to the key questions. The primary value of the action research methodology is that it represents a catalyst of change. It is accomplished by comparing various points of view, exchanging ideas, analyzing the problem and finding potential solutions (Capone et al., 2016). Cognition and metacognition are significant aspects of action research. Permanent research and a critical attitude of teachers regarding the current teaching practice improve both their skills and abilities and the education process. Moreover, teachers are stimulated to ask questions about knowledge, postulate theories and construct their own knowledge. Metacognition includes awareness of the cognitive processes and achievements. The primary goal of the teacher-researcher is creating knowledge applicable to teaching and learning which erases the gap between theory and action. Therefore, what is created in the classroom is the link between the theory of science and the theory of teaching. This is the reason why action research has a positive impact on teachers' efficiency and

*Corresponding author: jelena.osmanovic.zajic@filfak.ni.ac.rs

the increase of their metacognitive knowledge while teaching (Balashov, Pasicichnyk and Kalamazh, 2021; Kavousi, 2016). Science education requires a comprehensive, dynamic and long-term continuous professional development of teachers that ensures sustainable learning. This goal presupposes that teachers are supported in all phases of their teaching career, especially considering the implementation of the curricula changes or the improvement of their teaching methods and styles of teaching. As regards a wide range of possibilities offered to teachers with the purpose of their professional development, action research is viewed as either a practice-oriented research of teachers' work and teaching in the classroom or a development of a new education strategy oriented to the deficiencies or personal interests of teachers and students (Eilks, 2018; Eilks, Naaman and Rauch, 2012). Whichever the case, action research is aimed at the improvement and change of the classroom practice and providing the necessary support to teachers needed for their continuous professional development. Action research is a powerful means that teachers are offered to improve their professional skills and leadership qualities. Action research is also acceptable because it encourages teachers to take their own initiative when it comes to the improvement of their teaching in case of encountering certain problems related to teaching and learning. This enables them to explore and test the teaching strategies and thus enhance their professional knowledge (Hairon, 2017). Teachers accept their professional development due to their own conviction that they will consequently enlarge their knowledge and skills, gain specific, particular and practical ideas which will all contribute to their personal advancement and increase their efficiency in teaching (Šteh, Kalin and Mažgon, 2021; Glanz, 2016; Hairon, 2017). Reflexion is essential to innovative teaching processes, which is therefore the area in which action research proves its relevance. The teachers who reflexively consider the improvement of their teaching methods and record their ideas with the purpose of understanding both the whole situation and their own selves are actually action researchers. They should be directed properly in relation to their professional development so that they are encouraged and stimulated to individually create their own teaching and learning strategies (Feldman and Capobianco, 2000; Fulmer, Chu and Martin, 2018; Goodnough, 2003).

All this emphasizes the fact that school teachers, representing a link between theory and practice in contemporary education, are most able to assess their own teaching, critically review their shortcomings, and accordingly improve their work by their own active engagement. Teachers are supposed to be experts in one or more school subjects (part of their academic education), autonomous professionals who constantly improve their knowledge, including their motivation to learn, be creative, cooperate, understand the education context, integrate the principles of lifelong learning into the processes of teaching and learning, explore and improve their own teaching practice. Action researches stimulate teachers' emancipation, i.e. their awareness of the necessity of lifelong learning. It is through action research that teachers realize in which areas they are efficient and in which ones they have to develop some additional competences.

Research practice and knowledge of methodology assume not only theoretical methodological knowledge but also practical knowledge necessary for the selection and application of the appropriate methodological procedures in researches and discussion of results (Tindowen, Guzman and Macanang, 2019). Various flaws encountered during the process of improving education result from teachers' insufficient knowledge of methodology. This may be resolved by devising curricula with reference to the competences that teachers have to learn and acquire. This mission could be based on the assumption that the concept of education and research has to be transformed into the concept of education through research. It is a well-known fact that not all teachers possess methodological competences, which means that they should be the focus of future education of teachers.

The vision of lifelong learning and continuous professional development demands that teachers consider issues critically, develop the ability for reflexion and evaluation, provide conditions for the academic advancement of every single student, stimulate and improve their own teaching methods. All this makes teaching more professional, whereas teachers are appointed new role, that of a researcher. Action research enables teachers to solve certain noted problems and improve their own practice in accordance with the autonomously set goals. The central part of action research is occupied by action, while the collected data are used as the feedback on the basis of which planned activities may be adapted and altered. This makes the whole research process flexible and creative in response to the needs of the participants in the research.

According to the aforementioned, the action research has a positive impact on teachers' work: it increases teachers' self-confidence, improves relationships with colleagues, invokes a better understanding of research processes, creates better teaching practice and motivates experimentation. Action research is an approach that encourages teachers to pursue academic advancement and thus control their own work. Action research is able to mitigate the gap between theory and practice (Bolton, 2010; Burnaford, 2011; Burns, 2010; Farel, 2004; Jay and Johson, 2002). The stimulation of teachers to carry out action research

would enable the following: permanent professional improvement of teachers, implementation of changes in schools, professionalization of teaching, connection of theory and practice.

In order to be a successful scholar and researcher in the field of education, the teacher-researcher should possess certain theoretical, pedagogical and methodological skills, appreciate strict methodological procedures, obtain adequate research education and be creative. Education in the field of methodology is equally important for pedagogical practice and pedagogical theory, so the cooperation between a theoretician and a practitioner is a prerequisite for any crucial changes in education. This can be accomplished by action researches.

Materials and Methods

Every teacher that analyzes and evaluates their own practice is actually an action researcher. Therefore, the empirical research conducted examines the teachers' reflexion on the action research going beyond the teacher research. The goal of this research is to examine whether teachers reflect upon the feedback information related to their teaching and whether they use it to improve their teaching methods and their competencies.

The research tasks studied the following: self-evaluation of the teachers' methodological competences for carrying out action researches, cognition and metacognition in teaching as a very significant element of action researches, reflexive thinking applied in practical work, teachers' contribution to their own academic advancement and teachers' general attitudes towards lifelong learning and openness to innovations in teaching. The main hypothesis was the assumption that teachers knew the role of action research in teacher's education and that there would be a statistically significant difference in the respondents' replies regarding the sociodemographic characteristics of the research sample, i.e. the independent research variables, education cycle, teaching experience and the number of professional development seminars attended.

Methods, Instruments and Statistical Procedures

The research methods were selected in accordance with the research subject matter, goal, tasks and set hypothesis. The theoretical framework was based on the method of theoretical analysis together with the perception of various methodological approaches to the issue of the role of action research teachers in teachers' education. The method used was descriptive, which was also in accordance with the postulated research problem and it comprised the empirical and analytical parts of the research. The data concerning the teachers' attitudes towards the action research in relation to the teacher research were collected using the five-level (1-strongly disagree, 5-strongly agree) Likert scale containing 29 items, which was accepted as reliable and comprising all the metric characteristics (Cronbach's alpha test = .76).

Sample

The research sample was based on the following independent variables: education cycle – teachers teaching lower and higher grades in primary schools and secondary schools, teaching experience, the number of professional development seminars attended. The research was conducted on the territory of the Republic of Serbia during 2019/20 school year, and then retested in 2021. The teachers who participated in the research were selected on the basis of the simple random sample method, so that a total of 1021 teachers participated in the research. The participants were given the opportunity to fill the questionnaires at schools or electronically. Thus, every participant had an equal chance of being involved in the research.

Table 1.
Structure of the respondents by education cycle

School	f	%
Elementary school	693	67.2
Secondary school	328	32.8
Total	1021	

Table 1 shows the structure of the respondents by the education cycle. 693 elementary school teachers and 328 secondary school teachers participated in the research, totaling a number of 1021 (100% of the sample).

Table 2.
Structure of the respondents by teaching experience

Teaching experience	f	%
0-10	418	40.5
11-20	483	46.8
Over 20	120	12.6
Total	1021	

Table 2 shows the structure of the respondents by the second independent variable, teaching experience. The majority of the respondents had 0 to 20 years of teaching experience (0-10, N= 28; 11-20, N=483), while 120 of the respondents had over 20 years of teaching experience.

Table 3.
Structure of the respondents by the number of professional development seminars attended

Number of seminars	f	%
0	188	18.2
1	122	11.8
2	64	6.2
3	120	11.6
4	119	11.5
5	78	7.6
7	88	8.5
8	78	7.6
9	41	4.0
10	76	7.4
11	40	3.9
12	7	.7
Total	1021	

Table 3 shows that the number of professional development seminars attended ranges from 0 to 12, which means that certain respondents had never had the opportunity of attending a professional seminar while some had attended them several times (See the columns with frequencies and percentages).

Data Analysis

The data obtained using the factor analysis were analyzed by means of the descriptive statistics (arithmetic mean M and standard deviation SD). The procedure of multivariate statistics was first used in the research. Five research factors were extracted using the procedure of the factor analysis with a Varimax rotation: Teachers' methodological education, Cognition and Metacognition, Reflexive practice, Science Education and Lifelong learning. The items were appropriately grouped within the framework of each of the research factors and the statistical analysis was performed on the basis of the data factorization and in accordance with the postulated independent research variables. The research also used the parametric statistics of the t test and ANOVA test in order to examine the statistically significant differences in the teachers' responses concerning their teaching experience, education cycle and the number of professional development seminars attended, as well as the Bonfferoni post hoc procedure for those factors for which a statistically significant $p < .05$ was observed.

Results

The major research components used for a further data analysis were extracted by means of the factor analysis.

Table 4.
Factor analysis of the data

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.617	36.611	36.611	10.617	36.611	36.611
2	2.471	8.522	45.133	2.471	8.522	45.133
3	1.980	6.829	51.962	1.980	6.829	51.962
4	1.559	5.377	57.339	1.559	5.377	57.339
5	1.476	5.090	62.428	1.476	5.090	62.428
6	1.240	4.275	66.704	1.240	4.275	66.704
7	1.152	3.973	70.677	1.152	3.973	70.677
8	1.140	3.931	74.608	1.140	3.931	74.608

Extraction Method: Principal Component Analysis.

Eight factors were extracted by the data factor analysis. Since 5 factors satisfied all the criteria of the factor correlation with over 50% of the cumulative variance, i.e. 62.43%, all 5 factors were retained for analysis whereas the items were grouped within the items using a Varimax rotation.

Table 5.
Rotated Component Matrix

	Component				
	1	2	3	4	5
p9	,851	,074	,297	,089	,029
p11	,841	,091	,076	,173	,214
p10	,834	,112	,112	,140	,112
p12	,738	,156	,318	,035	,350
p3	,685	,235	,272	,113	,102
p7	,670	,415	,180	,145	-,016
p1	,659	,261	,096	,138	,138
p6	,436	,236	,350	,223	-,100
p21	,095	,811	-,007	,130	,002
p17	,175	,782	,205	,002	,102
p16	,292	,750	,184	,101	,125
p20	,149	,697	-,053	,354	,082
p18	,124	,623	,204	,320	,225
p22	,087	,569	,336	,141	,038
p15	,256	,557	,102	,327	,349
p29	,182	,242	,822	,119	,228
p28	,288	,121	,777	,158	,245
p27	,304	,115	,735	,340	-,016
p26	,300	,123	,710	,268	-,040
p2	,124	,123	,289	,706	,119
p24	,287	,174	,299	,700	,081
p23	,084	,299	,212	,689	,062
p4	,156	,255	-,030	,628	-,012
p25	,196	,162	,368	,550	,117
p13	,266	,069	,154	,078	,885
p14	,142	,279	,087	,103	,820

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Factor analysis was used in order to group the items into the factors. The advantage of factor analysis is reflected in the fact that it solved the issue of multi-correlativity. Therefore, the results of factor analysis were beneficial for further statistical analysis.

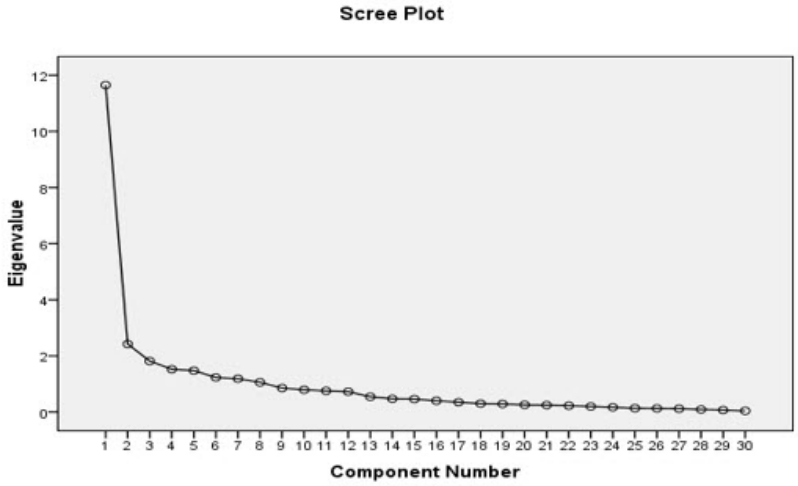

Figure 1. *Scree Plot*

The scree plot confirms the fact that the teachers' attitudes and action research in the scientific context can be analyzed by 5 major factors that explain over 50% of the total cumulative variance. All five factors are relevant; however, the first factor is at the highest level of significance.

The first factor was named Methodological component of action researches and it comprised the following items: 1. Knowledge of methodology is essential to the improvement of education and teaching; 2. The study of teaching and education practice requires methodological knowledge, such as construction and the use of instruments; 3. Teachers are expected to know methodology in order to carry out the action research successfully; 4. Professional development is preconditioned by methodological literacy and culture; 5. Attending seminars on the Methodology of pedagogical research should be compulsory for teachers.

Table 6.
Descriptive statistics of the factor Methodological component of action researches

	N	Min	Max	M	SD
p1	1021	1.00	5.00	3.6200	.92278
p2	1021	1.00	5.00	4.1391	.74245
p3	1021	1.00	5.00	3.6983	1.01319
p4	1021	1.00	5.00	4.1518	.75891
p5	1021	2.00	4.00	4.2449	3.63760

The items and the sums of the arithmetic means of the first factor were grouped into one variable, *Methodological component* of action researches, which was used for further analysis. This factor was highly valued by the teachers (Table 6).

The second factor was named Cognition and Metacognition and it comprised the following factors: 1. Being a teacher, I reflect on my own philosophy of teaching; 2. I ponder the significance or meaning of my teaching profession; 3. I endeavor to realize which aspect of teaching makes me content; 4. I contemplate both good and bad sides of my teaching; 5. I consider inconsistencies and contradictions occurring in practice.

Table 7.
Descriptive statistics of the factor Cognition and Metacognition

	N	Min	Max	M	SD
1	1021	1.00	5.00	3.7806	1.12845
2	1021	1.00	5.00	3.7777	.97645
3	1021	1.00	4.00	4.7209	5.77261
4	1021	1.00	5.00	3.5357	1.17904
5	1021	1.00	5.00	3.6964	1.23029

The items and the sums of the arithmetic means of the second factor were grouped into one variable, *Methodological component* of action researches, which was used for further statistical analysis. According to the respondents' replies, the factor was separated as ranging from indifference to agreement on the assessment scale (Table 7).

The third factor was named The teacher as a reflexive practitioner and action researcher and was comprised of the following items: 1. I have a file where I keep all my school reports; 2. I exchange teaching experience with my colleagues and seek advice and feedback information; 3. I record accomplishments/ failures related to each taught lesson or unit; 4. I discuss practical/theoretical issues with my colleagues; 5. I attend and observe my colleagues' classes with the purpose of learning more about their efficient practice; 6. I prompt my superiors to observe my classes and comment on my output and efficiency.

Table 8.
Descriptive statistics of the factor The teacher as a reflexive practitioner and action researcher

	N	Min	Max	M	SD
1	1021	1.00	5.00	3.7385	1.16618
2	1021	1.00	5.00	3.9109	1.07962
3	1021	2.00	5.00	4.4319	.82991
4	1021	2.00	5.00	4.5201	.69652
5	1021	3.00	5.00	4.6004	.58155
6	1021	2.00	5.00	4.4074	.71298

The items and the sums of the arithmetic means of the third factor were grouped into one variable, the teacher as a reflexive practitioner and action researcher, which was used for further statistical analysis. The majority of the teachers highly valued this factor (Table 8).

The fourth factor was named Science Education and it comprised the following items: 1. I read books/papers on efficient teaching; 2. I participate in workshops/conferences on the issues related to teaching/learning; 3. I plan to write the papers based on my classroom experiences; 4. I refer to the papers or browse the Internet in order to learn about the latest accomplishments in my profession; 5. I conduct minor researches during my classes; 6. I consider teaching as a potential matter for a research and I ponder methods to use in that research.

Table 9.
Descriptive statistics of the factor Science Education

	N	Min	Max	M	SD
1	1021	2.00	5.00	4.2693	.73760
2	1021	3.00	5.00	4.2331	.66460
3	1021	3.00	4.00	4.4643	3.89443
4	1021	3.00	5.00	4.2243	.73674
5	1021	3.00	5.00	4.2458	.71077
6	1021	2.00	5.00	4.3193	.72349

The items and the sums of the arithmetic means of the fourth factor were grouped into one variable, Science Education, which was used for further statistical analysis. This factor and all of its items were highly valued on the Likert scale by the teachers (Table 9).

The fifth factor was named Lifelong learning and it comprised the following items: 1. I constantly

aspire to something new; 2. I continually develop and improve myself; I want to understand the traits of methodology to be able to do a research; 3. I want to learn how to write reports on the conducted action research; 4. I never miss the seminars that can help me improve the quality of my teaching; 5. Lifelong learning is the goal of each profession.

Table 10.
Descriptive statistics of the factor Lifelong learning

	N	Min	Max	M	SD
p24	1021	2.00	5.00	4.2096	.74698
p25	1021	2.00	5.00	4.3849	.76551
p26	1021	1.00	5.00	4.4358	.92410
p27	1021	1.00	5.00	4.4750	.85784
p28	1021	2.00	5.00	4.6161	.68991
p29	1021	2.00	5.00	4.6317	.68709

The items and the sums of the arithmetic means of the five factor were grouped into one variable, Lifelong learning, which was used for further statistical analysis. The items of the factor Lifelong learning, which was estimated as extremely important, are shown in Table 10.

Table 11.
Methodological component of action researches considering the education cycle

	Education cycle	N	(M)	(SD)	t test	df	p
Methodological component	Primary school	693	19.93	2.64	.83	1019	.42
	Secondary school	328	19.68	7.32			

Contemporary system of education emphasizes the significance of teachers' analytical and research work, as well as their being methodologically trained to conduct reflexive practice. Teachers, on the other hand, are becoming more aware of the fact that methodological knowledge and competences are essential for their independent study of teaching practice. Teachers also value the need to improve their methodological knowledge in order to conduct action researches. Using the t test, the presented research examined whether the teachers' attitudes towards the methodological component of action researches differed considering the variable education cycle. The obtained results showed that regardless of the cycle of education, teachers who taught in both primary and secondary schools valued highly the necessity of the methodological knowledge. Their responses demonstrated no statistically significant difference, i.e. the number of homogenous responses predominated, $p > .05$.

Table 12.
Methodological component of action researches considering teaching experience

Methodological component	Sum of Squares	df	Mean Square	F	p
Between Groups	23.090	2	11.54	.52	.59
Within Groups	22382.166	1018	21.98		
Total	22405.256	1020			

The issue of the necessity of methodological education for conducting action researches was tested considering the variable teaching experience. All of the teachers who participated in the research, regardless of their teaching experience, agreed that the methodological component was essential for conducting researches. Regardless of the years of teaching experience, both less experienced and more experienced teachers valued highly the need to gain methodological knowledge and competences, so that their responses showed no statistically significant difference, $p > .05$.

Table 13.
Methodological component of action researches considering the number of professional development seminars attended

	(J) Number of seminars attended	Mean Difference (I-J)	Std. Error	p
(I) Methodological component	1	-1.02511	.46947	1.000
	2	-1.83710	.58440	.113
	3	-1.46418	.47183	.130
	4	-4.75648(*)	.47304	.0001
	5	-9.21931(*)	.54387	.0001
	7	-2.04449(*)	.52157	.006
	8	-1.88598(*)	.54387	.036
	9	-2.65646(*)	.69603	.009
	10	-3.36506(*)	.54891	.0001
	11	-4.18085(*)	.70314	.0001
	12	-3.68085	1.55443	1.000

* *The mean difference is significant at the .05 level.*

The differences in the respondents' responses were obtained using the multiple comparison of the teachers' answers to the question of the significance and necessity of methodological knowledge for conducting action researches. The comparison of the teachers' responses showed that the teachers who had attended 4 or more professional development seminars valued more the necessity of methodological education for conducting action researches than those who had rarely attended such seminars. The difference in the responses of these two groups of teachers is statistically significant, $p < .05$.

The data shown in Tables 11, 12 and 13 partially confirmed the hypothesis that there are statistically significant differences in the respondents' responses considering the independent variables education cycle, teaching experience and the number of professional development seminars attended. The differences in the teachers' responses are evident considering only one variable – the number of seminars attended, $p < .05$, but not regarding the other two variables, education cycle and teaching experience, $p>0.05$.

Table 14.
Cognition and metacognition considering education cycle

	Education cycle	N	(M)	(SD)	t test	df	p
Cognition and metacognition	Primary school	693	19.99	7.48	3.32	1019	.001
	Secondary school	328	18.48	4.92			

Metacognition is a manner of predicting, understanding, controlling and assessing cognition. The teachers were questioned about their own teaching philosophy, the feeling of satisfaction with their own profession, their perception of good and bad sides of teaching, their reflections on failures, inconsistencies and contradictions of teaching practice.

Cognition and metacognition are present in the work of teachers-action researchers; however, the respondents' responses are characterized by statistically significant differences. This research proved that cognition and metacognition were more present in the work of primary school teachers (M = 19.99) than in the work of secondary school teachers (M = 18.49). The difference is statistically significant, $p < .05$; $p = .001$.

Table 15.
Cognition and metacognition in teaching considering teaching experience

(I) Yrs of teaching experience	(J) Yrs of teaching experience	Mean Difference	Std. Error	p
		(I-J)		
0-10	11-20	1.67170(*)	.45009	.001
	over 20	2.72201(*)	.69777	.001
	N	M	SD	N
0-10	418	20.6220	8.52845	0-10
11-20	483	18.9503	4.81500	11-20
Over 20	120	17.9000	6.28911	Over 20
Total	1021	19.5113	6.80190	Total

Table 15 proves that the component cognition and metacognition predominated among the teachers with the fewest years of teaching experience (0-10). The differences in the respondents' responses were obtained using the multiple comparison of the teachers' answers about cognition and metacognition in teaching. The comparison of the teachers' answers showed that the teachers with 0–10 years of teaching experience valued more the factor of cognition and metacognition than those with 11–20 and more than 20 years of teaching experience. The differences were statistically significant, $p < .05$.

Table 16.
Cognition and metacognition in teaching considering the number of seminars attended

	(J) Number of seminars attended	Mean Difference (I-J)	Std. Error	p
Cognition and metacognition	1	-1.32630	.68633	1.000
	2	-.20745	.85436	1.000
	3	-2.42411(*)	.68979	.0301
	4	-4.10451(*)	.69155	.0001
	5	-6.14975(*)	.79510	.0001
	7	-2.13926	.76251	.0301
	8	-12.56001	.79510	.3201
	9	2.98158(*)	1.01755	.0301
	10	-5.20745(*)	.80246	.0001
	11	-3.95745(*)	1.02794	.0081
	12	-.45745	2.27247	1.000

* *The mean difference is significant at the .05 level.*

The differences in the respondents' responses were obtained using the multiple comparison of the teachers' answers regarding cognition and metacognition in teaching. The comparison of the teachers' answers proved that the teachers who had attended 3 or more (11 at most) professional development seminars valued more the factor of cognition and metacognition than those who had attended only one or possibly two professional development seminars. The difference in the responses of the teachers who had been improving themselves professionally and those who had done it "rarely" is statistically significant, $p < .05$.

The data shown in Tables 14, 15 and 16 prove the existence of the statistically significant differences in the respondents' responses considering the independent variables education cycle, teaching experience and the number of attended seminars, which confirms the hypothesis that there are statistically significant differences considering the independent variables of the research. The differences were actually evident in the teachers' responses regarding the independent variables, $p < .05$.

Table 17.
Reflexive practice and teachers' action researches considering education cycle

	Education cycle	N	(M)	(SD)	t test	df	p
Reflexive practice and action researches	Primary school	693	25.9206	3.51846	3.81	1019	.001
	Secondary school	328	24.9512	4.31171			

Reflexive practice has become an issue that is commonly discussed in the context of education and teaching. Reflexivity and reflexive practice are actually very important elements of efficient teaching and teachers' professional development. Teachers who are reflexive practitioners, i.e. action researchers, have to keep records of their teaching, exchange teaching experiences with their colleagues regarding their own accomplishments in class and analyze practical problems together. The obtained results showed that the primary school teachers valued more the factor of reflexivity in teaching and the significance of action researches (M = 25.92) than the secondary school teachers (M = 24.95). The difference in their responses was statistically significant, $p < .05$; $p = .05$.

Table 18.
Teachers' reflexive practice and action researches considering teaching experience

Reflexive practice and action researches	Sum of Squares	df	Mean Square	F	p
Between Groups	20.109	2	10.054		
Within Groups	14834.965	1018	14.573	.690	.502
Total	14855.073	1020			
	N	M	SD		N
0-10	418	25.5024	3.16171	0-10	418
11-20	483	25.6128	4.18419	11-20	483
Over 20	120	25.9667	4.32684	Over 20	120
Total	1021	25.6092	3.81625	Total	1021

The teachers were questioned about reflexive practice and action researches considering the variable teaching experience. The obtained results showed that regardless of their teaching experience, both less experienced and more experienced teachers valued highly the necessity of reflexive practice for a successful conduct of action researches. Their responses did not demonstrate any statistically significant difference, i.e. the responses are homogenous, $p > .05$.

Table 19.
Teachers' reflexive practice and action researches considering the number of seminars attended

	(J) Number of seminars attended	Mean Difference (I-J)	Std. Error	p
(I) Teachers' reflexive practice	1	-1.03113	.41567	.876
	2	-1.51064	.51744	.237
	3	-2.24397(*)	.41777	.0001
	4	-3.54635(*)	.41884	.0001
	5	-3.77346(*)	.48155	.0001
	7	-1.16973	.46181	.757
	8	-.97859	.48155	1.000
	9	-1.62649	.61628	.557
	10	-3.43169(*)	.48601	.0001
	11	-3.76064(*)	.62257	.0001
	12	-6.26064(*)	1.37632	.0001

* *The mean difference is significant at the .05 level.*

The differences in the respondents' responses were obtained using the multiple comparison of the teachers' answers regarding reflexive practice. The comparison of the teachers' answers within groups showed that the teachers who had attended 3 or more (with the exceptions in some cases) professional development seminars valued more the factor of the importance of reflexive practice for conducting action researches than those who had done that rarely. In the majority of cases, the difference in the teachers' responses considering the number of professional development seminars attended is statistically significant, $p < .05$.

The data shown in the Tables 17, 18 and 19 partially confirm the hypothesis that there is statistically significant difference in the respondents' responses considering the independent variables education cycle, teaching experience and the number of attended seminars. The differences in the teachers' responses were evident in relation to the variable's education cycle and the number of attended seminars, $p < .05$, but not in relation to teaching experience, $p > .05$.

Table 20.
Science education considering education cycle

	Education cycle	N	(M)	(SD)	t test	df	p
Science education	Primary school	693	30.41	5.86	2.18	1019	.03
	Secondary school	328	29.63	3.99			

Contemporary education system emphasizes the importance of teachers' analytical and research activities and their methodological education for reflexive practice and conduct of action researches. The goal of this research is to indicate that education of teachers and future teachers is important for enabling them to conduct their own researches, study reference materials, process and interpret the results obtained from their own practical work. For this purpose, the attitudes of teachers to the factor Science education were examined, i.e. the research explored whether the teachers attended workshops and scientific conferences on the issues of teaching and learning, whether they intended to write scientific and scholarly papers based on their classroom experience, whether they made use of additional reference materials and were informed about new accomplishments in their own profession and whether they conducted some minor action researches in their classes. The obtained results showed that the primary school teachers (M = 30.41) valued more the factor Science education than the secondary school teachers (M = 29.63). The difference in their attitudes was statistically significant, $p < .05$; $p = .03$.

Table 21.
Science education considering teaching experience

Science education	Sum of Squares	df	Mean Square	F	p
Between Groups	179.841	2	89.921		
Within Groups	28951.843	1018	28.440	3.162	.043
Total	29131.685	1020			
	N	M	SD		N
0-10	418	29.9234	3.58305	0-10	418
11-20	483	30.5694	6.79126	11-20	483
Over 20	120	29.3667	3.39038	Over 20	120
Total	1021	30.1636	5.34420	Total	1021

The teachers were questioned about the factor Science education considering their teaching experience. The obtained results demonstrated that the teachers' responses differed regarding their teaching experience and that they valued highly the factor Science education. Therefore, their responses are statistically different, $p< .05$.

Table 22.
Science education considering the number of attended seminars

	(J) Number of seminars attended	Mean Difference (I-J)	Std. Error	p
(I) Number of seminars attended	1	.15094	.56298	1.000
	2	-2.32447	.70082	.062
	3	-3.24113(*)	.56582	.0001
	4	-7.30766(*)	.56727	.0001
	5	-4.09370(*)	.65221	.0001
	7	-2.07447	.62547	.062
	8	-3.14498(*)	.65221	.0001
	9	-.88544	.83468	1.000
	10	-1.90342	.65825	.258
	11	-4.82447(*)	.84320	.0001
	12	-4.32447	1.86407	1.000

* *The mean difference is significant at the .05 level*

The differences in the respondents' responses were obtained using the multiple comparison of the teachers' answers to the question of Science education. The comparison of their answers within groups showed that the teachers who had attended 2 or more (which was the case with the majority of the teachers) professional development seminars valued more the factor Science education than those who had not attended them as often as it was necessary. The difference in the teachers' responses regarding the number of seminars attended was statistically significant, $p < .05$.

The data shown in the Tables 20, 21 and 22 confirm the hypothesis that there is statistically significant difference in the respondents' responses considering the independent variables education cycle, teaching experience and the number of attended seminars, $p< 0.05$.

Table 23.
Teachers' lifelong learning considering education cycle

	Education cycle	N	(M)	(SD)	t test	df	p
Lifelong learning	Primary school	693	35.74	3.78	4.31	1019	.001
	Secondary school	328	34.43	5.76			

The knowledge of methodology is the basis of any research conducted in all sciences, so that the methodological competence of a pedagogue represents a fundamental condition for their professional development, innovative teaching and improvement of education. This research examined whether the teachers aspired to something new, whether they wanted to use their professional development to perceive how to explore their teaching practice by means of action researches and learn how to write reports on conducted action researches, whether their attitude to lifelong or permanent education was positive. The obtained results proved that the primary school teachers ($M = 35.74$) valued more lifelong learning in the context of action researches than the secondary school teachers ($M = 34.43$). The difference in their responses was statistically significant, $p < .05$; $p = .001$.

Table 24.
Teachers' lifelong learning considering teaching experience

(I) Yrs of teaching experience	(J) Yrs of teaching experience	Mean Difference (I-J)	Std. Error	p
0-10	11-20	.99715(*)	.30184	.003
	over 20	1.80957(*)	.46794	.0001
	N	M	SD	
0-10	418	36.0096	3.38000	0-10
11-20	483	35.0124	4.88794	11-20
Over 20	120	34.2000	6.15159	Over 20
Total	1021	35.3252	4.55662	Total

* The mean difference is significant at the .05 level.

The differences in the respondents' responses were obtained using the multiple comparison of the teachers' answers to the question about lifelong learning. The comparison of their answers within groups showed that the teachers with 0-10 years of teaching experience valued more the factor of lifelong learning than those with 11–20 and over 20 years of teaching experience. The differences in their responses were statistically significant, $p < .05$.

Table 25.
Teachers' lifelong learning considering the number of attended seminars

	(J) Number of attended seminars	Mean Difference (I-J)	Std. Error	p
(I) lifelong learning	1	-2.09583(*)	.48710	.001
	2	-1.13630	.60636	1.000
	3	-1.75922(*)	.48956	.023
	4	-5.30096(*)	.49081	.0001
	5	-6.03614(*)	.56431	.0001
	7	-2.86074(*)	.54117	.0001
	8	-3.44640(*)	.56431	.0001
	9	-3.60963(*)	.72218	.0001
	10	-3.17413(*)	.56953	.0001
	11	-2.29255	.72955	.114
	12	-4.29255	1.61283	.522

* The mean difference is significant at the .05 level.

The differences in the respondents' responses were obtained using the multiple comparison of the teachers answers to the question about lifelong learning. The comparison of their answers within groups demonstrated that the teachers who had attended not fewer than one seminar and not more than 10 seminars had more positive attitudes to lifelong learning than those who did not exhibit any preferences regarding lifelong learning and improvement, $p < .05$.

The data shown in the Tables 23, 24 and 25 confirm the hypothesis that there is statistically significant difference in the respondents' responses considering the independent variables education cycle, teaching eperience and the number of attended seminars. The differences in the respondents' answers were present regarding all the independent variables of the research and their responses are not homogenous, $p < .05$.

Discussions

The presented empirical research used the procedure of the factor analysis to extract 5 factors that were the basis for a further statistical processing, analysis and interpretation of the research results. The following are the research results and suggestions for the scientific community:

There is no statistically significant difference in the responses related to the factor Methodological

components of Action Research considering teaching experience. Also, there is no difference in the teachers' attitudes to the necessity of methodological knowledge considering the variable education cycle. However, the differences are evident concerning the third variable – the number of seminars attended. The more seminars the respondents had attended, the more positive attitude they had to the necessity of methodological knowledge for conducting action researches. The applicable goal of this research may be reflected in the necessity to develop methodological knowledge and competences among both primary and secondary school teachers. The hypothesis is partially confirmed.

Cognition and metacognition in teaching is regarded as an important component of a successful design and realization of action researches. The research results showed that cognition and metacognition were more developed among primary school teachers. Moreover, this factor proved to be more developed among less experienced teachers than among their more experienced colleagues. It is, however, certain that a larger number of professional development seminars attended by teachers had a positive impact on cognition and metacognition. The applicable goal of this research: primary and secondary school teachers should have more positive attitudes to the components of cognition and metacognition in teaching. In addition, cognition and metacognition are to be present in the work of all teachers, regardless of their teaching experience. All teachers should be given the possibility to develop professionally in order to realize their teaching successfully, but also in order to be able to conduct action researches. The hypothesis that the teachers' responses will demonstrate a statistically significant difference regarding education cycle, teaching experience and the number of seminars attended, i.e. the independent research variables, is confirmed in full.

Reflexive practice and action researches as the components of education and teaching were most highly valued by primary school teachers. The applicable goal of this research: reflexive teaching for the purpose of action researches has to be understood as significant regardless of education cycle and teaching experience. Professional development is essential to the improvement of teachers even in this segment. The research proved the existence of statistically significant differences in the respondents' answers regarding education cycle and the number of seminars attended, but not regarding teaching experience, which means that his hypothesis is only partially confirmed.

Teachers need not only use other experts' researches and the results obtained from these professional studies. The factor Science education was valued more by the primary school teachers. The applicable goal of the research: teachers have to be trained and educated to conduct action researches, analyze and interpret research results, publish their papers presented at scientific conferences, regardless of education cycle and teaching experience. The teachers who attend professional development training can learn about the elements of Science education. This hypothesis is confirmed since the research results clearly show that there are statistically significant differences in the respondents' answers regarding education cycle, teaching experience and the number of seminars attended.

Teachers of various school subjects have to be innovative and eager to constantly learn something new, and improve themselves so as to go beyond their initial university education. Lifelong learning depends on education cycle, teaching experience or the number of seminars that teachers attend. The applicable goal of the research: teachers' competences have to be increased exclusively through innovative teaching methods and continuous improvement of teaching practice. It is concluded that this hypothesis is confirmed.

Conclusions

The theoretical and empirical benefits of action researches have been studied by numerous authors (Bolton, 2010; Burnaford, 2011; Burns, 2010; Elliot, 2007; Farrell, 2004; Jay and Johnson, 2002; Kayapinar, 2013; Kember, 2000; Lustic, 2009; McNiff and Whitehed, 2005; Noffke and Somekh, 2009; Vaughan and Burnaford, 2016; etc.). This research aimed to examine the components of action research present in the Serbian education system. The following are the results obtained in the course of this research.

Action researches represent a valid condition necessary for the improvement of teaching only if they are recognized and supported by the education system as a whole. Teachers who are willing to conduct action researches in their classrooms, who want to share the results of their researches with other teachers and constantly evaluate their teaching process are the action research teachers. Action researches are inseparable from teaching and they endow it with a higher level of quality.

The project to control and support action researches should be carried out systematically at each level of education system. Action researches encourage teachers to develop all aforementioned segments

regardless of the determined independent research variables: education cycle, teaching experience and the number of professional development seminars attended. Action research help teachers to understand their own efficiency and which competences they should develop further. In fact, action researches sustain teaching competences and offer possibilities for the affirmation of teachers in science.

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Conflict of interests

The authors declare no conflict of interest.

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The Impact of Slovenian Qualifications Framework: Stakeholders' Perspective

Borut Mikulec[1*], *Klara Skubic Ermenc*[1], *Nina Kristl*[1]

[1]University of Ljubljana, Faculty of Arts, Department of Educational Sciences, Slovenia,
e-mail: borut.mikulec@ff.uni-lj.si, klara.skubicermenc@ff.uni-lj.si, nina.kristl@ff.uni-lj.si

Abstract: This paper examines the impact of the national qualifications framework on the education and training system in Slovenia in the context of the European qualifications framework for lifelong learning and its influence on the design of the Slovenian qualifications framework. Although the role of the European Union in educational policy-making has received considerable attention, of which national qualifications frameworks are part of, only a few studies have focused on measuring the impacts of the European qualifications framework influenced national qualifications frameworks in Europe. By drawing on the theoretical concept of policy transfer in the analysis of European/global education policies, the study shows how European qualifications framework policy transfer influenced Slovenian qualifications framework development through soft instruments. Furthermore, this study examined the extent to which the Slovenian qualifications framework's objectives have been achieved according to key stakeholders (n = 50) using a quantitative research approach. The findings indicate that, unlike objectives related to the Slovenian qualifications framework's reform role, i.e. support for lifelong learning, the objectives related to the Slovenian qualifications framework's communication role, i.e. recognisability, understanding and transparency of qualifications and coordination of the qualifications subsystems, are mostly being met from the stakeholders' perspective.

Keywords: European qualifications framework, impact, qualifications framework, policy transfer, Slovenia.

Introduction

The role of international organisations (IOs) in global and/or European education policy-making has received considerable attention in the scientific community (Caspersen and Frølich, 2017; Jakobi, 2009; Kleibrink, 2011; Portnoi, 2016), particularly their role in the establishment of the European qualifications framework (EQF), a key European policy instrument for lifelong learning (LLL) (Elken, 2015), and the national qualifications frameworks (NQFs) whose establishment have also been strongly supported by various IOs around the globe (Chakroun, 2010; Raffe, 2013). Nevertheless, there is still much to be learned about their impact on national education systems, policies and practices (Portnoi, 2016) and the application of the policies from IOs to the national level (Crossley, 2019; Jakobi, 2009).

To address this research gap, the current study aimed to contribute to the better understanding of the impact of the EQF-influenced NQFs in Europe. This study explored the impact of the Slovenian qualifications framework (SQF) on the country's education and training system. We measured the impact indirectly by focusing on the views of the stakeholders, whom we named 'key stakeholders', i.e. members of the professional public who have been, by their occupational position, involved in the SQF's implementation or usage. Furthermore, we looked into the key stakeholders' views regarding the extent to which the SQF objectives were met and investigated their familiarity with the SQF's benefits and whether their views differed regarding the SQF's usage.

In what follows, we briefly introduce the role of IOs in fostering policy transfer and the instruments used in the EQF policy transfer, elaborate on the issue of measuring the impact of the current SQF, outline the methodological approach employed in this work and present the results of empirical study. In the final section, we discuss the EQF's impacts on the SQF and that of SQF on the education and training system.

*Corresponding author: borut.mikulec@ff.uni-lj.si

International organisations and instruments used to facilitate transfer

Due to globalisation, IOs as agenda-setters, such as the European Union (EU), the Organisation for Economic Co-operation and Development (OECD) and the United Nations Educational, Scientific and Cultural Organisation (UNESCO), among others, play an increasingly crucial role in the formation of the global and/or European education policies. They have been identified as 'central nodes for policy diffusion' (Jakobi, 2012, p. 391) that are able to transfer policies between countries and promote their own policies, although their formal competencies are generally limited. Despite the fact that the IOs generate different policy outputs and differ in focus and scope, connections and policy convergence among the IOs' policies exist (Jakobi, 2009). The case of the NQFs is a good example of such a convergence (Raffe, 2013). As influential actors framing education and contemporary LLL policies, IOs promote policy transfer towards evidence-based educational practices, the measurement of the effectiveness of education and the achievement of goals relating to competitiveness and employability (Mikulec, 2017) through new instruments and practices of governance based on knowledge and data generation, peer learning, benchmarks, indicators, monitoring, evaluation and funding (Ioannidou, 2014; Lawn and Grek, 2012).

Therefore, the IOs stimulate a kind of transnational educational policy transfer that encompasses ideas, ideology, practices and institutions, involving multiple actors (Crossley, 2019, p. 4). The process of policy transfer should be understood as a continuum that can incorporate various influences, from voluntary ones to more coercive ones (i.e. policies that are forcibly imposed on countries or those that countries must adopt due to political pressure) (Portnoi, 2016). Furthermore, as Jakobi (2009, pp. 34–36) pointed out, IOs promote policy transfer and influence national policy development through the following identifiable soft instruments: (a) discursive dissemination or the establishment of ideas and goals for national agendas; (b) standard setting or the conventions and recommendations as well as benchmarking, explicit aims and rules to which states should comply; (c) financial means aimed at eliciting specific behaviour (establishing programmes or institutions); (d) coordinative functions or the instruments of surveillance monitoring progress toward common policy aims; and (e) technical assistance enabling states to achieve set policy aims.

European education policy and instruments used in the EQF policy transfer

The EU is one of the key agencies contributing to the formation of European education policy. The adoption of the Lisbon Strategy in 2000 marked the starting point in establishing a European education policy defined by common goals, implementation tools and financial resources, although the EU formal competencies in the field of education were limited by the subsidiarity rule (Mikulec, 2017). For the purpose of formulating and maintaining the European education policy, the European Commission (EC) adopted an open method of coordination (OMC) to improve the effectiveness, coordination and measurability of the outcomes of various LLL policies. The OMC established a new form of multilevel educational governance that (a) is exercised in the form of 'soft law' (e.g. recommendations, guidelines, resolutions, conclusions, etc.), (b) is based on soft law voluntary implementation from the member states, (c) and strives to establish monitoring mechanisms through benchmarks and indicators in order to measure and compare the progress of member states (Ioannidou, 2014; Lawn and Grek, 2012).

The EQF is one of the numerous soft law recommendations produced by the EU. Whilst the initiatives leading to the development of the EQF can be traced back to 2001 (Elken, 2015), it was not before 2008 that European Parliament and Council issued the EQF recommendations—a 'translation grid' with eight-level descriptors—and recommended that member states use it as a common reference tool to compare qualification levels, relate qualifications systems or NQFs to the EQF and use an learning outcome-based approach when defining qualifications. In 2017, the Council (2017) issued slightly modified version of these recommendations to address the problematic issue regarding the concept of 'competence', amongst others (cf. Bohlinger, 2019, p. 400). Meanwhile, data from the latest Cedefop (2018, pp. 12–13) survey indicated the following: (1) a total of 39 European countries (all 28 member states plus another 11 countries) had adopted recommendations and either established or were in the process of establishing an NQF, (2) most countries had proposed or adopted the EQF's eight-level structure and established comprehensive frameworks, and (3) 34 countries had formally linked their NQFs to the EQF, whilst 29 countries linked theirs to the Bologna framework. Despite the non-binding nature of the EQF recommendations, the development of EQF-influenced NQFs in Europe in the last decade has been remarkable, notwithstanding the evidence indicating the NQFs' inability to fulfil the broader set of objectives and purposes they claim (Mikulec, 2017; Bohlinger, 2019).

Following Jakobi (2009), the main instruments used by the EU when promoting the EQF policy transfer and influencing national NQF policy development can be identified. On the level of (a) discursive dissemination, the following ideas and goals can be identified: the EQF is supposed to facilitate LLL

and employability, promote the mobility and social integration of European citizens and enable greater transparency, comparability and portability of qualifications (Cedefop, 2018; Council, 2017). On the level of (b) standard setting, as the EU issued the EQF recommendations, it must set clear timelines and benchmarks referring to the criteria and procedures for referencing SQF to the EQF, the quality assurance principles linked to the learning outcome-based approach, the outcome-based standards and the monitoring and credit system principles based on the learning outcome-based approach linked to quality assurance and validation of prior learning (Council, 2017). To achieve the EQF policy aims, the EU supported candidate countries and member states through (c) financial means, i.e. actions funded by the EU programmes (Council, 2017) (in case of Slovenia, the SQF development and implementation was supported with European social funds (ESF) in the years 2009–2014 and with Commission grants to the EQF national coordination points (NCP) from 2011 onwards). On the level of (d) coordinative functions that explore the progress made towards common policy aims, the EQF has been governed by the OMC and monitored through the EQF Advisory Group (EQF AG) and other networks (i.e. EQF national coordination points and EQF peer learning activities), whilst the implementation of the EQF and established NQF is one of the indicators in the two 'flagship initiatives' for the Europe 2020 Strategy (Mikulec, 2017). Finally, technical assistance is provided in terms of expert advice, because at least two international experts should be included in the EQF referencing process (Council, 2017) (in the case of Slovenia, three international experts were included).

Measuring the impacts of NQFs

Contrary to the numerous publications issued by the EC and contracting agencies in the last 12 years, which argued in favour of objectives the EQF and NQFs should bring – among others improved transparency of national qualification systems, reinforced use of learning outcomes approaches, enabled validation of non-formal learning and mobility of learners, enhanced quality of learning and greater stakeholders engagement (Cedefop, 2018; cf. Raffe, 2013, p. 147; Werquin, 2007, pp. 466–468; Young, 2007, pp. 449–500) –, critical scholars emphasised that NQFs are, in fact, unable to fulfil the broader set of objectives and purposes they claim and even problematised the idea of measuring the impacts of the EQF and NQFs. More than ten years after the EQF implementation, we still 'know little about its actual impact' (Bohlinger, 2019, p. 403), and member states adopted the EQF 'on paper while decoupling it from Member States' de-facto implementation' (Bohlinger, 2019, p. 395). Raffe (2013) pointed out that the impacts of NQFs are difficult to investigate, as they are not yet fully implemented and/or not functioning for long enough to measure such impacts. Similarly, Allais (2010, 2011) emphasised that the NQF's impact on the national education and training system may be difficult to measure, because 'the concepts and categories used to measure performance may be changed by the NQF itself' (Allais, 2010, p. 91). She added that the NQF cannot be researched and evaluated as 'policy mechanism[s] in their own right' (Allais, 2017, p. 769), but should rather be examined in a broader context of (education and labour market) systems and institutions, the relationship between them and the NQF and other ongoing reforms in the country (Allais, 2017, p. 775). Pilcher, Fernie and Smith (2017, p. 9) critically reminded that studying the impacts of NQFs is almost impossible due to the semantic vagueness of the term 'impact', the differences in NQFs' philosophies and objectives and the methodological complexities; thus, such a task is 'a dream for which it is impossible to identify a suitable yardstick to measure'. Yet, a clear definition of the term 'impact' and the conduct of independent research focusing on fundamental questions can help raise the value of such research.

The current study' research design takes these methodological limitations into consideration. The SQF's overall impact is studied 10 years after it came to existence, eight years after its referencing to the EQF and five years after the SQF Act was adopted. Moreover, the study is limited to the SQF's impact on the education system (excluding the labour market), by exploring the extent to which SQF objectives have influenced changes in education system: (1) improved recognisability and understanding of qualifications, (2) improved transparency of qualifications and qualifications subsystems, and (3) reinforced LLL support. The study examined the SQF in the context of wider education reforms undertaken before the SQF development as well. Finally, the impact is examined from the perspective of those stakeholders, whose occupational positions make them the primary users or implementers of the framework: they are the ones expected to implement it into various official and curricular documents and use it for different types of career, education and learning guidance and counselling activities. In that regard, they can be considered a representative sample.

The case of the SQF

Context and settings

After gaining independence in 1991, Slovenia reformed its entire educational system in the first half of 1990s based on European values regarding the principles of human rights and justice, the autonomy of students and teachers, quality provision and comparable European educational standards. Furthermore, it introduced the outcome orientation of the curricula and standards of knowledge as the basis for national external testing of knowledge, the essential purposes of which were to monitor the quality of educational institutions and to strengthen the autonomy of teachers (Ermenc, 2014; Mikulec and Ermenc, 2016).

In 1998, Slovenia started to prepare for its formal accession into the EU and later became a member in 2004. This triggered a second wave of educational reforms, especially in vocational, higher and adult education subsystems, which can also be attributed to the extensive financial support from European project funds. Slovenia was one of the 29 countries that signed the Bologna Declaration in 1999 and, in the coming decade, reformed its higher education system in line with Bologna requirements leading to the following: (a) a three-cycle degree structure, (b) the use of the European Credit Transfer and Accumulation System (ECTS) and learning outcome-based approach in curriculum development, (c) the use of the European Standards and Guidelines for Quality Assurance (ESG), (d) the establishment of the NQF in line with the EQF and framework of qualifications for the European higher education area (FQ EHEA) and (e) the establishment of recognition procedures in line with the Lisbon Recognition Convention (Ermenc and Mikulec, 2020). Furthermore, with the Lisbon Strategy set in 2000, Slovenia participated in its implementation and fulfilled the Education and Training 2010 programme in vocational education and training (VET) and adult education from 2002 on, in addition to monitoring and reporting on already achieved objectives. The reforms focused on (a) quality assurance, (b) transparency of (vocational) qualifications based on learning outcomes, (c) implementation of decentralised competence-based curricula, (d) development of flexible and individualised learning paths, (e) development of the LLL strategy, (f) implementation of key competences and validation of informal learning and (g) implementation of European transparency tools (SQF, Credit Transfer System for VET (ECVET), Europass) (Ermenc, 2014).

Therefore, the implementation of the Bologna and Lisbon processes in the first decade of the 21st century triggered a variety of educational reforms, with which the economic goals of education came to the fore, and the SQF's development, which started in 2009 and was one of the last initiatives to be implemented from the Lisbon period in Slovenia and built on previously undertaken reforms.

SQF features

The SQF development in Slovenia started in 2009, when the 'Slovenian Qualifications Framework' project was lunched and other supporting bodies were set, including the EQF national coordination point, the Interdepartmental Working Group established by the Government involving representatives of key stakeholders, and the SQF expert group. First, the SQF draft proposal was prepared at the end of 2010, and a comprehensive consultation process with stakeholders took place in 2011 and in the beginning of 2012. Then, the SQF's first referencing to the EQF and its self-certification to the FQ EHEA were prepared, discussed with the stakeholders, presented to the EQF AG in 2013 and adopted in 2014 by the EQF AG. Finally, at the end of 2015, the special SQF Act was formally adopted by the Slovenian government (CPI, 2014; ZSOK, 2015).

The SQF is comprehensive framework, which includes qualifications from all subsystems of initial and further education and training. The SQF includes three types of qualifications: (1) formal educational qualifications; (2) vocational qualifications that can also be obtained outside the formal education system and consist of (a) national vocational qualifications (NVQs) and (b) qualifications obtained under continuing vocational training or study programmes for continuing education; and (3) supplementary qualifications, i.e. qualifications that supplement an individual's competences in a specific professional field and are tied to the labour market's needs. Following the example of the EQF from 2008, the SQF level descriptors are described in terms of knowledge, skills and competences, although its definitions are adapted to the existing national system (CPI, 2014; ZSOK, 2015). The framework, which contains 10 levels, can be categorised as a 'communication framework' (Raffe, 2011, pp. 283–284; Raffe, 2013, p. 148), as it is mainly based on existing education legislation and established educational practices. Its purpose is to improve the existing qualifications system's transparency, and the form of learning outcomes is not prescribed uniformly for all qualifications in different educations subsystems by the SQF (Mikulec and Ermenc, 2016, pp. 6–7). However, the SQF is also designed as a tool of reform. This is because, for the first time, it introduced new type of qualifications (i.e. supplementary qualifications)

into an existing qualifications system and gave those qualifications coming from the labour market (i.e. employers) state recognised visibility. Nonetheless, this type of qualifications is not equivalent to the educational or vocational qualifications and there is no horizontal progression between supplementary qualifications and educational or vocational qualifications. Furthermore, the SQF also recognised new vocational qualifications (i.e. qualifications obtained under continuing vocational training programmes or study programmes for continuing education), which support LLL opportunities in higher education and foster the greater integration of the labour market and education in continuing VET.

By making a distinction between the SQF's communication and reform roles, we can better understand its main objectives. The first two, i.e. (a) 'to improve transparency, accessibility and quality of qualifications' and (b) 'to connect and coordinate Slovenian qualifications subsystems', are related to the SQF's communication role, whilst the third one, i.e. (c) 'to support LLL' and to integrate the labour market needs with education and support mobility, are related to the SQF's reform role (CPI, 2014, p. 30). For the purpose of the empirical investigation, we developed the following three categories related to the above-mentioned SQF objectives: (1) recognisability and understanding of qualifications, (2) transparency of qualifications and coordination of qualifications subsystems and (3) LLL support.

Materials and Methods

A quantitative research approach was employed in order to contribute to the better understanding of the impact of the EQF-influenced SQF on its education and training system. We examined the achievement of the objectives at a common level, that is, at the level of all stakeholders included in the survey, and also looked into the extent to which the SQF's objectives were met from the perspectives of those stakeholders who used the SQF at their work compared to those who do not. We also compared the perspectives of those stakeholders who were informed about the SQF's benefits (or assessed that the benefits were presented to them) with those who were not informed. The following research questions have been designed:

RQ1. What are the key stakeholders' views regarding the extent to which the SQF objectives have been met?

RQ2. Are there any differences in the stakeholders' views on the extent to which the SQF objectives have been met depending on their usage of the SQF?

RQ3. Are there any differences in the stakeholders' views on the extent to which the SQF objectives have been met depending on whether they are familiar with the SQF's benefits?

Survey sample

In the first phase, all relevant institutions were identified and requested to participate: including ministries responsible for education, higher education, labour market and economy; education institutions (vocational schools and colleagues, secondary general schools and universities); adult education colleges and institutes; students' organisations and employment service. The institutions were asked to identify those employees who best fit the description of the key stakeholder, so that the survey sample can be the best expert sample for the study. In other words, we were interested in those who were supposed to implement and use the SQF for professional (not personal) reasons, but were who not involved in the establishment or design of the framework. There were 50 key stakeholders included in the survey. Although the sample is of a medium size, it is representative for the studied population. The largest number of the sample included faculty representatives (44%), followed by educational institution representatives (18%) and career advisers (12%). The remaining categories—representatives of student organisations (4,0%), ministries (2,0%), adult education (4,0%) and vocational colleges (4,0%)—were represented to a much lesser extent.

Instrument

A questionnaire was designed to collect the data from the identified stakeholders. It consisted of three sets of questions, which measured the opinions of the stakeholders on (1) the recognisability and understanding of qualifications (5 items), (2) contribution of SQF to the transparency of qualifications and coordination of qualifications subsystems (6 items) and (3) the LLL support of SQF (4 items), respectively. The items were originally measured on a 5-point scale ranging from 'disagree' (grade 1) to 'fully agree' (grade 5). However, due to the small survey sample size, the grades were merged into a 3-point scale wherein grade 1 indicated disagreement, grade 2 indicated undecided respondents and grade 3 indicated their agreement.

In addition, two additional dichotomous questions, which considered the use of the SQF at work and being informed about the SQF's benefits, were asked. The respondents were given the opportunity to answer with 'I do not know' at each item, in case they did not have enough information to express their opinion.

Procedure

The study was conducted using an online questionnaire administered in February 2019. The collected data were analysed using quantitative analysis methods, such as basic descriptive statistics (frequency distribution). The existence of statistically significant differences regarding the SQF's benefits between users and non-users of SQF and between informed and non-informed stakeholders were examined with the Likelihood ratio test. The respondents who provided the 'I do not know' answer were omitted from the analysis.

Results

Recognisability and understanding of qualifications

Table 1.

Frequency distributions for items measuring recognisability and understanding of qualifications with the results of the likelihood ratio test regarding the use of the SQF and being informed about the SQF's benefits

	n	Disagree	Undecided	Agree	Likelihood ratio test		
					LR	df	p
Familiarity with the SQF	**50**	**12.0%**	**8.0%**	**80.0%**			
Users	30	0.0%	3.3%	96.7%	14.608	2	0.001
Non-users	18	27.8%	16.7%	55.6%			
Informed about the SQF's benefits	17	0.0%	0.0%	100.0%	8.090	2	0.018
Not informed about the SQF's benefits	30	13.3%	13.3%	73.3%			
Awareness of the purposes of the SQF	**49**	**16.3%**	**20.4%**	**63.3%**			
Users	30	6.7%	20.0%	73.3%	4.323	2	0.115
Non-users	18	27.8%	22.2%	50.0%			
Informed about the SQF's benefits	17	0.0%	11.8%	88.2%	8.562	2	0.014
Not informed about the SQF's benefits	30	20.0%	26.7%	53.3%			
Availability of the materials and other SQF-related information needed	**46**	**13.0%**	**26.1%**	**60.9%**			
Users	30	3.3%	20.0%	76.7%	9.370	2	0.009
Non-users	15	26.7%	40.0%	33.3%			
Informed about the SQF's benefits	17	0.0%	0.0%	100.0%	23.082	2	0.000
Not informed about the SQF's benefits	29	20.7%	41.4%	37.9%			
Familiarity with the EQF	**47**	**12.8%**	**19.1%**	**68.1%**			
Users	30	3.3%	16.7%	80.0%	6.082	2	0.048
Non-users	16	25.0%	25.0%	50.0%			
Informed about the SQF's benefits	17	0.0%	11.8%	88.2%	6.832	2	0.033
Not informed about the SQF's benefits	29	17.2%	24.1%	58.6%			
Contribution of the SQF to a better understanding of qualifications	**42**	**4.8%**	**33.3%**	**61.9%**			
Users	27	3.7%	25.9%	70.4%	2.277	2	0.320
Non-users	15	6.7%	46.7%	46.7%			
Informed about the SQF's benefits	15	0.0%	0.0%	100.0%	19.322	2	0.000
Not informed about the SQF's benefits	27	7.4%	51.9%	40.7%			

Table 1 shows that the recognisability and understanding of qualifications amongst the stakeholders is highest in terms of familiarity with the SQF, which is typical for SQF users (96, 7%) and for those who

are informed about the SQF's benefits (100%). Familiarity with the EQF amongst the stakeholders is lower than familiarity with the SQF, and this finding holds for those who use the SQF at their work and those who are informed about the benefits of the SQF.

About two-thirds of the stakeholders state that they are familiar with the SQF's purpose, and a slightly smaller proportion state that they have access to the materials and other information on the SQF that they need.

Being informed of the SQF's benefits has a significant impact on the recognisability and understanding of qualifications amongst the stakeholders. This is because the levels of familiarity with the SQF and EQF, awareness of the SQF's purpose and the availability of materials and information on the SQF are all statistically significantly higher amongst the stakeholders who are informed about the SQF's benefits. Furthermore, the stakeholders who are informed about the SQF's benefits believe that it contributes to better understanding the qualifications compared to the non-informed stakeholders. To some extent, the use of the SQF is also a predictor of achieving the goals of recognisability and understanding of qualifications, as the levels of familiarity with the SQF and EQF and the accessibility of materials and information on the SQF are statistically significantly higher amongst SQF users compared to non-users.

Transparency of qualifications and coordination of the qualifications subsystems

Table 2.

Frequency distributions for items measuring transparency of qualifications and coordination of the qualifications subsystems with the results of the likelihood ratio test regarding the use of the SQF and being informed about the benefits of the SQF

	n	Disagree	Undecided	Agree	Likelihood ratio test		
					LR	df	p
Contribution of the SQF to a simpler description of qualifications	**42**	**2.4%**	**40.5%**	**57.1%**			
Users	27	0.0%	33.3%	66.7%	4.247	2	0.120
Non-users	15	6.7%	53.3%	40.0%			
Informed about the SQF's benefits	15	0.0%	6.7%	93.3%	14.540	2	0.001
Not informed about the SQF's benefits	27	3.7%	59.3%	37.0%			
Contribution of the SQF to greater transparency of knowledge, skills and competences of each individual qualification	**42**	**7.1%**	**33.3%**	**59.5%**			
Users	27	0.0%	25.9%	74.1%	10.319	2	0.006
Non-users	15	20.0%	46.7%	33.3%			
Informed about the SQF's benefits	15	0.0%	6.7%	93.3%	13.246	2	0.001
Not informed about the SQF's benefits	27	11.1%	48.1%	40.7%			
Contribution of the SQF to greater transparency of qualifications in a particular field of expertise (e.g. construction, agriculture, etc.)	**40**	**5.0%**	**45.0%**	**50.0%**			
Users	25	0.0%	48.0%	52.0%	4.113	2	0.128
Non-users	15	13.3%	40.0%	46.7%			
Informed about the SQF's benefits	14	0.0%	7.1%	92.9%	18.174	2	0.000
Not informed about the SQF's benefits	26	7.7%	65.4%	26.9%			
Contribution of the SQF to better understanding of the relations between individual types of qualifications	**40**	**7.5%**	**42.5%**	**50.0%**			
Users	26	3.8%	38.5%	57.7%	2.448	2	0.294
Non-users	14	14.3%	50.0%	35.7%			
Informed about the SQF's benefits	14	0.0%	14.3%	85.7%	12.560	2	0.002
Not informed about the SQF's benefits	26	11.5%	57.7%	30.8%			
Simplifying the understanding of the transition between qualifications acquired through formal and non-formal education and supplementary qualifications of the SQF	**38**	**10.5%**	**31.6%**	**57.9%**			
Users	27	3.7%	25.9%	70.4%	7.403	2	0.025
Non-users	11	27.3%	45.5%	27.3%			
Informed about the SQF's benefits	15	0.0%	20.0%	80.0%	7.170	2	0.028
Not informed about the SQF's benefits	23	17.4%	39.1%	43.5%			
Facilitating comparison of qualifications for the needs of study and work	**40**	**7.5%**	**17.5%**	**75.0%**			
Users	27	0.0%	11.1%	88.9%	10.862	2	0.004
Non-users	13	23.1%	30.8%	46.2%			
Informed about the SQF's benefits	15	0.0%	0.0%	100.0%	11.336	2	0.003
Not informed about the SQF's benefits	25	12.0%	28.0%	6.0%			

In the context of the SQF's contribution to the transparency of qualifications and the coordination of the qualifications subsystems (Table 2), stakeholders assessed the facilitation of the comparison of qualifications for the needs of study and work as the highest (75,0%). The results show that there is a significant proportion of stakeholders who remain undecided about the SQF's contribution to the transparency of qualifications or do not have enough information about it. Despite the small proportion of those who consider the transparency of qualifications to be inadequate based on the following aspects and the high shares of those who acknowledge the SQF's contribution to the transparency of qualifications in terms of the following: (1) a greater transparency of knowledge, skills and competencies of each qualification (59,5%); (2) a simpler description of qualifications (57,1%); (3) simplified understanding of the transition between qualifications acquired through formal and non-formal education and the SQF's supplementary qualifications (57,9%), (4) contribution to a better understanding of the relations between individual types of qualifications (50,0%); and (5) contribution to the greater transparency of qualifications in a particular field of expertise (50,0%).

The stakeholders' opinions regarding the SQF's contribution to the transparency of qualifications and to the coordination of qualifications subsystems are significantly dependent on whether or not they are informed about the SQF's benefits. The stakeholders who are informed about the SQF's benefits recognise its contribution to the transparency of qualifications and to the coordination of the qualifications subsystems in all respects to a statistically significantly greater extent than those who are not informed. The latter are most often undecided regarding the contribution, whilst those who are informed about the SQF's benefits have a mostly high level of agreement regarding the SQF's contribution to the transparency of qualifications and to the coordination of the qualifications subsystems.

Furthermore, the usage of the SQF conditions the respondents' views regarding the SQF's contribution to the transparency of qualifications and the coordination of qualifications subsystems to some extent. Notably, the SQF's contributions to the achievement of greater transparency of knowledge, skills and competences of individual qualifications; to the simplification of the understanding of the transition between qualifications acquired through formal and non-formal education and the SQF's supplementary qualifications; and to a comparison of qualifications for the needs of study and work, are all recognised to a statistically significantly greater extent by SQF users compared to non-users.

Lifelong learning support

Table 3.

Frequency distributions for items measuring lifelong learning support with the results of the likelihood ratio test regarding the use of the SQF and being informed about the benefits of the SQF

	n	Disagree	Undecided	Agree	Likelihood ratio test		
					LR	df	p
Contribution to a better understanding and comparability of Slovenian qualifications abroad	**39**	**12.8%**	**20.5%**	**66.7%**			
Users	27	7.4%	22.2%	70.4%	2.128	2	0.345
Non-users	12	25.0%	16.7%	58.3%			
Informed about the SQF's benefits	15	0.0%	0.0%	100.0%	16.544	2	0.000
Not informed about the SQF's benefits	24	20.8%	33.3%	45.8%			
Contribution of the SQF to a more successful dialogue between the labour market and education and training institutions	**36**	**16.7%**	**44.4%**	**38.9%**			
Users	24	4.2%	45.8%	50.0%	9.064	2	0.011
Non-users	12	41.7%	41.7%	16.7%			
Informed about the SQF's benefits	14	0.0%	42.9%	57.1%	7.822	2	0.020
Not informed about the SQF's benefits	22	27.3%	45.5%	27.3%			
Contribution of the SQF to a better match between available market knowledge and skills, and workplace need	**35**	**14.3%**	**54.3%**	**31.4%**			
Users	24	8.3%	54.2%	37.5%	2.714	2	0.257
Non-users	11	27.3%	54.5%	18.2%			
Informed about the SQF's benefits	14	0.0%	42.9%	57.1%	10.521	2	0.005
Not informed about the SQF's benefits	21	23.8%	61.9%	14.3%			
Facilitating easier planning of workers' needs and their professional development	**35**	**22.9%**	**42.9%**	**34.3%**			
Users	23	13.0%	43.5%	43.5%	4.510	2	0.105
Non-users	12	41.7%	41.7%	16.7%			
Informed about the SQF's benefits	13	7.7%	15.4%	76.9%	17.558	2	0.000
Not informed about the SQF's benefits	22	31.8%	59.1%	9.1%			

The SQF's LLL support seems to be the weakest area amongst the ones studied (Table 3), as only about one third of the sample acknowledge the SQF's contributions to a better match between available market knowledge and skills and workplace needs as well as to easier planning of workers' needs and their professional development.

The SQF's contribution to a more successful dialogue between the labour market and education and training institutions is acknowledged by more than one third of the stakeholders (38,9 %), with those using the SQF at their work assessing this contribution to a statistically significantly higher extent than non-users. Furthermore, the stakeholders who are informed about the SQF's benefits statistically significantly differ in their assessment of the contribution from those who are not informed about such benefits. Two thirds of the stakeholders believe that the SQF contributes to a better understanding and comparability of Slovenian qualifications abroad. Moreover, from all measured aspects, the stakeholders who are informed about the SQF's benefits recognise its LLL support to a statistically significantly greater extent than those who are not aware of the SQF's benefits.

Discussion

The EQF policy transfer influenced SQF development through discursive dissemination, i.e. common objectives related to facilitation of LLL, such as the promotion of mobility, transparency and

comparability of qualifications; standard setting, i.e. clear timelines and benchmarks related to the use of criteria and procedures for referencing the SQF to the EQF; financial means, i.e. the SQF development and implementation being supported with ESF and Commission grants to the EQF NCP; coordinative functions, i.e. progress made towards common policy aims (the SQF) being monitored through the EQF networks (EQF AG and EQF NCP); and through technical assistance, i.e. three international experts were included in the EQF referencing process. The SQF was built on two waves of reforms undertaken before SQF development: one related to the comprehensive education reform in 1990s and another which made Slovenia part of the Europeanisation process. The SQF's development started in 2009 and was formally established based on these two waves of educational reforms, which provide the necessary context for better SQF analysis and understanding (cf. Allais, 2017).

As is the case with most EQF-influenced NQFs in Europe (cf. Cedefop, 2018, p. 17), the SQF has mostly been designed as a communication framework (Raffe, 2013), which includes some reform elements related to the support for LLL, namely, the mobility and integration of labour market needs with education (CPI, 2014, p. 29).

The results indicate that the SQF is more successful in its communication role compared to the reform role: objectives related to the SQF's communication role are, from the key stakeholders' perspectives, realised to a much greater extent compared to those related to the SQF reform role. Hence, objectives related to the reform role, except for mobility, seem to be a much more difficult nut to crack.

The finding that those stakeholders who use the SQF in their work and/or are informed about its benefits assess the framework's communication role to be much better, compared to those who do not use it or are not informed about its benefits, implies that the communication role is a productive one that may be even improved in time when more people are informed and eventually become SQF users. This is particularly true where recognisability and understanding of the SQF is concerned, but to a lesser extent when transparency and coordination of qualifications subsystems are involved. As for the latter, the high proportion of the undecided users is still rather high, although this improves in those who are informed about the SQF's benefits.

More specifically, the majority of the stakeholders agree that the SQF contributes to the recognisability and understanding of qualifications; two thirds also agree that it improves the EQF's recognisability. More than half agree that the SQF improves the transparency of qualifications and coordination of the qualifications subsystems according. This finding is in line with Cedefop's (2018, p. 16) conclusions on the early impact of the European NQFs. We additionally found that the stakeholders who are informed about the benefits of the SQF, along with those who use the SQF (to slightly lesser extent), recognise the contribution of the SQF to the transparency of qualifications and coordination of the qualifications sub-systems to a statistically significantly greater extent compared to those who do not use it or are not informed about its benefits well enough. This finding implies that the NQFs' role in the transparency of qualifications and coordination of the qualifications subsystems may improve after more people who use it professionally gain a deeper understanding of the framework's roles and benefits.

When it comes to the SQF's support to the LLL, a disparity of results can be noticed. Whilst two thirds of the stakeholders believe that the SQF contributes to the mobility of learners and workers on the one hand, less than 40% of the respondents acknowledge the SQFs contribution to other objectives related to the LLL policy on the other hand. For instance, only 38.9% stakeholders agree that the SQF can contribute to a better integration of labour market needs and education despite the fact that the SQF introduced supplementary qualifications that are tied to the labour market needs into the SQF. Such a finding may be influenced by the sample's composition sample (the labour market representatives were excluded), yet a recent CPI (2020) report, which included a broader range of respondents, revealed that supplementary qualifications were not successfully implemented, because they were not 'organically' integrated into the existing education system and thus functioned as an alien body causing tensions amongst different stakeholders and decision-makers. The SQF's reform role has not proven to be productive in terms of including new types of qualifications, such as those that did not exist before the framework was introduced, into the SQF. It seems that the disparity can also be explained along the line of the SQF's communication–reform functions: mobility has been part of the Slovenian education policy ever since Slovenia became a member of the EU in 2004 and is well-embedded in the education practice with full infrastructure in place. The SQF is merely one element in the mobility policy, thereby enhancing but not enabling it. In comparison, the supplementary qualifications are not part of any background policy or pre-existing practices.

Conclusion

The indirect measurement of the impacts of the SQF and the small sample prevented us from drawing very solid conclusions. Therefore, the findings of the study should be seen as an addition to the previous studies investigating the influence of the European education policy on national educational policies, focusing on the development and implementation of NQFs in Europe. The study addresses the tensions and growing gap between the advocates of the EQF and NQFs. Such a gap arises from the IOs and their belief that NQFs and EQFs are a 'panacea' that can resolve many educational problems faced by Europe on the one hand, and the critical research community arguing that the EQF and NQFs are unable to fulfil a broader set of objectives and purposes as they claim on the other hand. By examining the case of the Slovenian framework—an example of an EQF-influenced NQF—from the key stakeholders' perspectives, we tried to find a productive way of approaching the impact measurement problem. A more balanced and larger sample would enable us to reach less tentative conclusion, yet the results persuade us to agree with those who claim that the NQFs indeed cannot function as a panacea. They do, however, seem to have the potential to become 'the cherry on top of the cake' of more comprehensive reforms if implemented as a final policy step supporting other relevant policies related to the recognisability, transparency, mobility of qualifications, system coherency and education–labour market cooperation.

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Conflict of interests
The authors declare no conflict of interest.

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Teachers' Key Competencies for Innovative Teaching

Nikola Simonović[1]*

[1]University in Niš, Faculty of Philosophy, Serbia, e-mail: nikola.simonovic84@hotmail.com

Abstract: The educational process is by its nature and essence very dialectical, so it necessarily requires teachers to have a developed whole set of various competencies. The aim of the research was to examine teachers on self-assessment of competencies that were crucial for innovating the teaching process. The sample of respondents included 1300 elementary and secondary school teachers in the territory of Southern Serbia. The instrument used was a five-point TCS scale of attitudes, with a total of 48 items (individual competencies). The results of the analysis showed that teachers, based on their self-assessments, highly value all diverse groups of competencies, which fully confirms the general hypothesis. The results also showed the existence of statistically significant differences in the degree of expression of attitudes about competency groups with regard to independent research variables, within special hypotheses, based on which the first was rejected, the second partially and the third and fourth special hypothesis fully confirmed. The issue of key competencies of teachers is certainly one of the fundamental issues when it comes to quality teaching, its innovation, generally successful and efficient dealing with the educational process. Based on these postulates, there is hope that the obtained research results will represent a good starting point and incentive for further research work in this field in the future.

Keywords: teacher, competencies, innovations in teaching, reflective practice.

Introduction

A completely defined expertise and professionalism are recognized through certain special abilities, ie. the competence of teachers to plan and organize certain activities, achieve or realize the intended goals and evaluate the teaching process at all stages. A well-coordinated education system encourages the nurturing of a diverse group of competencies and directs teachers towards continuous personal and professional improvement and development, as well as permanent learning.

The term competencies is defined and interpreted differently depending on the specifics of the purpose, approach and context in which it is used as a term, but in many definitions common features can be found Andevski and Arsenijević (2012). The term competencies stands for a complex mosaic of characteristics, knowledge, beliefs, abilities, skills, experiences, motivation, value attitudes, habits and self-regulation as interdependent and connected elements that enable an individual to be active and efficient in a certain specific situation.

Competences are a dynamic and multidimensional category subject to constant change, enrichment and upgrading, which is influenced by various factors that are cause-and-effect related. Competencies are the core of every professional success and achievement, no matter what one does for life. Defined as such, key competencies are crucial for the work and actions of all individuals in society, including teachers, and are based on goals that are embedded in all school subjects.

The necessity of having a wide group of teacher competencies is pointed out by various authors (Tapani and Salonen, 2019; Teodorović, Milin and Stanković, 2019; Call, 2018; Turk, 2016; Jorgić, 2015; Bertschy, Künzli and Lehmann, 2013; Gojkov, 2012; Nessipbayeva, 2012; Panić and Wubbels, 2010; Selvi, 2010). In the further review, various groups of teacher competencies were analyzed.

Interpersonal competencies specifically include possessing the necessary human qualities, knowledge, abilities and skills related to processes and interpersonal relationships in teaching, possessing the ability to create trust and empathy towards colleagues and other individuals, creating positive interdependence and equal participation in work, ability to act by personal example with expressed propensity for individual and group responsibility (Englefield et al., 2019; Brundiers and Wiek, 2017; Gojkov, 2012). Certain authors (Jurčić, 2014; Vrkić-Dimić, 2013; Andevski and Arsenijević, 2012), see

*Corresponding author: nikola.simonovic84@hotmail.com

them in the form of personal competencies that include teacher personality traits, personal potentials, personal and interpersonal skills.

Socioemotional group of competencies related to the ability to provide additional support to students from vulnerable social groups to realize educational potential in complete socioemotional development, but also the ability to actively contribute to an inclusive approach to education, encouraging students to respect universal human and national values, respect for diversity and multiculturalism, is particularly highlighted by (Fiorilli et al., 2017; Brust Nemet and Velki, 2016; Dorman, 2015; Gojkov and Stojanović, 2015; Jurčić, 2014; Vrkić-Dimić, 2013; Andevski and Arsenijević, 2012; Livazović, 2012).

In the light of emphasizing the importance and necessity of possessing competence, pedagogical-psychological is emphasized by (Tapani and Salonen, 2019; Dubovicki and Jukić, 2017; Jorgić, 2015; Buljubašić-Kuzmanović, 2014; Jurčić, 2014; Đuranović, Klasnić and Lapat, 2013; Voss and Kunter, 2013; Liakopoulou, 2011). This group of competencies includes, among other things, knowledge of general principles, goals, outcomes of education and upbringing, general and special standards of student achievement, knowledge of psychological bases of working with children, possession of ability to apply different types of motivation, specific knowledge of different learning styles and strategies of learning, as well as taking measures to support students with learning difficulties.

Subject-professional group of competencies related to knowledge of the entire education system, standards, strategies, legislation, possession of self-assessment and personal orientation in the field of planning their own professional development, but also knowledge and extremely good management of the scientific discipline to which the subject belongs is particularly highlighted by (Call, 2018; Nikitchenko, 2017; Sigrid-Blömeke, 2017; Jurčić, 2014; Baumert and Kunter, 2013; Guseva, 2013; Kunter et al., 2013; Andevski and Arsenijević, 2012; Anugerahwati and Saukah, 2010).

The importance of didactic competencies is emphasized by (Tejedor et al., 2019; Milošević and Medić, 2018; Dubovicki and Jukić, 2017; Gojkov and Stojanović, 2015; Malaspina, Mallart and Font, 2015; Jurčić, 2014; Kuhnigk, Schreiner and Harendza, 2013; Tichá and Hošpesová, 2013; Vrkić-Dimić, 2013; Gojkov, 2012). The didactic group of competencies implies the possession of the ability of didactic content design with the application of various didactic methods, techniques, forms of work, available teaching resources and aids for the efficiency and effectiveness of the teaching process, as well as the development of new and creative didactic materials for teaching.

The issue of methodological education of teachers for reflective practice is one of the crucial issues when it comes to effective teaching and quality education. The necessity of having methodological education, but also methodological culture and teacher competence, which includes knowledge of scientific research methodology, methodological scientific terminology, ways of valid statistical processing, structure of writing a scientific report, mastering intellectual work techniques that are universal for all sciences, but also possessing examination skills, studies and research of pedagogical reality and own practice, as well as the ability to participate in research conducted by other researchers, is pointed out by numerous authors (Albareda-Tiana et al., 2018; Koichu and Pinto, 2018; Taylor, 2017; Letina, 2016; Wareerat et al., 2016). We will indicate that it is closely related to methodological competencies as a related group of competencies in relation to scientific research.

The modern era of the rule of information and communication technologies, among other things, requires a change in the professional development of teachers, which must primarily be based on professional competencies in certain domain because it is indisputable that today, "ICT provides excellent and very useful changes in teaching and learning" (Stošić, Dermendzhieva and Tomczyk, 2020, p. 132-133). In this context, numerous authors emphasize information and communication competencies (Ricardo-Barreto et al., 2020; Chen, Gorbunova and Masalimova, 2017; Feng et al., 2017; Turk, 2016; Wambiri and Ndani, 2016; Adelabu and Adu, 2015; Chai, Koh and Tsai, 2013; Branekova, 2010; Cortes and Lau, 2009), which are an integral and inseparable component of multimedia (Instefjord and Munthe, 2017; Matijević and Topolovčan, 2017; Turk, 2016; Duh, Bratina and Krašna, 2013; Witfelt, 2000), according to other authors. Accordingly, it is important to note that media literacy and media competence are "important features in the process of self-realization of an individual in modern media society", as the authors state (Maksimović, Osmanović and Mamutović, 2020, str. 2688), and to represent "basic skills of the 21st century" (Novković Cvetković, Stošić and Belousova, 2018, p. 1108). If we take into account the fact that multimedia, with its existence and constant progress, poses new challenges to the entire educational technology, as well as the teaching process itself, and that they "become an unavoidable segment in the process of acquiring knowledge" (Stanković, Maksimović and Osmanović, 2018, p. 107), it is quite clear and justified to pay significant attention to multimedia competencies. Some authors especially emphasize the development of digital competencies of teachers (Cabero-Almenara et al., 2020; Falloon, 2020; Miljković and Trnavac, 2020; Mirete et al., 2020; Müller and Varga, 2020; Ristić, 2018; Ferrari, 2012), because digital literacy is

necessary for functioning in a system of digital education that is constantly changing and transforming. Numerous advantages of having this competence are that, among other things, "a digitally competent and literate teacher can communicate with colleagues, students and parents, using various digital tools and applications" (Kožuh, Maksimović and Osmanović Zajić, 2021, p. 161).

We emphasize the leadership roles of teachers with prominent organizational and "managerial"skills in school from the aspect of participation in decision-making and responsibility, through the phrase "leadership in education". In this light, we can speak of organizational competencies that are in particular highlighted by (Chiriac and Granström, 2012; Fairman and Mackenzie, 2012; Xu and Patmor, 2012). Building on the previous, Turk (2016), emphasizes the importance of organizational competence in human resources management as the main feature of every manager in leading people and employees, while the authors (Tapani and Salonen, 2019), emphasize the importance of competence for pedagogical leadership that is, leadership that encompasses school management. This group of competencies includes, among other things, the ability to motivate associates to participate and openly share and use available useful knowledge to make important decisions, the ability to shape a cooperative atmosphere and collaborative climate, facilitate the dissemination of knowledge through organizational culture and initiative, as well as emphasized traits of leaders and inclinations towards leadership, ie. leadership without compromising group cohesion and team spirit.

Self-initiative in professional development, intrinsic motivation for reflective and critical reflection on practice, but also openness to innovation and change (Stanković and Stanojević, 2019; Nikolić, 2015; Schellenbach-Zell and Gräsel, 2010), represent significant features of professionalism. Based on competencies, their development, expansion and complexity, professionalism is one of the essential factors guaranteeing quality and success at work, in the teaching and the entire educational process.

Materials and Methods

Today's school, in accordance with modern tendencies, indisputably needs a "new profile" of a modern teacher, with a wide range of developed competencies, which would enable them to successfully organize work, motivate and encourage students, critically reflect on their practice, independently research and use these results for the purpose of self-improvement. In accordance with the above and the overall issue, which is very topical, the question necessarily arises: Do teachers have a wide group of diverse, as well as individual competencies, within these groups, which are key to innovating their own, but also the entire educational and teaching practice?

The subject of this research, therefore, is the self-assessment of elementary and secondary school teachers in the territory of Southern Serbia on the competence to introduce innovations in teaching and reflective practice, expressed through the evaluation of a wide and diverse group of competencies and individual competencies necessary for successful and efficient educational work.

The general hypothesis of the research is: It is assumed that elementary and secondary school teachers in the territory of Southern Serbia, based on their self-assessments, should highly value all groups, including individual competencies within these diverse groups, which in the literature are considered key to innovation of the teaching process, but also very important in pedagogical activities in general.

Special research hypotheses, 4 of them, refer to assumptions about: existence or non-existence of statistically significant differences in teachers' attitudes about competence groups - interpersonal, socioemotional, pedagogical-psychological, subject-professional, didactic, methodological-research-statistical, multimedia-digital and organizational, in relation to each of the independent research variables separately.

The sample of respondents is appropriate and included 1300 elementary and secondary school teachers surveyed on the territory of Southern Serbia. The survey was conducted during October, November and December 2019, as well as January, February and early March in 2020 in 16 elementary schools, 3 highschools and 11 secondary vocational schools.

Table 1.
Sample structure according to independent variables included in the research

Sample structure according to independent variables included in the research		f	%
Type of school	Elementary	588	45.2%
	Secondary	712	54.8%
Academic achievement	6-7	136	10.5%
	7.01-8	385	29.6%
	8.01-9	549	42.2%
	9.01-10	230	17.7%
Attending seminars in the field of educational technologies and applications of multimedia systems in teaching	Yes	898	69.1%
	No	402	30.9%
Application of internal evaluation in teaching	Yes	740	56.9%
	No	560	43.1%

The method used in this research is a descriptive-scientific-research method. In accordance with the nature of the issue and the choice of an adequate method as a data collection technique, the scaling technique was applied. The instrument used in this research for self-assessment of teachers' attitudes about competencies was a five-point scale of attitudes, TCS scale (Teacher Competence Scale), which contained eight sub-scales, and within each six statements (individual items), therefore a total of 48 items. The assessment scale was constructed independently for the purposes of this research, and was anonymous. The scale started from the possibility of low, ie. non-evaluation (No, not at all - 1), through partial (To a lesser extent - 2), (I am undecided - 3), (To a greater extent - 4), to high evaluation (It is extremely important - 5).

The reliability of the instrument (Teacher Competence Scale - TCS and its subscales) was examined by Cronbach's Alpha coefficient of internal consistency.

Table 2.
The reliability of Teacher Competence Scale - TCS

Scale	AS	SD	α	Number of items
Teacher Competence Scale	205.84	17.366	0.928	48

Table 2 shows that the Teacher Competence Scale - TCS has a high and acceptable reliability (Cronbach α = 0.928). The data obtained by this procedure indicate that the instrument independently constructed for the purposes of this research has good psychometric characteristics and is suitable for measuring attitudes about teacher competencies.

Table 3.
Reliability of subscales of teacher competences

Subscales of competences	AS	SD	α	Number of items
Intrerpersonal	4.492	2.463	0.735	6
Socioemotional	4.253	2.867	0.693	6
Pedagogical-psychological	4.376	2.841	0.722	6
Subject-professional	4.299	2.865	0.707	6
Didactic	4.241	2.912	0.704	6
Methodological-statistical-research	4.086	3.683	0.816	6
Multimedia-digital	4.219	3.701	0.832	6
Organizatonal	4.336	2.846	0.736	6

In Table 3, we notice that seven of the eight sub-scales of teacher competencies have an acceptable reliability (above Cronbach's α = 0.7), except for the scale of socioemotional competencies whose reliability is (Cronbach's α = 0.693), below the limit of the acceptable reliability. The reliability of individual subscales, which are, therefore, at a satisfactory level, given that it is an assessment scale, testifies to the existence of a certain internal coexistence of the instrument itself.

Among the statistical procedures, in addition to descriptive statistics (frequencies, percentages, minimum and maximum values of the empirical range), AS arithmetic mean, SD standard deviation,

Crombach alpha was used within the statistics to check the reliability of instruments and examine the internal correlation of sub-scales.

To determine statistically significant differences in attitudes about competency groups as dependent variables in relation to the offered independent variables, One-factor analysis of variance - ANOVA (F-test) and t-test were used.

Results

The statistical analysis aimed to provide data and results based on which the general, but also specific research hypotheses would be confirmed or refuted. In order to verify them, from the statistical procedures, the Analysis of variance and the Post hoc test were applied to the independent variable - academic success. In all others, a parametric t-test was used to determine statistically significant differences in attitudes about competency groups. By applying descriptive statistical analysis, for the mentioned groups of competencies, the basic descriptive measures of the examined research variables were determined.

Table 4.
Basic parameters of teachers' attitudes about competencies

Subscales of competencies	Theor. min.	Theor. max.	Emp. min.	Emp. max.	AS	SD	Number of items
Interpersonal	1	5	4.365	4.652	4.492	2.463	6
Socioemotional	1	5	3.943	4.420	4.253	2.867	6
Pedagogical-psychological	1	5	4.247	4.436	4.376	2.841	6
Subject-professional	1	5	4.125	4.475	4.299	2.865	6
Didactic	1	5	4.192	4.337	4.241	2.912	6
Methodological-statistical-research	1	5	4.042	4.215	4.086	3.683	6
Multimedia-digital	1	5	4.172	4.296	4.219	3.701	6
Organizational	1	5	4.268	4.448	4.336	2.846	6

The results showed that based on the values of arithmetic means that all exceed the values of 4 (Table 4), elementary and secondary school teachers in Southern Serbia, based on their self-assessments, highly value all diverse groups of competencies, which were offered in the assessment scale. Neither of the groups of competencies stands out drastically, but we will mention that the highest values are observed on the subscale of interpersonal (AS = 4.492), and the lowest on the subscale of methodological-statistical-research competencies (AS = 4.086), with emphasis on minimal differences. In the framework of further statistical analysis, in order to confirm or refute the set special hypotheses, the existence of statistically significant differences in the degree of expression of attitudes about competency groups with respect to independent research variables was examined.

Table 5.
Differences in the degree of expression of attitudes with regard to the type of school

Variables	Type of school	N	AS	SD	t-test	df	Statistical significance	Effect size
Interpersonal	Elementary	588	27.178	2.179	3.040	1298	0.000***	-0.084
	Secondary	712	26.762	2.661				
Socioemotional	Elementary	588	25.481	2.705	-0.425	1298	0.002**	0.012
	Secondary	712	25.549	2.995				
Pedagogical-psychological	Elementary	588	26.222	2.765	-0.411	1298	0.092	0.011
	Secondary	712	26.287	2.904				
Subject-professional	Elementary	588	25.722	2.655	-0.839	1298	0.064	0.023
	Secondary	712	25.856	2.904				
Didactic	Elementary	588	25.387	3.009	-0.683	1298	0.062	0.019
	Secondary	712	25.498	2.830				
Methodological-statistical-research	Elementary	588	24.471	3.504	-0.408	1298	0.006**	0.0011
	Secondary	712	24.554	3.827				
Multimedia-digital	Elementary	588	24.947	3.914	-3.236	1298	0.220	0.089
	Secondary	712	25.612	3.490				
Organizational	Elementary	588	25.726	2.875	-3.324	1298	0.894	0.092
	Secondary	712	26.251	2.801				

Effect size - obtained via Point-biserial correlation coefficient
*** The difference is statistically significant at the level of 0.001
** The difference is statistically significant at the level of 0.01

To determine the existence of statistically significant differences in the degree of expression of attitudes about competency groups with regard to the type of school, a t-test was performed. The results showed that there are statistically significant differences in terms of the expression of certain dimensions of competencies, namely interpersonal ($t_{(1298)}$=3,040, p<0.001), socioemotional ($t_{(1298)}$=-0,425, p<0.01), and methodological-statistical-research ($t_{(1298)}$=-0.408, p<0.01), as evidenced by the data (Table 5). Teachers who work in elementary school have more emphasized interpersonal competences, and teachers who work in secondary school have more emphasized socioemotional and methodological-statistical-research competencies.

Table 6.

Differences in the degree of expression of attitudes with regard to academic achievement (Anova)

Variables	Average grade during completed studies	N	AS	SD	F	df	Statistical significance
Interpersonal	From 6 to 7	136	27.102	1.956	5.595	1299	0.001**
	From 7.01 to 8	385	26.522	2.549			
	From 8.01 to 9	549	27.143	2.409			
	Form 9.01 to 10	230	27.117	2.631			
Socioemotional	From 6 to 7	136	25.573	3.228	9.887	1299	0.000***
	From 7.01 to 8	385	24.870	2.699			
	From 8.01 to 9	549	25.801	2.700			
	From 9.01 to 10	230	25.895	3.127			
Pedagogical-psychological	From 6 to 7	136	26.477	2.535	4.165	1299	0.006**
	From 7.01 to 8	385	25.831	2.885			
	From 8.01 to 9	549	26.428	2.894			
	From 9.01 to 10	230	26.439	2.747			
Subject-professional	From 6 to 7	136	25.500	3.098	8.443	1299	0.000***
	From 7.01 to 8	385	25.254	2.991			
	From 8.01 to 9	549	26.107	2.667			
	From 9.01 to 10	230	26.134	2.824			
Didactic	From 6 to 7	136	25.250	2.445	18.369	1299	0.000***
	From 7.01 to 8	385	24.693	3.028			
	From 8.01 to 9	549	25.630	2.995			
	From 9.01 to 10	230	26.395	2.399			
Methodological-statistical-research	From 6 to 7	136	24.477	3.936	7.058	1299	0.000***
	From 7.01 to 8	385	23.820	3.576			
	From 8.01 to 9	549	24.887	3.715			
	From 9.01 to 10	230	24.821	3.479			
Multimedia-digital	From 6 to 7	136	24.279	4.545	12.942	1299	0.000***
	From 7.01 to 8	385	25.075	3.462			
	From 8.01 to 9	549	25.218	3.963			
	From 9.01 to 10	230	26.539	2.361			
Organizational	From 6 to 7	136	25.529	3.001	10.589	1299	0.000***
	From 7.01 to 8	385	25.735	2.933			
	From 8.01 to 9	549	25.950	2.970			
	From 9.01 to 10	230	26.917	1.999			

*** The difference is statistically significant at the level of 0.001

** The difference is statistically significant at the level of 0.01

Only in the case of determining the existence of statistically significant differences in the degree of expression of attitudes about the groups of competencies with regard to the academic achievement of teachers, an Analysis of variance was performed. In Table 6 it can be seen that in all eight dimensions of competencies - interpersonal ($F_{(1299)}$=5.595, p<0.01), socioemotional ($F_{(1299)}$=9.887, p<0.001), pedagogical-psychological ($F_{(1299)}$=4.165, p<0.01), subject-professional ($F_{(1299)}$=8.443, p<0.001), didactic ($F_{(1299)}$=18.369, p<0.001), methodological-statistical-research ($F_{(1299)}$=7.058, p<0.01), multimedia-digital ($F_{(1299)}$=12.942, p<0.001), and organizational ($F_{(1299)}$=10.589, p<0.001), there are statistically significant differences with regard to the mentioned academic achievement of teachers, ie. their average grade during completed studies.

Table 7.

Differences in the degree of expression of the competence dimension with regard to academic achievement (Post hoc test)

Variables	(I) Average grade during completed studies	(J) Average grade during completed studies	AS Difference (I-J)	Statistical significance
Interpersonal	From 7.01 to 8	From 6 to 7	-0.580	0.018*
		From 8.01 to 9	-0.621	0.000***
		From 9.01 to 10	-0.595	0.004**
Socioemotional	From 7.01 to 8	From 6 to 7	-0.703	0.013*
		From 8.01 to 9	-0.931	0.000***
		From 9.01 to 10	-1.025	0.000***
Pedagogical-psychological	From 7.01 to 8	From 6 to 7	-0.646	0.022*
		From 8.01 to 9	-0.596	0.002**
		Frpm 9.01 to 10	0.607	0.010*
Subject-professional	From 6 to 7	From 8.01 to 9	-0.607	0.026*
		From 9.01 to 10	-0.634	0.039*
	From 7.01 to 8	From 8.01 to 9	-0.852	0.000***
		From 9.01 to 10	-0.880	0.000***
Didactic	From 8.01 to 9	From 7.01 to 8	0.936	0.000***
	From 9.01 to 10	From 6 to 7	1.145	0.000***
		From 7.01 to 8	1.702	0.000***
		From 8.01 to 9	0.765	0.001**
Methodological-statistical-research	From 7.01 to 8	From 8.01 to 9	-1.066	0.000***
		From 9.01 to 10	-1.000	0.001**
Multimedia-digital	From 6 to 7	From 7.01 to 8	-0.795	0.029*
		From 8.01 to 9	-.0939	0.007**
		From 9.01 to 10	-2.259	0.000***
	From 9.01 to 10	From 7.01 to 8	1.463	0.000***
		From 8.01 to 9	1.320	0.000***
Organizational	From 9.01 to 10	From 6 to 7	1.387	0.000***
		From 7.01 to 8	1.182	0.000***
		From 8.01 to 9	0.966	0,000***

*** The difference is statistically significant at the level of 0.001
** The difference is statistically significant at the level of 0.01
* The difference is statistically significant at the level of 0.05

In further statistical analysis, in order to determine the differences in the degree of expression of the competence dimension with regard to academic achievement, a Post Hoc test was performed. Teachers whose average grade during their studies was from 7.01 to 8 have less emphasized interpersonal and socioemotional competencies than teachers whose average grades during their studies are below or above this level. Teachers whose average grade during their studies was from 7.01 to 8 have less emphasized pedagogical-psychological competencies than those whose grade was lower and those whose grade was from 8.01 to 9. However, teachers whose average grade during their studies was from 7.01 to 8 have more emphasized pedagogical-psychological competencies than those whose grade was from 9.01 to 10. Subject-professional, didactic, methodological-statistical-research, multimedia-digital and organizational competencies are more emphasized with teachers who have higher average grades compared to teachers with lower average grades in completed studies (Table 7), which represents the results that we fully expected.

Table 8.

Differences in the degree of expression of attitudes with regard to attending some of the seminars in the field of educational technologies and the application of multimedia systems in teaching

Variables	Seminar attendance	N	AS	SD	t-test	df	Statistical significance	Effect size
Interpersonal	Yes	898	27.043	2.523	2.030	1298	0.006**	-0.056
	No	402	26.743	2.311				
Socioemotional	Yes	898	25.634	2.691	2.189	1298	0.000***	-0.061
	No	402	25.258	3.214				
Pedagogical-psychological	Yes	898	26.508	2.715	4.790	1298	0.003**	-0.132
	No	402	25.699	3.033				
Subject-professional	Yes	898	25.983	2.869	3.535	1298	0.616	-0.098
	No	402	25.378	2.814				
Didactic	Yes	898	25.485	2.912	0.686	1298	0.261	-0.019
	No	402	25.365	2.912				
Methodological-statistical-research	Yes	898	24.757	3.521	3.531	1298	0.016	-0.098
	No	402	23.980	3.974				
Multimedia-digital	Yes	898	25.611	3.547	4.395	1298	0.002**	-0.121
	No	402	24.641	3.948				
Organizational	Yes	898	26.236	2.720	4.235	1298	0.053	-0.117
	No	402	25.517	3.054				

Effect size - obtained via Point-biserial correlation coefficient

*** The difference is statistically significant at the level of 0.001

** The difference is statistically significant at the level of 0.01

To determine the existence of statistically significant differences in the degree of expression of attitudes about competency groups with regard to attending some of the seminars in the field of educational technologies and the application of multimedia systems in teaching, a t-test was performed. The results (Table 8), indicate the existence of statistically significant differences in terms of the expression of interpersonal ($t_{(1298)}$=2.030, p<0.01), socioemotional ($t_{(1298)}$=2.189, p<0.001), pedagogical-psychological ($t_{(1298)}$=4.790, p<0.01), and multimedia-digital competencies ($t_{(1298)}$=4.395, p<0.05). Teachers who attended some of the mentioned seminars have more emphasized previously mentioned groups of competencies in relation to teachers who did not attend them.

Table 9.

Differences in the degree of expression of attitudes with regard to the application of internal evaluation

Variables	Internal evaluation	N	AS	SD	t-test	df	Statistical significance	Effect size
Interpersonal	Yes	740	27.070	2.319	2.013	1298	0.001**	-0.056
	No	560	26.792	2.634				
Socioemotional	Yes	740	25.831	2.605	4.553	1298	0.000***	-0.125
	No	560	25.105	3.134				
Pedagogical-psychological	Yes	740	26.460	2.695	2.960	1298	0.003**	-0.082
	No	560	25.991	3.005				
Subject-professional	Yes	740	26.098	2.514	4.406	1298	0.000***	-0.121
	No	560	25.396	3.231				
Didactic	Yes	740	25.816	2.640	5.288	1298	0.000***	-0.145
	No	560	24.962	3.174				
Methodological-statistical-research	Yes	740	25.054	3.273	6.128	1298	0.000***	-0.168
	No	560	23.807	4.059				
Multimedia-digital	Yes	740	25.647	2.918	3.779	1298	0.000***	-0.104
	No	560	24.867	4.498				
Organizational	Yes	740	26.471	2.497	6.780	1298	0.000***	-0.185
	No	560	25.408	3.151				

Effect size - obtained via Point-biserial correlation coefficient

*** The difference is statistically significant at the level of 0.001

** The difference is statistically significant at the level of 0.01

To determine the existence of statistically significant differences in the degree of expression of attitudes about competence groups with regard to the application of internal evaluation in working with students, a t-test was also performed. The data (Table 9), indicate that there are statistically significant differences in terms of the expression of interpersonal ($t_{(1298)}$=2.013, p<0.01), socioemotional ($t_{(1298)}$=4.553, p<0.001), pedagogical-psychological ($t_{(1298)}$= 2.960, p <0.01), subject-professional ($t_{(1298)}$=4.406, p<0.001), didactic ($t_{(1298)}$= 5.288, p <0.001), methodological-statistical-research ($t_{(1298)}$=6,128, p <0.001), multimedia-digital ($t_{(1298)}$= 3,779, p<0.001), and organizational competencies ($t_{(1298)}$=6,780, p<0.001). Therefore, we find that all 8 groups of competencies are more emphasized among teachers who apply it in teaching than those who do not apply the specified type of evaluation.

Discussion

Based on the obtained results after determining the differences in the degree of expression of attitudes about the groups of competencies with regard to sociodemographic characteristics, ie. independent research variables, t-test and Analysis of variance, we came to the following findings: The results of the analysis based on the obtained arithmetic means, which all exceed the values of 4, lead us to the conclusion that teachers, based on their self-assessments, highly valued all various groups of competencies, which fully confirmed the general hypothesis. The results showed that teachers' attitudes about competencies were not concentrated around central values, but they generally considered that certain competencies were to a greater extent or extremely important. We expected this tendency in the evaluation of individual competencies within groups to some extent, because they are all important and necessary for successful engagement in the teaching and educational process. We will also point out that no group of competencies stood out drastically, because the results are relatively uniform and speak of the positive attitudes of teachers towards each of the existing competencies that were the subject of their assessment. However, the highest values were observed on the subscale of interpersonal, and the lowest on the subscale of methodological-statistical-research competencies, with an emphasis on minimal differences. The highest observed values in the interpersonal group of competencies were to some extent expected because this group of competencies, as necessary for establishing, building and improving relationships with students, parents and colleagues, should represent and be the embodiment of universal and fundamental value and the "character of the teacher". The lowest values on the subscale of methodological-statistical-research competencies may also indicate that teachers do not consider this group of competencies less important, but only in relation to other groups of competencies, a slightly lower degree of agreement is shown.

Further statistical analysis that should confirm or refute the presumed special hypotheses, examined the existence of statistically significant differences in the degree of expression of attitudes

about competency groups with respect to independent research variables.

Based on the results obtained after using the t-test, the first special hypothesis was rejected. We assumed that there were no statistically significant differences in teachers' attitudes about various groups of competencies in relation to the type of school in which they teach (elementary and secondary), as independent variables, because teachers, regardless of the school in which they teach, should highly value all groups of competencies, especially interpersonal, socioemotional, pedagogical-psychological as universal and common to all teachers and participants in the educational process. In this respect, the type of school should not affect the evaluation of a certain group of competencies.

Based on the results obtained after the use of Analysis of variance (Anova), but also the Post Hoc test, which were applied only in this case, the second special hypothesis was partially confirmed. It assumes the existence of statistically significant differences in teachers' attitudes about competency groups in relation to academic achievement, in the sense that teachers who had average grades during completed studies above 8.01, relatively speaking - more successful, value more pedagogical-psychological and didactic, as well as subject-professional in relation to teachers whose average grades during completed studies are below 8. The results showed that in addition to methodological-statistical-research, multimedia-digital and organizational, teachers with higher average grades emphasized more subject-professional and didactic competencies, as we assumed. Teachers whose average grade during their studies was from 7.01 to 8 emphasized less pedagogical-psychological competencies than teachers with an average grade from 8.01 to 9, which is in line with our hypothesis, but on the other hand, have emphasized more pedagogical-psychological competencies than teachers with an average score of 9.01 to 10, on the basis of which this hypothesis could not be fully confirmed but only partially. We did not expect such a result and that cognition brings us to a certain dilemma.

Based on the results obtained after using the t-test, the third special hypothesis was confirmed. It presupposes the existence of statistically significant differences in teachers' attitudes about competency groups in relation to attending some of the seminars in the field of educational technologies and the application of multimedia systems in teaching, in the sense that teachers who attended them value multimedia-digital more than teachers who did not, due to the essential and logical connection of the mentioned phenomena as independent or dependent research variables. The results provided us with the cognition that the teachers who attended some of the mentioned seminars, in addition to the multimedia-digital competences, as previously mentioned, emphasized more interpersonal, socioemotional and pedagogical-psychological ones.

The fourth hypothesis in which the assumption is made about the existence of statistically significant differences in teachers' attitudes about competency groups in relation to the application of internal evaluation in working with students, in the sense that teachers who apply it in their work, value subject-professional and didactic in relation to teachers which do not apply it, like the previous one, is fully confirmed. Between the application or non-application of internal evaluation in working with students as independent variables and teachers' attitudes about the evaluation of subject-professional and didactic competencies, a possible direct cause-and-effect relationship and feedback of evaluation results on the quality and effects of teachers' work was noticed. The results, after the use of t-test, which determined the existence of statistically significant differences in terms of expression in all eight groups of competencies, showed and provided us with the knowledge that the teachers who apply it, emphasize more, among all others, and in accordance with our assumption, the subject-professional and didactic group of competencies.

It is important to point out that the results of the research additionally provided us with some very interesting and useful knowledge. Namely, the existence of statistically significant differences in the degree of expression of attitudes about interpersonal, socioemotional and pedagogical-psychological competencies was determined in relation to all 4 independent variables - type of school, academic achievement, attendance of some seminars in the field of educational technologies and multimedia systems, as well as the application of internal evaluation. On the other hand, in relation to independent variables - academic achievement and the application of internal evaluation in teaching, the existence of statistically significant differences is determined in the degree of expression of attitudes in as many as 5 groups of competencies - subject-professional, didactic, methodological-statistical-research, multimedia-digital and organizational competencies.

Based on the review of research dealing with similar topics, we especially refer to the results of some previous tangential research on competencies that speak in favor of the importance of all these groups of competencies as key, among other things for innovating the teaching process (Zobenica and Stipančević, 2017; Bogunović and Stanišić, 2013; Andevski and Arsenijević, 2012; Gojkov, 2012). The importance of professional development of teachers for improving the professional competencies of

teachers in general, and thus raising the quality of the entire teaching process, is indicated in the research by Tapani and Salonen (2019), while Teodorović, Milin and Stanković (2019), compare standards for teacher competencies in Serbia with countries/regions in their research. In the relevant professional literature, we did not encounter research that looked at the existence of statistically significant differences in teachers' attitudes about various groups of competencies in relation to independent variables (type of school, academic achievement, attendance at seminars in the application of educational technologies and multimedia systems in teaching and the application of internal evaluation in teaching), which was the case here. Based on this cognition, there is hope that the research will make a modest contribution to shedding light on similar issues, and the obtained results will represent a good starting point and incentive for further research work in this field in the future.

Conclusion

The task of every country that wants quality education is that it must inevitably permanently improve the educational policy focused on the field of education and professional development of teachers. Improving the quality of school work is a dynamic process, open to innovations and changes brought about by the accelerated development of modern society. Education as indisputably one of the most dynamic professions requires a certain meta-competence of constant self-examination and finding ways to respond to the always new needs of the future society.

The issue of key competencies of teachers, necessary for innovating the teaching process, is certainly one of the fundamental issues when it comes to good and quality teaching, because innovation changes the pedagogical system, improving the teaching process and its results.

The theoretical significance of this research is reflected in the fact that it is necessary to obtain knowledge and relevant data on the attitudes of teachers shown by self-assessment through the degree of evaluation/non-evaluation of a wide and diverse group of competencies, as well as individual competencies within these groups. The results of the analysis provided us with the cognition that teachers, based on their self-assessments, highly value all various groups of competencies, which fully confirms the general hypothesis. The results also showed the existence of statistically significant differences in the degree of expression of attitudes about competency groups with regard to independent research variables, within special hypotheses, on the basis of which the first was rejected, the second partially, the third and fourth special hypotheses were fully confirmed. We can say with some certainty that the knowledge and results we have obtained are a kind of indicator of the quality of teachers' work and a predictor of their focus on continuous reflection on the effects and effectiveness of their work, application of innovations in teaching, reflectivity and research to improve their own work, but also the entire educational work. Also, the cognition of the existence of statistically significant differences in teachers' attitudes about key competencies for innovation in relation to independent variables (type of school where the teacher teaches, academic achievement of teachers, attending seminars in the field of educational technologies and multimedia systems in teaching, and finally internal evaluation in teaching), would significantly contribute to the consolidation or refutation of the attitude on the connection of these phenomena and thus indicate a realistic picture of the set goal.

In addition to the theoretical, the research certainly has practical significance and more far-reaching implications, which are reflected in the fact that it is desirable to find out what the attitudes of teachers on this issue are, as direct participants in the teaching process. All this is crucial and invaluable because it enables teachers to always keep pace with social progress, therefore it is necessary to raise awareness and point out the importance of research work, focus on reflection, application of innovations in teaching and possession of developed various competency groups which is generally the topic of this research. Only in this way do teachers trace the path to teaching in which research, innovation, critical reflection and only with such an approach will they be directed towards reflective practice and declare themselves as reflective practitioners. The implications of research can also potentially be important for creators of educational strategies that define the domains of teachers' professional competencies, because despite their enviable theoretical foundation, there is always room for further empirical research in perspective.

Teacher competencies are the capacity of an individual that is realized through performing complex activities during educational work and include a set of certain knowledge, skills and attitudes of teachers with which he influences the improvement of the entire educational process. Given that the educational process is by its nature and essence very dialectical, teachers are faced with quite justified requirements to have developed a whole mix of diverse groups and individual competencies within these groups, in order to always be at a high level in their work and fulfill their roles in a flexible way.

Today's school, in accordance with modern tendencies, indisputably needs a "new profile" of a modern teacher, with a wide range of developed competencies, which would enable them to successfully organize work, motivate and encourage students, critically reflect on their practice, independently research and use these results for the purpose of self-improvement. The positive attitudes of teachers about the important role and exceptional importance of having a wide range of individual competencies for teaching innovations, shown through the high evaluation of all offered groups of competencies, are certainly encouraging. Based on the previous postulates, we can conclude that all these groups of competencies are important and crucial for innovating the teaching process and that they represent the necessity of the modern age for all employees in education and not just an ideal.

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Conflict of interests

The author declares no conflict of interest.

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Students' School Satisfaction: The Role of Classroom Climate, Self-efficacy, and Engagement

Tomislava Vidić[1*]
[1]Primary school Remete, Zagreb, Croatia, e-mail: tomislava.vidic@zg.t-com.hr

Abstract: Students' satisfaction with school is subjective, cognitive appraisal of overall positivity of school experiences, and precisely because it represents the key aspect of children's overall perception of quality of life, it is important to find out what influences students' school satisfaction and to which extent. The goal of this research was to establish whether self-efficacy and engagement function as mediating variables in the relationship between classroom climate and students' school satisfaction. The research included 597 students from primary schools in Zagreb, Croatia. A structural equation model was designed and tested. The model testing showed that positive classroom climate has statistically significant and positive effects on self-efficacy and engagement. Furthermore, self-efficacy has a significant positive impact on explaining engagement. At the same time, negative classroom climate has a significant positive influence on engagement, which in turn contributes to the final effect on school satisfaction. The model has explained 56% of the school satisfaction variance in total.

Keywords: classroom climate, engagement, self-efficacy, school satisfaction.

Introduction

The principal aspect of students' quality of life is manifested in their satisfaction with school. How students feel in school should be equally important both to them and to the school they attend. Schools should be organized so that all students feel equally important, have the same opportunities for learning and therefore enjoy the school life. Students' satisfaction with school is an indicator of emotional and affective aspect of the quality of school life and other positive attitudes toward school, and it is linked to students' academic achievement, motivation and interests.

Based on theoretical and empirical literature in the field of subjective welfare, student school satisfaction is defined as cognitive-affective evaluation of satisfaction with school experience (Huebner, 1994). Although it is connected to other areas of subjective welfare, school satisfaction can be clearly separated from other areas of life satisfaction such as satisfaction with family, friends, living conditions, or contentment with oneself. Namely, it was proven that a student can be pleased with his/her family or living conditions, but at the same time dissatisfied with school and school experiences. The concept of the quality of school life originates from the general quality of life concept and defines student welfare from the standpoint of both positive and negative student experiences in school activities. A great number of students evaluate general life satisfaction as positive; however, if the satisfaction dimensions are observed, differences can be noticed in evaluating satisfaction with family, friends, oneself, school, and environment (Huebner et al., 2005). Students pronounce the weakest satisfaction, i.e. high dissatisfaction, with school experiences. In a research by Huebner, Drane and Valois (2000), almost one fourth of students have shown discontentment with school, and 9% of the participants have rated school experiences as „awful". Students' perception of school environment is connected with their self-image, behavior and welfare. The importance of creating positive relationships between students and school is derived from the results of initial research in this field. The students who do not like school are underachievers and adopt forms of risky behavior (Epstein, 1981). The students who perceive school and classroom climate positively are more motivated and achieve better results (Epstein, 1981; Fraser, 1994; Voelkl, 1995). The latest longitudinal research (Löfstedt et al., 2020), which examined the trends of school pressure and school satisfaction in 32 European countries in the period between 2002 and 2018, has shown that school satisfactoin tended to increase over the focus period among boys, whereas school pressure increased among girls. Furthermore, it was proven that only a smaller proportion of the students was highly satisfied and without

*Corresponding author: tomislava.vidic@zg.t-com.hr

school preassure. There was variability across countries, but no clear patterns associated to geographical location or differences in educational systems were apparent. Newer research (Zhou, Huebner and Tian, 2021) points to the importance of educational experiences in primary education because it is considered key to optimal development of mental health and students' academic abilities. Whether a child will attain high academic achievement is an issue influenced by many elements so it is important to understand how students perceive their school and all the factors influencing the formation of their school satisfaction.

Classroom climate represents dynamic relationships within the classroom and shows how a child experiences educational, psychological, social and physical aspects of classroom environment. In fact, it represents the psychosocial classroom climate (Fraser and Fisher, 1982). Classroom climate can be positive and negative. In general, it is considered that positive climate is dominated by satisfaction, harmony, teacher support, student cohesiveness, task orientation, student equality, and righteousness (Dorman and Adams, 2004). Relationships between students have the greatest effect on formation of positive classroom climate, i.e., they are the key factor in this process (Hattie, 2008). Apart from these relationships, positive classroom climate entails goal directedness, positive mutual relations and social support. Haertel and Walberg (1980) have established that better results in learning are achieved by students whose classrooms are dominated by cohesiveness, satisfaction, high demands, goal-orientation and organization. On the other hand, negative classroom climate is characterized by tension students feel in class, apathy and disorganization, and it is associated with poor academic achievement of students (Haertel and Walberg, 1980; Haertel et al., 1981). The synthesis of newer research has shown that classroom climate is connected with social competence, motivation and engagement, and academic achievement (Wang et al., 2020).

Self-efficacy is defined as an individual's belief that he/she is capable of performing certain actions required for attaining a specific goal, i.e. belief in possessing the ability to organize and implement actions in a way needed to achieve the planned type of effect (Bandura, 1995; 1997). Self-efficacy has proven to be the key factor connected with academic achievement, both for students and teachers, not only on an individual but also on a group level, i.e. the collective plain (Bandura, 1997). The social-cognitive theory, in whose frame the self-efficacy construct was created, considers human functioning a consequence of dynamic interaction of personal, behavioural and environmental influences. Self-regulation of learning represents active students' participation in their own process of learning through directing one's own efforts in gaining knowledge and abilities (Zimmerman, 1990; Zimmerman and Schunk, 2001). In the frame of social-cognitive theory, it is emphasized that students with self-regulated learning direct their own process of learning by setting challenging goals, using appropriate strategies and including self-regulatory influences, which motivate and steer them. Students who are self-regulated in such a way show a strong belief in their own abilities, which influences their knowledge, skills and dedication in the work done to realize their goals (Zimmerman, 1990). Self-efficacy for self-regulated learning presents a student's belief in own abilities of using various strategies in the process of learning. Such students possess the ability to plan and organize their own activities, understand and memorize class contents, disregard disruptive factors in learning, and motivate themselves to work (Zimmerman et al., 1992). Recent study (Maricuțoiu and Sulea, 2019) showed a high correlation between self-efficacy and self-engagement. When students feel competent and achieve well academically, they also become more engaged in schoolwork.

Engagement is defined as a measure of students' involvement, connection and devotion to academic and social activities in school (Li and Lerner, 2013). Students' success in school, and in later life, depends on an individual's intention to use the attained knowledge and skills in the course of education (Elmore, 2009; Fredricks, Blumenfeld and Paris, 2004). Engagement should be observed as a multidimensional construct encompassing cognitive aspects and aspects of student emotions and behavior (Fredricks, Blumenfeld and Paris, 2004). The three-component engagement model entails cognitive, behavioural and emotional engagement. Cognitive engagement delineates a measure to which students perceive the importance of classes and their attitudes toward learning. Behavioural engagement can be observed at lower and higher level. Lower level is characterized by students' class attendance, while the higher level is defined by investing efforts in class. It actually describes students' willing behavior in the school context. Emotional engagement entails a student's sense of belonging to a school and respective emotions of happiness, excitement and enjoyment (Li and Lerner, 2011). It is well known that students who participate in class more show greater interest in the teaching content, identify more with school goals, are more cognitively engaged and self-regulated in learning, attain better school grades and higher overall academic achievement. A research by Barksdale et al. (Barksdale, Peters, and Corrales, 2021) proved that student learning is influenced by building relationships, availability and organisation of classroom resources, establishing classroom guidelines, and making the students feel safe and cared about in the classroom. Furthermore, newer research confirms the correlation between classroom atmosphere and

student engagement. In Gaspard and Lauermann's research (Gaspard and Lauermann, 2021), it was shown that student and teacher perception of teacher enthusiasm and student engagement significantly shapes classroom climate.

The current study

The social-cognitive theory reflects the view of positive psychology about human functioning in which individuals strive to take control over the outcomes of their actions. Persons have beliefs that make it possible for them to influence their own thoughts, feelings, actions, social interactions and aspects of environment. At the same time, these individuals are under the influence of their own actions and social environment. According to the social-cognitive theory, strategies for increasing welfare can entail stimulation of emotional, cognitive or motivational processes and developing behavioural competences or aspects of social surroundings (Schunk and DiBenedetto, 2014). The basic idea of this research is derived from the assumption that human life is interdependent in great measure: what a person does affects the welfare of his/her environment, and vice versa. In this work, it is assumed that classroom climate is in correlation with student school satisfaction, but through the mediating role of self-efficacy and engagement (Figure 1). In other words, positive classroom climate fulfills students with belief in one's own capabilities due to which he/she manifests greater cognitive, emotional and behavioural engagement, which in turn leads to students' school satisfaction.

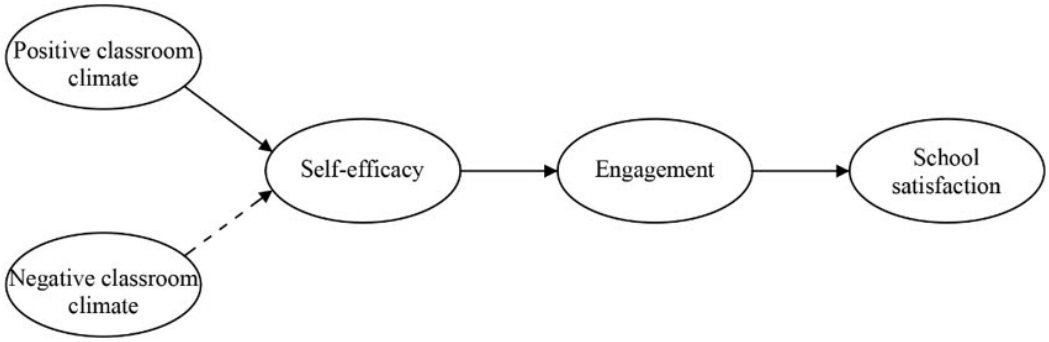

Figure 1. The hypothesed structural model tested in the present study

The aim of this research was to test whether students' self-efficacy and engagement function as mediating variables in the relationship between classroom climate and students' satisfaction with school. Accordingly, the following hypotheses were set:

(H1) Self-efficacy and engagement are mediator variables between classroom climate and students' school satisfaction.

(H2) Positive classroom climate is in direct correlation with students' self-efficacy; negative classroom climate is in negative correlation with students' self-efficacy.

(H3) Self-efficacy is in direct correlation with student engagement.

(H4) Students' engagement is directly correlated with students' school satisfaction.

Materials and Methods

Participants and procedure

The data were gathered in the course of making the doctoral dissertation Classroom climate, self-efficacy, engagement, and student school satisfaction in elementary school (Vidić, 2020). The research included students of the fourth to eighth grade of primary school, for which a written consent was previously obtained from their parents. The total number of participants was 685; however, 26 participants were left out of the examination due to incompletely filled consent forms. Besides, additional 62 students were excluded from the subsequent analysis because of the outliers. The final total number of participants was 597, out of which 292 were boys (49%) and 305 were girls (51%). The age of the participants was in range from 9 to 14 years, and the average age was 11.92 (SD = 1.49). The gathered data on final grades

in Croatian, mathematics and English show that as much as 50.25% of the participants have all three As, and 17.25% of them have two As and one B. The overall average of the final grades in these three school subjects for all examinees in this research was 4.5.

Measurements

Classroom climate

For testing the perceptions of classroom climate, the questionnaire My class inventory was used (Fisher and Fraser, 1981). The questionnaire consists of 25 claims and measures five dimensions of classroom climate: satisfaction, cohesiveness (positive classroom climate), competitiveness, difficulty and friction (negative classroom climate). The factor structure was tested via main components method with ortogonal (varimax) rotation (KMO = .920; Bartlett's sphericity test χ^2_{df300} = 6068.00; p = .000), and these five factors explained 54.90% of the variance. The obtained reliability coefficient values for the friction factor is α = .843, competitiveness α = .783, cohesiveness α = .822, for satisfaction α = .830, and for the difficulty factor α = .589. Due to the low obtained value of reliability coefficients on the last factor, difficulty was excluded from further analyses.

Self-efficacy for self-regulated learning

To measure students' self-efficacy, one-dimensional questionnaire Self-efficacy for self-regulated learning was utilized (Zimmerman, Bandura and Martinez-Pons, 1992). The questionnaire consists of 11 claims. Factor analysis with the main components method with varimax rotation was implemented (KMO = .909; Bartlett's sphericity test $\chi^2_{.df55}$ = 2535.44; p = .000). One-factor structure was obtained that explained 44.47% of the self-efficacy variance for self-regulated learning. Cronbach alpha reliability coefficient for the scale was α = .868.

Engagement

To measure students' engagement, The Behavioral-Emotional-Cognitive School Engagement Scale (BEC-SES) was employed (Li and Lerner, 2013). The questionnaire entails 15 claims and measures three engagement dimensions: cognitive, behavioural, and emotional engagement. Factor structure of the questionnaire was tested via the main components method with varimax rotation (KMO = .909; Bartllett's sphericity test χ^2_{df105} = 3062.84; p = .000). According to the Kaiser-Guttman criterion, three factors had characteristic roots over one, and they explained 53.30% of the variance. After the rotation, the first factor, i.e. emotional engagement, explained 20.79%; the second factor, i.e. behavioural engagement, explained 16.64%; and the third factor, cognitive engagement, explained 15.87% of the variance. The extracted factors match the factor solutions of the original scale. The Cronbach alpha coefficient of emotional engagement is α = .779, of behavioural engagement α = .707, and cognitive engagement α = .699.

School satisfaction

The questionnaire on school satisfaction presents one dimension of the multidimensional questionnaire Multidimensional students' life satisfaction scale, MSLSS (Huebner, 1994; Huebner et al., 1998). Factor structure of the questionnaire was tested via the main components method (KMO = .871; Bartlett's sphericity test χ^2_{df28} = 2122.54; p = .000). One-factor structure was obtained, and it explains 50.15% of the school satisfaction variance. Cronbach α coefficient is α = .851.

The participants evaluataed all the claims on a five-degree Likert scale, from 1 – I completely disagree, to 5 – I completely agree.

Data analysis

The correlations between classroom climate, self-efficacy, engagement and school satisfaction have been analysed using Structural Equation Model (SEM), implemented and analysed using AMOS package. In this work, exploratory factor analyses were implemented to test the measurement instruments, and then confirmatory factor analysis was utilised to test the measurement model, with testing the structural model in the end. After the implemented necessary modifications, the hypothesis on serial mediation was checked. As the data of the present study were distributed normally, the maximum likelihood estimation method was employed for SEM. Multiple fit indices – Chi-square/degrees of freedom ratio, Root-Mean-Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI) – were utilized to check whether the model fits the data.

Results

Descriptive statistics (e.g., means, standard deviations, minimum, maximum, skewness, and kurtosis) are presented in Table 1. Skewness and kurtosis of all variables were examined and found to be within recommended guidelines for assuming normality, allowing for standard SEM analyses and fit indices.

Table 1.

Descriptive statistics for the observed variables (N = 597).

Observed variable	*M*	*SD*	*Min*	*Max*	*Skew.*	*Kurt.*
Cohesiveness	3.36	1.04	1.00	5.00	-,280	-,791
Satisfaction	3.57	0.76	1.60	5.00	-,320	-,403
Friction	2.70	0.91	1.00	4.80	,127	-,700
Competitiveness	3.49	0.82	1.33	5.00	-,267	-,550
Self-efficacy	4.16	0.55	2.64	5.00	-,409	-,589
Emotional engagement	3.72	0.75	1.80	5.00	-,305	-,468
Cognitive engagement	4.37	0.50	3.00	5.00	-,646	-,305
Bihevioural engagement	3.75	0.56	2.20	5.00	-,220	-,334
School satisfaction	3.47	0.75	1.50	5.00	-,001	-,433

Note. Skew. = Skewness; Kurt. – Kurtosis

Two models are tested in structural modelling: the measurement and the structural model. Checking the models in this research was done in two steps: the first step tested the measurement model via confirmatory factor analysis, and the relationship between latent variables was tested in the second step. Testing of the measurement model was implemented on the whole sample, and it included five latent variables and their indicators. Item parcels were used as indicators. Latent variables and the number of respective item parcels in this research are as follows: positive classroom climate consisting of two indicators (cohesiveness and satisfaction); negative classroom climate entailing two indicators (competitiveness and tension); self-efficacy divided into three indicators; engagement, also comprised of three indicators (emotional, cognitive and behavioural engagement); school satisfaction divided into two indicators. The model showed a good fit to the empirical data: $\chi^2 = 149.89$, $\chi^{2/df} = 3.57$, CFI = .96, TLI = .93, RMSEA = .07. Due to a large sample, the Chi-square test is not satisfactory, while the other indicators show the fitness of the model so it was accepted.

The correlations between latent variables are presented in Table 2. The correlations between latent variables show the expected relationships. Hence, negative classroom climate is negatively correlated to all other variables. Positive classroom climate is positively correlated to self-efficacy, engagement and school satisfaction. The greatest correlation was found between school satisfaction and engagement, i.e. self-efficacy and engagement. Expectedly, the highest negative correlation was proven between positive and negative classroom climate.

Table 2.

Correlations among the observed variables in the study.

	2	3	4	5
1. Positive classroom climate	-,85***	,37***	,68***	,44***
2. Negative classroom climate		-,25***	-,41***	-,16**
3. Self-efficacy			,75***	,57***
4. Engagement				,81***
5. School satisfaction				

Note. *$p < .05$; **$p < .01$; ***$p < .001$

Considering that the final structural model is based on the hypothesis of serial mediation wherein self-efficacy mediates between classroom climate and engagement, in turn influencing overall school satisfaction, the mediation effect of self-efficacy was initially shown in the connection between two aspects

of classroom climate (positive and negative) and engagement (Figure 2).

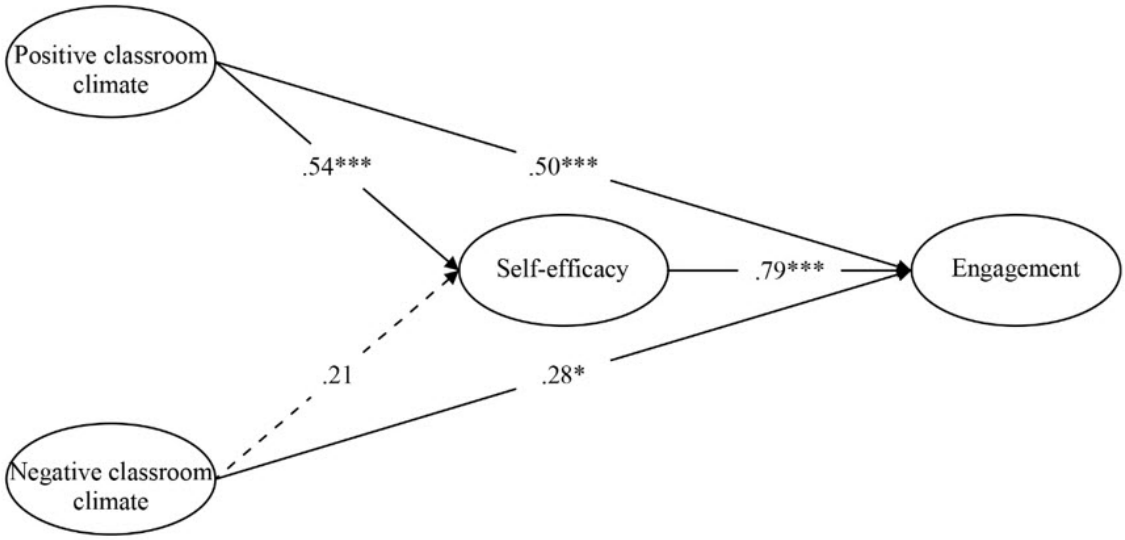

Figure 2. The mediation effect of self-efficacy in the relationship between classroom climate and engagement
*p < .05; **p < .01; ***p < .001

In the course of testing the path between classroom climate as a predictor, self-efficacy as mediator and engagement as criterion, the obtained values indicated a significant contribution of positive classroom climate to self-efficacy and direct and significant positive contribution to engagement. Negative classroom climate has no statistically significant contribution to self-efficacy, but its effect on engagement is statistically significant and positive, contrary to expectations. Finally, the contribution of self-efficacy, as mediator, to engagement is also statistically significant, positive and proportionally high. The results are congruent with the expectations, apart from the result that points to a positive effect of negative classroom climate on student engagement. The cause of this finding can be in the fact that a part of friction or competitiveness variance has, apart from the negative, a positive correlation to engagement aspects. In this research, it is visible that competitiveness is negatively associated with self-efficacy and emotional and cognitive engagement, while it has no significant correlation with emotional engagement. This means that bigger part of friction is still negatively correlated with these constructs. In the mediation analysis, if a certain latent variable contains a part of the covariance of the opposite sign of expected, depending on other relationships in the model, that covariance can be increased, i.e. expressed, and therefore create a significant effect. Hence, although the total correlation of negative climate with overall engagement is negative, a part of the negative climate variance is in positive correlation with one part of the engagement variance. Regarding other variables in the analysis (in this case, primarily positive classroom climate, due to high negative intercorrelation), a suppressive effect takes presence – the covariance with a positive climate neutralizes the significant negative contribution to self-efficacy, but leaves residual variance of the opposite sign, which becomes significant in the contribution to engagement. Although it could be deliberated, based on such result, that negative classroom climate is redundant in the model, it actually contributes to it significantly with its effect to engagement and with the increase in covariance between positive climate and included mediators. The right interpretation of such results is that positive classroom climate positively and directly influences self-efficacy, and it has an indirect effect on engagement when negative classroom climate is kept under control.

Furthermore, analysis of the path foreseen in the research hypotheses is presented. According to these hypotheses, self-efficacy realizes the effect on overall school satisfaction only through engagement. The results are presented in Figure 3.

Figure 3. The path analysis – effects of self-efficacy via engagement on school satisfaction.
*p < .05; **p < .01; ***p < .001

Both effects are statistically significant and positive. Self-efficacy contributes to engagement while engagement also shows a positive effect on school satisfaction. In other words, self-efficacy exerts the effect on overall school satisfaction via student engagement.

With regard to the results showing significant contributions of positive classroom climate to the mediators and school satisfaction, whereas negative climate had no effects, except in the case of engagement, such structure was created in the final model with all present effects of positive climate, whereas negative climate only had an effect on engagement. From such final structural model, presented in Figure 4, it is visible that positive classroom climate has statistically significant and positive effects on self-efficacy and engagement. However, after introducing mediators into the analysis, the direct effect of positive classroom climate on school satisfaction has become close to zero and statistically insignificant. It shows that full mediation of self-efficacy and engagement in effecting positive classroom climate and school satisfaction took place. Self-efficacy also had a significant positive effect on explaining engagement. At the same time, negative classroom climate had a significant positive contribution to engagement, which in turn emphasized the final effect on school satisfaction. In the model, age was kept under control, i.e. students' grade. The model has explained 56% of the satisfaction with school variance in total.

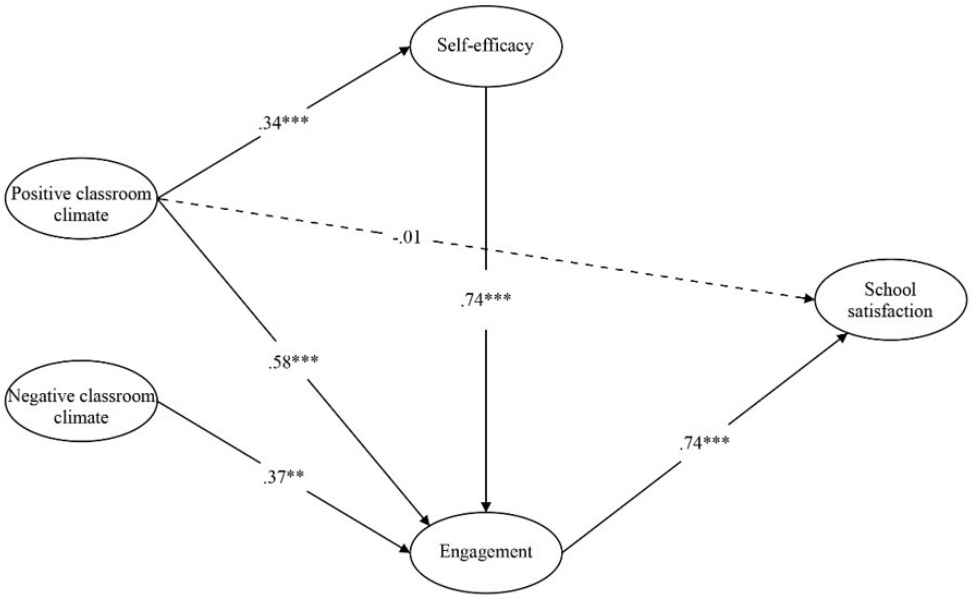

Figure 4. The final structural model for the whole sample.
*p < .05; **p < .01; ***p < .001

It was established that the model fits the data. Chi-square test, which is one of the most frequently used indicators of the model's fitness, has proven to be statistically significant (χ^2 = 121.82; df = 50; p < .001). Such result points to insufficient data's fitness for the model; however, the drawback of this test is that it is almost always significant for models tested on large samples. Therefore, a correction was done regarding the number of freedom degrees. The obtained value ($\chi^{2/df}$ = 2.4) is smaller than the recommended value $\chi^{2/df} \leq 5$ and indicates the measurment model's fitness for the data. Furthermore, the average standard residual mistake (RMSEA) is.049, which points to a good fit. The CFI was.97, and TLI .96, which are satisfactory fit indices.

Discussions

As was assumed, the final model of this research has shown that positive classroom climate has statistically significant and positive effects on self-efficacy and engagement. Previous insight on the matter indicates correlation between self-efficacy, behavior and environment (Bandura, 1997; Schunk and DiBenedetto, 2014). Highly self-efficient students are motivated to learn, engaged and create efficient learning environment. At the same time, self-efficacy is under the influence of external factors such as, for example, feedback from teachers and social comparisons to peers. Individuals receive much information about their own abilities through cognizance of abilities of others. It is a known fact that peers influence self-efficacy through observing experiences of others, and such comparison with others is especially

emphasized among children and adolescents primarily because they find themselves in unknown situations that are alike. Observing similar students can raise a person's confidence in one's own abilities because it provides the feedback "if they can do it, so can I". Of course, the opposite also applies. A student who witnesses failure of another similar student can convince himself that he is not capable of successful task performance. However, relationships between students are set up on the principle of resemblance, i.e. students are more inclined to bond with other students with whom they share the same characteristics, interests and likeness, and with time, they become even more similar. Their conversations influence their activities and choices, causing them to make similar decisions, and such cohesion contributes to self-efficacy and motivation. It was proven even before that students' satisfaction with the class they attend contributes to their desire to learn and persistence in work (Asakereh and Dehghannezhad, 2015). The emotional component of classroom climate was proven as a contribution to students' achievement if their needs for bonding, competence and autonomy are met (Connell and Wellborn, 1993). The teachers who create a positive climate and stimulate student interaction at the same time encourage students to persist in learning (Skinner and Belmont, 1993). Consequently, students will be more engaged in school (Patrick, Ryan and Kaplan, 2007; Wentzel, 1997).

Self-efficacy is directly linked to engagement, which entirely confirms the hypothesis in this research. It can be assumed that a student's belief in her abilities advances the amount of invested effort and industry in performing school tasks. It is known from before that highly self-efficient individuals invest increased effort and do not give up on completing tasks even if they are faced with more complexed tasks or problems. On the contrary, individuals with low self-efficacy are more inclined to avoid or give up work when confronted with issues that are more complex. Along the same lines, the implementation of more in-depth learning strategies, as the main feature of cognitive engagement, is linked to self-efficacy. These results are in line with the learnings of previous research, which show that highly self-efficient students use diverse cognitive, metacognitive and self-regulatory learning strategies more frequently (Pintrich, 1999) and generally display greater engagement (Appleton et al., 2006; 2008). Students who are assured of their own abilities try to think in different ways in order to solve problems they are faced with and are therefore more cognitively engaged. Similarly, it is more probable that highly self-efficient students will perceive positive emotions such as pride or happiness concerning school and therefore become emotionally more engaged (Linnenbrink and Pintrich, 2003).

Despite the expectation that positive classroom climate would have a direct effect on students' school satisfaction, this research proved a direct effect on students' school satisfaction only of self-efficacy and engagement. A greater body of research heretofore indicates that cohesion between peers and their positive attitudes towards school influence school satisfaction and life in general (Epstein, 1981), which was also assumed in this research. However, it seems that positive classroom climate is indispensable in forming self-efficacy and engagement of students, and only consequently will such students be content with school. It is possible that the participants in this reserach perceive school as a place to learn and work on school tasks and that, in order for them to be satisfied with school, only positive classroom climate will not suffice, but they need to know they are capable of performing school chores and perservere in doing so in order to feel satisfied. The reserach done by Bubić and Goreta (2015) found similar results. The contribution of social integration to overall school satisfaction by mediation of the perceived academic control of students was proven. It seems that starting and maintaining good social relationships with other students is not sufficient for increasing school satisfaction in students who feel they cannot control their academic achievement. However, there is little research implemented which included the influence of environmental factors on students' school satisfaction. A qualitative research by Lam, Yeung and Yuen (2018) has shown that Chinese students, who achieve high results and at the same time possess high cognitive abilities, show contentment with school if personal (goal-directedness, self-discipline and self-regulation) and environmental influences (positive relations between students and teachers, emotional and instrumental support from peers, support from parents) are realized. Besides, while Chinese culture entails a belief that only hard work leads to success, the examined students stressed they had positive attitudes about school only if they had peer support. It is known that students' school satisfaction should also be observed through the cultural dimension: while in western cultures external factors such as teacher support and availability of opportunities and means in and out of school have significant influence on students' school satisfaction (Subotnik, Olszewski-Kubilius and Worrell., 2011), Lam, Yeung and Yuen (2018) research emphasized strong relationships with teachers, students and family.

The ideal classroom is ruled by positive classroom climate; in such classroom, students are satisfied and mutually related. Negative classroom climate is dominated by friction, competition and difficulty. According to these assumptions, the hypotheses of this research were formulated. However, the final structural model shows that negative classroom climate has a significant positive contribution

to engagement, which in turn contributes to the final effect on school satisfaction. This might be due to students being more engaged in a competitive environment and put more effort in the work. It is generally considered that competition within a group or a class is a negative characteristic possibly leading to series of unwanted phenomena because competitive classroom climate places emphasis on marks and is less directed to learning, i.e. gaining knowledge and skills. When a class is characterized by competitive climate, students are directed to achieving goals, constantly comparing with others. Thus, their goal is to attain positive evaluation from their environment and avoid failure. When considering a class that does not stress competition, students have a chance to be more directed to learning. Competitiveness is defined as a general personality trait according to which an individual has a maladjusted desire to win, at any cost (Horney, 1937, as cited in Klein and Newby, 2017). In classroom ruled by competitive climate, students can perceive their own success as failure if their performance is not pointed out as an example of excellence. Considering that experience of achievement is an important source of self-efficacy, precisely such perception of poor success or failure, even among accomplished students, can lead to weaker self-efficacy. On the other hand, in non-competitive classrooms students are not burdened with the need to stand out and are therefore more inclined to find similarities than differences to other students when compared, and in such a way evaluate their own performance more positively. However, this research found that students do not perceive negative sides of competition. It is possible they are more directed to achieving goals, and they feel they have attained them through assigned marks. Namely, as much as 50,25% of the participants have As in Croatian language, mathematics and English language, and additional 17,25% have one B and two As. It is possible that precisely such high final marks made students insensitive to competitve classroom climate because they felt they had been successful and realised the assigned tasks. One part on authors underline that competitive classroom climate is not necessarily negative, but also has positive effects. For example, Ryckman et al. (1997) consider such climate creates the desire for personal development. The motivation to succeed is greater in such students (Smither and Houston, 1992), they are more inclined to behaviors leading them to success (Bing, 1999), and they are more involved in the teaching process (Shimotsu-Dariol, Mansson and Myers 2012). Therefore, a positive direct effect of negative classroom climate on engagement found in this research should be observed in this context.

Conclusions

The principal theoretical contribution of this research is verification of the correlation between classroom climate and self-efficacy and engagement, and their effect on students' school satisfaction. According to the social-cognitive theory, whose frame entails the basic idea of this research, strategies for improving individual benefits can be realized through influence on emotional, cognitive and motivational processes and improvement of behavioural competence or environmental aspects. It was assumed in this research that positive classroom climate would be directly correlated with self-efficacy, directly and indirectly with students' engagement, which would in turn lead to students' satisfaction with school. The verification of the assumed model by structural modelling has confirmed previous hypotheses. It was found that students who perceived positive classroom climate were characterized by greater self-efficacy and engagement and were more satisfied with school. At the same time, positive classroom climate directly influenced students' engagement so they felt satisfied with school. Regardless of this research having examined only dimensions of students' satisfaction with their class and cohesion, the results are in line with previous research that included additional dimensions of positive classroom climate. The basic assumption that students who feel good in their class would be diligent and more devoted to school work, which would in turn effect their school satisfaction, has proven to be correct. Although it was not presupposed, the final model indicated direct influence of negative classroom climate on engagement, and consequently on students' school satisfaction. Therefore, the results showed that competitive environment did not disturb students in greater measure, and that they were nevertheless engaged in school assignments and satisfied with school. However, the aforementioned leads to the conclusion that classroom climate is a whole with all its advantages and drawbacks, and if negative characteristics of such climate do not prevail over the good ones, students will get the chance for self-realization: they will be self-efficient, engaged and satisfied with school.

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Conflict of interests

The author declares no conflict of interest.

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Relationship Between Facial Areas With the Greatest Increase in Non-local Contrast and Gaze Fixations in Recognizing Emotional Expressions

Vitali Babenko[1], Denis Yavna[1], Elena Vorobyeva[2], Ekaterina Denisova[3], Pavel Ermakov[1], Ekaterina Kovsh[1]*

[1]Southern Federal University, Rostov-on-Don, Russian Federation,
e-mail: babenko@sfedu.ru, yavna@fortran.su, paver@sfedu.ru, katya-kovsh@yandex.ru
[2]Don State Technical University, Southern Federal University, Rostov-on-Don, Russian Federation,
e-mail: evorob2012@yandex.ru
[3]Don State Technical University, Rostov-on-Don, Russian Federation,
e-mail: denisovakeith@gmail.com

Abstract: The aim of our study was to analyze gaze fixations in recognizing facial emotional expressions in comparison with o the spatial distribution of the areas with the greatest increase in the total (nonlocal) luminance contrast. It is hypothesized that the most informative areas of the image that getting more of the observer's attention are the areas with the greatest increase in nonlocal contrast. The study involved 100 university students aged 19-21 with normal vision. 490 full-face photo images were used as stimuli. The images displayed faces of 6 basic emotions (Ekman's Big Six) as well as neutral (emotionless) expressions. Observer's eye movements were recorded while they were the recognizing expressions of the shown faces. Then, using a developed software, the areas with the highest (max), lowest (min), and intermediate (med) increases in the total contrast in comparison with the surroundings were identified in the stimulus images at different spatial frequencies. Comparative analysis of the gaze maps with the maps of the areas with min, med, and max increases in the total contrast showed that the gaze fixations in facial emotion classification tasks significantly coincide with the areas characterized by the greatest increase in nonlocal contrast. Obtained results indicate that facial image areas with the greatest increase in the total contrast, which preattentively detected by second-order visual mechanisms, can be the prime targets of the attention.

Keywords: face, emotion, eye movements, nonlocal contrast, second-order visual mechanisms.

Introduction

The ability to recognize a facial expression is considered as a component of emotional intelligence and plays important part in human communication, including educational communication (Kosonogov V. et al., 2019; Belousova and Belousova, 2020; Budanova I., 2021). In recent years, symptoms of a disruption of the ability to perceive facial expressions are often a special subject of therapeutic interventions (Skirtach et al., 2019). Contemporary research also acknowledges the genetic influence on functioning of the systems involved in the recognition and experiencing of emotions (Vorobyova et al., 2019).

Previous studies generally confirm that faces are detected and perceived faster than objects of other categories (Liu et al., 2000; Liu, Harris and Kanwisher, 2002; Crouzet, Kirchner and Thorpe, 2010; Crouzet and Thorpe, 2011). A face is not only categorized in a scene in less than 100 ms, but this time is enough to form a first impression of a person (Willis and Todorov, 2006; Cauchoix et al., 2014). MEG studies show the medial prefrontal cortex and amygdala activation in the first 95 ms during differentiating facial expressions (Liu and Ioannides, 2010). It is suggested that the ability to quickly recognize faces is mediated by a special "facial module", and the appearance of a face in the visual field automatically turns on this processing system (Fodor, 1983; 2000; Kanwisher, 2000; Rivolta, 2014).

The ultra-rapid saccades can be initiated to the face faster than to any other objects (Crouzet, Kirchner and Thorpe, 2010). At the same time, the movement of the eye always is the result of shifting attention to a new area in the visual field (Theeuwes, 2014). Moreover, because faces are simply more

*Corresponding author: babenko@sfedu.ru

effective at engaging observer's attention than other objects, they may already have a competitive advantage in the preattentive stage of processing (Reddy, Wilken and Koch, 2004). Prior research substantiates the belief that ultra-rapid face detection is largely determined by the information extracted preattentively (Vuilleumier, 2002; Honey, Kirchner and VanRullen, 2008; Allen, Lien and Jardin, 2017; see also the review by Tamietto and DeGelder, 2010).

Since selecting visual content is determined by the principle of maximizing information (Bruce and Tsotsos, 2005), then in face recognition the gaze distribution shows the most informative areas. These areas are proven to be the eyes, nose and mouth (Luria and Strauss, 1978; Mertens, Siegmund and Grüsser, 1993; Eisenbarth and Alpers, 2011). However, at the preattentive level of visual processing, there are no mechanisms that are selective to facial features. But the human visual system contains preattentive filters called second-order visual mechanisms (see the review by Graham, 2011). These filters are capable of highlighting areas of spatial heterogeneity in images. And it is namely these areas that can be the most informative (Itti, Koch and Niebur, 1998 ; Itti and Koch, 2001; Gao and Vasconcelos, 2007; Gao, Han and Vasconceloset, 2009; Hou et al., 2013).

The existence of second-stage filters at first has been predicted theoretically (Babenko, 1989; Chubb and Sperling, 1989; Sutter, Beck and Graham, 1989) and then was repeatedly attested by numerous experimental studies (e.g. Dakin and Mareschal, 2000; Landy and Oruç, 2002; Kingdom, Prins and Hayes, 2003; Reynaud and Hess, 2012; Babenko and Ermakov, 2015). These mechanisms combine the outputs of first-order visual filters (simple striate neurons) in a certain way and respond to spatial modulations of brightness gradients (their contrast, orientation, or spatial frequency).

Initially it has been assumed that the targets of attention can be local heterogeneities identified by first-order filters (Bergen and Julesz, 1983). However, more recent evidence reveals that higher-level traits have an advantage over lower-level traits in controlling overt attention (Frey, König and Einhäuser, 2007; Açık et al., 2009). So now, it is clear that the targets for attention are probably the extended areas of the image, which differ from the surroundings in their physical characteristics. Based on such differences various models of bottom-up saliency have been promoted over the past two decades (Hou and Zhang, 2007; Valenti, Sebe and Gevers, 2009; Perazzi et al., 2012; Wu et al., 2012; Marat et al., 2013; Xia et al., 2015).

The aim of our work is to analyze gaze fixations in recognizing facial emotional expressions in comparison with to the spatial distribution of the areas with the greatest increase in the total (nonlocal) contrast. The research hypothesis is that the most informative areas of the facial image that getting more of the observer's attention could be the areas with the greatest increase in nonlocal contrast.

Materials and Methods

Participants

The study sample consisted of 100 university students (Europeans, women 59%) aged 19 to 21 years (average age 20.4 ± 2.6). All participants had normal or normalized vision and no history of neurological or psychiatric illness. In the initial stage of the process all participants were informed about the study's purpose and procedure and gave written consent for voluntary participation. The study was approved by the local ethics committee and conducted in accordance with the ethical standards of The Code of Ethics of the World Medical Association (Declaration of Helsinki).

Stimuli

490 full-face photo images were used as stimuli, which were selected from open excess databases: MMI (Pantic et al., 2005), KDEF (Lundqvist, Flykt and Öhman, 1998), Rafd (Langner et al., 2010) and WSEFEP (Olszanowski et al., 2015). The number of male and female faces was equal (245 each). These were the faces of adult Caucasians. The images displayed faces of 6 basic emotions according to P. Ekman (anger, disgust, fear, happiness, sadness and surprise) (Ekman, 1992) and a neutral facial expression. We aligned the images by average brightness and RMS contrast and inscribed them into a conditional circle of 880 pixels in diameter (22.8 angular degrees).

Procedure

Participants were positioned in a head-chin rest at 60 cm distance from the center of the screen. The instruction did not require subjects to fixate gaze prior to the stimuli. The subjects were asked to recognize the emotional expression of the shown face. Images of male and female faces with different emotional expressions were presented in a random sequence. The duration of the stimulus exposure

was 700ms. Verbal labels of all possible facial expressions appeared following each faded stimulus The subjects responded by clicking a mouse button to indicate which emotion they thought was shown. Prior to the experiment, all subjects underwent training that helped to understand the task, procedure and allowed to actualize the names of emotional expressions. Since the differentiation of emotions is a common task for an adult, prolonged training was not required. At first, subjects in free viewing mode went through photographs of men and women showing different facial expressions. Each image was accompanied by a caption indicating the displayed emotion. Then, in order to familiarize the subjects with the procedure and make sure that they understood the task correctly, several training trials were carried out. The images used in the training were not used in the main experiment.

The duration of the main experiment did not exceed 20 minutes, and the experimental task was not tiring. However, since we recorded not only eye movements, but also the responses of the subjects, this allowed us to monitor the development of fatigue during the experiment. Comparing the percentage of correct answers in the first and last third of the experiment, we did not find a significant decrease in the performance efficiency.

Eye-tracking

Eye movements were recorded using the SMI Red-m tracker. The standard calibration procedure for the device was carried out prior to each experiment. The position of the eyes was recorded at a frequency of 60 Hz. The gaze localization accuracy was 30 arc minutes. For each stimulus, a fixation density map (FDM) was constructed by averaging over all subjects.

Digital image processing

Using software we developed that compares the total luminance contrast in the central operator window with the total contrast in the surrounding area, the face image areas with the highest (max), lowest (min), and intermediate (med) increases in the total contrast were established. The med areas were defined on a conditional straight line connecting the nearest min and max regions, while the degree of contrast increase in med was average between these min and max areas.

For digital image processing, we used a concentric operator. The operator included a central area (central window of the operator) and a surrounding ring (peripheral part of the operator). The width of the peripheral ring was equal to the diameter of the central window. First, in the center area of the concentric operator, we calculated the total energy of the image filtered at a frequency of 4 cycles per diameter of this central area. This filtering frequency was set based on the optimal ratio of carrier-envelope frequencies for human perception of contrast modulations (Babenko, Ermakov and Bozhinskaya, 2010; Sun and Schofield, 2011; Li et al., 2014). In the peripheral part of the operator, the spectral power of the entire range of spatial frequencies perceived by a person was calculated per 1 octave on average. The contrast modulation amplitude was equal to the difference in the spectral power calculated between the central and peripheral regions of the operator.

Changing the diameter of the operator's window while maintaining the filtering frequency (4 cycles per window diameter) made it possible to identify these areas in 5 different ranges of spatial frequencies 1 octave wide (with a center frequency of 4, 8, 16, 32 and 64 cycles per image). The relationship between the operator's diameter and the filtering frequency (the smaller the diameter, the higher the frequency) reflects the well-known property of second-order visual mechanisms, which ensures their scale-invariant capabilities (Sutter, Sperling and Chubb, 1995; Kingdom and Keeble, 1999; Dakin and Mareschal, 2000; Landya and Oruç , 2002).

Using the largest gradient operator, where the diameter of its central area equaled the size of the image, we were able to mark one area with the highest, lowest and intermediate modulation of the total contrast in every stimuli. Then, by repeated halving of the operator's diameter, 2, 4, 8 and 16 areas were marked for each contrast modulation amplitude (min, med and max). The total diameter of the identified at different spatial frequencies areas was equal to the diameter of the conditional circle into which the original image was inscribed. For each stimulus 3 maps of the distribution of areas with the min, med and max modulation of contrast were constructed. These maps were a superposition of Gaussians.

Statistical data analysis

The empirical maps (FDMs) were compared with calculated theoretical maps which were a result of digital processing of stimuli. To assess the similarity of the maps, two distribution-based metrics were used: Pearson's linear correlation coefficient (Cc) which shows if there is a linear relationship between two variables; EMD (Earth mover's distance or Wasserstein distance) which is a spatially robust measure that, unlike all other similar metrics, takes into account the spatial differences between theoretical and empirical

results (Bylinskii et al., 2018). To calculate the distance matrix, we used a computer implementation of the similarity metric for the Python language (Pele and Werman, 2009).

Results

First, we compared empirical maps for each of the 490 stimuli with the distribution maps of min, med, and max regions constructed from image areas identified in all five spatial frequency ranges. Due to the non-normal distribution of the data obtained and the heterogeneity of the variances, we used a non-parametric test. The medians of the correlation coefficients for min were -0.109, for med and max were 0.323 and 0.459, respectively. By comparing these scores using the Kruskal-Wallis rank sum test (df = 2, n = 1470), it was found that the similarity of theoretical and empirical maps significantly increases with an increase in the modulation amplitude of the total contrast of the selected areas (p <0.000). The median EMD scores for min, med, and max were 5.266, 3.371, and 3.266, respectively. It also should be noted that the shorter EMD indicated less the similarity between theoretical and empirical maps. The Krus-kal-Wallis rank sum test showed that this similarity significantly increases with the increase in the contrast of the selected areas (p <0.000).

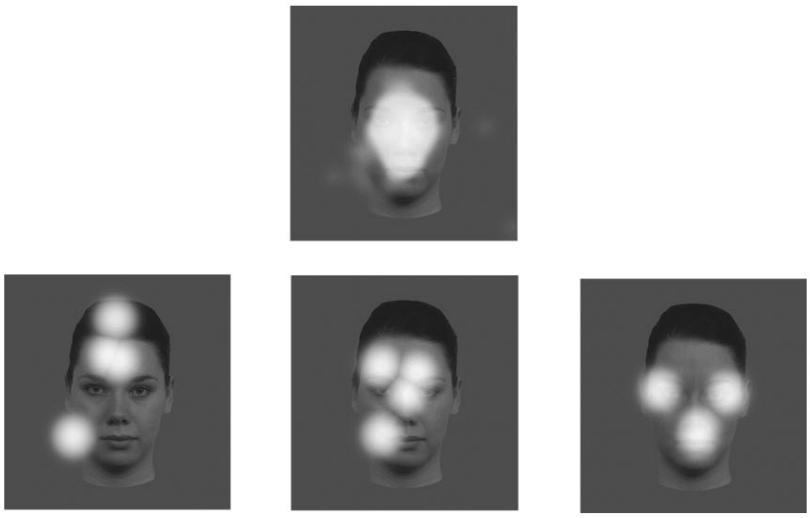

Figure 1. Examples of an empirical FDM (above) and the areas with the lowest (left), intermediate (center) and highest (right) increases in the total contrast, highlighted at a frequency of 16 cycles per image. The brightness level of the selected areas reflects the probability of gaze fixation on a given area of the image.

Then we performed a similar analysis separately for each of the spatial frequency ranges. At this stage, the empirical maps remained the same, and the calculated theoretical maps were built from the areas identified in a narrow range (1 octave) of spatial frequencies with a central frequency of 4, 8, 16, 32 and 64 cycles per image. The correlation analysis results are presented in Table 1.

Table 1.

Median scores of correlation coefficients for maps in different ranges of spatial frequencies and the effect of increasing the amplitude of contrast modulation

Cycles per image	min	med	max	Kruskal-Wallis chi-squared	p
4	-0,089	0,294	0,361	1047,0	< 0.000
8	-0,094	0,122	0,503	795,82	< 0.000
16	-0,019	0,330	0,474	963,63	< 0.000
32	-0,023	0,000	0,000	455,83	< 0.000
64	-0,023	0,066	0,137	811,64	< 0.000

The higher the Kruskal-Wallis chi-squared scores, the more pronounced the differences between the compared values (in this case, the correlation coefficients). Statistical comparison of the obtained scores using the Kruskal-Wallis rank sum test showed that the similarity of theoretical and empirical maps significantly increases with an increase in the contrast modulation amplitude of the selected areas.

Table 2.
EMD scores in different spatial frequency ranges and the effect of increasing the contrast modulation amplitude

Cycles per image	min	med	max	Kruskal-Wallis chi-squared	p
4	6,760	3,755	3,609	1009,5	< 0.000
8	6,061	3,696	2,380	776,72	< 0.000
16	3,519	1,832	1,658	843,0	< 0.000
32	7,197	4,098	4,070	77,079	< 0.000
64	5,601	2,801	2,676	328,08	< 0.000

The results of the EMD analysis (shown in Table 2) were consisted with the previous analysis. These results also support the conclusion that, the higher the increase in the total contrast of the selected areas, the more the calculated maps coincide with the empirical FDMs.

To clarify the results obtained at various spatial frequencies, we conducted a post-hoc pairwise comparison of the values obtained for min, med and max areas, using Conover test (Table 3 and 4).

Table 3.
Post-hoc analysis results for the correlation coefficients

Cycles per image	min-med	p med-max	min-max
4	< 0.0000	< 0.0000	< 0.0000
8	< 0.0000	< 0.0000	< 0.0000
16	< 0.0000	< 0.0000	< 0.0000
32	< 0.0000	= 0.14	< 0.0000
64	< 0.0000	< 0.0000	< 0.0000

Table 4.
Post-hoc analysis results for the EMD

Cycles per image	min-med	p med-max	min-max
4	< 0.0000	< 0.0000	< 0.0000
8	< 0.0000	< 0.0000	< 0.0000
16	< 0.0000	< 0.0000	< 0.0000
32	< 0.0000	= 0.14	< 0.0000
64	< 0.0000	< 0.0000	< 0.0000

The post-hoc analysis showed that the relationship between facial areas with the greatest increase in nonlocal contrast and gaze fixations is disturbed at high spatial frequencies (32 and 64 cpi). It is clear that low and medium spatial frequencies (4, 8 and 16 cpi) are more important for attention control when viewing time is limited. Higher spatial frequencies also seem to be able to direct the observer's attention, but with a longer exposure.

Discussions

The main goal of our study was to test the hypothesis that the most informative facial regions may be the regions with the greatest increase in nonlocal contrast. The results obtained definitively showed that in recognizing emotions on faces the distribution of gaze fixations significantly coincide with the layout of areas with the greatest increase in nonlocal contrast at low and medium spatial frequencies. The similarity of theoretical and empirical maps significantly decreases with a decrease in the amplitude of the contrast modulation in selected areas. This effect has been observed and confirmed comparing maps using both the correlation coefficient and the EMD. This applies to both maps that combine the selected areas from all five octaves, and maps constructed the 1-octave ranges of spatial frequencies.

Consistent with previously stated, image areas with contrast modulation activate second-order visual mechanisms in human vision. But how can the functioning of these mechanisms be related to the organization of eye movements? Based on the fact that image areas that differ from the surroundings in their physical characteristics are more informative (Itti, Koch and Niebur, 1998; Einhauser and Konig, 2003; Honey, Kirchner and VanRullen, 2008; Fuchs et al., 2011), it is logical to assume that the targets of focal attention are the areas with the greatest increase in non-local contrast. Spatially overlapping second-order visual mechanisms are able to automatically find these areas in the image at different levels of resolution. The increase in activation of this mechanisms is proportional increase of contrast modulation in the receptive field of the second order filter. We assume that the more the filter is activated, the higher its ability to draw attention to a certain part of the visual field. As a result, the most activated second-order visual mechanisms become “windows” for attention. Through these windows the higher levels of processing receive information from the preattentive stage.

We believe that the perception of a face goes through certain stages. When a new object appears in the observer’s field of view, a face in particular, the perception begins with separating this object from the background. Since second-order visual mechanisms have receptive fields of different sizes (Sutter, Beck and Graham, 1995; Kingdom and Keeble, 1999; Dakin and Mareschal, 2000; Landy and Oruç, 2002), it is always possible to find among them the one with a field that best matches the size of the appeared face. As a result, this mechanism is centered relatively towards the appeared face. It is tuned to a lower spatial frequency than other, smaller second-order visual mechanisms also involved in facial processing. Therefore, it has an advantage in initiating the saccade. This conclusion is based on the fact that ultra-rapid saccades to faces are initiated precisely by low spatial frequencies (Guyader et al., 2017). Thus, because the low-frequency second-order visual mechanism is centered relative to the face, the initial saccade with a high probability will be directed towards the center of the face. This may explain previously reported tendency of the first saccades to be directed to the geometric center of the presented image (Tatler, 2007; Bindemann, Scheepers and Burton, 2009, 2010; Atkinson and Smithson, 2020). Attention directed to the center of the face allows us to obtain general (low-frequency) information about the configuration of the appeared object and classify it as a face (Meinhardt-Injac, Persike and Meinhardt, 2010; Cauchoix et al., 2014; Comfort and Zana, 2015). As shown in Figure 1, the averaged FDM has a peak in the center of the face (between the nose bridge and the mouth). Moreover, statistical data analysis (Tables 1 and 2) confirms that the empirical map of gaze fixations most closely matches the calculated max map obtained at the lowest spatial frequency.

However, prior research, both the performance results (Leder and Bruce, 1998; Cabeza and Kato, 2000; Collishaw and Hole, 2000; Schwaninger, Lobmaier and Collishaw, 2002; Bombari, Mast and Lobmaier, 2009) and neuroimaging data (Rossion et al., 2000; Harris and Aguirre, 2008; Lobmaier et al., 2008; Betts and Wilson, 2009; Liu, Harris and Kanwisher, 2010), indicate the contribution of not only configural processing, but also feature processing to face recognition. A detailed (featural) description of faces can be performed by second-order visual mechanisms tuned to higher spatial frequencies. These filters, as the frequency setting increases, highlight smaller and smaller parts of the face. It is agreed that the most valuable frequency range for face recognition is from 8 to 32 cycles per face (Nasanen, 1999; Ruiz-Soler and Beltran, 2006; Willenbockel et al., 2010; Collin et al., 2014). As shown in Figure 1 (lower right corner), the areas with the greatest increase in contrast in frequency range from 11 to 22 cpi (the central frequency is 16 cpi) are located in the area of the eyes and mouth - areas that are most informative for the perception of faces (Butler et al., 2010; Peterson and Eckstein, 2012; Smith, Volna and Ewing, 2016; Royer et al., 2018). Therefore, the smaller image areas are highlighted by second-order visual mecha-nisms, the more detailed information is available for analysis at higher processing levels.

Conclusions

The results of the study allow us to conclude that in recognizing emotional facial expressions the higher the luminance contrast of the facial area, the higher the probability that this area will become the object of the observer's attention. It was shown that gaze fixations correlate better with the regions of maximum modulation of nonlocal contrast, containing information from the lower half of the frequency spectrum. Perhaps this can be explained with the fact that in our experiments the viewing time was limited to 700 ms per image. This amount of time is enough to make a decision about emotional expression, but during this time the observer can perform only 2-4 saccades, initiated by low-frequency information. Increasing the exposure time will allow the observer to pay attention to the details of the perceived image and can enhance the connection between gaze fixations and high-frequency information.

In our opinion, spatial modulation of contrast in an image can be extracted by the second-order visual mechanisms. The more the contrast is modulated in their receptive field, the higher their activation is. The higher the activation, the higher the probability of drawing the attention to this area of the visual field. Those mechanisms that are more activated can alternately attract visual attention and initiate saccades towards the areas with the greatest increase in nonlocal contrast, starting with lower spatial frequencies.

The results obtained set perspectives for new studies, where it could be determined the universal role of modulations of nonlocal contrast in the perception of not only faces, but also other objects, as well as examined the role of other spatial modulations of luminance gradients (modulations of orientation or spatial frequency) in bottom-up visual attention control.

The accumulation of experimental data in this field is related to the development of image segmentation algorithms and solving the problem of salience. New knowledge about the regularities and mechanisms of determining "regions of interest" will help to optimize the operations of preliminary processing of input information in artificial vision systems and can be useful in the development of image classification systems using deep learning networks.

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Conflict of interests

The authors declare no conflict of interest.

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The Order in The Structure of Motives of Activity: Quantitative Description

Yulia A. Mochalova[1*]

[1]Faculty of Psychology, Pedagogy and Defectology, Don State Technical University, Rostov-on-Don, Russian Federation, e-mail: guliya@mail.ru

Abstract: The purpose of the study is to conduct an empirical verification of the validity of the theoretical assumption that there is an order in the structure of motives of activity, which is determined by the proportionality between the significance of each motive in their aggregate significance and is quantitatively manifested in the parameters of the hyperbolic H-distribution ranked by the parameter. The necessary conditions for solving this problem are highlighted: a) structural elements - weakly functionally dependent on each other motives; b) in the structure of motives, the functional significance of each has a quantitative expression, which must be measured through the organization of empirical research; c) the measure of the total functional significance of all motives is limited by the situation of activity and the costs of obtaining its product. On a sample of students of the first, second, third, fourth courses of technical and humanitarian specialties (N=860) using the method of subjective assessment of the significance of each of the three motives for studying at the university in their combined significance ("acquisition of knowledge"; "mastering a profession"; "obtaining a diploma") and using a given level of the average error of approximation of empirical results with an H-distribution of 10%, it was found that statistically, at a level of error probability less than 20%, students with an average error below a given level predominate. The possible formal and substantive reasons that led to a decrease in the validity of the result are named. The interpretation of the results in the context of the "junction" of systems theory and activity theory is presented. The directions of further research in the context of the proposed model are determined.

Keywords: activity, motive, system, structure, structure order, model validity.

Introduction

Taking into consideration the degree of development of the problem and understanding by this the number of different information sources on this topic, it can be argued that the study of human motivation, along with the problem of personality, occupies a leading place in Russian psychology according to this parameter. There is a huge number of different kinds of such sources, which reflect certain aspects of the study of the motivation of a person. These are monographs (Badmaeva, 2004; Leontiev, 2002 etc.), doctoral dissertations (Gordeeva, 2013; Orlov, 1984 etc.) and a huge number of articles, theses in various collections, journals. Our article is connected not so much with an attempt to introduce elements of mathematisation into a systematic approach to the study of motivation in the theory of activity, as with a desire to move away from the analytical (elemental) approach in this "segment" of psychological research (various types of regression analysis, multidimensional analysis, including factor analysis) and to present a mathematized model of studying the order in the structure of motives of activity, determined by the quantitative balance between the motives forming the structure and interpreted in the context of the methodology of self-organization.

The choice of the order of the structure of the motives of activity as the subject of mathematical description is due to the following factors. A structure exists where there are not one, but several elements potentially capable of forming it. For example, the purpose of an activity cannot form a structure, because it is always the same. And also, A. N. Leontiev's understanding of the motive as an objectified need and, at the same time, the fact that "In the very need state of the subject, the object that is able to satisfy the need is not rigidly recorded....." (Leontiev, 1983). It can be assumed that the same need can be satisfied by different objects (motives), and the activity itself is always potentially polymotivated, which potentially can

*Corresponding author: guliya@mail.ru

form a structure. Our point of view regarding the interpretation of the polymotivation of activity differs from the point of view of a number of domestic psychologists. So D. A. Leontiev interprets the polymotivation of activity as "not that one activity has several motives, but that, as a rule, several needs are identified in one motive to varying degrees" (Leontiev, 2016). Further, we can say that one of the most important factors (others are, such as the situation, the goal, etc.) determining the future structure of motives is the ability of each motive (object) to satisfy the need. In the ratio of these abilities of objects to satisfy the need, a structure of motives arises, including through self-organization, which will be characterized by a certain order. The order in the structure of motives will determine the effectiveness of the activity.

The motives that are present at the same time and which are much more strongly connected with the need than with each other, and at the same time each individual is able to satisfy this need to some extent, it is necessary to correlate with each other in their structural totality. We will call them functionally autonomous motives, since, hypothetically, each of them individually can satisfy the need (fulfill its function) and, as a result, they are relatively autonomous, but in reality they are, albeit weakly, but connected to each other. For example, highlighted A. N. Leontiev's sense-forming motives and motives - stimuli are not such, because the main function of the motive-stimulus is not aimed at satisfying the need that determines the activity, but to "accelerate" the movement towards the sense-forming motive. It is worth paying special attention to the fact that it is a very difficult task to identify truly functionally autonomous motives that determine a specific type of activity. It was possible to follow the empirical path, through statistical factorization (FA), since it is based on orthogonal rotation of factors, which gives statistical independence, but, firstly, what elements can we take as the basis of such a factor model, secondly, there will be a problem with adequate measurement of these elements and, thirdly, no real model explains even 70% of the total elements. For example, in the context of the object field of our research (students), D.Ts. Badmaeva, as a result of a survey of students and subsequent factorization, identified 7 motives for learning: 1) avoiding failure; 2) prestige; 3) creative self-realization; 4) social; 5) educational and cognitive; 6) communicative; 7) professional (Badmaeva, 2004). However, when you get acquainted with the characteristics of each motive presented by the author, you see that there is no functional autonomy between the motives. For example, the prestige motive and the social motive are functionally strongly related to each other the latter being in its turn related to the communicative motive.

The question arises – how to empirically measure in the structure of motives the ratio between the significance of each of them in their aggregate significance in order to quantitatively reflect the features of the order in the structure. We believe that this can be done by a special organization of a research situation in which the subjects, using a subjective assessment, will quantitatively correlate the measure of significance of each motive in their totality and distribute points in accordance with this assessment. It is only necessary to take into account the fact that the general measure of the significance of motives in their totality is not limited by the need of the subject of activity, but is limited by the situation in which the activity unfolds. For example, the measure of the cumulative functional significance of motives is limited by the price of error in this activity - the higher the price of error, the more limited the overall measure.

According to the mathematical description of the order in the structure of motives of activity, we can assume that the order may manifest itself in the parameters of hyperbolic distributions, which have long been used in the study of self-organization processes in such scientific disciplines as sociology (Pareto, 2008), pedagogy (Gurina, 2017), philology (Arapov and Schrader, 1978) and which have begun to be tested in psychological research (Dorofeev, 2019; Dorofeev and Mochalova, 2015).

We believe that to study the order in the structure of activity motives, it is necessary to use a hyperbolic H-distribution ranked by parameter (parameter is the significance of each motive in their aggregate significance) (Kudrin, 2002). Distribution formula:

$$W = \frac{A}{r^{\beta}}, + B$$

W - is the parameter by which objects are ranked (the significance of the motive); r - is the rank number of the motive (1, 2, 3 ...); A - is a constant value equal to the maximum value of the measure of expression of the most significant motive in the structure having 1 rank; β is the rank coefficient characterizing the degree of steepness of the hyperbola; B is a constant.

In order to verify the theoretical assumptions put forward, we conducted an empirical study in which we assumed that if our assumptions are correct, then at the level of empiricism this fact should manifest itself in the coincidence of the empirical (real) H-distributions of the intensity of motives in a structure with a theoretical (ideal) calculated by the hyperbolic regression equation. However, for this it is necessary: firstly, to apply to a specific type of activity, and secondly, on a large sample volume. The

statistical solution to this problem can be the average approximation error (s). Due to the fact that the statistical reliability of s cannot be determined, we used a standard that is found most often in the literature on regression modeling, namely, s = 10%. The whole sample was divided into two (1 sample - s≤10%, 2 sample - s>10%).

The empirical hypothesis of the study: the motives of students' learning activities form a structure, the order of which is manifested in a hyperbolic H-distribution ranked by parameter (parameter - the significance of each motive in their aggregate significance).

Due to the fact that testing such a hypothesis requires special attention to statistical analysis, we considered it reasonable to formulate statistical hypotheses - null and alternative.

Statistical hypotheses: H0 - students with an average approximation error (s) below the acceptable level (s≤10%) will not statistically significantly prevail over students with s above the acceptable level (s>10%). H1 - students with an average approximation error (s) below the acceptable level (s≤10%) will statistically significantly prevail over students with s above the acceptable level (s>10%).

Materials and Methods

1) To study the polymotivational structure of students' learning activities, we used the motives identified by T.I. Ilyina, which could potentially form this structure - 1) "acquisition of knowledge"; 2) "mastering a profession"; 3) "obtaining a diploma" (Ilyin, 2015). Our choice was due to the fact that this classification, as it seems to us, is most suitable for the criterion of "functional autonomy of the motives of educational activity", although we understand that there is a functional connection between them. Before the measurement, the subjects were given the following definitions of the content of motives: 1) the motive of "acquiring knowledge" - the desire to acquire knowledge, curiosity; motive; 2) the motive of "mastering a profession" - the desire to acquire professional knowledge and form professionally important qualities; 3) the motive of "obtaining a diploma" - the desire to acquire a diploma with formal assimilation of knowledge.

2) In order to study the proportionality between the significance of each motive in their aggregate significance in the polymotivational structure of educational activity, students were asked to distribute a fixed sum of 21 points (7×3 =1) between the three above-mentioned motives, in accordance with the subjective ideas of the subject about the above-mentioned significance. Instruction to the subjects: "You are offered 21 points for three motives of learning. Your task is to correlate them with each other according to the degree of significance and distribute them according to their significance." The choice of such a number of points was due to two factors. Firstly, since the basis of the measuring procedure was the method of subjective scaling, in which the low dimension of the scale gives poorly differentiable results, and the high one does not give an increase in accuracy, the maximum value was chosen at 7 points. Secondly, the analysis of numerous research papers carried out using the questionnaire by T. I. Ilyina showed that there is a linear relationship between the motives, therefore, their interaction is additive, which is reflected in their sum.

Methods of statistical and mathematical analysis

To find the parameters of the hyperbolic H-distribution ranked by the parameter, the computer program SPSS 17.0 (module "Curve fitting") was used. To determine the measure of the discrepancy between the empirical values and the values calculated by the regression equation, the average approximation error (s) was used. For statistical evaluation of the reliability of the differences in the frequency of occurrence of subjects in two groups differentiated by level s, a nonχ^2rametric criterion for dichotomy adjusted for continuity was used.

Study participants

A total of 860 students of DSTU were examined. To increase the representativeness of the results, we took into account two factors when forming the sample: 1) the course of study (1st, 2nd, 3rd, 4th) and the specialty received at the university (technical, humanitarian).

Results

After finding the parameters of hyperbolic distributions for all subjects (N=860), ideal (theoretical) values of severity corresponding to these parameters in the structure of motives of each motive were calculated and average approximation errors were found with rounding to 0.1 (values <0.05 were rounded down, and values ≥0.05 were rounded up). The accumulated frequencies of the subjects in two samples

differentiated by the criterion s≤10% and s>10% are shown in Figure 1.

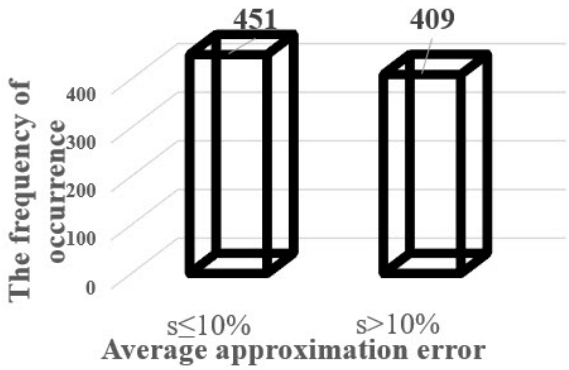

Figure 1. Diagram of the frequency of occurrence of students with s≤10% and s>10% in the hyperbolic H-distribution ranked by parameter (parameter is the severity of the motives of educational activity in their totality)

Figure 1 shows that the frequency of occurrence of those students with s≤10% (n=451) is higher compared to those with s>10% (n=409). Checking the statistical reliability of the significance of the differences in empirical frequencies showed that χ^2–empirical (1,954) is greater than χ^2-tabular at p ≤ 0.2 (1,642) and, as a consequence, the frequency of occurrence of those students whose average approximation error is ≤ 10% is statistically significantly higher than the frequency of occurrence of those students who have it >10% with an error probability of no more than 20%. Let's give a statistical interpretation of the result obtained. The presence of three statistical conditions, namely: 1) the use of "low reliable" nonparametric statistics, especially related to dichotomy; 2) exceeding the acceptable level of error probability in psychology by 5% and 3) the lack of statistical verification of the reliability of the average approximation error, forces us to accept the statistical hypothesis H0 and say that the structure of motives for educational activity cannot be described by a hyperbolic H-distribution ranked by parameter. However, it can be assumed that there are some statistical refinements.

To do this, we decided to visualize the accumulated empirical frequencies of the occurrence of the average approximation error (s) in the combined sample.

For clarity, the smoothed curve of the polygon of accumulated empirical frequencies of occurrence of the average approximation error (s) with rounding to 0.1 (values <0.05 were rounded down, and values ≥0.05 were rounded up) in the combined sample is shown in Figure 2.

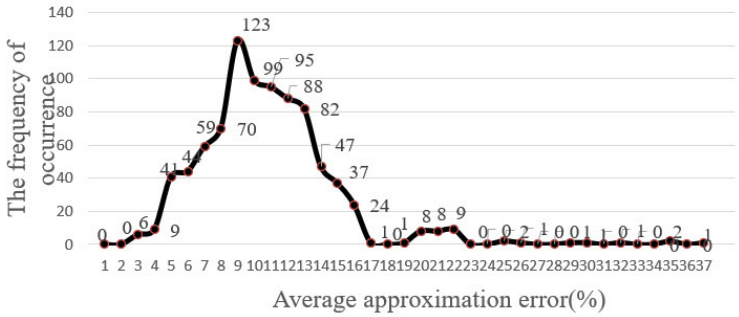

Figure 2. The smoothed curve of the polygon of accumulated frequencies of the average approximation error in the hyperbolic H-distribution ranked by the parameter (the parameter is the severity of the motives of educational activity in their totality) in the combined sample.

Visual analysis of the data presented in Figure 2 gives us reason to assume that the validity of the above result could be reduced by the following factors.

Firstly, the features of the nature of the distribution reflected in the smoothed curve of the polygon of accumulated empirical frequencies. Visually, it differs from normal (for the application of the χ^2– criterion is a prerequisite) and may be lognormal. To test our assumption, we calculated the indicators of the mean, mode and median. The ratio of their values, expressed in the fact that the median (9.1) is located to the left of the mean (10.7), but to the right of the mode (9) only confirmed our assumption. And the lognormal distribution qualitatively characterizes a sample in which most of the subjects have low values, and a

relatively insignificant one has too high values. As a consequence, the division of students "on the edge" s = 10% could reduce the validity of the manifestation of s in the entire sample.

Secondly, it is not possible to check the statistical reliability of the average approximation error. We must rely on the operation of the "statistical law of large numbers". And if in terms of sample size (n=860) our study relatively meets this requirement, then in terms of the number of elements in the structure under study (in our case 3) it does not.

Thirdly, the differentiation of the subjects into two groups by an average approximation error of 10% did not allow taking into account the fact that a large number of subjects turned out to be "above or below" this indicator, not because it really is, due to the effect of the "number of decimal places".

Fourth, the presence of an increase in the frequency of occurrence of subjects (up to 8-9 subjects for each value of the average approximation error) in its interval [20% - 22%]. This may be a random fact, or it may have some kind of pattern and in the future it will be necessary to conduct an empirical study of the qualitative specifics of this contingent of subjects.

Discussions

Due to the fact that the study was carried out "at the junction" of systems theory and activity theory, we will try to "interpretatively integrate" the methodologies of these theories in a meaningful interpretation of the empirical results.

Firstly, although A. N. Leontiev gives priority to motives in the genesis and implementation of activities, nevertheless, contextually motives always correspond to them with purpose and meaning (which is required by the principle of unity of consciousness and activity). The "presence" in the activity of not only motives, but goals and meaning, most likely, manifests itself in the order of the structure of motives (in our study, the motives of students' learning activities). Taking into account this fact, we conclude that the order in the structure of the motives of educational activity of students is a product of both the process of self-organization, which is a consequence of the proportionality between the motives of educational activity, and the process of purposeful, which is a consequence of the presence of meaning and purpose in educational activity. In their aggregate dynamics, the processes of self-organization and purposefulness can be codirected, alternative (for example, due to the action of situational and subjective factors, motives form a structure that does not "agree" with the teaching goal imposed by teachers on students) and relatively autonomous.

Secondly (a consequence of the first), the result we have obtained gives us reason to believe that the study of the role of the systemic organization of activity in the "movement" to its meaning should begin with the level of motives, and not the level of needs, as a number of authors believe, considering that polymotivation is generated by the "convergence" of several needs in one object (Gerasimov, 2002; Leontiev, 2016; Leontiev, 1993 etc.).

Conclusions

If we follow strict statistical requirements, then we must admit that in our study we have not proved an alternative hypothesis at a sufficient level of significance and must accept zero - students with an average approximation error below the acceptable level (s≤10%) do not statistically significantly prevail over students with such an error above the acceptable level (s>10%). However, as it was shown when analyzing such a situation, there are factors (the "weakness" of nonparametric statistics, the absence of a normal distribution of the trait in the combined sample, relatively low elaboration of diagnostic material and measurement procedures, etc.) that do not give grounds to abandon not only the study of the order in the structure of motives, but also the use of a hyperbolic H-distribution ranked by parameter. This fact gives us grounds to identify promising areas for further research.

Direction of further research

1) Due to the fact that in the interpretation of the results of studies related to the use of hyperbolic distributions, an important role is assigned to specific values of parameters, especially the coefficient β, which not only reflect important characteristics of the properties of the system, but allow you to predict its development, in the future it is interesting to study:

- the basic dynamics of changes in the order of the structure of motives - either from order to chaos (classical entropy model), or from chaos to order (Ludwig von Bertalanfi model);
- the presence of not fully realized motives in the structure;

- the potential possibility of including new motives in the structure.

2) Recently, more and more attention has been paid in psychology to the study of meaning in human life. Now there are many works in which we encounter such concepts as “meaning formation”, “ meaning creation”, “finding meaning”. Within this framework, it seems promising to study the role of order in the structure of motives at each stage of the formation of meaning, which can be both direct – the content of motives and the order of their structure generate the content of meaning, and indirect - the content of motives and the order of their structure manifest themselves in the stages of the formation of meaning.

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Conflict of interests

The author declares no conflict of interest.

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The Basic Principles of Training Future Teachers to Work With Younger Students With Experience of Traumatic Effects

Alla Belousova[1], Anna Grinko[2], Olga Fedotova[1], Nusaiba Marachli[3], Shiraz Alali[3]*

[1]Don State Technical University, Rostov-on-Don, Russian Federation, e-mail: belousovaak@gmail.com, fod1953@yandex.ru
[2]South Russian Humanitarian Institute, Rostov-on-Don, Russian Federation, e-mail: anigrin@rambler.ru
[3]Damascus University, Damascus, Syrian Arab Republic, e-mail:dr.n.merashli@gmail.com, Shirazalali00@gmail.com

Abstract: The article shows that the unstable situation in the world leads to possible armed conflicts, affecting primarily children, experiencing various traumatic consequences. Such a situation arises in post-conflict regions and creates a need for teachers who possess the necessary competencies when teaching children with experience of traumatic effects. The purpose of the article is to study the state and trends in the development of psychological and pedagogical issues related to the use of collaborative learning technologies to form the psychological culture of future teachers in order to further work with children with experience of traumatic effects. It is shown that the analysis of the formation and development of the problems of group psychological corrective work is grounded on the basic principles identified by representatives of various directions. The authors propose to build the training of future teachers on the basis of a model of joint thinking for the subsequent organization of teachers' interaction with children who have experience of traumatic effects. The authors analyzed the basic principles of group psychologically corrective work from the point of view of the possibilities of organizing joint thinking. The basic principles of the organization of training of future teachers were highlighted, their meaningful characteristics for the purposes of organizing joint thinking were given. A comparison of the principles of group psychological corrective work and the principles of the organization of joint thinking of future teachers is carried out. Their correlation and the importance of using joint thinking in organizing the training of future teachers and for conducting psychologically corrective work with children are shown.

Keywords: principles of teaching, psychological corrective work, collaborative thinking, junior schoolchildren, traumatic impact, future teacher.

Introduction

The current situation of world social development is characterized by a high level of instability associated with the permanently emerging armed conflicts in various areas of the world space. These conflicts differ in nature, but they have similar consequences for civilians and especially for children. As is known, the child's psyche is characterized by impressionability, the dominance of perception processes in the structure of intelligence (Piaget, 2001) and consciousness (Vygotsky, 2005). These features lead to the fact that the perception of conflict situations, military actions that threaten the life of a child, his relatives or other people, have a negative impact on the child, having long-term consequences in the further adaptation of a person to new conditions.

Children who find themselves in conditions of armed conflict experience various traumatic events: a threat to their physical health or the health of relatives and friends, the death of people, which lead to a fairly wide range of psychological disorders - a change in the image of "I", loss of identity, transformations of the image of the world and lifestyle. In psychology, such consequences are described by the term "mental trauma", denoting experiences caused by severe events that traumatize the psyche (Burlakova, 2019). As shown by L. C. Terr, the following features are characteristic of children who have experienced traumatic effects: depressing obsessive memories of an event; "repetitive reproduction of a traumatic event in games, dreams, visual images; special fears concerning trauma; changing attitudes towards peers, adults, various spheres of life", to the future (Terr, 1991). Yul and Williams (1992) also emphasize that children begin to study poorly, their emotional and behavioral inhibition, the desire to be with their

*Corresponding author: belousovaak@gmail.com

parents is noted; severe anxiety, increased alertness and suspicion.

Researchers note (Osofsky, Osofsky and Harris, 2007; Masten and Obradovic, 2008; Masten and Osofsky, 2010) that school acts as one of the most important factors that have a positive and constructive impact on the restoration of a child's normal life, on the development of his\her relationships with peers and reference adults, on the development of personal potential in the manifestation of leadership, support. Scientists also emphasize the role of groups or communities that have a health-improving effect on the child (Betancourt and Khan, 2008; Masten and Obradovic, 2008; Norris et al., 2008).

The organization of educational activities and psychological support for younger schoolchildren with traumatic experiences involves the use of the principles of group correction. There is a fairly large body of work devoted to various aspects of group correction (A. Adler, C.G. Jung, J. Kelly, J. L. Moreno, F. Perls, K. Rogers, E. Watkins).

According to these ideas, group psychological correction is the most effective way to eliminate the negative experience acquired during a person's life and the experience of psychological traumatic effects (Leitz, 2017; Moreno, 2001; Rudestam, 2006). Researches on psychological correction (Rudestam, 2006) claim that group itself can be considered as a psychotherapeutic factor. Although it is obvious that with individual interaction, a child receives more concentrated attention from a psychologist, the advantages of the group form of work cannot be overestimated.

The analysis of the psychological features of the consequences of armed conflicts for children attracts the special attention of psychologists and educators, both from the point of view of the need to help children with experience of traumatic effects, and from the point of view of helping teachers interacting with such children in the educational process (Fedotova, 2015; Fedotova and Latun, 2015). In this case, a separate task is to analyze the issues of preparing future teachers to work with children who have experienced the traumatic effects of military operations.

Materials and Methods

The purpose of the article is to study the state of psychological and pedagogical issues related to the use of collaborative learning technologies to form the psychological culture of future teachers in order to work with children with experience of traumatic effects.

The object of research is scientific texts that reveal the results of research on various aspects of the problem of training future teachers who are in demand to work with children who have experienced the traumatic effects of military operations.

The hypothesis of the study. We proceed from the assumption that the formation of the psychological culture of future teachers, necessary for subsequent work with children with traumatic effects experience, is associated with the use of co-learning technologies in the form of the organization of joint thinking.

The hypothesis implemented will be based on the analysis of existing theoretical and empirical studies concerning group psychological correction work and the principles of organizing joint training of future teachers. This will make it possible to highlight the principles of teaching of joint thinking when preparing future teachers to work with children who have experienced the traumatic effects of military operations.

Research methods - analysis, synthesis, generalization, abstraction, comparative analysis (Fedotova and Chigisheva, 2015), content analysis, interpretation.

Content analysis has many options, we used the option associated with the allocation of the fixed unit of analysis (Titscher et al., 2009).

The object of the study was publications on Collaborative learning and related research from 2011 to 2021, posted in eLIBRARY and Scopus.

The sources of the research are publications and materials presented in scientific and analytical databases. We turned to the publications presented in the Scopus, the largest international database of scientific publications, and in the scientific electronic library eLIBRARY.RU, the Russian information and analytical database - Russian Science Citation Index (RSCI).

The following categories were taken as a fixed unit: "Collaborative learning", "Collaborative thinking", "Collaborative thinking activity", "Collaborative problem solving in learning", "Collaborative problem solving in a group", which were mentioned in the titles of publications. We assumed that the significance of this problem in the subject field of science lies behind the frequency of distribution of publications on this issue.

Results

Based on these categories of content analysis, we studied the frequency of reflection of problems associated with collaborative learning and its psychological and pedagogical analogues: “Collaborative learning”, “Collaborative thinking”, “Collaborative thinking activity”, “Collaborative problem solving in learning”, “ Collaborative problem solving in a group”, from 2011 to the present.

This period is chosen as a time period within which, according to our assumption, this issue has become more in demand. The results are presented in Figure 1.

Based on thematic search queries in the Scopus and the Russian Science Citation Index, it was found that for the period 2011 - 2021 there is a progressive increase in the number of publications on the problems of the collaborative learning. According to the results of queries in the Scopus database, the number of publications on the problem of collaborative learning has almost doubled: if in 2011 the Scopus database shows 2483 publications, then in November 2021 - the number of publications is already 5453. According to the scientific electronic library eLIBRARY.RU, the situation is even more indicative: in 2011, the number of publications - 104, in 2021 - 655. Thus, in our opinion, the results indicate a general global trend associated with the dissemination and development of various forms of collaborative learning.

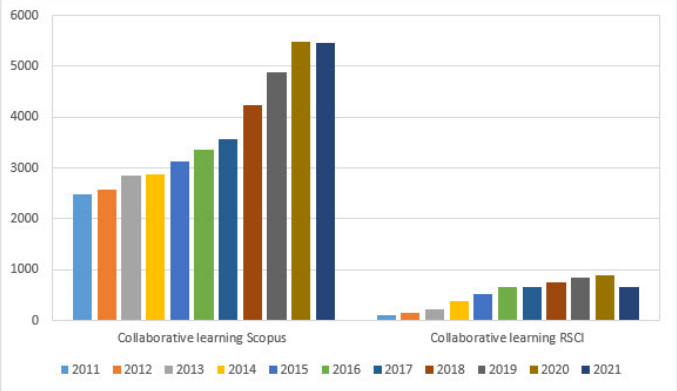

Figure 1. Number of publications in the Scopus and the Russian Science Citation Index databases in the category “collaborative learning” by year

Our next step was to try to understand what tendencies exist in relation to the problem of the development of thinking and mental activity in collaborative learning. In accordance with our ideas (Belousova, 2002; 2010; 2020), the thinking that develops in collaborative learning can be described in terms collaborative thinking, collaborative thinking activity, collaborative problem solving in learning, collaborative problem solving in a group. It seems to us that behind these concepts there is one objective reality, namely, collaborative thinking. We believe that the catalog of possible names is associated with the focus of the authors’ research activities aimed at various aspects of the problem of collaborative thinking.

We were interested to see how publications related to collaborative learning are represented in authoritative databases: “Collaborative thinking”, “Collaborative thinking activity”, “Collaborative problem solving in learning”, “Collaborative problem solving in a group”, from 2011 to the present. The results are presented in Figure 2.

Using topical searches in the Scopus and the Russian Science Citation Index, we also found an increase in the number of publications on the problems of the collaborative thinking. If we combine the number of publications by categories related to collaborative thinking, we get the following results. In the Scopus database, the number of publications on the problem of collaborative thinking has almost doubled: in 2011, 501 publications, in November 2021 - 1022. According to the Russian Science Citation Index: in 2011 - 27 publications, in 2021 - 169. In this case, there is a correspondence a general global trend associated with interest in the development of various forms of collaborative thinking.

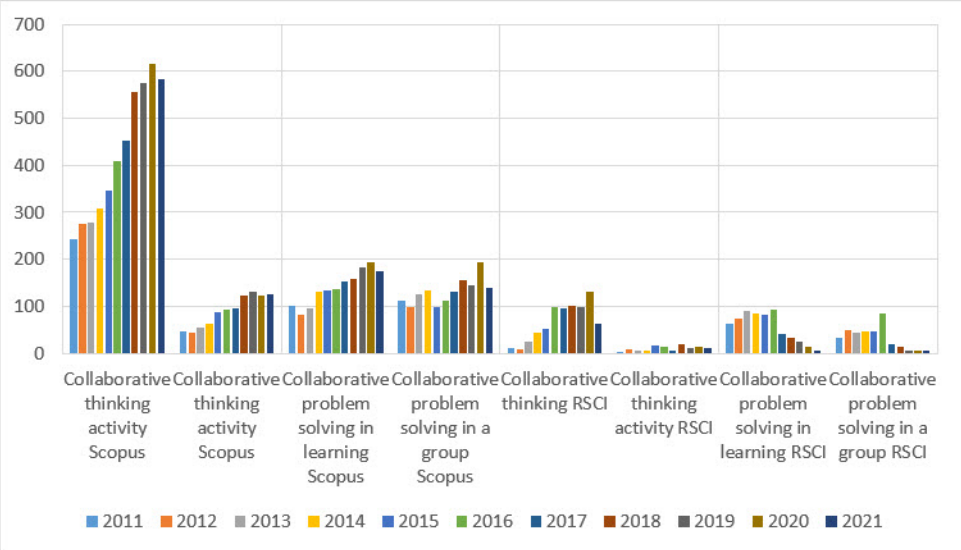

Figure 2. Distribution of publications in the Scopus and the Russian Science Citation Index (RSCI) databases in the categories "Collaborative thinking", "Collaborative thinking activity", "Collaborative problem solving in learning", "Collaborative problem solving in a group" by year

Based on: 1. The analysis of the distribution of publications on the development of collaborative learning and collaborative thinking; 2. Our assumption that the formation of the psychological culture of future teachers to work with children with trauma experience is associated with the use of collaborative learning technologies and the development of collaborative thinking, we consider it appropriate to conduct a comparative analysis of studies related to group psycho-correctional work. Such an analysis is necessary in order to show that the possibilities for the development of collaborative thinking are laid down in the postulates of group correctional work. This will give us the opportunity to correlate the principles of group correction and the principles of teaching collaborative thinking when preparing future teachers to work with children who have experienced the traumatic effects of military operations.

K. Rudestam highlighted some advantages of group work in comparison with other forms of psychological correction (Rudestam, 2006). The first advantage, which experts note, is that a person is constantly surrounded by people, he is constantly affected by the assessments of partners, social assessments of others and relatives, conformism. The correction groups reveal which factors had a direct impact on the views and behavior of the individual. Awareness and comprehension of the effects on the personality leads to a therapeutic effect. At the same time, the experience gained in the created group, the psycho-correction group, is usually transferred to the outside world (Rudestam, 2006).

The second important advantage of the group is the possibility of reflecting a problematic situation for a person by other members of the group, which leads to the formation of each participant's own vision of this situation, their own solution, their own assessments. This situation allows you to get support from participants who have similar problems. In a group, each participant feels accepted by others and accepting others, feels self-confidence and trusts others, shows care and feels care from others, provides help and receives it. Such interaction contributes to the formation of positive assessments of one's image of the world (Rudestam, 2006).

The third advantage is that a group member can observe from the outside active group members who have similar problems, thereby having the opportunity not to get involved in the course of events, but to assess the situation from the outside and get a more complete experience to assess their emotions and actions. A multitude of feedbacks creates a reflection of the personality in many angles simultaneously, allowing it to evaluate its own behavior and attitudes (Rudestam, 2006).

The fourth advantage is that the group promotes personal growth. Conditions are created in the group where the personality of the participants inevitably tends to self-exploration and introspection. Often people know what they want, but they are afraid of a negative assessment of others and do not declare their needs, aspirations and desires, thereby not allowing themselves to be realized. In group interaction, each attempt at self-disclosure and self-change of a group member causes positive assessments from other group members, which contributes to an increase in the individual's self-esteem (Rudestam, 2006).

Currently, there are many methods of group psychological correction. The main ones are traditionally considered to be gestalt groups, body therapy groups, transactional analysis, behavioral therapy and

psychological drama therapy (Rudestam, 2006).

Without a doubt, each of these directions is effective in its own way, but the choice of direction remains with the specialist, who can integrate the directions within the framework of the tasks and goals that he\she faces in order to remove the negative consequences of traumatic effects.

Discussions

In the broadest sense, representatives of almost all directions consider group psychological correction as a process of interaction of participants in which group members can solve various tasks (Rudestam, 2006).

There is a fairly large body of work that examines changes in personality, cognitive processes, emotional characteristics, patterns of behavior that are the result of group correctional work.

However, the specificity of the material in this article is aimed at the opportunity to consider the principles of teaching future teachers when working with younger schoolchildren with traumatic effects experience. It seems possible for us to consider the principles of training future teachers to work with younger schoolchildren with experience of psychotrauma from the point of view of the possibility of organizing various forms of joint thinking. Studies show (Barron, 2003; Belousova and Grinko, 2010; 2016; Belousova and Nurmukhamedov, 2010; Belousova and Pavlova, 2013; Chi, 2009; Chi and Menekse, 2015; Craig, Chi and and VanLehn, 2009; Dautov et al., 2019; 2021; Ermak, 2013; Heyman, 2008; Johnson and Johnson, 2013; Nurmukhamedova, 2011), collaborative thinking is an effective platform in which cooperation, mutual activity, dialogism, cognitive processes develop, meanings change, dynamic processes occur in values, self-assessments, evaluation of others. And it seems to us that joint thinking as a meaningful platform on which the training of future teachers is based can also be expanded to the introduction into practice of the educational process of younger schoolchildren with experience of traumatic effects.

The following considerations can be identified, based on which we consider it possible to correlate the norms and principles of group correctional work and implement it as an organization of joint thinking.

First of all, as emphasized by Craig and Bokum (2019), the age of middle childhood, or primary school age (Elkonin, 1997), is characterized by intensive development of thinking, its logic, characteristic of the stage of specific operations (Piaget, 2001; Craig and Bokum, 2019); the development of theoretical thinking (Davydov, 2001). Thus, the thinking of children of primary school age develops intensively during this age period.

The next factor influencing is the child's participation in school education (Craig and Bokum, 2019), which has a multidimensional effect on him, helping to express himself and develop cognitive processes, personality, social skills, adapt to the requirements of others. Osofsky, Osofsky and Harris, 2007; Masten and Obradovic, 2008; Masten and Osofsky, 2010 also the health-improving role of schooling for children was emphasized. In accordance with the views of Elkonin (1997), in primary school age, educational activity is leading, major psychological changes of personality occur in it and mental processes are rebuilt.

In this regard, we consider it possible to say that the implementation of measures to correct psychological traumatic effects may include the entire educational activity of a younger student, and not just a separate cycle of remedial classes with them.

It can be said that the process of group correction when working with younger schoolchildren implies a change in their attitude to the experience of psychotrauma, a change in psychological characteristics and qualities. It is known that any action is an expression of a holistic personality: a person is realized in the world, performing actions together with others, in a group of schoolchildren, in an atmosphere of goodwill, this process proceeds faster, since joint activity is included in the dynamics. In our opinion, correctional work in the group will acquire new opportunities if it is organized as a joint problem-solving activity. Thinking is one of the highest mental processes through which a person not only finds a solution, but it is such a process that involves the whole person, his\her personal aspirations, thanks to which a person in the process of thinking is able to go beyond the actual needs, realizing his\her higher aspirations, needs for self-development and self-actualization. The principles of group psychological correction proposed by Moreno (2001), make this process fruitful and corrective (K. Levin, K. Rogers, I. Yalom, etc.). Thus, when organizing group correctional work in the form of joint thinking, two determinants are included that can change a person's attitude to events, change his\her psychological characteristics - this is group correction and joint activity.

Consider the consolidation of the principles of group correction and joint activities. The main four principles of group correction proposed by Ja. Moreno at the beginning of the last century, and currently

remain relevant and in demand in group psychological correction (Leitz, 2017).

One of the most important principles of group psychological correction proposed by Ja. Moreno is that "each individual – and not only the therapist - can influence another individual as a therapeutic agent, any group - as a therapeutic agent on another group" (Moreno, 2001). This principle confirms the position of scientists (Betancourt and Khan, 2008; Masten and Obradovic, 2008; Norris et al., 2008) that the study group of younger schoolchildren, as a small social group, has a therapeutic and psychologically correctional effect on its participants.

The next principle is that "group psychocorrection is a psychotherapeutic method that strives for the most optimal grouping of members. This method contributes, if necessary, to the regrouping of members, bringing the constellation of the group into line with the spontaneous motives and sympathies of its members" (Moreno, 2001). During the work of the psycho-correction group, the participants solve the tasks set, receive new information and rethink the existing knowledge. Entering information into the image of the world is one of the fundamental processes that can influence the self-development and self-organization of the individual (Klochko and Galazhinskiy, 1999; Belousova, 2002; 2010). At the same time, in accordance with the concepts of the theory of psychological systems (Klochko and Galazhinskiy, 1999; Belousova, 2010) opportunities to interact are realized for the corresponding opposites. In relation to the psycho-correction group, this means that the younger student perceives from the outside world, from communication and interaction with other members of the group the information that corresponds to him. This process of perceiving information, fitting it into the image of the world and the consciousness of schoolchildren begins from the moment they accept the meanings and values of the people who surround them. The problem of conformity has been considered in many psychological theories: K. Levin considered it with respect to the attraction of objects for a person (Levin, 2019). Moreno (2001) analyzed the correspondence of group members, considering the dynamic processes of attraction and rejection in relation to people to each other as the main ones in their interaction. In his opinion, it is the dynamic processes of attraction and rejection that are decisive in the process of grouping and regrouping members, and it is this group that is the most promising for psychological corrective work.

The third principle "group psychocorrection is therapy not only for one individual who finds him\herself in the center of attention due to difficulties of adaptation and integration, but also for the whole group and all individuals who are associated with it" (Moreno, 2001). Under the influence of one partner, the meanings and values of objects and surrounding people change for the other, new emotions are formed, attitudes change, new attitudes are generated, connecting with emotions. All this can cause the appearance of psychological neoplasms, leading to the emergence of new emotions, changes in the image of the Self, rethinking of previous experience (Yalom, 2001).

The fourth principle states that "the purpose of group psychotherapy is: a) promoting the integration of the individual as opposed to the uncontrolled forces that surround him\her: this is achieved through the individual's study - for example, with the help of sociometric analysis - of this immediate environment; b) facilitating the integration of the group. This rapprochement of the parties - the individual and the group - contributes to their mutual integration. The fundamental rule is "spontaneous and free interaction" between patients, as well as between patients and therapists" (Moreno, 2001). In the conditions of a psychocorrective group, a common semantic field is created (Vygotsky, 2005), a common psychological situation (Belousova, 2010), in which new formations of a common worldview are generated, acting in the conditions of "here and now" in the form of common meanings and values (Belousova, 2010). The formation of a common psychological situation as a result of group interaction forms correspondences in the worldview and contributes to the generation of a common part of the image of the world of each participant. The formed neoplasms are transmitted through semantic channels during group communication and interaction from one group member to another, due to which significant information is integrated into the image of the world of each participant (Belousova, 2010; Suroedova, 2019).

The analysis of the principles of group psychocorrection leads us to formulate the principles of teaching future teachers who can implement the basic ideas of psychocorrection in educational activities with younger schoolchildren. At the same time, the use of such methods requires taking into account specific psychological and pedagogical principles (Abakumova et al., 2019; Verbitsky, 2017), which can become the basis for training future teachers to realize the possibilities of group correctional work with younger schoolchildren through the development of joint thinking:

1. the principle of joint activity;
2. the principle of modeling;
3. the principle of dialogicity;
4. the problem principle;
5. the principle of gaming activity, or gamification.

The principle of joint activity assumes that the training of future teachers is carried out through the organization of various forms of joint activity. This can be an activity using critical thinking technologies, project methods, interactive teaching methods. The conditions for organizing various forms of joint activity (group methods, work in pairs, etc.), on which innovative teaching methods are built, fully create conditions for the development of subjectivity, the formation of readiness and ability for self-development and self-improvement, the development of creativity and the potential for self-realization of the individual (Abakumova et al., 2019).

The principle of joint activity creates the most favorable conditions for the development of the personality of each student:

1. organization of educational activities as a group and joint, during which the situation of discovery and finding of knowledge is modeled, which corresponds to the formation of readiness for uncertainty, the development of the ability to anticipate;
2. educational activities are carried out in the form of joint projects, involving their active interaction, which implies the development of the ability to cooperate, to act together in new situations;
3. trusting relationships between the teacher and the trainees, contributing to the formation of tolerance to uncertainty, abilities to justified risk, responsibility, the need for self-realization, achievement motivation, reflexivity, creativity of participants;
4. encouragement from the teacher and other members of the group, contributing to identification with the group, helping the student to believe in his own strength, and, consequently, on the basis of this, to form the readiness of the individual for the rapidly coming changes in society.

The idea of collaborative learning corresponds to the main directions of innovative approaches to learning presented in the psychology of education (Ahonen and Harding, 2018; Belousova, 2020; Care, Scoular and Griffin, 2016; Chen et al., 2019; Dillenbourg et al., 1996; Griffin, 2017; Harding et al., 2017; Johnson and Johnson, 2013; Lioe, Fai and Hedberg, 2006; Yuan, Xiao and Liu, 2019).

The principle of modeling involves recreating situations, the analysis and reflection of which contribute to the development of joint thinking skills. To implement this principle, it is necessary to create situations of interpersonal interaction that stimulate discussion between participants and the development of joint thinking (Abakumova et al., 2019; Belousova, 2010; Verbitsky, 2017).

The principle of dialogicity is aimed at developing the mutual orientation of communication processes going from one participant to other partners. The conditions of dialogue and communication create the necessary prerequisites and opportunities for the development of each participant in the discussion. Dialogue or polylogue, in the form of which joint thinking is carried out, involves the use of verbal (verbal) and non-verbal means of communication. Verbal communication is the medium through which participants in the educational process transmit to each other formed hypotheses, plans, intentions, goals, etc. Thanks to verbal communication, meaningful changes are made in solving problems, participants' thinking develops through the accumulation and discovery of new knowledge (Belousova, 2010; Verbitsky, 2017).

Nonverbal means of communication perform an important function in dialogue and polylogue: thanks to them, thinking develops, intellectual activity is formed, the effectiveness of educational activities increases due to the transmission of the meaning of the ideas generated by the participants. In this regard, for the organization of training, it is extremely important to organize not only verbal, informational interaction, but also to create a certain emotional atmosphere that would allow participants of joint thinking to understand each other, stimulate the development of intellectual activity (Abakumova, Kagermazova and Ermakov, 2016; Suroedova, 2019).

In the process of communication, by transmitting information to each other about solving problems, participants change each other's ideas about the course of the solution, about the subject being studied, and at the same time change and correct ideas about the teacher, communication and solution partners, ideas about themselves. Thus, there is an expansion of horizons, detailing the image of the world, the situation, the transformation of their own positions and the positions of partners.

The problem principle means that the content of training is constructed as a statement of a problems set (the detection of the incomprehensible, unknown or even paradoxical for the trainees). In the process of solving these problems, there is a clash of different points of view. In this case, the teacher performs the functions of posing problems to students and at the same time is an active participant in the dialogue, helps each person to express their thoughts, hypotheses to others, even if they are erroneous and weird (Belousova, 2010; Verbitsky, 2017).

This moment seems extremely important already due to the fact that, according to the ideas (Vygotsky, 2005; Davydov, 2001; Leontiev, 2004), the learner comprehends, internalizes concepts in the process of a detailed external dialogue with others, which gradually becomes an internal dialogue, that is, a discussion and dispute between a person and himself. Internally, speech utterances are reduced,

curtailed and become understandable only to the person himself. Quite often these individualized representations are not correct or not accurate. In order to change or rebuild these ideas, they need to be externalized, deployed in terms of direct communication and problem solving, i.e., reflexed and brought out. An outwardly detailed dialogue is the main condition for the exteriorization of internal schematisms of thinking.

The principle of gaming activity, or gamification, emphasizes the need for students to reproduce the real practical activities of people. This principle involves the practical training of students in performing certain actions, the development of creative thinking, the formation of practical skills and abilities. But the most valuable thing is that in the situation of modeling a practical situation in the conditions of practical activity (cognitive or other), certain qualities, personality traits are transformed, his\her position, assessments, ideas change, the desire for self-development develops (Belousova, 2010; Verbitsky, 2017).

Conclusions

Thus, generalizing, we can say that the principles of group psychological correction, highlighted by Ja. Moreno, correlate with the principles of the development of joint thinking (Abakumova et al., 2019; Belousova, 2002; 2010; Verbitsky, 2017).

The idea of co-education is currently extremely popular; it is implemented in various models. The article presents a model based on the use of collaborative thinking as a solution to problems. In our opinion, training based on the joint solution of tasks or problems by participants in the educational process most corresponds to the essence of the profession of a teacher, designed to help, interact and communicate with students, parents, colleagues, representatives of various social strata and groups.

In this case, the organization of training of future teachers as joint thinking contributes to the development of competencies, soft skills, aimed primarily at improving the skills of interaction and communication with students.

This becomes especially important for children who have traumatic experience. A teacher who has passed the school of joint thinking training receives: skills of interaction with people, skills of cooperation in solving problems; experience of interaction and communication; experience of perception, listening and understanding of another person; experience of reflection about another person.

It can be said that such a teacher is prepared to organize educational interaction with children who have experienced traumatic effects, and is set up to organize interaction with them in the form of cooperation and joint activities, group work to solve problems, which is the most effective and constructive factor for children to adapt to normal life and recovery.

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Conflict of interests

The authors declare no conflict of interest.

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Factors of Professional Activity of Educators in Pedagogical Practice

Vesna, B. Kravarušić[1*]

[1]The Academy of Applied Preschool Teaching and Health Studies, Kruševac, Department Aleksinac, Republic of Serbia,
e-mail: vesna.kljajic@gmail.com

Abstract: The indisputable importance of early learning as well as the accepted documents of international organizations dealing with education have an impact on educational policy in the Republic of Serbia. Systemic solutions support the professional progress of educators/preschool teachers. Clearly limited and publicly recognizable areas of practice, accumulated fund of knowledge acquired through education, experience, which is expanded and deepened by continuous improvement and exchange with the environment; independent and/or cooperative decisions on timely and correct actions; meeting internal and external standards (self / control); ethics in personal and professional life are characterized by professional/competent actions of educators. Factors that modulate the level of competence of educators are the status of society, the immediate social context, the quality of the study program, professional environment, continuous professional development, pedagogical practice, personal characteristics of educators, job satisfaction and private life. The paper critically examines the key elements of the structure of factors in the Republic of Serbia in order to put light on weak points and their improvement. The research of a set of macrosystemic and subsystemic factors points out to the necessity of restructuring, improvement of the quality of selection, basic education of educators, interventions in the offer of trainings in accordance with the real needs of educators. Ensuring an effective, respectful climate in the preschool institution is necessary for microsystem changes. Pedagogical implications are contained in the creation of conditions for the development of participatory relations, critical observation, but also the emancipation and independence of professionally accomplished educators.

Keywords: educator/preschool teacher, professional activity, competence, factors.

Introduction

Educational policy in the Republic of Serbia is aimed at developing conditions for the professional activities of preschool teachers. Society/state has an interest in supporting educators, according to scientific knowledge about the importance of early learning. The results of research by Sammons et al. (2014) show that the quality and scope of time (more than three years) in preschool have a positive effect on the cognitive and social/behavioral development of students. They are reflected in a better start in school and significantly better achievements of children after the first year of schooling. The study Starting Strong 2017: Key OECD Indicators on Early Childhood Education and Care (2017: 146) confirms that the number of years spent in early childhood education and care is a strong predictor of the level of performance achieved in later stages, both in and out of school. The recommendations and decisions of international organizations dealing with education, which directly affect the regulation of the level of preschool education, are also included in the domestic regulations. The tendency is to improve the basic activity of the preschool institution - upbringing and education of children, as well as comprehensive care that includes health-preventive, social protection, care, care and nutrition. The focus is on overcoming the traditional view of educators as a person who takes care of children while their parents are at work. The effects of the quality of pedagogical work of educators should be measurable by a systematically planned and monitored level of reaching the competencies of preschool children. In the recent past, regardless of a couple of reform changes in this level of the educational system, such an evaluation has not been conducted at the level of the Republic of Serbia. Despite that fact, a valid condition for the answer to the set goals of preschool education is, among other things, an educator who professionally performs the planned activities.

In the Dictionary of the Serbian Language, profession is explained as an occupation, vocation, profession; professional refers to the profession, ie, the one who is something by profession (Rečnik

*Corresponding author: vesna.kljajic@gmail.com

srpskog jezika, 2011: 1064). In the Dictionary of Synonyms, profession is equated with service, title, vocation, job, employment, engagement, position, activity, business, furniture, duty, indebtedness, employment, vocation, employment... A professional is one who deals with a job as by his profession, the one who stands out especially in his profession, expert, master, connoisseur, good connoisseur... This interpretation gives value to an occupation that is embodied in emphasizing, coping in the profession (Ćosić et al., 2008: 517). The fact that these are not the only added values is indicated by Bolčić's interpretation in the Sociological Dictionary where it is emphasized that the profession formally implies the highest existing level of education based on scientific and theoretical knowledge, "... requires the acquisition of top expertise, professional competence and authority as a rule, they do not question"(Bolčić, 2007: 48). Professionalism is also linked to standards, practices or motivation within the profession (Encyclopedia Britannica, 2010). Evetts (2007) points out that in recent decades, professionalism has been preferred as a set of competencies, trust and discretion. Professional behavior, according to Yusoff (2009: 2), can be defined as "... the appropriateness of an action or reaction intentionally or unintentionally to changes in the environment or condition or situation that reflect traits associated with his or her responsibilities. In other words, professional behavior is a reflection of professionalism. "

Profession and professional conduct are complementary concepts, but they do not bear identical characteristics. Unlike the profession, where a recognizable occupation is an obligatory and a sufficient condition, professional work in the profession is characterized by: clearly limited and publicly recognizable areas of practice, accumulated fund of knowledge acquired through education, experience, which expands and deepens through continuous improvement and exchange with the environment; independent and / or cooperative decisions on timely and correct actions; meeting internal and external standards (self / control); ethics in personal and professional life. This ensures the acquisition of authority at the level of the institution (interest groups) and the community. What are the factors influencing the formation of a professional educator is a problem that explodes in the work.

Foreign views on the problem of professional activity of educators

The issue of determining the factors and elements that have a decisive effect on the professional engagement of educators is a relatively new topic (as well as occupation) that preoccupies researchers. The problem of professionalization of occupations in the field of early education was addressed by Boyd (2013), who defines the solution as the need for a higher education, professional development and advanced skills to improve the quality of the program. The results of his research indicate that acquiring professional status and credentials for workers in early education are not enough to keep the most professional and motivated in the field of preschool education, but it is necessary to take steps to significantly improve working conditions, increase salaries and benefits. Boyd points to the lack of observation of the professional status of educators as a personal matrix, drawing attention to the role of society. Butcher and Pletcher (2017) write that the National Association for the Education of Young Children (NAEYC) has prescribed that the establishment of a profession that works to support quality learning for children up to the age of 8 is based on a common purpose, identity and agreement on unique responsibilities and characteristics. They see the support of the profession in legal guidelines, a code of ethics, a set of standards and expectations for practice. In doing so, the set of standards covers various aspects of early education and care, including the learning curriculum, the learning environment, the philosophy of care, and staff support. The authors also identify approaches to teaching young children based on research in psychology, philosophy and education. Among the guidelines for professional behavior of educators are: respect for childhood, child, family, culture, trust in mutual relations, recognition, context, care, upbringing and education, values, commitment... What they emphasize is the unquestionability of safety, health, interests of a child , data confidentiality and cooperation with the family. Analyzing the professional profile of educators, Crosby Kile (2018) points out to four main dimensions of the professionalism of early childhood teachers: professional knowledge, competence, commitment to ethical standards, and personal characteristics. He explains that a professional in the field of early childhood education is someone who has the personal characteristics, knowledge and skills necessary to provide programs that facilitate children's learning. A facilitator is an environment that allows children to learn and grow, to be confident and to gather skills and acquire the skills they will need for later success. He is competent to inform the public about children's and family issues, promote high standards of work and is constantly improving. Educators' presentation/behavior greatly influences public perception of the level of professionalism achieved, according to Crosby Kile. Starting from the premise that professional identity is gradually developed through three complementary steps: education, professional integration

and performing professional duties with professional development, Androusou and Tsafos (2018: 554) investigated the parameters that influence the formation of professional identity of teachers in preschool education. Tentative findings have shown that professional experience and dominant beliefs about early childhood education are more important for the construction of professional identity than studies. In this research, reflections on the problem include personal characteristics, higher education, knowledge, skills, professional development, respect for ethical and professional standards derived from regulations and competence, as influential ones in the professional activities of educators.

Factors influencing the professionalism/competence of educators

The starting point for considering the factors that influence the professional activity of educators in the current conditions in the Republic of Serbia is Illeris's theory of learning (Illeris, 2007). The theory considers lifelong learning that takes place through two dynamic and often intertwining processes - interaction and acquisition. The process of interaction is of a social nature, depending on the social and material character of the environment in space and time, thus providing different learning opportunities. Learning takes place on an unconscious and conscious level where the orientation of the individual is an important element. The acquisition process refers to the psychological processing of impulses and influences carried by interaction, building connections with the results of relevant earlier learning. Each learning encompasses three dimensions, two of which take place on a personal level (content, encouragement), through interaction, but always within a broader social system that is crucial for learning opportunities. The richness of content, what is learned, opens a space for acquiring knowledge, understanding, skills that enable the development of insights and functional abilities. Incentives that precede and last during content learning include motivation, emotion, and willpower, ensuring the mobilization of mental energy and maintaining a balance between the physical and the mental health. The tripartite process includes interaction with the social and material environment through immediate situations in the workplace (communication, actions, cooperation) and the general social level, thus achieving integration and sociality. Through acquisition and interaction, through three presented dimensions, it is possible to achieve "functioning appropriately in the different contexts in which we are involved" (TUNING of educational structures in Europe (2006: 4)) or the development of competencies.

Learning seen as the development of competencies suggests specifying this concept. Competences are defined in the TUNING of educational structures in Europe (2006: 4) as "a dynamic combination of cognitive and metacognitive abilities, knowledge and understanding, interpersonal, intellectual and practical skills, as well as ethical values". There is a difference between competence, as a comprehensive, ideal construct of numerous elements, and realized competence. According to Branković (2011), competence refers to the formed ability to perform work. Branković and Popović (2018: 9) believe that there is no competence in the absolute sense, but, "... to a certain extent, they can be developed through education and exercise. Competences in a combination of knowledge, skills, attitudes, motivation and personal characteristics (values, habits, independence, responsibilities) enable active and efficient action in the profession". A high level of achieved competence can be recognized in professional excellence.

Factors of importance for lifelong learning and the realization of a certain level of important competences for the professional activity of educators can be singled out in the manner shown in Figure 1.

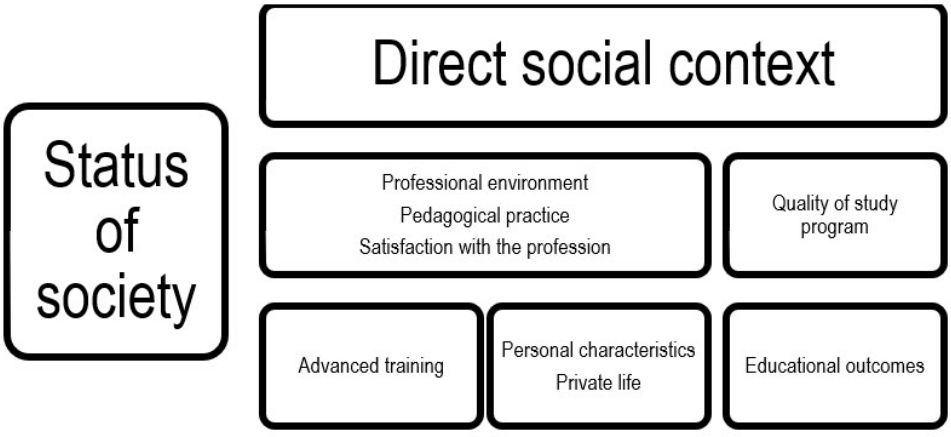

Figure 1. Factors influencing the professional performance of educators

Within the framework of isolated factors, there are numerous structural elements. Some of the basic ones are:

• Society: organization, economic strength, culture, tradition, position of competent institutions and their systemic functioning, laws and bylaws and their application...;

• Immediate social context: family, resource characteristics of places of growing up, studying, professional work, everyday life-material, economic, cultural, educational, health, social conditions (scope and quality of interactions with family members, relatives, friends, colleagues, children from the group, their parents, contacts with people from the local community, cultural and material goods...);

• Quality of the study program: spatial, material and technical conditions, teaching staff, program (plan, content of the program, modernity of scientific-theoretical sources, balance of theoretical and professional / applied subjects, plan, organization and quality of professional practice, their connections due to transfer and integrity general educational and professional outcomes, individual achievement, ie success in studying...);

• Professional environment: urban, rural, rural environment, type and conditions of work in the preschool institution - private, public; conditional, not in accordance with the prescribed conditions; small, medium, large collective; number of children in the group according to the norm, cooperation with colleagues, local community...;

• Continuous professional development: forms of training, portfolio of professional training as a result of reflection, situational or random...;

• Pedagogical practice: compliance with standards and procedures;

• Personal characteristics: personality structure, its development and dynamics;

• Satisfaction with work and private life.

Factors influencing the professional work of educators are in an overlapping, intertwined and dynamic relationship. Each of them, in addition to universality, also carries certain specifics that arise from a specific social milieu. Due to the extensiveness of the issue, only some of the aspects within the presented factors were analyzed.

Status of society

Society is an integrated community based on production processes in all areas of human activity, with developed interpersonal relationships depending on the specifics of culture: science, art, education, tradition, religion, the ruling value system (Šušnjić, 1973). “Social institutions are the basis for creating preconditions for general social participation, but also the revitalization and security of citizens, since each of them implies the behavior of all social factors in accordance with assumed values and norms” (Živković, 2013: 24). The Republic of Serbia is a newly established capitalist state, a young democracy with an aspiration to develop civil society and join the European Union (EU). With all the positive developments, it is still on a transitional path, with limited economic powers. Cultural movements are turning from the former Eastern bloc towards Western European achievements and values. Practice in social fields is a mixture of modern and traditional concepts that resist change. In the reform processes since 2000, the Ministry of Education, Science and Technological Development has been established, with a sector that manages preschool education. Strategic developments are aimed at the widest possible coverage of children. According to the data of the Republic Bureau of Statistics (Republički zavod za statistiku, 16.4.2020) in the school year 2019/20. 224,563 children attended preschool education (a significant increase compared to 2016), 76% of whom were aged from three years to school. The compulsory preparatory preschool program covered more than 97% of the school-age population.

Historically, the first organized types of gathering of preschool children in our area date from the end of the 18th century (Andrijević, 2012). During this period, preschool institutions were classified into other more developed activities - sometimes educational, sometimes health, and sometimes social (Gavrilović, 2006: 57). In the development of the preschool institution, according to Kopas Vukašinović (2004: 97), the turning point in defining the role of the preschool institution is the adoption of the Program of educational work in the preschool institution in 1969 by the Education Council of Serbia. The goal of preschool education is determined: “... to provide the youngest generation with a healthy and cheerful childhood within the limits of social possibilities and, in accordance with the general educational goals and laws of psychophysical development of the child, to contribute to his proper physical, intellectual, moral and aesthetic education.” (Program of educational work in a preschool institution, 1970: 9, according to Kopas Vukašinović, 2004: 98). The process of establishing preschool institutions was accompanied by the regulation of the field of preschool education and the establishment of educational institutions for the education of staff for work

with small children. Among the first schools for educators, a school was founded in Novi Sad, in 1952, as a four-year, later a five-year high school, then a two-year high school (Andrijević, 2012). Following the social needs, the network of higher schools for educators branched out. Since 2006, in accordance with the Bologna Declaration, the education of educators has been transformed into higher education, lasting three years. To date, the possibility of formal education of educators through academic and professional higher education has expanded. Specialist and master education has been introduced. Changes in the level of education of educators are caused by demands for the transformation of their original roles (guardianship, care) which have diversified into multidisciplinary ones. For a relatively young profession, in order to take the level of professional/competent action of educators, the state has taken action to complete the legislation, as guidelines and obligations. The current situation is that, with the approval of the National Council, numerous laws and bylaws have been adopted, which harmonize the norms with the EU, with little respect for social conditions. Among the basic ones, with annual amendments, are: the Law on Preschool Education (Law on Preschool Education, 2017-2019), as a special law derived from the Law on the Fundamentals of the Education System (Law on the Fundamentals of the Education System, 2017-2020); Rulebook on quality standards of the institution (Rulebook on the quality standards of the work of the institution, 2018); Rulebook on competency standards for the profession of educator and his professional development (Rulebook on standards of competencies for the profession of educator and his professional development, 2018) and Rulebook on the basics of preschool education program (Rulebook on the basics of preschool education programs, 2018). These documents have been harmonized and new foundations have been laid for the work of the preschool institution.

Direct social context

The Republic of Serbia is characterized by very diverse conditions when it comes to the immediate environmental conditions (developed, middle and poorly developed regions) that preschool institutions have (Municipalities and Regions in the Republic of Serbia, 2020: 304-307). The global tendency of demographic movement of the population from smaller areas to larger cities, lack of funds, causes an imbalance of needs and opportunities. On the one hand, the insufficient capacity of preschool institutions in large centers is verified, but the lack of preschool institutions in smaller areas as well. Considering that local self-governments also participate in the financing of preschool institutions, differences in conditions are evident. The conditions also depend on the awareness of the authorities in the municipalities and institutions about their importance. The government, local governments, international organizations, and civil society organizations are engaged in unifying the environment in which young children grow and develop.

The situation is similar with higher education institutions for educators. The Ministry of Education, Science and Technological Development of the Republic of Serbia is the owner of public higher education institutions. Spatial and material-technical conditions depend on the management of the institution, developed cooperative relations with the competent institution and local government, which differ from institution to institution. It is not unknown that adequate space (sufficient and attractive), good conditions (eg amphitheater equipment, classrooms, exercise rooms, power, flow, open internet access, library fund that qualitatively meets the requirements of the study program and quantitatively the number of students; reading room; teaching aids (scriptorium/bookstore where resources and materials can be provided for monitoring teaching and realization of pre-examination obligations) are some of the factors that favorably affect studying. Although these conditions are different in institutions, as well as in the case of preschool institutions, poorer conditions can be somewhat compensated by the culture of the institution (synergistic fit of individual cultural capitals of employees and students). The guideline for students and associates is the culturally competent practice of employees as "the ability of systems, services and professionals to provide services in an effective and respectful way ..." (Žegarac, Kišjuhas and Koprivica, 2016: 29). The most frequent student interactions take place on a peer-peer realization. Thus, educational experiences are acquired, harmonized and supplemented, but, at the level of the higher education institution, knowledge is conditioned by direct and indirect interactions of the student with the teacher. The main mediators of this interaction are content with encouragement. "Today, the importance of the quality of teachers and their impact on the quality of the educational process and its outcomes are not questioned" (Vranješević and Trikić, 2013: 60). Staff conditions of the institution, ie. the actual capacity of teachers varies. According to the Law on Higher Education (Law on Higher Education, 2020, Article 74), a person who has the appropriate professional, academic, scientific or artistic title acquired in an accredited study program and an accredited higher education institution and the ability to teach can be elected a teacher. In addition to

the Law on Higher Education, higher education institutions in the field of vocational education take into account the Rulebook on the procedure, evaluation and quantitative expression of scientific research results of researchers (Rulebook on the procedure, manner of evaluation and quantitative presentation of scientific research results of researchers, 2017) when drafting internal acts, additionally defining the profile of teachers' competencies. Ability to teach is assessed on the basis of the results shown by the candidate in working with students (often without defined criteria). Evaluation of pedagogical work of teachers by students is measured quantitatively or qualitatively (depending on how the institution has structured the instrument) and not always regularly. Scales for scientific/professional papers published in scientific/professional journals or collections of reviews from the scientific or professional field for which the teacher is selected are set differently. In some institutions they are specified in one, two, three or five papers for the election period, in some the number is not specified. The framework of the national categorization to which the work should belong is usually missing. When choosing a teacher for the title (lecturer, senior lecturer, professor of vocational studies), the reference of papers for subjects that the teacher realizes within the study program is not always taken into account, which opens the possibility for abuse. Sometimes conditions included are: providing professional youth, contribution to improving the quality of work of the institution, contribution to the academic and wider community, participation in domestic and international projects, participation or conducting special professional courses, seminars or workshops in the country and abroad; leadership or engagement in national or international scientific or professional organizations and the like. For now, the very accreditation of the study program confirms the quality of the existing teaching staff.

However, the quality of teachers cannot be assessed only on the basis of qualifications (formal education, scientific field/narrow field). Quality defines the value system of teachers, didactic-methodical knowledge, pedagogical experience, personal characteristics, work style, communication and attitude towards students, continuity, quality and readiness to implement the knowledge acquired through training, scientific and professional references. Few studies draw attention to this problem. The ATEPIE project (2013) defines "professional development and responsibility for professional development" as an area that consists of "skills and values that teachers assess as the ones that are most lacking." (Vranješević and Trikić, 2013: 62). Đukić (2010: 144) emphasized that "no higher education reform will meet expectations, nor will it reach the set goal, if pedagogical-didactic issues of modernization of higher education itself, including various didactic innovations, do not become a priority." Miočić (2017: 73) states that "at all previous levels of education, in order to work in teaching, it is obligatory to attend programs that ensure the acquisition of basic pedagogical-psychological and methodological-didactic knowledge." Trivunović also recommends (2017: 129) creating the program of specialization that would be dedicated to developing the communicational competences as well. Research by Babić Kerkez (2011) indicates that the educational needs of teachers and associates at the faculty for knowledge in pedagogy, didactics and methodology exist. The need for contents from pedagogy and methodology grows with a higher title and a longer length of service, while the need for contents from didactics decreases.

In practice, apart from teachers in the field of pedagogical and andragogical sciences and teachers who have prepared themselves for the teaching profession at some level of higher education, a large number of teachers do not have a fundamental basis for the teaching profession / work with students. They rely on the personal experience of the teaching function within the system, known models, exchange of experiences, which results in implicit pedagogies. Standards for the work of teachers (Rulebook on standards and procedure for accreditation of study programs, 2021) have recently been applied at the level of higher vocational education. This insufficiently and inadequately regulated resource of a higher education institution is in the process of external regulation by reforming higher schools into academies and, in relation to the current situation, is slow and tolerant.

When it comes to programs for the education of educators, in addition to general pedagogy, the backbone consists of relatively young pedagogical sciences, such as family pedagogy, preschool pedagogy, general and special methods of educational work. Unlike the initial unified bases, from the application of the Bologna rules, the study programs of basic studies through which educators of preschool children are educated are variously structured. This phenomenon is in line with the document TUNING of educational structures in Europe (2006), based on the approach of developing, restructuring, developing, implementing and evaluating study programs. The TUNING project supports differences in study programs in the same field, but works to provide common reference points, in order to ensure their comparability in Europe. In the set of reference points, the competencies that students acquire are emphasized: general (generic) and professional (subject specific). General competencies include:

- Instrumental: cognitive abilities, methodological abilities, technological abilities, language skills;
- Interpersonal: individual abilities, e.g. ability to communicate and cooperate;

• Systemic: abilities and skills related to entire systems: a combination of understanding, sensibility and knowledge ... (Introduction to harmonization (TUNING) of educational structures in Europe, 2006: 12), which are cumulative in nature compared to the previous ones.

One dimension of the problem of acquired competencies during studies is illuminated by a look at the curricula of study programs for educator education. This opens a dilemma: is it possible for educators to master general competencies in the formal system. The standards for study programs of basic vocational studies prescribe the size of participation in general education (about 15%), professional (about 40%) and professional-applied (about 45%) subjects (Rulebook on standards and procedure for accreditation of study programs, 2021). The prescribed setting of the study program does not support the development of general competencies, while the existing general education subjects are often an inadequate basis for the development of general competencies of students. The second dimension is the construction of the study plan, which includes subjects that do not follow scientific diversification (from general sciences, to special, specialized, interdisciplinary, multidisciplinary). The setting of the subject in the plan is also conditioned by the personnel possibilities of the higher education institution.

Krnjaja (2019: 21) believes that "it is necessary to prepare a practitioner through initial education, who in addition to conceptual and functional knowledge has a critical, reflective attitude towards their own practice, within the sociocultural approach to education of future primary school teachers and educators." He proposes continuous changes in the study program, shifting the focus to the learning process, research instead of teaching, overcoming the gap between theory and practice, opening a higher education institution, establishing a partnership between students, teachers and practitioners.

However, the study programs of levels one and two, and approved by the National Body for Accreditation and Quality Assurance in Higher Education of Serbia (NAT), represent only something more than a basic support for the profession of educator, in relation to the requirements of the profession.

In the process of selection when enrolling future educators in basic studies, the requirements that were set in the middle of the last century (spiritual and physical health, to have hearing) were not moved away. In addition to completed secondary education, of any field /educational profile/occupation, candidates for enrollment pass a test of speech, music and physical abilities and take a classification exam (Serbian language, general culture and information). The interest of higher education institutions for educators is self-preservation (in the absence of a network of institutions in line with market needs). The most basic rules are followed during the enrollment procedure. However, regardless the scientific knowledge about the importance, there is no question of examining the personal characteristics of candidates that are desirable for working with children and the initial abilities needed for further development of prescribed competencies of educators (as well as in many other areas which involve working with people).

Professional environment

By completing the formal, higher vocational/academic education and entering the world of work, the process of professional development of educators begins, which flows through pedagogical practice, with which it is in a reversible relationship. The diversification of the network of preschool institutions, the possibility of establishing private ones, the coverage of children with preschool education and the removal of restrictions on employment in the public sector have influenced the higher capacity of hiring educators, applying and starting professional work. The teams of preschool institutions are small, medium and large. Private institutions mostly belong to the group of small collectives, with a low number of students and educators who perform tasks that go beyond the scope of the educator's workplace. Public institutions are territorially connected to municipalities, branched, with several calendar and mixed groups of children, facilities/departments and larger collectives (Municipalities and Regions in the Republic of Serbia, 2020: 304-307). In larger environments, material and cultural wealth provides the opportunities for direct natural and social contacts of children with various resources within the educational work. Numerous teams open up greater opportunities for the exchange of professional work experiences.

Continuous professional development

Recognized and standardized as a necessary part of the professional development of educators, continuous professional development includes numerous forms. It takes place through formal, non-formal and informal education. Educators self-selectively use the opportunity to improve the level of their formal education within the higher education system (specialist, master studies). "The key feature of non-formal education is flexibility and it enables the acquisition of various skills and competencies, through activities

such as seminars, lectures, conferences and workshops (Pavićević and Petrović, 2015: 103)." This includes the activities of educators within the institution: action research, mutual exchange of experiences, examples of good pedagogical practice, work in professional bodies, promotion of preschool activities, preparation of professional papers, attending trainings approved by the Institute for the Advancement of Education. These forms are planned within the institution. The findings of the research conducted by Gutvajn (2017: 34) show that "almost half of educators state that attending seminars, which are organized in the institution, is the most common type of professional development of employees." It is about the approved trainings for a particular group of educators held in the institutions due to efficiency and cost reduction. In this way, greater availability of training, coverage of educators and the realization of a certain number of points to the educator on the basis of professional development is provided. The training offer does not cover all areas of educators' work (see the Catalog of Professional Development Programs/ Katalog programa stručnog usavršavanja, 2018-2021). The authors of the trainings are mostly fellow educators. Educators have already had the opportunity to get to know some of the examples of positive pedagogical practice during the gatherings of the professional association. The obligation to participate in trainings affects the motivation of educators (and the result). For the selection of national training, the basis should be professional portfolios of educators, resulting from self / evaluation and individual needs for specific topics.

Gutvajn (2017: 34) states that one third of educators "improve outside the institution (summer / winter schools, forums, meetings, reading and analysis of professional texts and manuals)." At the same time, thanks to the development of information technology, incidental, unintentional, unintentional learning, due to its accessibility (a large number of electronic sources), relevance at a certain moment of pedagogical practice and freedom of choice of the researcher, gained a significant place in the process of individual professional development.

Pedagogical practice or competence and achieved level of competence

In order to improve the work of the preschool institution, the areas of quality are marked, primarily educational work, then, support for children and families, quality management and organization (Rulebook on quality standards of the work of the institution, 2018). The key carrier in all areas is the educator. The area of quality refers to the preschool institution as a professional learning community, which includes professional communication, teamwork, as the indicators that are achieved through the process of informing about all issues that are important for the institution. According to the research, Rakić, Stojadinović and Čolović (2017: 70) play an important role in achieving a higher level of quality in the work of educators "more active role of employees in business processes, taking responsibility for business improvement and greater authority of employees to make decisions of greater importance ... for what the integration and interconnection of organizational structure, procedures and resources are needed ", in order to realize quality management. The application of digital technologies is also an indicator for the area of quality. Modern communication and information technologies are an integral part of the lives of young children. This cannot be said for educators, so their implementation in work is less pronounced. Smieško Bokanić et al. (2019: 5-6) as preliminary results of the research of educators' attitudes on the application of the Basics of Education Program (Basics of preschool education programs - Years of take-off, 2018) state that educators: mostly agree that new technologies are necessary, that it is needed pay attention more to "information education", and that the exchange of experiences of educators contributes to the development of competencies for the application of technology. Educators are mostly able to search the Internet, 67% of educators exchange information via e-mail or social networks. More than half of the surveyed educators are able to communicate with other educators through online collaboration systems in order to access the materials that have been created. Educators use digital technologies in their work. Media resources are mostly used to plan learning activities, collaborate with colleagues and follow blogs intended for educators. Modern communication and information technologies, whose consumers are children from an early age, still do not reach educators at the same pace, and their representation in educational work is less pronounced. Research by Mesaroš Živkov et al. (2019: 39) shows that the largest number of educators sometimes use the Internet, TV programs and computers in the preparation and implementation of activities with children. In the current time (covid pandemic19), situationally conditioned, educators have advanced in the use of ICT as well. The area of quality determines the establishment and maintenance of cooperation with all institutions important for the implementation of the preschool program. In the second year of successive implementation of the new program, educators devote most of their time to the implementation of projects in which children participate (Smieško Bokanić et al., 2019:

5-6) and spend the least time involving children in local projects, events and activities and cooperation with colleagues from other institutions for the purpose of exchanging experiences, joint learning and research.

The standard in this area also refers to fostering a climate of trust and togetherness. It was explained through indicators such as respect for the norms for exercising rights and responsibilities, joint work of different professions, exchange of experiences and respect for the perspectives of the participants in the construction of the vision of the development of the institution. Achieving the standard of developing a culture of self-evaluation is recognized through reflective, research and critical review of one's own competencies and practice (Rulebook on quality standards of the work of the institution, 2018). Self-assessment is a short-term practice, still developing. Obstacles are established, models of work, limited types and use of objectified instruments, centeredness of educators ... In support of the claim are the findings of the research that will be presented below.

The standard by which the institution becomes a place of continuous change is considered on the basis of the previous standard and its indicators, with the addition of professional training in accordance with the needs of employees. The latest standard in the field of professional learning community is characterized by a public action and activism in the community, in order to stimulate the visibility of the profession, promote the institution and cooperate with relevant institutions from the local environment, already appointed in the field of direct educational work (Rulebook on quality standards of the work of the institution, 2018).

The professional profile of educators is characterized by a multitude of roles. The self made one (as a characteristic of the personality) changes the structure of the institution into an open system, and is the creator of a participatory atmosphere, is a teammate of children, interesting, cheerful, supports their independence, directs them, develops their social skills (assuming he has his own - author's comment), encourages the development of self-control, initiative, constructive discussion, with a partnership and non-authoritarian attitude. He is able to observe children, follow them, adapt the plan to their needs, implement and evaluate educational work - children's achievements, his own achievements, develop the program. He is reflexive and critically evaluates the results of his own work. It exchanges assessed values within the team of educators, through a democratic debate, as a type of additional verification (Rulebook on standards of competencies for the profession of educator and his professional development, 2018). The educator realizes his professional role through direct work with children ("learning and development support focused on well-being through relationships and sharing"), program development ("planning, joint program development, monitoring, documenting, evaluating"), professional development ("reflective practice"), horizontal learning, networking, professional development" and professional public action ("advocacy, promotion, contribution, initiation of actions") (Fundamentals of preschool education programs, 2018: 34). By defining these three areas of competence of educators, the corresponding professional knowledge, skills and values are determined. For the fulfillment of the level of standards, as well as the competence of educators, internal (self-evaluation) and external models (external evaluation) of monitoring are envisaged.

Empirical research of the segments of pedagogical practice that are an integral part of the competencies of educators in recent years signals a discrepancy between the prescribed and the real one. The research findings (Gutvajn, 2017: 34) show that the largest number of educators (85%) have a positive image of themselves as professionals, as well as to recognize their "good" and "bad" traits. The majority of educators (77%) stated that they feel qualified to gather relevant professional information, as well as to use different sources and methods of gathering information in the field of educational work (for example, horizontal learning - "learning from each other"). The author states that the changes in the education system of Serbia have "encouraged a significant number of educators to develop their own practice and professional competencies." How realistic is the self-assessment of educators, further results show. The attitudes of students, future educators, about democratic values (Kravarušić, 2014: 376) indicate that the majority: do not accept the basic postulates of democratic decision-making if they are contrary to personal attitude (67.8%); does not accept teachers as a dyad partner/as a potential collaborator in the process of their formation as educators (58.6%); less than half of the respondents are not for socializing with peers of other nationalities (43.5%) and express disagreement with attitudes that support multiculturalism in any form. The obtained results are contrary to the generationally expressed positive tendencies of accepting equality, and thus diversity of each kind. Such attitudes can have an adverse effect on the future actions of educators, especially with children from vulnerable groups. Students are reluctant and show a lack of responsibility for performing team tasks if it does not fit into their personal agenda (39.1%). They believe that active participation is not significant (38.7%). The research that Marković (2014) conducted with students and future educators indicates that students express beliefs about the child that are close to

modern scientific knowledge, but their approach is closer to the traditional one. The transfer of identified attitudes to the sphere of professional work is also stated by Zlatković and Ristić (2019: 65). "... implicit beliefs are deeply rooted in the thought process, partly because once established implicit beliefs form the frameworks from which new information and experiences are built and evaluated. New information that supports implicit beliefs is easier to notice and accept than information that is opposed to it. "As educators, former students fit into the dominant patterns of work in preschool (Kravarušić, 2019: 108). Colić (1997) explains that educators dominantly perceive the child through a mixture of modern and traditional attitudes: as active, curious, free, spontaneous, creative (with differences in such attitudes and pedagogical behavior), fun and affectionate (traditional approach), while in response the child's needs for tenderness and support are recognized by the difference in the educator's attitude and practical behavior. Miškeljin (2012: 4) states that the way in which educators understand and interpret the curriculum (formal program as an official text or "active" program, or what happens and constructs in the specific context of educational practice) depends on their implicit pedagogies, knowledge, beliefs and assumptions they have about the program, the child and their own role. "In the research of direct educational work (Kravarušić, 2016: 524). educators have proven to be a limiting factor in the process of choosing the type of activity, following the plan and program of work, with a low degree of respect for children's initiative, choices, interests and needs. During communication with children, they send messages, the characteristic ones of which belong to the groups of regulatory, conditioning and stimulating, which do not express a personalized approach and close opportunities for developing the communication process in the interpersonal educator-child relationship. In more than half of the monitored educators, the roles of managing discipline and organization of the educational process were detected as the most represented roles, where only a fifth of educators dedicate themselves to creating respectful interpersonal peer relationships and relationships between educators and children. External motivation of children is stimulated mainly by visual materials for work, which are used in the dominant frontal form of work, along with verbal methods. Contrary to the beliefs of educators, the influence on the development of the intellectual sphere is not sufficiently represented. The most frequent are creative and physical activities (Kravarušić, 2019: 107). In the applied research Mišić (2017), speech, drama, art, music and dance activities were singled out as the most represented (33.33%). It is important to note that a longitudinal study conducted by Baker et al. (2015) found that preschool teachers have an important impact on children's academic performance, and that teachers 'misperceptions about children's academic skills could have negative consequences, especially for preschoolers from economically deprived backgrounds. In light of these indicative findings and the newly established regulatory documents for the work of educators, intensifying research on the real level of competence of educators would contribute to isolating weaknesses and taking actions aimed at their further development. Miškeljin (2016: 395) also states: "In line with modern understandings and research on professional development, which indicate the fact that training professionals is not enough if we want to create sustainable change."

Personal characteristics

The structure of the personality consists of a relatively permanent, complex and special organization of the basic building blocks of the personality (Trebješanin, 2001: 468), such as ability, temperament, character, motives, interests, attitudes, values, etc. In relation to the measure and quality of the influence of hereditary factors, environment and personal activity, dynamic developmental processes take place that characterize the individual. The characteristics of educators that are considered positive and socially acceptable are openness, altruism, empathy, tolerance, consistency, responsibility, critical attitude, perseverance and the like. They are joined by traits "such as motivation or the lifestyle of the educator" (Radovanović, 2019: 82). In professional work, they are reflected through a dominantly recognizable performance in relation to children and associates (authoritarian, anarchic, democratic style, according to Kamenov, 2006). It should be noted that the choice and existence in the profession of educator is not always a process that lasts driven by the internal motivation of the person for the profession. It can be conditioned by the current attractiveness of the occupation, limited offer, achieved educational achievement, acting along the line of least resistance, conformism, acquisition of life circumstances, existential and other reasons. The degree of influence of all explained factors on the educator depends on the accumulated knowledge, in addition to the personal characteristics of the educator (eg focus on available stimuli, resilience, level of neuroticism ...).

Job satisfaction and private life

On socially recognized mastery of the profession, as in other activities, feedback on work have achieved job satisfaction and private life. Although one should rationally separate these two aspects of life, man is a socio-emotional being and such distancing will depend on the established usages of personal control. In larger environments, due to the lower frequency of social interactions and alienation, there are greater opportunities for this. Examinations of this problem (Matanović, 2009: 335) distinguish two predictors. Pleasure (higher score-higher pleasantness) is attributed to people who are good-natured, cooperative, nurture friendly relationships with other people, adopt norms from multiple sources, and easily fit into the work environment. The second, most common predictor is neuroticism (high score-low satisfaction). People with pronounced neuroticism find it harder to adapt, often clash with co-workers and authority, recover significantly longer from stress, are prone to violent reactions and "experience negative emotions in all spheres of life." In the research Mirković and Čekrlija (2015: 213) as a significant predictor of overall job satisfaction, neuroticism was singled out (especially for aspects: salary, nature of work and communication). "Extraversion and pleasure for the aspect of associates, conscientiousness for the aspect of the nature of work" were also singled out. The authors conclude that "the results obtained have significant implications for selection procedures and human resource management practices." From the received results, it could be hinted that in order to decrease the risk of being unsatisfied with the job and private life, there should be a psychological test for the enrollment of candidates in higher education institutions that educate educators.

Finally, considerations of factors that model the professional character of educators would not be complete without emphasizing the existence of professional integrity ("honesty, reliability, sound thinking, maintaining professional boundaries, lifelong learning and training, etc.", Žegarac, Kišjuhas and Koprivica, 2016: 36), without which the educator would be reduced to a technical executor of the activity of upbringing and education.

Conclusion

Exploring the problems of macrosystem and microsystem factors and their subsystems indicates the complexity, dynamism and differences in the level of influence on the professional/competent actions of educators. The efforts of the society/state on the regulation of the system of preschool education are evident. The contribution of macrosystem factors would be more effective by restructuring: networks of higher education and preschool institutions in line with the needs of the market and parents, which would provide an opportunity to equalize material conditions. Strengthening the monitoring of the application of legislation and evaluation of the outcomes of preschool education after the introduction of the preschool program at the national level would provide clear indicators of the value of the program, the work of educators and weak points. The introduction of the state obligation for acquiring knowledge from pedagogical sciences would contribute to the quality of higher education teaching staff, as well as clearly specifying the criteria for the selection and monitoring of the quality of teachers. Redesigning study programs, with an emphasis on introducing more subjects, would support the development of students' general competencies. Expanding the qualification process by introducing a psychological examination and determining the limits of previous school success would affect a better selection of candidates for enrollment in the study program for educator education. The setting of compulsory professional development should be adjusted to the needs of educators, based on the portfolio of professional development, by introducing thematic units that arise from direct educational work: human and children's rights, psychological, didactic-methodological knowledge, communications and ICT, work evaluation. At the microsystem level, improvements can be expected by involving educators in considering and deciding on the work of the institution, encouraging reflexivity, teamwork, self-evaluation process, developing pleasant relationships and rewarding according to jointly conceived rules. These would also be recommendations from the presented analysis.

Conflict of interests
The author declares no conflict of interest.

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Research Trends in Media Pedagogy: Between the Paradigm of Risk and the Paradigm of Opportunity

Łukasz Tomczyk[1*]

[1]University of Macerata, Department of Education, Cultural Heritage and Tourism, Italy
e-mail: tomczyk_lukasz@prokonto.pl

Abstract: The use of computers, internet, and smartphones in the learning and teaching process has become an irreversible fact. Information and communication technologies (ICT) are now one of the fundamental teaching resources and even one of the principal teaching environments. The widespread use of ICT stands in positive correlation to the growing number of studies on educational aspects of the use of new media in schooling. The dynamically growing number of publications in this field requires reflection on the directions of research in the intensely developing sub-discipline of education science, i.e. media pedagogy. The aim of the article is to explore the two dominant directions of research on didactic and upbringing aspects of ICT use in education. The text presents the assumptions and processes assigned to both the opportunity paradigm and the risk paradigm of media pedagogy. These paradigms clash, giving rise to research directed at positive or negative phenomena related to the digitalization of schooling and educational processes. The text is an attempt to draw attention not only to the development of media pedagogy, but also to methodological errors resulting from anchoring research to only one trend.

Keywords: media education, paradigms, school, digitalization of education, risk paradigm, opportunity paradigm.

Introduction

Analyses of the results of research into the behavior of young people in cyberspace show that there are two approaches taken by teachers, parents, researchers, individuals, and opinion-forming institutions. One assumes that digital media (the Internet, computers, mobile phones) lead to many positive results when they are introduced into learning, teaching, and leisure. Representatives of this point of view recognize the role of Information and Communication Technologies (ICT) and associate the use of digital media with positive pedagogical outcomes. One of the arguments for implementing (sometimes ill-considered) ICTs in almost every educational activity is the desire to keep up with technological progress. Using more recent and faster digital devices and visually attractive software and websites seem to be indicators of being up-to-date with the rapid changes in the world of technology. Device upgrades evoke positive connotations (e.g. more focused students, the greater prestige of the teacher who uses ICT, increased educational added value) (Pelgrum, 2001; Keane, Keane and Blicblau, 2016; Reyes et al., 2017). The opportunities paradigm, included within the category of benefits, is successfully used as an argument in the discussion about the directions of the development of formal education and the changes that occur due to the common use and implementation of new technologies in learning, teaching, and education processes (Petko, 2012). In both the scientific and mainstream discussion, the opportunities paradigm often "clashes" with the opposite perspective that emphasizes the negative consequences of using ICT. The risk paradigm is particularly noticeable in the global EU KIDS research (Pyżalski et al., 2019; Smahel et al., 2020) which assumes that the Internet may be a source or environment that facilitates aggression and peer violence, access to pornographic content, and sexual behavior. In addition to these negative behaviors and threats, there is a debate on addiction to phones and the Internet, problematic Internet use, and the harmful Deep Web. From an educational perspective, each of these threats raises many concerns and controversies (Livingstone, 2004). Additionally, every issue has been discussed in numerous scientific publications (empirical research) and methodological works (the effective prevention of e-threats and the implementation of digital media in education). However, many of these publications and, consequently, the research itself is one-sided and does not consider the opposite point of view.

*Corresponding author: tomczyk_lukasz@prokonto.pl

For this reason, it has become necessary to conduct analyses of the research results and redefine the perspective regarding the relationship between the paradigms in the context of modern challenges. There is an urgent need for the integration of the two paradigms due to the rapid changes in the information society and the apparent need to prepare modern teaching staff in the wider European community. A brief summary of the elements assigned to both paradigms is presented in Diagram 1.

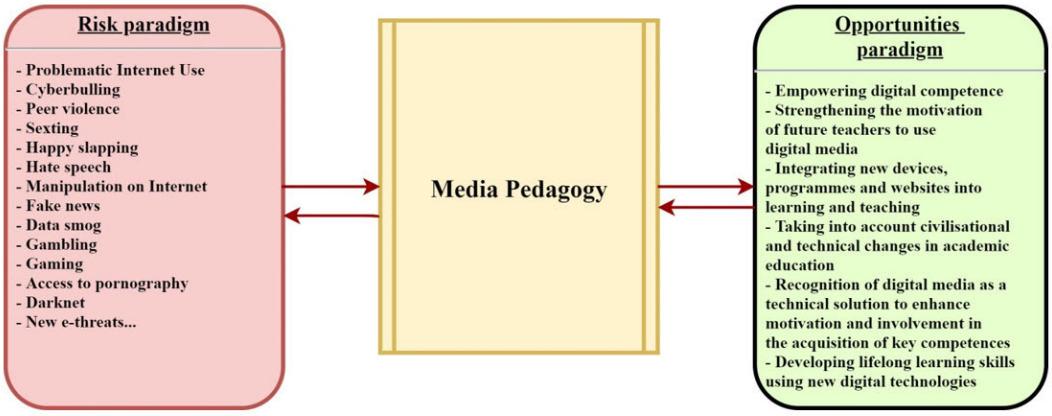

Diagram 1. The risk paradigm and the opportunity paradigm
Source: own source

The aim of the article is to explore the characteristics of both the risk paradigm and the opportunity paradigm of media pedagogy. An intermediary aim of this article is to draw attention to the errors and methodological limitations arising from the narrowing of educational research to one perspective, i.e. positive or negative options, as they relate to the digitalization of schooling or educational processes.

Digitalization of education

The phenomenon of the digitalization of education is a global challenge. The process of the implementation of ICT in formal education means that this topic arouses interest not only in specialists involved in educational research in the fields of pedeutology, media pedagogy, educational theory, and computer science, but it also arouses the curiosity of the general public. The effective use of digital media by teaching staff and students has been particularly noticed in the period since March 2020, when most of the processes related to education and upbringing were involuntarily "digitized" (Potyrała et al., 2021; Tomczyk and Walker, 2021).

The digitalization of education has become an irreversible phenomenon. For more than two decades, both teachers and experts (scientists, NGO representatives) have drawn attention to the fact that it is necessary to modernize educational environments through the use of IT devices, computers, smartphones, software, and websites that can all become effective teaching resources (Stošić, 2015). Nowadays, i.e. in the post-pandemic stage, the use of new technologies in education has acquired a new meaning. ICTs have not only become an attractive educational gadget, but have formed the basis for crisis didactics (emergency e-learning) over the last several months, enabling the continuity of the educational process in the era of the COVID-19 pandemic (Ptaszek et al., 2020).

Currently, there appears to be no turning back towards the non-application of ICT in education. The implementation of ICT in education in recent years has usually been carried out in an unaccelerated emergency manner. Teachers have become acquainted with the possibilities of new technologies within the framework of self-study, peer education, and specialised courses. In this way, they sought to raise the level of their own digital competences oriented towards teaching and educational activities (Novković Cvetkovićet, Stošić and Belousova, 2018). The digitalisation of education has also taken place through government programmes, the enhancement of teachers' professional education, and the participation of schools in projects that seek to improve teachers' teaching skills. In short, changes to the implementation of ICT in subject teaching were usually accelerated by external actors. Nevertheless, there were also situations when transformations took place from the inside, perhaps through passionate teachers or techno-optimistic principals who implemented e-learning platforms in their own schools in recent years, equipped their institutions with Wi-Fi, interactive whiteboards, laptops, tablets, 3D printers, robots,

e-books, or software for simulating phenomena (Tomczyk et al. 2017). Regardless of whether the changes associated with the digitalization of education were triggered by external or internal circumstances, it was an inevitable but slow process. Digitalization occurred according to the capacity of the institutions funding education, was mediated by teachers' attitudes towards new media, or was linked to the broader development of the information society (Ziemba, 2019; Walotek-Ściańska et al., 2014). Most recently, the process of digitalization has gained speed due to the aforementioned economic, pandemic, and modernisation processes.

The focus on digitalization was not only determined by the positive possibilities inherent in the use of ICT in subject teaching. For a long time both teachers and researchers have been focusing on the negative effects of new media on individuals and selected social groups in unusual, abnormal, or crisis situations. Typically, reflection or preventive actions related to the negative consequences of new media use have emerged in circumstances of situations such as cyberbullying (Pyżalski, 2012; Del Rey et al., 2015), sexting (Pyżalski et al., 2019), copyright infringement (Tomczyk, 2019), and others. Crises resulting from the negative use of ICT forced schools to take swift action to curtail the phenomenon and counteract the negative consequences (Tomczyk, 2017). The digitalization of education, therefore, generated a number of educational problems that were then faced by teachers, students, parents, and the school management.

Digitalization has caused a division of teachers into groups negatively oriented towards new technologies on the one hand and on the other, enthusiasts who see the potential of new media in education. The dual character of new media has also been noticed among experts involved in research on the processes of upbringing and education. A rarity in comprehensive studies is showing the process of digitalization of education through the simultaneous presentation of 'dark' and 'light' sides of ICT. Very often the subject of digitalization in scientific studies has been clearly oriented towards exclusively positive or negative dimensions. Of course, this condition has not applied to all studies (e.g. Global Kids Online, EU Kids Online); however, as a trend it has certainly been visible in media pedagogy. The orientation towards one dimension was not only due to the attitude of the researchers dealing with the issues surrounding digitalization, but was also a kind of mapping of the school reality.

In order to understand more fully the extreme approaches involved in the implementation of new media in the educational space, both research trends attributed to media pedagogy are discussed below.

Opportunity paradigm

Researchers, techno-enthusiasts, and teachers representing the research stream and the style of thinking assigned to the opportunity paradigm, emphasise in their statements, analyses, and theoretical frameworks the necessity of implementing teaching solutions based on ICT. Representatives of this perspective automatically assume the existence of positive consequences related to the implementation and use of ICT in school didactics and educational activities (Greenstein, 2016; Tomczyk, 2017; Alexander and Rutherford, 2019; Tomczyk, 2021). Very often the analysis of the impact of new media is combined with technological progress and the necessity to modernise education. Research on the positive aspects of ICT in education stems from the perception of digital didactic means as solutions that are attractive to students, and that enable increased concentration, satisfaction, and involvement during learning. The aforementioned features of the opportunity paradigm are effectively used as an argument justifying the directions of development of formal and non-formal education with the use of digital hardware resources and the Internet (Tomczyk, 2021).

Researchers conducting studies anchored only in the opportunities paradigm are propagators of the idea of the computerisation of education, and thus they clearly see the opportunities that result from the use of ICT. Representatives of this paradigm are convinced of the legitimacy of implementing and conducting research with an emphasis on the benefits of using IT devices (e.g. tablets, mobile phones, computers), and digital teaching aids (e.g. multimedia boards, digital printers, educational software), as well as virtual educational and communication environments (e.g. e-learning platforms). Sometimes researchers assigned to this stream do not take into account the dual character of new media. One consequence of this situation is the creation of research tools, as well as theoretical frameworks, which are prepared only to confirm the only valid hypothesis, which is that without ICT, the quality of education decreases. Such an erroneous assumption may result from poor knowledge of the impact of the use of new media in education, or a high level of techno-optimism, or from insufficient experience either in designing research that takes into account the broader context of media pedagogy or in the broader realm of pedagogical research methodology. At the same time, it should be emphasised that not all of the

research anchored in the opportunity paradigm of media pedagogy leads to erroneous results. However, highlighting only the positive sides of the use of new technologies is fraught with the risk of various kinds of errors related to the interpretation of the complex ecosystem that is educational reality.

In order to more precisely exemplify the opportunity paradigm, it is worth referring to the most common phenomena and processes attributed to the positive impact of new media on learning, teaching, and education. For this purpose, it will be useful to use the EU KIDS Online typology, which notes that ICTs in educational contexts are useful as educational resources, enabling contact with others to develop one's own interests, providing an opportunity to create, initiate, and collaborate in the learning process, enabling access to global information including OER, are useful in creating diverse forms of social engagement, are the basis for creating educational content, are a transmitter of guidance activities, and provide an opportunity for a multifaceted understanding of the surrounding reality, as well as the opportunity to express one's own identity (Livingstone and Haddon, 2009; Haddon and Livingstone, 2017). In turn, Jacek Pyżalski in analysing the phenomena assigned to the paradigm of opportunities in media pedagogy points out that the Internet has become the basis for many positive developmental phenomena for children and young people. Analysing the positive aspects of the impact of new media, he further notes their importance in education and self-development, and in the development of competence in specialised, self-creative, social, consistent, independent, original ways, leading to protection against unwarranted criticism, as well as increased patience, self-improvement, and independence (Pyżalski, 2019). ICT can therefore be a crucial factor in self-development, as well as in improving hard competences of use in the labour market. The opportunity paradigm offers a wide spectrum of possibilities, many of which are proffered by cyberspace and digital tools.

Analysing the last few years of research in the area of media pedagogy, it is possible to see that the positive possibilities of ICT are also linked to creating efficient digital learning environments (Sanchez, et al, 2021; Chan, Bogdanovic and Kalivarapu, 2021), supporting the development of children and young people with special educational needs (Gallardo-Montes et al., 2021), simulating real world phenomena through VR and AR technologies (Fedeli, 2013; Gaol and Prasolova-Førland, 2021), supporting the development of teamwork skills (Awour et al, 2021), enhancing the functioning of vocational education (Cattaneo, Antonietti and Rauseo, 2022), strengthening the assessment of educational outcomes (Misiejuk and Wasson, 2021), diversifying learning methods and self-assessment (Cheng, Bogdanovic and Kalivarapu, 2021), supporting the development of soft skills (Samuelsson, Price and Jewitt, 2021), and predicting educational achievements (Yu, Wu and Liu, 2019). The aforementioned aspects of the application of ICT are only a fraction of the possibilities offered by ICT. Nowadays, cyberspace and digital devices lend themselves to unlimited deployment in almost every area related to learning and teaching. In turn, such implementations offer an opportunity for pedagogical measurement, which can be based on the opportunity paradigm of media pedagogy, thus significantly highlighting the advantages of using ICT in the educational dimension. The focus of researchers and educators on positive aspects is a driving force for change. The assumption of working hypotheses when implementing new ICT solutions in didactics and education is an indispensable activity for the opportunity paradigm of media pedagogy. The paradigm provides opportunities to improve the educational system through taking into account the strengths that result from the specificities of new media: multimedia, versatility, speed of operation, speed of data transfer, and the universality of ICT, not to mention the exponential growth of software aimed at education. The opportunity paradigm is therefore the basis for many studies on the educational application of ICT for both formal, informal, and non-formal education.

Risk paradigm

A different perspective of the phenomenon of digitisation is provided by research embedded in the risk paradigm. Research that represents the risk paradigm is characterised by an emphasis of the negative consequences that result from the pervasiveness of ICT. In this view, ICT are the cause or consequence of negative behaviors. The use of new media may lead to the breaking of the rules of social life, and can contribute to physical and mental health problems that lead to long-term disorders. Experts embedded in this paradigm very often link negative phenomena mediated by digital media to each other, and integrate problematic functioning in the online world with similar problems in the offline world. The risk paradigm is a kind of warning about how digital technologies hijack life and impede proper socialisation and upbringing (Tusseyev et al., 2021). Studies and opinions representing the risk paradigm are very often cited when problematic behavior among children and adolescents emerges and it is new technologies that receive the blame. Phenomena assigned to the risk paradigm are also often an

argument in discussions on the psychosocial functioning of children and adolescents in the modern world. The range of phenomena associated with the 'dark side' of the Internet is systematically expanding with the development of information society services.

In the aforementioned EU Kids Online model, the authors highlight that the Internet can be both a space and a source for fostering undesirable behavior (Pyżalski et al., 2019). However, in many reports on negative behavior, cyberspace is just an additional place where young people with certain tendencies are exposed to undesirable phenomena (Tomczyk and Wąsiński, 2020). Thus, in the risk paradigm, one can encounter multiple approaches where new technologies are the cause, the effect, and the space of e-risks.

Typical phenomena attributed to the risk paradigm of media pedagogy include electronic violence and aggression, harassment and stalking, access to pornography, grooming and abuse of sexual content, exposure to encounters with strangers, distress by providing inappropriate content, sexting, exposure to racist content, hate speech, and ideological manipulation. Among the phenomena of concern, representatives of EU KIDS Online also mention the generation of potentially harmful content, product placement, misuse of personal data, access to gambling, and copyright infringement (Livingstone, Mascheroni and Staksrud, 2017). Other threats in the digital world include the issue of problematic internet use (often mistakenly defined as internet addiction) (Király et al., 2014; Király and Demetrovics, 2021), and pathostreaming (Kmieciak-Goławska, 2018), FOMO (Jupowicz-Ginalska, 2018), and nomophobia (Bhattacharya et al., 2019).

Jacek Pyżalski, in assessing the behaviors assigned to the risk paradigm of media pedagogy, clearly stresses that the activities listed above are undertaken by a minority, whereas in analysing the literature on the subject, one may receive the impression that they concern the entire adolescent population. Presenting young users of new media only as perpetrators and victims of incidents assigned to the risk paradigm of media pedagogy may create a distorted image of this age group. Pyżalski also points out that the dark side of the Internet is researched through small samples (often accidental), using non-standardised research tools without a proper theoretical foundation, or by overinterpreting the data collected (Pyżalski, 2017). The position he presents is very important for several reasons. Firstly, when examining risky phenomena, it should be kept in mind that only a small percentage of young users of new media experience e-risks, and an even smaller percentage trigger such threats. Moreover, young people are not always fully prepared to deal with problems related to cyberspace on their own. Despite the fact that this is a group which uses new media intensively, selected layers of competence within this group need to be strengthened. The stereotypical approach to young people, indicated by Pyżalski, as intensive users of ICT and also the most threatened or most likely to pose a threat, is surely the wrong approach. The risk paradigm is very often used by educators to show the dark side of new media, as well as to highlight the problems that the young generation of users causes. However, in most cases the studies of this type do not fulfill the elementary principles of social research methodology in the field of pedagogical sciences.

Methodological errors and paradigms of research in media pedagogy – the author's approach

The two positions presented here are the basis for many studies attributed to media pedagogy and psychology. The unambiguous focus on the positive or negative aspects of the influence of new media on processes related to education is visible in the research assumptions (objectives, hypotheses, ways of interpreting research results) or is unintentionally hidden through how the narrative is constructed around the features and directions of influence of ICT. Emphasising too strongly the positive or negative aspects, or failing to take into account phenomena from the opposite side in the creation of the research model, may lead to errors. This list is an attempt to point out the most typical errors resulting from the failure to take into account the duality of the paradigms. Ten typical errors that may result from intentional or unintentional consideration of only one research paradigm are described below.

1. Creating stereotypical knowledge about the influence of the media on the upbringing and educational processes.
2. Strengthening negative beliefs among parents, teachers, and students about the use of ICT in education and upbringing.
3. Increasing information noise about the impact of ICT on the behavior of individuals and groups.
4. Making public methodologically flawed research reports that may become an unscientific basis for the creation and implementation of school digitalization policies.

5. Generating descriptions of educational phenomena lacking a holistic perspective.
6. Creating false beliefs and establishing incorrect norms related to the how new media is used by children and young people, with these beliefs then providing the basis for the production of new, inadequate, diagnostic tools.
7. Methodologically flawed publications entering the scientific circuit, which are then disseminated and cited by less experienced researchers.
8. Conducting research that has no real application in the school reality, and therefore is inherently useless.
9. Creating training programmes (e.g. preparing future pedagogical staff, or teachers improving their own competences) based on one type of dominant narrative, either techno-optimism or techno-pessimism.
10. Lowering the prestige of media pedagogy as a science based on unclearly defined paradigms or popular opinions.

The errors presented above are typical situations that may occur when one of the two paradigms is dominant or absent. Of course, it should also be taken into account that more experienced scientists or teachers, as well as people with a high level of critical thinking, are able to spot such errors and inaccuracies. Nevertheless, the 10 most common consequences represent a set of specific arguments about the need for a serious and critical debate on the quality of research attributed to media pedagogy.

Conclusions

In analysing the results of research on young people's behavior in cyberspace, two dichotomous approaches can be observed among teachers, parents, researchers, opinion leaders, and institutions. One of these assumes that digital media bring a number of positive effects when they are integrated into the processes of learning, teaching, and leisure. It is the representatives of this point of view who appreciate the role of ICT, who link the use of digital media with positive effects from a pedagogical point of view. Sometimes these opinions and actions are exaggerated, lacking an empirical basis. One of the most frequently mentioned arguments for including ICT (sometimes thoughtlessly) in almost every educational activity is the desire to keep up with technological progress. The use of newer and faster digital devices as well as graphically appealing software and websites seems to be an indicator of keeping up with constant and rapid change. The opportunity paradigm in scientific and colloquial discussion repeatedly 'clashes' with the opposite perspective, where the emphasis is on the negative consequences of ICT use. The risk paradigm is particularly evident in the global studies of media psychologists, where it is assumed that the Internet may be a source or a space conducive to aggression and peer violence, access to pornographic materials, and the sexual and other negative behaviors discussed in the present study. Each of these risks raises many concerns and controversies from an educational perspective. Moreover, each issue is characterised by a huge number of scientific publications (empirical studies) and methodological studies (how to effectively counter e-risks and implement digital media in the process of education and upbringing). However, many of these studies, and thus research, have a unidirectional tone that does not take into account the opposite perspective. Therefore, it becomes necessary to conduct meta-analyses of research results and redefine our perspective on the relationship between the two paradigms in the context of contemporary challenges, with this having a knock-on effect on the modernization of programs that prepare pedagogical personnel.

The risk paradigm and the opportunity paradigm are two increasingly visible trends and research directions in media pedagogy. It is rare for both perspectives to be combined in studies devoted to the education or psychosocial functioning of children and adolescents in the new media space. As shown in this study, each of these paradigms emphasises one side of the impact of new media on groups and individuals. Conducting research in either one or the other runs the risk of distorting reality, which may not only lead to a deepening of the disagreement between techno-optimists and techno-pessimists (Tomczyk, 2017), but also build new stereotypes, distort the basis for creating effective directions for the digitalization of education, and create an imprecise theoretical framework for effective preventive actions against e-risks.

Both the risk paradigm and the opportunity paradigm are necessary directions for reflection on the changes that new media bring about in upbringing and education. The interpenetration of different opinions, positions, assumptions, research results, and theories on the opportunities inherent in new media (Stošić, 2015; Tomczyk and Kopecký, 2016) is a necessity in realizing methodologically correct research on the digitalization of education. The lack of simultaneous consideration of both perspectives in

further research assigned to media pedagogy may become one of the cardinal mistakes in the next stage of the development of media pedagogy.

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Conflict of interests

The author declares no conflict of interest.

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