UNIVERSITY OF NIŠ

ISSN 2560 – 4600 (Print)
ISSN 2560 – 4619 (Online)
COBISS.SR-ID 241074956
UDC 37

FACTA UNIVERSITATIS

Series
TEACHING, LEARNING AND TEACHER EDUCATION
Vol. 5, No 2, 2021

Scientific Journal **FACTA UNIVERSITATIS**
UNIVERSITY OF NIŠ
Univerzitetski trg 2, 18000 Niš, Serbia
Phone: +381 18 257 095 Telefax: +381 18 257 950
e-mail: facta@ni.ac.rs http://casopisi.junis.ni.ac.rs/

Scientific Journal FACTA UNIVERSITATIS publishes original high scientific level works in the fields classified accordingly into the following periodical and independent series:

Architecture and Civil Engineering
Automatic Control and Robotics
Economics and Organization
Electronics and Energetics
Law and Politics
Linguistics and Literature
Mathematics and Informatics
Mechanical Engineering
Medicine and Biology
Philosophy, Sociology, Psychology and History
Physical Education and Sport
Physics, Chemistry and Technology
Teaching, Learning and Teacher Education
Visual Arts and Music
Working and Living Environmental Protection

SERIES **TEACHING, LEARNING AND TEACHER EDUCATION**

Publication frequency – one volume, two issues per year.

Published by the University of Niš, Serbia

Printed by ATLANTIS DOO, Niš, Serbia
Circulation 70

ISSN 2560-4600 (Print)
ISSN 2560-4619 (Online)
COBISS.SR-ID 241074956
UDC 37

FACTA UNIVERSITATIS

SERIES **TEACHING, LEARNING AND TEACHER EDUCATION**
Vol. 5, N° 2, 2021

UNIVERSITY OF NIŠ

INSTRUCTIONS FOR CONTRIBUTORS

Contributions should be (preferably) in English, French or German.
Under the paper title, the name(s) of the author(s) should be given while the full name, official title, institute or company affiliation and the like should be placed at the end of the paper together with the exact mail and e-mail address, as well as short (running) title of paper.
Manuscript format. A brief abstract of approximately 100 to 250 words in the same language and a list of up to six key words should precede the text body of the manuscript. Manuscripts should be prepared as doc. file, Word version 6.0 or higher. Manuscript should be prepared using a Word template (downloaded from web address http://casopisi.junis.ni.ac.rs/files/journals/17/download_documents/futltetemplate.doc).
Manuscript length. Brief articles and discussions (10 pages or less) are encouraged. Otherwise, papers should present well-focused arguments of approximately 16 pages.
Style requirements. **Letters, figures and symbols** should be clearly denoted.
Equations should be typewritten and, with the number, placed in parentheses at the right margin. References to equations should be in the form "Eq. (2)" or simply (2). For equations that cannot be entered in a single line, use the Equation Editor in MS Word. In equations and in the text, *italicize* symbols that are used to represent variables or parameters, including subscripts and superscripts. Only use characters and symbols that are available in the Equation Editor, in the *Symbol font* or in *Times New Roman*.
All illustrations (figures, photographs, line drawings, graphs) should be numbered in series and all legends should be included at the bottom of each illustration. All figures, photographs, line drawings and graphs, should be prepared in electronic form and converted in TIFF or JPG (max quality) file types, in 300 dpi resolution, for superior reproduction. Figures, line drawings and graphs prepared using elements of MS Drawing or MS Graph must be converted in form of pictures and unchangeable. All illustrations should be planned in advance so as to allow reduction to 12.75 cm in column width. Please review all illustrations to ensure that they are readable.
All **tables** should be numbered with consecutive Arabic numbers. They should have descriptive captions at the top of each table and should be mentioned in the text.
References should follow the **APA Style** convention, in alphabetical order at the end of the manuscript. The list of references should be formatted so that the second row in each entry is indented (Paragraph Indentation, Special - choose Hanging, by 0.5cm). Wherever possible, the DOI number should be provided, too, in addition to other reference data.
The APA style **citation** is applied in the text (according to the instructions that can be downloaded from the link http://www.apastyle.org/ or using samples given in the template). Citations in the text should be given in brackets, stating the author's surname, year of publication and, possibly, pages, if it is a direct quote).
Electronic submission. Papers for consideration should be submitted to the Series Editor in electronic form via the Journal's home page: http://casopisi.junis.ni.ac.rs/index.php/FUTeachLearnTeachEd/.

FACTA UNIVERSITATIS

Series

Teaching, Learning and Teacher Education

Vol. 5, N° 2, 2021

Contents

FACTA UNIVERSITATIS
Series: **Teaching, Learning and Teacher Education** Vol. 5, Nº2, 2021, pp. 115 - 122
https://doi.org/10.22190/FUTLTE211103009A

Original research paper

THE INFLUENCE OF PHONETIC GYMNASTICS ON THE DEVELOPMENT OF FINE MOTOR SKILLS OF PRESCHOOL CHILDREN

UDC 796::371.3; 796.08.012; 159.943-053.4

Aleksandra Aleksić Veljković[1], Slađana Stanković[2], Danijel Božić[3]

[1]Faculty of Sport and Physical Education, University of Niš, Serbia
[2]Faculty of Pedagogy, University of Kragujevac, Jagodina, Serbia
[3]Faculty of Physical Education and Sport, University in Banja Luka, Bosnia and Herzegovina

Abstract. *The development of fine motor skills of preschool children is extremely important, because this ability refers to the coordination of small muscle groups of the hands, which are used in performing tasks such as writing, coloring and cutting. The aim of this research is to determine the influence of phonetic gymnastics program on the development of fine motor skills of preschool children. The research was conducted on a sample of 30 respondents, children attending a younger educational group. The experimental program consisted of a phonetic gymnastics activities which consisted of three parts: introductory, main and final part of the activity, and was conducted for 12 weeks. The introductory part of the activity lasted for about five minutes and a complex of shaping exercises was conducted in it, followed by speaking exercises, e.g. imitating the blowing wind (whizz), the flying bee (buzz) and others. The main part of the activity lasted for 20 minutes, and in this part, various moving and speaking games and songs were used, in order to stimulate children's interest. For the purpose of this research, two subtests from the battery of BOT2 tests (Bruinkins – Oseretsky Test of Motor Proficiency, Second Edition) were applied: fine motor integration and manual dexterity. The obtained results confirmed the positive influence of programmed phonetic gymnastics on the fine motor skills of preschool children. The implementation of this type of treatment in preschool institutions would be of great benefit, especially because it is relatively short (about 30 minutes) and does not require special equipment and space.*

Key words: *phonetic gymnastics, fine motor integration, manual dexterity, physical activity, preschool children*

Received November 3, 2021/Revised December 13 2021/Accepted December 15, 2021
Corresponding author: Aleksandra Aleksić Veljković
Faculty of Sport and Physical Education, University of Niš, Čarnojevića 10a, 11000 Niš, Serbia
E-mail: aleksic.veljkovic@gmail.com

1. INTRODUCTION

The growth of a child in the system of all-round human development plays an extremely important role. From the very birth of a person, his attitudes towards health, as well as physical and intellectual abilities develop. Habits of movement are formed, speech and motor skills are developed, and he adapts to the environment (Lubysheva, 2016). The period of early childhood, i.e. preschool age, is also marked by a more expressive development of new motor skills. Their development is based on solving simple motor tasks during the first three years of life, which after acceptance and adoption become more sophisticated and complex (Mikas, 2009). Crucial, but often neglected for the physical, cognitive, as well as social development of the child, is the movement (Cools, De Martelaer, Samaey, & Andries, 2009) which represents the movement of the body or its parts in space (Perić & Petrović, 2015).

The development of motor skills in early childhood is observed through two aspects: the development of gross and fine motor skills; where the term *gross motor skills* refers to the use of larger muscle groups of the whole body for the purpose of performing more complex motor tasks, such as running, jumping, grasping, etc., which are necessary to move, maintain control and balance of body and objects (Radomski & Trombly-Latham, 2008). On the other hand, fine motor skills refer to the coordination of small muscle groups, especially of the hands, which are used in performing tasks such as writing, coloring and cutting (Smith, 2003; Sortor & Kulp, 2003; Gallahue & Ozmun, 2006; Dinehart & Manfra, 2013). Also, fine motor skills play a key role in many everyday activities such as self-care, feeding and dressing (Marr, Cermak, Cohn, & Henderson, 2003; Van der Linde et al., 2013). The importance of fine motor overall, and especially in children's development is also shown by a study conducted by McHale and Cermak (1992) in which they proved that children spend between 30% and 60% of their school day performing fine motor tasks.

Nowadays, when physical inactivity becomes one of the leading causes of poor health of the entire population, the fine motor skills of preschool children are neglected. The development of motor skills provides a wide range of actions, so that researchers are given space to examine the best methods for the best possible progress (Bruininks & Bruininks, 2005). As the development of physical, mental and social well-being of children and adults can be influenced by a number of factors, research such as Haydari, Askari and Zarra (2009) can provide important conclusions about how the home environment and the load within it can affect a child’s development.

In the last decade, due to the problem of hypokinesia, the idea of creating programmed sports schools has experienced a great expansion. In a review study, with the topic of the relationship between physical activity and motor skills in preschool age, Figueroa and An (2017) proved a positive correlation in eight of the eleven studies. However, this relationship depends on several factors such as the intensity of physical activity and the type of motor skills. Therefore, the problem of finding an ideal program exists, although a large number of authors have tried to reach the same goal. One of them is Brown (2010), who after the implementation of the program called Primary Movement, in 65 boys and girls aged four to five years, found a statistically significant progress of the experimental group, and thus showed the positive effects of this type of program. Daya (2017) proved that programmed stacking of glasses (sport stacking), lasting for five weeks, leads to the improvement of fine motor skills of preschool children. The positive effect of programmed occupational therapy on the development of fine motor skills called

Response to Intervention (RtI) Tier 1, designed by the American Association for Occupational Therapy, was found by Ohl et al. (2013). They conducted this type of occupational therapy program in preschool children for ten weeks and thus helped the experimental group with statistically significant progress, while in the group that was not included in the program there was a slight decrease in the level of fine motor skills. On the other hand, in their longitudinal study, Uzunović et al. (2017) with the help of BOT-2 battery tests obtained statistically significant differences between the group which conducted additional sports programs within preschool institutions, and the control group which had no additional activity, and thus found that the programmed sports school can affect the development of fine motor skills to a great extent. Randjelović, Stanišić, Dragić, Piršl, and Savić (2018) also spoke about the positive effects of physical activity and the order of the processes of developing physical coordination of preschool children, through different types of games. Through their research, they found that voluntary control and coordination between arm, hand and finger movements, both hands, as well as between hands and eyes, can be greatly improved with the help of guided and free physical activities on playgrounds, moving games and morning gymnastics.

In their research, Kim, Taele, Seo, Liew, and Hammond (2016) tried to design a special interface, as a new method, based on shape sketching, in order to more accurately assess children's fine motor skills, while reducing the hard work of experts. They came to the conclusion that their interface, called Easy-Sketch, is extremely effective, and that the most suitable age for the development of fine motor skills in children is the age of five.

Referring to the study by Kim et al. (2016), it can be clearly concluded that modern technology imposes more modern methods of assessing the development of children's abilities, so that older studies, which therefore use older methods of assessment and development, become neglected. However, there is currently little evidence of how technological and technical innovations affect the development of children’s fine motor skills (Gaul & Issartel, 2016). The impact of modernization of technology on the development of fine motor skills was examined by Lin, Cherng, and Chen (2017), who in a sample of 40 children aged 48-72 months, conducted a program of using touch screen tablets over 60 minutes per week and indicated that excessive use of touch screen tablets can cause negative effects on the development of fine motor skills. However, despite the large number of possibilities for action, the best method of developing fine motor skills of preschool children has not been defined yet. On the other hand, researches remain vague because the topic concerning the development of fine motor skills of preschool children is complex, so that a small number of papers can bring a final and general conclusion about the "ideal" model for their development.

In this regard, the aim of this study is, in accordance with modern times and the need to find the best possible method, to examine the impact of phonetic gymnastics programs on the development of fine motor skills of preschool children.

2. METHOD

The research was conducted on a sample of 30 respondents, namely children who attend a younger educational group (from 3 to 5 years) in a preschool institution in Niš. Prior to testing, parents were asked for written consent to participate in the research. The research was conducted in accordance with the Declaration of Helsinki.

For the purpose of this research, a battery of tests BOT2 [Bruinkins – Oseretsky Test of Motor Proficiency, Second Edition (Bruininks & Bruininks, 2005)] was used to assess the development of basic and fine motor efficiency, which is regularly used to identify people with small to medium motor coordination deficit. It is applicable at the age of 4 to 21, and the tasks are similar to games and are not difficult to explain. An abbreviated version of selected tests related to the topic of the paper was used. The following subtests were used in the research:

- Fine motor integration (copying circles and squares; copying overlapping circles and curved lines; copying curved lines; copying triangles; copying diamonds; copying stars; copying overlapping pencils); and
- Manual dexterity (drawing dots in a circle; transferring coins; placing "dice" in the board; sorting cards; arranging objects).

The experimental program consisted of a phonetic gymnastics activity which consisted of three parts: introductory, main and final part of the activity and was conducted for 12 weeks. The introductory part of the activity lasted for about five minutes and a complex of shaping exercises was conducted in it, followed by speaking exercises, e.g. imitating the blowing wind (whizz), the flying bee (buzz) and others. The main part of the activity lasted for 20 minutes, and in this part various moving-speaking games and songs were used, in order to stimulate children's interest. Some of the games are: "On the farm", "Zoo", "Wild animals", "Domestic animals" and others. During the given activities, children imitate the movements of the given animals, performing various forms of movement such as: walking, running, jumping, skipping, galloping, jumping, walking "four-legged", turns, crawling, rolling, throwing, catching, hitting and the like. Along with various songs, fine motor activities are performed, such as: movements of following the fingers in time, movements of twitching and stretching the fingers, movements of the fist up and down, etc. The final part of the activity lasted for five minutes and was intended for stretching and relaxation exercises, with breathing exercises and voice games (ssssss, zzzzz, shhhhh ...).

All statistical analyzes were performed using IBM SPSS Statistics (Version 20). Descriptive statistics were used to calculate Mean and Standard Deviation (SD) for each variable separately. The normality of the data distribution was examined using the Kolmogorov-Smirnov test. The Wilcoxon rank test was used for the differences between the initial and final measurements. The alpha level was set to $p < 0.05$ to indicate statistical significance.

3. RESULTS

Table 1 shows the basic statistical parameters for all variables of fine motor integration on the initial and final measurement, as well as the test results for the normality of the distribution. By interpreting the results, it can be noticed that the mean value of the obtained results increased after the final measurement in six variables, while in two variables the mean value of all results remained unchanged. In this regard, the very beginning of the statistical analysis of the results can highlight the positive impact of the phonetic gymnastics program.

Table 1 Descriptive statistics and differences for fine motor integration variables on final and initial measurement

Variables	IN (Mean ± SD)	FIN (Mean ± SD)	Z	Diff. (FIN – IN) Asymp. Sig. (2-tailed)
KKk	3.80 ± .407	4.00 ± .000	-2.449	0.014
KKv	6.00 ± .000	6.00 ± .000	0.000	1.000
KKP	4.80 ± 1.031	6.00 ± .000	-3.999	0.000
KKL	1.00 ± .743	1.33 ± .479	-3.162	0.002
KT	3.80 ± 1.126	3.80 ± 1.126	0.000	1.000
KD	1.20 ± 1.064	2.20 ± .484	-3.825	0.000
KZ	1.00 ± .910	2.00 ± .910	-5.477	0.000
KPO	1.00 ± .830	2.00 ± .830	-5.477	0.000

Legend: KKk Copy circle; KKv Copy squares; KKP Copying Overlapping Circles; KKL Copy curved line; KT Copy triangle; KD Copying diamonds; KZ Copying the star; KPO Copying overlapping pens; IN Initial measurement; FIN Final measurement

Analyzing the normality of data distribution with Kolmogorov-Smirnov test of normality, it was determined that the results deviate from the normal distribution, which further required the use of nonparametric statistical analyzes, i.e. Wilcoxon rank test. It should be noted that four variables (KKv IN, KKr FIN, KPK FIN, KKv FIN) were omitted from the analysis because their value was recognized as a constant.

The differences between the initial and final measurements, related to the fine motor integration tests, were examined using the Wilcoxon rank test. Interpreting the results (Table 1), we come to the conclusion that there are statistically significant differences between the initial and final measurements, in all measured variables.

The manual dexterity of the respondents was assessed with the help of five tasks, and the obtained results on the initial and final measurement were presented with the help of descriptive statistics (Table 2).

Table 2 Descriptive statistics and differences for manual dexterity variables on initial and final measurement

Variable	IN (Mean ± SD)	FIN (Mean ± SD)	Z	Diff. (FIN – IN) Asymp. Sig. (2-tailed)
CTK (15 s)	2.47 ± .776	3.47 ± .776	-5.303	.000
PN (15 s)	2.27 ± .740	4.13 ± .730	-4.922	.000
SBT (15 s)	2.03 ± .809	3.40 ± .855	-4.964	.000
SK (15 s)	2.50 ± .974	3.10 ± .481	-2.990	.003
NP (15 s)	1.20 ± .714	2.03 ± .718	-5.000	.000

Legend: CTK Drawing dots in a circle; PN Coin transfer; SBT Placing "stings" in the board; SK Map Sorting; NP Sequence of subjects; IN Initial measurement; FIN Final measurement

The examination of the normality of the data distribution was performed with the help of the Kolmogorov-Smirnov test, which indicated a statistically significant deviation of the obtained results from the normal distribution.

Since the distribution of the obtained results deviates from the normal distribution of data, further analysis was approached using non-parametric statistical analyzes. Based on the analysis and interpretation of the results obtained after the Wilcoxon rank test, a statistically significant difference was found between the two measurements for all variables of manual dexterity (Table 2).

4. DISSCUSION

In this paper, where the experimental group was included in the phonetic gymnastics program, the aim was to examine the progress in the development of fine motor skills of preschool children, used movement-speech games and songs. Vigotski (1996) argues that children explore their own possibilities and the world around them. In this way, they develop their motor, intellectual, social-emotional, communication and creative abilities (De Privitellio, Caput-Jogunica, Gulan, & Boschi, 2007). During the game, children are maximally engaged, using the acquired knowledge, experience and skills. The success of performing motor tasks through play can greatly affect the child's sense of security in the company of others (Bratovčić, 2005). They also perform tasks very patiently, which is rarely noticed in some other activities. Psycho-motor activities of children aged four to five enable the understanding of more complex actions, while in the previous period, these activities were mainly directed towards the manipulation of objects.

Any research, in which some kind of experimental treatment was conducted in preschool age, resulted in the improvement of all abilities that the researchers tried to influence (Iivonen, Nissinen, Sääkslahti, & Liukkonen, 2007; Hraski, Stojsavljević, & Hraski, 2009; Brown, 2010; Ohl et al, 2013; Daya, 2017; Uzunović et al., 2017; Randjelović et al., 2018). Even the increase in the total volume of physical exercise, with the same activities that are applied, gave positive effects on the improvement of fine motor skills of preschool children (Savičević, Suzović, & Dragić, 2012). There are many ways for children to learn and prepare for the development of fine motor skills through play. This implies that participation in movement games, with an emphasis on writing and speaking exercises, includes limited activities, primarily in the domain of motor skills (Randjelovic et al., 2018).

Similar to other available research, the results obtained in this study also confirm the positive impact of programmed exercise on fine motor skills of preschool children. The application of the phonetic gymnastics program statistically improved the results in all eight variables of fine motor integration. The good influence of phonetic gymnastics on the development of fine motor skills is reflected in the fact that the respondents in their final tests set a statistically significant progress based on the minimum results shown in the tables. Namely, with six of the eight variables, an increase in the minimum score of points by 50% was noticed, which is a clear indicator of the positive effect of the applied program. On the other hand, if we look at the manual dexterity of the respondents and their progress in the final measurement, it is evident that the respondents improved their results by at least 50% compared to the initial measurement. In all five variables, the average minimum score on the final test indicated great progress of the respondents. The positive impact can be noticed by observing the maximum results, which are significantly increased, which also confirms that phonetic gymnastics is one of the effective methods for the development of fine motor skills. However, the obtained results should be taken with a dose of caution since it was not determined how much the respondents were familiar with the tasks to be performed on the initial and final measurement.

This study had several limitations. The first refers to the sample of respondents, which was small in this study. Second, differences between respondents in relation to gender were not taken into account. Third, it should be noted that the analysis was done only on the basis of the differences obtained in the experimental group, and the final effect could not be determined.

5. CONCLUSION

In conclusion, this study indicates that the phonetic gymnastics program, applied to preschool children, can have a positive impact on the development of fine motor integration, as well as manual dexterity. The implementation of this type of treatment in preschool institutions would be of great benefit, especially because it is relatively short (about 30 minutes a day) and can be carried out with entire groups. Another advantage of the phonetic gymnastics program is that it does not require special equipment and space, because it is based mainly on activities in which children imitate movements and voices. Professional training of staff working with groups is desirable.

REFERENCES

Bratovčić, V. (2005). *Motoričke sposobnosti predškolske djece srednje grupe u korelaciji sa psihomotoričkom stimulacijom* [Neobjavljen magistarski rad]. Tuzla, BiH: Edukacijsko-rehabilitacijski fakultet, Univerzitet u Tuzli.

Bruininks. R., & Bruininks, B. (2005). *Bruininks-Oseretsky Test of Motor Proficiency* (2nd Ed.). Circle Pines, MN: AGS Publishing.

Brown, C. G. (2010) Improving fine motor skills in young children: an intervention study. *Educational Psychology in Practice: theory, research and practice in educational psychology*, *26*(3), 269-278. https://doi.org/10.1080/02667363.2010.495213

Cools, W., De Martelaer, K., Samaey, C., & Andries, C. (2009). Movement skillassessment of typically developing preschool children: A review of seven movement skill assessment tools. *Journal of Sports Science and Medicine*, *8*, 154-168.

Daya, B. (2017). *The effect of a sport stacking intervention programme on fine and gross motor skills in preschool children* [Unpublished Master Thesis]. School of Health Sciences: University of KwaZulu-Natal.

De Privitellio, S., Caput-Jogunica, R., Gulan, G., & Boschi, V. (2007). Utjecaj sportskog programa na promjene motoričkih sposobnosti predškolaca. *Medicina*, *43*(3), 204-209.

Dinehart, L., & Manfra, L. (2013). Associations Between Low-Income Children's Fine Motor Skills in Preschool and Academic Performance in Second Grade. *Early Education & Development*, *24*(2), 138-161. https://doi.org/10.1080/10409289.2011.636729

Figueroa, R., & An, R. (2017). Motor skill competence and physical activity in preschoolers: A review. *Matern Child Health Journal*, *21*(1), 136-146. https://doi.org/10.1007/s10995-016-2102-1

Gallahue, D., & Ozmun, J. (2006). *Understanding motor development: Infants, children, adolescents, adults* (6th ed.). New York: Mc Graw Hill.

Gaul, D., & Issartel, J. (2016). Fine motor skill proficiency in typically developing children: On or off the maturation track? *Human Movement Science*, *46*, 78-85. https://doi.org/10.1016/j.humov.2015.12.011

Haydari, A., Askari, P., & Zarra, M. N. (2009). Relationship between affordances in the home environment and motor development in children age 18-42 months. *Journal of Social Sciences*, *5*(4), 319-328. https://doi.org/10.3844/jssp.2009.319.328

Hraski, M., Stojsavljević, V., & Hraski, Ţ. (2009). The distributon of the development of some motor abilities in preschool boys who participated in a three-year preschool sports programme. In I. Prskalo, V. Findak & J. Strel (Eds.), *Proceedings Book of III Special Focus Symposium on Kinesiological Education, "Heading towards the future"* (pp.83-90). Zagreb: Faculty of teacher education.

Iivonen, S., Nissinen, K., Sääkslahti, A., & Liukkonen, J. (2007). Effects of preschool physical education curriculum – program on 4-5 year old children's fundamental motor skill. In A. Jones (Ed.), *12th Annual Congress of the Europien College of Sport Science* (pp. 11-14). Jyväskylä, Finland: Europien College of Sport Science.

Kim, H., Taele, P., Seo, J., Liew, J., & Hammond, T. (2016). EasySketch^2: A novel sketch-based interface for improving children's fine motor skills and school readiness. In Yotam, G. & Akleman, E. (Eds.) *EUROGRAPHICS Symposium on Sketch-Based Interfaces and Modeling* (pp.7-9). Lisboa, Portugal: EXPRESSIVE.

Lin, L. Y., Cherng, R. J., & Chend, Y. J. (2017). Effect of Touch Screen Tablet Use on Fine Motor Development of Young Children. *Physical & Occupational Therapy in Pediatrics*, *37*(5), 457-467. https://doi.org/10.1080/01942638.2016.1255290.

Lubysheva, L. I. (2016). Sportizaciya obscheobrazovatelnyh shkol: konceptualnye osnovy i tehnologicheskieresheniya. *Fizicheskaya kultura: Vospitanie, Obrazovanie, Trenirovka, 1*, 5-8.

Marr, D., Cermak, S., Cohn, E. S., & Henderson, A. (2003). Fine motor activities in head start and kindergarten classrooms. *American Journal of Occupational Therapy*, *57*(5), 550-557. https://doi.org/10.5014/ajot.57.5.550

McHale, K., & Cermak, S. (1992). Fine motor activities in elementary school: Preliminary findings and provisional implications for children with fine motor problems. *American Journal of Occupational Therapy*, *46*(10), 898-903. https://doi.org/10.5014/ajot.46.10.898

Mikas, D. (2009). Sportski programi i socijalna kompetencija djece predškolske dobi. *Paediatria Croatica*, *53*(1), 227-232.

Ohl, A. M., Graze, H., Weber, K., Kenny, S., Salvatore, C., & Wagreich, S. (2013). Effectiveness of a 10-week Tier-1 Response to Intervention program in improving fine motor and visual – motor skills in general education kindergarten students. *American Journal of Occupational Therapy*, *67*, 507-514. https://doi.org/10.5014/ajot.2013.008110

Perić, D., i Petrović, B. (2015). *Antropomotorika*. *Zakonitosti razvoja motoričkih sposobnosti čoveka.* Banja Luka, BiH: Fakultet sporta i fizičkog vaspitanja Univerziteta u Banjoj Luci.

Radomski, M., & Trombly Latham, C. (2008). *Occupational therapy for physical dysfunction* (6th ed.). Baltimore: Lippincott Williams & Wilkins.

Randjelović, N., Stanišić, I., Dragić, B., Piršl, D., & Savić, Z. (2018). The sequence of procedures in the development of fine motor coordination through physical activities and movement games in preschool children. *Facta Universitatis, Series: Physical Education and Sport, 16*(3), 611-620. https://doi.org/10.22190/FUPES180607055R

Smith, J. (2003). *Activities for Fine Motor Skills Development*. Huntington Beach: Teacher Created Materials, Inc.

Sortor, J. M., & Kulp, M. T. (2003). Are the results of the Beery-Buktenica Developmental Test of Visual-Motor Integration and its subscales related to achievement test scores? *Optometry and Vision Science*, *80*, 758-763. https://doi.org/10.1097/00006324-200311000-00013

Uzunović, S., Đorđević, N., Nikolić, D., Stošić, D., Marković, J., Petrović, V., & Kostić, L. (2017). The effects of kindergarten sports school on bilateral coordination of preschool age children. *Facta Universitatis, Series: Physical Education and Sport*, *15*(3), 481-491. https://doi.org/10.22190/FUPES1703481U

Van der Linde, B. W., Van Netten, J. J., Otten, E., Postema, K., Geuze, R. H., & Schoemaker, M. M. (2013). A systematic review of instruments for assessment of capacity in activities of daily living in children with developmental co-ordination disorder. *Child: care, health and development*, *41*(1), 23-34. https://doi.org/10.1111/cch.12124

Vigotski, L. S. (1996). *Problemi razvoja psihe, sabrana dela, III tom*. Beograd: Zavod za udžbenike i nastavna sredstva.

Savičević, D., Suzović, D., & Dragić, B. (2012). Transformation effect of the program model of physical activities on motor preschool children abilities. *Fizička kultura*, *66*(2), 119-128.

UTICAJ FONETSKE GIMNASTIKE NA RAZVOJ FINE MOTORIKE DECE PREDŠKOLSKOG UZRASTA

Razvoj fine motorike dece predškolskog uzrasta je izuzetno značajan, jer se ova sposobnost odnosi na koordinaciju malih mišićnih grupa ruku, posebno šake, koji se koriste u izvođenju zadataka poput pisanja, bojenja i sečenja. Cilj ovog istraživanja je da se utvrdi uticaj programa fonetske gimnastike na razvoj fine motorike dece predškolskog uzrasta (od 3 do 5 godina). Istraživanje je sprovedeno na uzorku od 30 ispitanika, dece koja pohađaju mlađu vaspitnu grupu. Eksperimentalni program činila je aktivnost fonetske gimnastike koja se sastojala iz tri dela: uvodnog, glavnog i završnog dela i koja se sprovodila 12 nedelja. Uvodni deo aktivnosti trajao je oko pet minuta i u okviru nje je sprovođen kompleks vežbi oblikovanja praćen govornim vežbicama, npr. oponašanje vetra koji duva (fijuuuu), pčelice koja leti (bzzzzzz) i drugim. Glavni deo aktivnosti trajao je 20 minuta i u ovom delu korišćene su razne pokretno-govorne igre i pesmice, kako bi se podstaklo dečije interesovanje. U svrhu ovog istraživanja primenjena su dva podtesta iz baterije testova BOT2 (Bruinkins–Oseretsky Test of Motor Proficiency, Second Edition): fina motorička integracija i manuelna spretnost. Dobijeni rezultati su potvrdili pozitivan uticaj programiranog vežbanja fonetske gimnastike na finu motoriku dece predškolskog uzrasta. Implementacija ovakve vrste tretmana u predškolske ustanove bila bi od velike koristi, posebno iz razloga što je relativno kratkog trajanja (oko 30 minuta dnevno) i ne zahteva posebnu opremu i prostor.

Ključne reči: *fonetska gimnastika, fina motorička integracija, manuelna spretnost, fizička aktivnost, predškolski uzrast.*

FACTA UNIVERSITATIS
Series: **Teaching, Learning and Teacher Education** Vol. 5, Nº2, 2021, pp. 123 - 135
https://doi.org/10.22190/FUTLTE211203010S

Original research paper

CREATIVE GAMES WITH DIFFERENT MATERIALS IN ARTS EDUCATION

UDC 73/76:: 371.3; 371.213.1::73/76 (497.11 Vranje); 371.3: 75:: 159.954)

Milena Stojanović Stošić[1], Jovana Stajić[2]

[1]Pedagogical Faculty in Vranje, University of Niš, Serbia,
[2]Independent researcher, Germany

Abstract. *The paper analyzes teachers' attitudes and beliefs concerning the use of different materials that can be used for artistic expression in arts education called non-standard art material (NAM)*[1]*. By manipulating and experimenting with these materials children participate in creative games that incite curiosity, initiate first original ideas and strengthen the team spirit. The research was conducted on a sample of 56 teachers who work in primary schools in the territory of the town of Vranje. The instrument used to collect the data was constructed for the purpose of this research. The results indicate the importance of the use of NAM in arts education – their application in the realization of a great number of units since the first grade of primary school develops creative and critical thinking among pupils, which further contributes to a more creative approach to teaching other subjects.*

Key words: *creativity, creative games, arts education, NAM.*

1. INTRODUCTION

The word 'creativity' originates from the Latin phrase *creation ex nihilo*, which signifies creation of something out of nothing. Historically, creativity has been observed and treated differently, ranging from the opinion that it is a gift from God, an external inspiration of muses, through the idea that creativity is tied with madness, to the belief that it is half-way between man's rational and irrational part.

Received December 03, 2021/Accepted December 24, 2021
Corresponding author: Milena Stošić Stojanović
Pedagogical Faculty in Vranje, University of Niš, Partizanska 14, 17500 Vranje, Serbia
Phone: +381 17 422 962 • E-mail: milenas77@gmail.com
[1]A vast array of semi-shaped, refuse material for recycling, natural material that has found its application in arts education.

The first research into the topic of creativity began over half a century ago, when its importance was emphasized by American psychologist Gilford (1950), stressing the difference between divergent and convergent thinking, where divergent thinking is directly connected with creativity. Gilford (according to Torrance, 1979) said that flexibility, fluency, originality and elaborativeness were the most important factors of creating thinking. Although research done in the meantime offered diverse results and insights, it is still believed that the phenomenon of creativity has not been researched enough (Đorđević, 2005; Maksić, 1998, 2006).

In modern psychology creativity is usually connected to the right hemisphere of the brain, which is in charge of emotions, intuition, imagination and synthesis (Slunjski, 2014). According to Amabil (1989, 1992), creative people do not have an inclination towards prejudice, but are inclined to take risks and consistently follow their ideas until they finish what they started.

On the basis of research conducted in primary schools in Serbia, Maksić and Pavlović (2014) list the following characteristics of creative people: curiosity, imagination, originality, individuality, expressiveness, resourcefulness and experience; in addition, talented students who have maladjusted behaviour are often creative children (Maksić, 2010).

According to Maksić (2006), the application of certain methods, the support of children's interests, talents and abilities, as well as the respect for individual characteristics of each child and the activation of analytic and synthetic thinking can lead to increased creativity in school conditions.

Artistic creativity can develop through games, research, by awakening imagination and curiosity (Karlavaris and Kraguljac, 1981), by observing great artistic work, through audio and tactile stimulation (Stojanović Stošić, 2016), by strengthening the child's self-confidence and by eliminating their fear of failure. In addition, by developing artistic creativity creative thinking in general is developed as well (Karlavaris and Kragujac, 1981).

The educational role of arts education is reflected in the fact that contact with art activates children's positive attitudes, it strengthens their motivation, inspires their curiosity and initiates new ideas, all of which contributes to the formation of a versatile personality. The other important function of arts education is preparation for practical work. As Ilić (2020) believes, arts education is different from other subjects in the character of its content, in creative processes, but also in the relationship between students and the teacher and the way results are assessed.

Karlavaris (1987) lists five phases when it comes to the processes in arts education while relying on creative processes:

- Process of learning
- Process of playing
- Process of creation
- Process of work
- Process of assessment (verification).

According to Filipović (2011) artistic areas and media are: drawing, painting, graphic art, sculpting, elements of applied arts, multimedia and foundations of aesthetic assessment. The term 'art techniques' implies the materials that are used and ways of using these materials (Jakubin, 1989).

Other art techniques used in primary school are: drawing, painting, sculpting, graphic art and applied art. However, arts education also provides numerous opportunities for using NAM. Creative games with NAM in arts education help the development of artistic

thinking by allowing pupils to explore the potential of materials, to seek original solutions, to enjoy their own artistic creation without fear of failure, because the game in its own nature does not leave room for failure.

2. Current Study

According to Bruner (1976), game is an activity that fulfils children's time when they are not involved in their existential needs. Game is a natural state for children and greatly affects their development in a positive sense but it also influences their innovative and creative behaviour.

Game in arts education is characterized by freedom and playfulness, curiosity and readiness to acquire new artistic visual experiences.

Šefer (2005) says that creative games include:

- Constructive games (creative manipulation of material)
- Multimedia games (games from different media with a similar content)
- Syncretic games (type of multimedia games)
- Imaginative games (dramatic, empathic and metaphorical games)
- Stylistic or paradigmatic games (creative individual approach to the interpretation of some styles in art, culture or periods).

Arts education in primary school offers numerous possibilities for using games in the realization of arts activities.

Our research intends to investigate teachers' attitudes and beliefs concerning the use and significance of NAM in arts education in the first, second, third and fourth grades of primary school, as well as to establish if working with NAM can motivate creative thinking among children, which further results in a versatile creative personality.

NAM can include: different grains, tin foil, newspapers, textile, refuse, bottle caps, different types of plastic and cardboard packaging, fruits of nature, styrofoam, buttons, pasta, unused CD's, sponges and many other materials.

The category of unshaped material comprises: paper, textile, wire, wool, string, styrofoam, foil, etc. Natural shapes and materials include: rocks and pebbles, shells, fruit, leaves, seeds, both dried and fresh petals of various plants, flowers, etc. While working with these materials children encounter different colours, textures, even smells thus enriching their sensory, motoric, emotional and psychological experiences: "when a child makes new forms from fruit and other natural materials, he/she learns about the functional organization of nature and its beauty. At the same time he/she shapes aesthetic feelings and is ennobled by the beauty of natural colours and shapes" (Filipović, 2011, p. 291).

Speaking about NAM that include semi-shaped and refuse, as well as natural and unshaped materials, in creative games in arts education it is possible to use different plastic and cardboard packaging, bottle caps, buttons, styrofoam, textile, newspapers and magazines, screws, etc. During these activities children learn that refuse materials can be used again for various purposes, they learn about the importance of recycling, they gain practical life experience and develop creativity. However, we should note that it is important to take into consideration the compatibility of materials that are combined in the sense of their technological and aesthetic features, so that the result is a harmonious aesthetic whole.

The diversity of characteristics of NAM can inspire children to make new and unusual solutions that are creative and original.

3. METHOD

The sample in this research includes 56 teachers from the territory of the town of Vranje. The survey was conducted in all six schools in the area: Vuk Stefanović Karadžić, Dositej Obradović, Jovan Jovanović Zmaj, Branko Radičević, Radoje Domanović and Svetozar Marković.

The methods applied in this research have been chosen in accordance with the nature of the problem, the research topic, research aim and research tasks, as well as in accordance with the stipulated hypotheses. Content analysis was used to analyze the answers from the surveys and in the theoretical part of the paper, while in the process of collecting, processing and interpreting the data we used the descriptive scientific method.

In order to investigate teachers' attitudes and beliefs regarding the importance of work with NAM in arts education the survey technique was used. The instrument used for data collection was designed by the author of the paper for the needs and purposes of this research and was administered anonymously to the informants.

The research was conducted in the second semester of the academic 2020/2021 in primary schools in the territory of the town of Vranje. There were no greater problems or difficulties in the organization and implementation of this research. The research and data collection were conducted by the authors of this paper. Informants showed a large degree of understanding for this research.

In terms of descriptive statistics, frequencies and percentages were used in this paper. Research results result which were the outcome of the analysis of collected data were presented in tables.

4. RESULTS AND DISCUSSION

In the process of analyzing the collected data similar statements that reflected the same concept were repeated quite often so in order to have a better insight into answers, the answers were grouped into categories. In addition, it was noted how many times in the survey each answer was repeated and all answers were organized in the same order as the questions in the instrument itself.

a) Which NAM is used by teachers in arts education?

In terms of NAM that teachers use in working with children during arts education classes, it is possible to list a large number of different materials, so the answers below show a vast range of materials, some being used very frequently, while others not so frequently.

Table 1 presents all the answers that teachers gave to the question above. Column (*f*) lists how many teachers gave the answer in question and in the next column there is percentage for each of the answers. Of all informants eleven listed general answers without listing specific NAM:

- 5 informants (8.9%) stipulated they used *All materials that can be found in nature*
- 6 informants (10.7%) stipulated they used *Materials that can be recycled.*

Table 1 Diversity of NAM in arts education

Response	f	(%)
Leaves	23	41.1
Seeds and grains	38	67.9
Fabric	24	42.8
Pebbles	16	28.6
Dried flowers	18	32.1
Different types of pasta	36	64.3
Sea shells	12	21.4
Cotton	4	7.1
Plastic packaging	47	83.9
Glass packaging	7	12.5
Wooden sticks	13	23.2
Matches	8	14.3
Soap	3	5.3
Buttons	33	58.9
Popcorn	23	41.1
Wool	19	33.9
Fruit	42	75.0
Vegetables	38	67.9
Sand	3	5.3
Styrofoam	9	16.1
Straws	15	26.8
Q-tips	7	12.5
Old newspapers	40	71.4
Old CD's	25	44.6
Paper bags	33	58.9
Plastic bags	34	60.7
Plastic cups	31	55.3
Caps from different packaging	37	66.1
Tins	12	21.4
Balloons	23	41.1
Parts of toys	7	12.5
Wax	5	8.9
Toilet paper and cardboard rolls	16	28.6
All materials that can be found in nature	5	8.9
Materials that can be recycled	6	10.7

All other individually listed NAM are presented in Table 2 according to the degree of frequency:

- Rarely (listed by 0-33% of informants)
- Typically (34-66% of informants)
- Frequently used NAM (67-100% of informants)

It is clear that the most frequently used materials that teachers listed were also the ones that were easiest to work with in the sense of easy handling and shaping, which also reduced the chances of children not being able to do the task to a minimum. What is especially interesting, despite being present to a lesser extent, is the use of soap and wax, which can also be described as sculpting materials in arts education.

Table 2 NAM in arts education classes according to the degree of frequency (from lower to higher)

NAM	Degree of frequency
▪ Soap ▪ Sand ▪ Cotton ▪ Wax ▪ Parts of toys ▪ Glass packaging ▪ Q-tips ▪ Matches ▪ Styrofoam ▪ Sea shells ▪ Tins ▪ Straws ▪ Toilet paper and cardboard rolls ▪ Pebbles ▪ Dried flowers	Rarely used
▪ Wool ▪ Fruit ▪ Balloons ▪ Popcorn ▪ Leaves ▪ Fabric ▪ Old CD's ▪ Plastic cups ▪ Buttons ▪ Paper bags ▪ Plastic bags ▪ Pasta	Typically used
▪ Caps from different packaging ▪ Seeds and grains ▪ Old newspapers ▪ Plastic packaging	Frequently used

Since all informants gave answers and listed 37 different NAM, we can conclude that the hypothesis that *teachers use many NAM in arts education* was confirmed.

b) What does the use of NAM develop in arts education classes?

All informants agree that working with NAM contributes to the development of creativity: 55 of them (98.2%) believe that it contributes to developing imagination and 52 teachers (92.8%) say that it contributes to the development of fine motor skills (Table 3). These are the answers of the majority of informants. Furthermore, secondary importance is ascribed to the more cheerful atmosphere in the classroom (41 informants, 73.2%), which simultaneously implies greater interest in arts education (15 informants, 26.8%). Only one informant listed *student's satisfaction in work* as the answer to this question, which is from a psychological point of view just as important as developing creativity, imagination and motor skills.

Table 3 Importance of application of NAM in arts education classes

Response	f	(%)
Development of creativity	56	100
Development of imagination	55	98.2
Development of fine motor skills	52	92.8
More cheerful atmosphere in the classroom	41	73.2
Acquisition of visual and artistic values	37	66.1
Development of creative abilities	30	53.6
Freedom of artistic expression	29	51.2
Strengthening the team spirit	20	35.1
Learning about the characteristics of material	17	30.3
Developing sense for unusual and original	15	26.8
Greater interest in classes	15	26.8
Development of practicality	13	23.2
Development of logical thinking	10	17.8
Better concentration	9	16.1
Development of sense for frugality and economy	4	7.14
Pupils' satisfaction in work	1	1.8

In accordance with the results, we believe that the hypothesis that *working with NAM in arts education contributes to greater motivation, development of creativity and better classroom atmosphere* has been confirmed.

c) How do children react and how often do they use NAM in arts education?

Table 4 Children's reactions to working with NAM and frequency of use

Response	f	(%)
Children love it and are very active.	37	66.1
Children have wonderful reactions.	24	42.8
They are always happy when I announce working with NAM.	21	37.5
Pupils are interested because they have fun while working with NAM.	19	33.9
Pupils are happy and excited.	12	21.4
They are happy and inspired because they can experiment.	9	16.1
Pupils are free and creative.	7	12.5
Children have positive reactions because the material inspires their creativity.	4	7.1
Pupils are impatient to have a class when we work with NAM.	4	7.1
Children are additionally motivated by the characteristics of materials.	2	3.6
Children like working with these materials.	39	69.6
They happily accept these materials.	27	48.2
They love using NAM.	11	19.6
They gladly accept different materials and ideas for working with them.	5	8.9
They are sometimes fearful in working with NAM.	1	1.8

In Table 4 we can see that the majority of teachers (37 of them, 66.1%) think that children love working with NAM and are very active in that process, that they have great reactions (24 informants, 42.8%), that they are happy and inspired because they can experiment (9 informants, 16.1%). Two informants said that *the qualities of materials themselves motivate children additionally* and one informant said that *children are fearful in working with NAM* because they are afraid of failure, which can be interpreted as a

consequence of the teacher's failure to comply the chosen materials with the children' age or the unit they are teaching.

d) At which age is it possible (and necessary) to introduce NAM in arts education and what are the reasons behind that?

Table 5 Children's age and use of NAM in arts education

Response	f	(%)
Since the first grade	49	87.5
Since the second grade	4	7.1
Since the third grade	3	5.3

In Table 5 we can see that 49 informants (87.5%) said that it is possible and necessary to introduce NAM since the first grade of primary school, that 4 informants (7.1%) think that it is advisable to introduce NAM in the second grade, while 3 informants (5.3%) think that NAM should be introduced in the third grade.

Table 6 Grade and NAM

Response	f	(%)
Since the first grade		
Inspire the development of creativity and imagination.	35	62.5
Children acquire new experiences.	18	32.1
They develop fine motor skills.	12	21.4
They develop voluntary activities.	9	16.1
Working with NAM greatly resembles a game.	7	12.5
Children develop brain functions by touching and feeling the material.	5	8.9
They are learning how to express themselves in an original way.	2	3.6
They develop awareness on how they should think in a creative and original way.	1	1.8
Since the second grade		
They are more independent in work.	2	3.6
Every innovation is interesting for them.	1	1.8
They are learning how to use materials beyond their primary use.	1	1.8
Since the third grade		
They have learnt how to work with all necessary "tools" without hurting themselves.	3	5.3

Table 6 lists all the answers that teachers gave as reasons for using NAM in arts education. They are grouped according to the grade when they should be introduced. The majority of informants who said that NAM should be introduced in the first grade think that the main reasons for that are: motivation of creativity and imagination, acquiring new experiences and developing fine motor skills. As reasons to introduce NAM in the second grade the informants listed: children's independence, interest in classroom innovation and a need to find a new purpose for the object or material that differs from the primary one. Three informants said that NAM should be introduced in the third grade with an explanation that it is for the children's safety, i.e. that at that age they are able and ready to handle all necessary additional materials to work with NAM in an adequate way.

In accordance with these results we can conclude that the hypothesis that *according to teachers NAM should be introduced to arts education in the first grade* has been confirmed.

e) Which units are taught through the use of NAM?

Since all teachers work according to the same Curriculum, there were answers that were repeated a few times, so in Table 7 they are given by frequency.

Table 7 Units taught with the use of NAM

Response	f	(%)
Here comes the New Year	28	50
We are celebrating Easter	23	41.1
Spring. Summer. Autumn. Winter	20	35.7
My unusual journey	19	33.9
My seal	16	28.5
My initials	14	25
We are making a Snowman	13	23.2
We are making greeting cards (for New Year, Easter, Mother's Day, birthdays...)	12	21.4
We are making a robot	12	21.4
My imagination has no limits	11	19.6
Turn something old into new	10	17.8
Cardboard house	8	14.3
Young creators	8	14.3
Wondrous world	7	12.5
I'm making my own doll	6	10.7
Unusual objects	6	10.7
Heroes from our favourite books	5	8.9
Making theatre masks and costumes	4	7.1
A journey to space	4	7.1
Collage from natural materials	4	7.1
A chain from natural materials	3	5.3
My favourite animal	3	5.3
We are making masks	2	3.6
A rock souvenir	1	1.8
A photo as a gift for mom	1	1.8
A photo frame	1	1.8
I am connecting different materials	1	1.8
A birthday gift	1	1.8
There are many units. the curriculum is great for working in this manner	1	1.8

Table 7 presents all units taught with the use of NAM. Only one informant gave a general answer, that *there are many units and that the curriculum is great for working in this manner*. Other informants listed four or more units on average. It is noticeable that the most frequently mentioned units are those that relate to various holidays (New Year, Easter) and seasons of the year, but there are other interesting answers also. Since the total number of units listed in informants' answers was 243, we classified them into 28 groups. Since there are 36 classes in the first grade and 72 in the second, third and fourth grades, we can conclude that the hypothesis that *the majority of units can be taught with the use of NAM* has been confirmed.

f) What are the disadvantages of NAM?

In Table 8 we can see that 30 informants (53.6%) list lack of time and the duration of class as the greatest disadvantages when working with NAM. This is followed by the lack of space or its poor organization (26.8%). Only two teachers stated that there are no disadvantages in working with NAM. One informant said that *the greatest disadvantage in working with NAM is that it is not adjusted to children's age*. In accordance with the results presented here, the hypothesis that *the most frequent disadvantage in working with NAM is time limitation of a class* has been confirmed.

Table 8 Disadvantages of working with NAM in arts education classes

Response	f	(%)
Time limitation/duration of class	30	53.6
Lack of space or poor organization of space	15	26.8
Not all children bring the required material/providing the required material	10	17.9
Financial situation of children, their parents, the school	7	12.5
Teachers' lack of experience	5	8.9
Teachers' prejudice	4	7.1
Pupils' insufficient motivation	4	7.1
Children's underdeveloped motor skills	3	5.3
Children are not careful and can hurt themselves	2	3.6
No disadvantages	2	3.6
NAM not adjusted to children's age	1	1.8

g) Do teachers think that these classes require a more extensive and more complex preparation?

In Table 9 we can see that 45 informants agreed that a more complex and extensive preparation is necessary to organize a class with NAM. Seven informants (12.5%) said that preparation is not necessary. Only one informant believes that *t*he *teacher's will and persistence are all that is needed*. In accordance with these results, the hypothesis that *the organization of these classes requires a more complex and extensive preparation* has been confirmed.

Table 9 More complex preparation for teaching classes that imply the usage of NAM

Response	f	(%)
Yes	45	80.3
No	7	12.5
I think that the teacher's will and persistence are all that is needed.	1	1.8
It all depends on the pupils. If they are creative, it is easy to motivate them. Those who are less creative always become engaged in group work and are very active and curious during the entire class.	1	1.8
A more complex preparation is necessary for a well-organized class.	1	1.8
Teachers do not need a special preparation, but more active class participation is necessary.	1	1.8

h) Do creative games in arts education contribute to seeing other subjects in a more creative way?

Since 98.2% of informants gave a positive answer to this question, the hypothesis that *creative games in arts education contribute to seeing other subjects in a more creative way* has been confirmed. Only one informant believes that creative expression in arts education does not have a particular effect on the more creative approach to teaching other subjects.

Table 10 Creative games in arts education and their contribution to seeing other subjects in a more creative way

Response	f	(%)
Yes	55	98.2
Not necessarily	1	1.8

5. CONCLUSION

All children possess creative potential that must be activated and then inspired and developed. The society can make progress only with creative people, so we can conclude that the future of humanity is uncertain without creative children (Cvetković-Laj and Pečjak, 2004).

On the basis of the analysis of research results we can conclude the following:

a) in addition to standard material, in arts education classes it is desirable to use NAM, which have various features, textures, shapes, sizes and offer a plethora of possibilities for work and design;
b) the use of NAM in arts education classes can inspire creativity, imagination and it can influence the development of fine motor skills; it inspires team spirit, the atmosphere in the classroom is more cheerful and pupils' interest in arts education is greater; classes organized in this manner contribute to the development of economicity, practicality as well as logical thinking; pupils gain confidence and express satisfaction while working with them;
c) teachers are aware of the fact that working with NAM motivates children's imagination and creativity and they think that freedom and lack of restraints in working with NAM are important factors that contribute to the development of creative potentials of children; while working with NAM children are motivated by the materials themselves, which makes them want to experiment and innovate; by developing creative thinking children also develop higher mental structures and processes, as well as critical thinking;
d) children's reaction to working with NAM is a combination of thrill, joy, interest, fun, experimenting, inspiration and pleasure, which are some of the reasons why teachers choose to work with NAM in arts education classes;
e) most teachers are aware of the importance of developing pupils' creative potentials, and since working with NAM is one of the ways to do it, teachers believe it is possible and desirable to use these materials since the first grade of primary school;
f) the current curriculum allows for a large number of units in the first, second, third and fourth grades of primary school to be taught with NAM; teachers prioritize units related to New Year and Easter holidays;

g) in teachers' opinion the greatest disadvantage in working with NAM is the time limitation of a class, poor spatial organization, material supply, pupils' bad financial situation, children's lack of interest and teachers' inexperience and prejudice;
h) according to teachers, working with NAM contributes to inspiring and developing artistic creativity, but it also contributes to a more creative approach to teaching other subjects.

A general conclusion is that it is very important for teachers to use NAM in arts education classes, because working with these materials greatly contributes to the development of children. A vast range of NAM can also facilitate the teaching process, because it is simple to find NAM that are compatible with the children's age and preferences as well as the unit being taught. In addition, the diversity of material and their qualities can inspire children to come up with unusual and original solutions. While designing creative games, teachers need to be ingenious, dedicated to choosing the adequate materials, they need to know the technological characteristics of materials used in classes and to plan each class so that it is dynamic and inspiring for children. Another benefit of creative games as group activities that include NAM is that children communicate amongst themselves and exchange ideas, so motivation is increased even among less interested pupils.

All in all, in arts education classes there are many ways to inspire and develop the creativity both among children and among teachers. Working with NAM is only one of them.

REFERENCES

Amabile, T. (1989). *Growing up creative*. Amherst: The Creative Education Foundation.

Amabile, T. (1992). *Growing up creative: nurturing a lifetime of creativity*. Buffalo: Creative Education Foundation Press.

Brunner, J.S. (1976). Nature and uses of immaturity. In J.S. Bruner, A. Jolly, & K. Sylva (Eds.). *Play – its role in development and evolution* (pp. 28-64). London: Harell, Watson & Viney.

Guilford, J. P. (1950). Creativity. *American Psychologist,* 5(9), 444-454.

Đorđević, B. (2005). *Darovitost i kreativnost dece i mladih*. Vršac: Viša škola za obrazovanje vaspitača.

Ilić, V. (2010). Individualizacija u nastavi likovne kulture primenom učewa na osnovu slobodnog izbora. *Obrazovna tehnologija, 1*, 25-41.

Jakubin, M. (1989). *Osnove likovnog jezika i likovne tehnike*. Zagreb: Institut za pedagogijska istraživanja Filozofskog fakulteta Sveučilišta u Zagrebu.

Karlavaris, B. (1987). *Metodika nastave likovnog vaspitanja* (2. izd.). Beograd: Zavod za udžbenike i nastavna sredstva.

Karlavaris, B., Kraguljac, M. (1981). *Razvijanje kratívnosti putem likovnog vaspitanja u osnovnoj školi.* Beograd: Institut za pedagoška istraživanja, Prosveta.

Maksić, S. (1998). *Darovito dete u školi*. Beograd: Institut za pedagoška istraživanja.

Maksić, S. (2006). *Podsticanje kreativnosti u školi*. Beograd: Institut za pedagoška istraživanja.

Maksić, S. (2010). Student creativity and behavioural problems. In Železnikov Seničar, M. (Ed.), *Social and Emotional Needs of Gifted and Talented, II International Scientific Conference* (pp. 80-89). Ljubljana (Slovenija): MIB.

Maksić, S., Pavlović, J. (2014). Implicitne teorije kreativnosti nastavnika osnovne škole: studija slučaja. *Psihologija, 47*(4), 465-483.

Slunjski, E. (2014). *Kako djetetu pomoći da (p)ostane kreativno i da se izražava jezikom umjetnosti: priručnik za roditelje, odgajatelje i učitelje*. Zagreb: Element.

Stojanović Stošić, M. (2016). *Razvijanje kreativnih sposobnosti dece kroz nastavu likovne kulture primenom taktilnih, vizuelnih i auditivnih podsticaja* [Doktorska disertacija]. Vranje: Pedagoški fakultet u Vranju.

Torrance, E. P. (1979). *The Search for Satori and Creativity*. New York: Creative Education Foundation.

Filipović, S. (2011). *Metodika likovnog obrazovanja i vaspitanja*. Beograd: Univerzitet umetnosti u Beogradu, Klett.

Cvetković-Laj, J., Pečjak, V. (2004). *Možeš i drukčije – priručnik s vježbama za poticanje kreativnog mišljenja.* Zagreb: Alineja.

Šefer, J. (2005). *Kreativne aktivnosti u tematskoj nastavi.* Beograd: Institut za pedagoška istraživanja.

KREATIVNE IGRE RAZLIČITIM MATERIJALIMA U NASTAVI LIKOVNE KULTURE

U radu se razmatraju stavovi i mišljenja učitelja razredne nastave o upotrebi različitih materijala koji se mogu koristiti za likovno oblikovanje u nastavi likovne kulture, nazvanih nestandardni likovni materijali (NLM). Manipulisanjem i eksperimentisanjem ovim materijalima deca učestvuju u kreativnim igrama koje pobuđuju znatiželju, iniciraju pojavu novih, originalnih ideja i jačaju timski duh. Istraživanje je sprovedeno na uzorku od 56 učitelja osnovnih škola na teritoriji grada Vranja. Instrument koji je korišćen za anketiranje konstruisan je za potrebe ovog istraživanja. Rezultati istraživanje upućuju na značaj i važnost upotrebe NLM u nastavi likovne kulture – njihovom primenom u realizaciji velikog broja nastavnih jedinica već od prvog razreda razvija se stvaralačko i kritičko mišljenje kod učenika, što dalje doprinosi kreativnijem pristupu nastavi ostalih predmeta.

Ključne reči: *kreativnost, kreativne igre, nastava likovne kulture, NLM*

FACTA UNIVERSITATIS
Series: **Teaching, Learning and Teacher Education** Vol. 5, Nº2, 2021, pp. 137 - 152
https://doi.org/10.22190/FUTLTE211212011M

Original research paper

SCHOOL AS AN EDUCATIONAL ENVIRONMENT FROM THE PERSPECTIVE OF SENIOR PRIMARY SCHOOL STUDENTS

UDC 371.212:371.4 (497.11); 37.018.2; 37.013/.014

Tatjana Milosavljević Đukić[1], Dragana Bogavac[2], Andrijana Mikić[3*]

[1]Pedagogical Faculty in Vranje, University of Niš, Serbia
[2]Faculty of Education, University of Belgrade, Serbia
[3]Faculty of Philosophy, University of Belgrade, Serbia

Abstract. *Starting from the fact that primary school is a very important factor for the education of young people, we were interested in how senior primary school students see school as an educational environment, which is the goal of our research. The research was conducted on a sample of 309 eighth grade primary school students in ten cities in the Republic of Serbia. In this research, a descriptive method was used, and the Questionnaire for assessing the educational function of school from the perspective of senior primary school students was designed and used as the instrument. Statistical procedures such as frequencies and percentages, mean with corresponding standard deviation were used. Differences were tested with the Student's t-test. The obtained research results show a more complete picture of the educational role of school from the perspective of senior primary school students in the Republic of Serbia. The research findings can be used for a deeper observation of this very important pedagogical problem, in order to work on greater engagement, involvement in creating and maintaining a more positive attitude of students towards the school environment.*

Key words: *educational role of school, school as an educational environment, aspects of educational activities, student.*

1. INTRODUCTION

As an educational environment, school is seen as a multidimensional phenomenon that encompasses various aspects of school organization and school life. The perception of the school environment depends on how students experience the school environment, which is determined by various factors of socio-emotional relations and organizational

Received December 12, 2021/Accepted December 26, 2021
Corresponding author: Tatjana Milosavljević Đukić
Pedagogical Faculty in Vranje, University of Niš, Partizanska 14, 17 500 Vranje, Serbia
Phone: +381 17 422 962 • E-mail: tatjanamdj@pfvr.ni.ac.rs
[*]PhD student at the Department of Psychology

structure. The branched structure of school activities provides a higher level of satisfaction with school among students and the achievement of favorable relationships with peers and teachers (Marsh & Kleitman, 2002).

Starting from this standpoint, we were interested in the students' view of school as an educational environment and their opinion on various aspects of the educational activities in school. The opinions of students about school are formed during their stay at school, and how these opinions develop depends on a number of factors (Zullig, Koopman, Patton, & Ubbes, 2010; Wang & Degol, 2016). Some authors conceptualize most of these factors in terms of school climate, which includes various aspects of educational activities such as material environment, quality and quantity of interaction in school, academic success, support, etc. (Marshall, 2004).

After studying the literature that analyzes school as an educational environment, it can be said that this segment of educational activities is insufficiently researched because it requires empirical evidence in the form of students' perceptions of school climate, security and organizational structure. However, the perception of school as an educational environment is a subjective perception of the environment and personal characteristics that affect the individual outcomes and behavior of students.

2. BACKGROUND OF RESEARCH

School climate is often described as “the quality and character of school life”, including the social and physical aspects of school, which can positively promote student behavior, achievement and social and emotional development (Seligman et al., 2009; Fredricks & Eccles, 2006; Borkar, 2016). School climate is based on the patterns of experiences of participants in the school environment and reflects norms, goals, values, interpersonal relationships, teaching and learning practices and organizational structure (Cohen, McCabe, Michelli, & Pickeral, 2009).

The school climate can be perceived as motivation for individual development and ensure constructive behavior and involvement of individuals in school activities or as a demotivating context that causes passivity and resistance (Holtappels & Meier, 2000; Pužić, Baranović, & Doolan, 2011).

An empirically based finding presented in the research by Kutsiuruba (Kutsiuruba et al., 2015) speaks of integrative categories which are connected with the study of school climate. As a result of a detailed review of published empirical evidence, the abovementioned author says that there are three main categories that are in the same axis of categorization of the school environment called "dimensions of the school climate": (a) physical, refers to school facilities, environmental quality and their effect on student academic performance and student behavior; (b) academic, where it is mentioned that personal skills and traits of teachers serve as factors for the development of their students; and (c) social, this specific category suggests that the quality of relationships between members of the school community is fundamental in the configuration of the school climate (Kutsiuruba et al., 2015). In a study of student satisfaction with the school environment, a group of authors (César Tapia-Fonllem et al., 2020) integrated these three dimensions into the variable “school environment”. Its impact on student well-being was also examined in the primary school sample of students, and it was found that the variables school environment and student well-being are positively correlated (César Tapia-Fonllem et al., 2020).

Studies on students' subjective satisfaction with the school environment shows that it is associated with academic success and positive functioning of the school (Bird & Markle, 2012). Thapa's integrative overview of school climate (Thapa et al., 2013) focuses on five dimensions of the school climate: (a) security (e.g. rules and standards, physical security, social and emotional security), (b) relationships (e.g. respect for diversity, connection/engagement in school, social support, leadership and race/ethnicity of students and their perception of school climate), (c) teaching and learning (e.g. social, emotional, ethical and civic learning; service learning; support for academic learning, support for professional relationships, perceptions of teachers and students about the school climate), (e) institutional environment (e.g. physical environment, resources, supplies) and (e) school improvement process (Thapa et al., 2013).

Dymara (2009) states that, as an educational institution, school is characterized by: purposefulness – the existence of adopted goals to be achieved; complexity – consists of elements that can be identified and interconnected with the targeted activities; and differentiating goals and structure in relation to the environment. Purpose is also relevant for the specific needs of each student on the way to the realization of educational goals (Milosavljević Djukić, Bogavac, & Radovanović, 2020, according to: Perkowska-Klejman & Górka-Strzałkowska, 2016, p. 14).

When it comes to students' subjective experience of the school environment, the results of research by Tian et al. (2015) indicate that social support (i.e., teacher support and classroom support) is statistically significantly related to students' subjective well-being at school. School is one of the most important aspects of adolescents' life and their perception of school directly affects their overall subjective well-being and sense of satisfaction, better academic performance, better school behavior, more adaptable attitudes and beliefs about school (e.g., educational self-efficacy) and improved mental and physical health (Tian, Tian, & Huebner, 2016). The factor structure of the research results of students' perception of school environment by a group of authors (Bear et al., 2011) indicate five specific factors within a general ("school climate"): teacher-student relations, student-student relations, established rules, satisfaction with school and school safety.

The research findings support that a motivating school environment is very important for students, and it is characterized by meeting main educational needs that eventually result in the positive subjective satisfaction of students with school. It is important that teachers understand how students experience school, because it will help improve students' learning and achievement (Hanaa, Atiat, & Heba, 2018).

Students' subjective experience of school as an educational environment is more than an individual experience: it is a group phenomenon that is greater than the experience of any person; norms, values and expectations that support students to feel socially, emotionally and physically safe (Cohen et al., 2009). There is a strong connection between the school environment and student well-being. Moreover, it was found that the quality of the school climate perceived by students also affects engagement in school activities (Lombardi et al., 2019).

3. METHOD

The aim of the research was to investigate how senior primary school students see school as an educational environment. In accordance with the goal, the following research tasks were set:

1. Identify the opinions of eighth grade students on various aspects of the educational activities in primary school;
2. Identify the opinions of eighth grade students on aspects that affect the education and personality development of young people;
3. Investigate eighth grade students' satisfaction with certain aspects of being at school, as well as the relationship between teachers and students;
4. Identify the opinions of eighth grade students on the problems they face in primary school;
5. Investigate the differences in the opinion of eighth grade students regarding the education-related activities, and with regard to independent variables (gender, position within the class community, participation in extracurricular activities, membership in the Student Parliament).

The main research hypothesis was set, which reads as follows: it is assumed that the eighth-grade primary school students recognized the school as an educational environment.

The research was conducted in a sample of 309 eighth grade primary school students. The sample included ten schools from ten cities in the Republic of Serbia. The sample included 169 girls and 140 boys.

The descriptive method was used in this research. For the purposes of the research, a questionnaire was constructed to assess the educational function of school from the perspective of senior primary school students. The questionnaire consists of four subscales that have shown excellent reliability (Cronbach's Alpha = 0,846 – Cronbach's Alpha = 0,915). The first subscale: Opinions of students on various aspects of educational activities of primary school operationalized through categorical questions: student participation in extracurricular activities, student participation in the class activities, student participation in the student parliament, reasons for students' participation in certain extracurricular activities organized in primary school, students' opinions on the most common activities of the class teacher in the class meetings, students' opinions on the student organization Student parliament. On the Likert's five-point scale (ranging from 1 = strongly disagree to 5 = strongly agree), the level of agreement with the items related to: students' opinion on the class meeting and opinions on the content of compulsory elective subjects in primary school was examined. In the second subscale, the students assessed the extent to which certain aspects of school activities affect the education and development of young people's personality. In the second subscale, the participants rated the importance of aspects influencing the education and development of young people's personality on an eight-point Likert-type scale (ranging from 1 = strongly disagree to 8 = strongly agree), while a five-point Likert-type scale was used (ranging from 1 = strongly disagree) to 5 = strongly agree) to assess peers' opinions and how much the school pays attention to activities important for the education of students. In the third subscale, students expressed the degree of satisfaction with certain aspects of school, as well as the teacher-student relationship, using the Likert's five-point scale (ranging from 1 = strongly disagree to 5 = strongly agree). The problems that students encounter in primary school are included with the fourth subscale. It consists of categorical questions that examine the opinions of students about the frequency of certain problems in primary school, who they turn

to when those problems occur and what they are satisfied with in school. The fourth subscale related to the assessment of students on the Likert five-point scale (ranging from 1 = strongly disagree to 5 = strongly agree) on the school's success in counteracting negative phenomena in student behavior.

The results were presented using frequencies and percentages for categorical variables, and means and standard deviations for continuous variables. Differences were tested with the Student's t-test. The probability level of $p \leq 0.05$ was considered statistically significant. Statistical analysis was carried out using the IBM SPSS Statistics for Windows, ver. 24.0 (IBM Corp., Armonk, NY, USA).

4. Results of the Research and Discussion

The first research task was to examine the opinions of eighth grade students on various aspects of the educational activities in primary school including the following: student participation in extracurricular activities; what are the reasons for students' choice for certain extracurricular activities that are organized in primary school; what is the number of students with responsibilities within the class community; students' opinion about the most common activities by the class teacher in class meetings, as well as the opinions of students about the class meetings; as well as, what is the number of students who are members of the Student Parliament and students' opinions about the student organization Student Parliament; as well as the opinions of eighth grade students on the contents of compulsory elective subjects in primary school.

After the survey, out of the total number of respondents (N = 309), 200 eighth grade students (or 64.7%) were not involved in any extracurricular activity, while the other 109 (35.3%) students answered that they took part in some extracurricular activities. Statistical analysis of the obtained data regarding the reasons why eighth grade students opt for certain extracurricular activities available in primary school shows the following: the largest number of students 95 (31.3%) believe that extracurricular activities should be chosen by students themselves, 49 (16.1%) students believe that activities should be diverse and meet the interests of students, 43 (14.1%) students believe that extracurricular activities should be oriented towards research and discovering something new, 38 (12.5%) students are of the opinion that these activities should include different types of cultural, musical, sports and similar activities, the same number of students 38 (12.5%) believe that these activities should include public appearances, and 37 (12.2%) students believe that they should be organized at the suggestion of students and together with them. Only four students (1.3%) believe that such activities should help students acquire the skills needed to socialize with peers.

The number of students engaged within the organizational activities of the class community was noteworthy. A total of 218 students (72.9%) stated that they were not involved in the class community at all, while 81 (27.1%) students answered that they have certain responsibilities in the class community. Eighth grade students are of the opinion that in the class meeting they usually discuss the obligations and duties of students in school (4.15 ± 0.99), disciplinary measures (4.00 ± 1.09), rules of conduct in school (3.82 ± 1.14), and the least about the Code of Children's Rights (3.24 ± 1.36) and praising and rewarding students (3.15 ± 1.23). The opinions of eighth grade students on the most common activities of the class teacher in the class meeting are as follows: 132 (42.7%) students answered that in class meeting the class teacher solves peer problems in

the class, and 112 (36.2%) students believe that in these class meetings, the class teacher sorts out student absenteeism and completes other administrative tasks, but they did not specify what they were exactly. A smaller percentage of students (37 (12.4%)) answered that the class teacher has conversations with only certain students, and 17 (5.7%) students state that the class teacher covers the topic he/she prepared in advance.

A total of 46 (14.9%) students stated they were members of the student organization Student Parliament, and 263 (85.1%) students answered that they were not members of this student organization. Statistics related to the opinions of eighth grade students on the student organization Student Parliament show that 79 (26.2%) students believe that the Student Parliament enables students' involvement in the school decision-making process, 69 (22.3%) students believe that students develop freedom of opinion, 51 students (16.5%) believe that Student Parliament actively involves students in school activities, 43 (13.9%) believe that it allows students to develop independence and responsibility, 42 (13.6%) students believe that the Student Parliament develops students' feeling that they have rights and obligations. Lower scores were observed for these items: that students present themselves through various activities, which is stated by 7 (2.3%) students, and only two (0.6%) students believe that the Student Parliament organizes activities and actions that enable peer education of students.

According to students, the compulsory elective subjects Civic Education and Religious Education allow the students to learn how to communicate with other people properly (4.00 ± 1.38), to love and respect themselves and others (3.89 ± 1.41), and are there to educate students (3.83 ± 1.25), moreover, that these subjects allow students to improve their personality in the moral and spiritual sense (3.60 ± 1.38), and students at least acquire skills to peacefully solve conflicts and issues (3.53 ± 1.34). Some students also believe that they do not benefit from attending a compulsory elective course (2.80±1.59). These answers given by eighth grade students are shown in Table 1.

The second research task was to examine the opinions of eighth grade primary school students on aspects that affect the education and development of young people's personalities, peer values and how much the school pays attention to activities important for educating students.

The opinions of eighth grade students on the aspects that affect the education and development of young people's personality is as follows: the education and development of young people's personality is most influenced by family (7.56 ± 1.07), followed by class teacher (5.88 ± 1.56), school (5.77 ± 1.78) and teachers (5.55 ± 1.89). There are also peers (5.19 ± 2.01), as well as social media (Internet) (4.49 ± 2.59), social groups (3.62 ± 2.21), while the media have the least influence (3.16 ± 2.14).

The statistical analysis of the obtained data related to the assessment of students on the values of the generation to which they belong is the following: in their peers, students value the most socializing and helping others (3.69 ± 1.30), followed by attitude towards the elderly, teachers (3.62 ± 1.31), then the respect for the rights of others and religious tolerance (3.57 ± 1.22), development of positive moral qualities (3.55 ± 1.08), engagement in the class community (3.47 ± 1.33), attitude towards learning and school obligations (3.42 ± 0.95) and creativity and imagination (3.33 ± 1.08). The lowest score within the stated values is related to observing, experiencing and expressing aesthetic values (3.28 ± 1.03) and respecting the rules of conduct (discipline) (3.28 ± 1.39).

Table 1 Opinions of eighth grade students on various aspects of the educational activities in primary school

Participation of students in extracurricular activities	n (%)
yes	109 (35.3%)
no	200 (64.7%)
Reasons why students choose certain extracurricular activities organized in primary school	n (%)
that students themselves choose extracurricular activities	95 (31.3%)
that these are diverse and meet the interests of students	49 (16.1%)
that they are focused on research and discovering something new	43 (14.1%)
that they include different types of cultural, musical, sports and similar activities	38 (12.5%)
they enable students to make public appearances	38 (12.5%)
that they are organized at the suggestion of students and together with them	37 (12.2%)
that they are there help students acquire the skills needed to socialize with peers	4 (1.3%)
Percentage of students with responsibilities within the class, n (%)	
yes	81 (26.2%)
no	218 (70.6%)
Opinions of students on the most common activities by the class teacher in the class meetings	n (%)
solves peer problems in the department	132 (44.3%)
the class teacher sorts out absenteeism with students and performs other administrative tasks	112 (37.6%)
the class teacher conducts individual conversations with individual students	37 (12.4%)
the class teacher realizes the topic he prepared in advance	17 (5.7%)
Students' opinion about the class meeting	M ± SD (Min – Max)
about the obligations and duties of students in school	4.15 ± 0.99 (1 – 5)
about disciplinary measures	4.00 ± 1.09 (1 – 5)
on the rules of conduct prescribed by the House Rules of the school	3.82 ± 1.14 (1 – 5)
on the Code of Children's Rights	3.24 ± 1.36 (1 – 5)
on rewarding students	3.15 ± 1.23 (1 – 5)
Number of students who are members of the Student Parliament	n (%)
yes	46 (14.9%)
no	263 (85.1%)
Students' opinions on the student organization Student Parliament	n (%)
it involves students in the school decision-making process	79 (26.6%)
it develops students' freedom of opinion	69 (23.2%)
actively involves students in school activities	51 (17.2%)
it develops students' independence and responsibility	43 (14.5%)
it nurtures and encourages students' feeling that they have rights and obligations in school	42 (14.1%)
that students present themselves through various activities	7 (2.4%)
it organizes activities and actions that enable peer education of students.	2 (0.7%)
Opinions of eighth grade students on the compulsory elective subjects in primary school	M ± SD (Min – Max)
they allow the students to learn how to communicate with other people properly	4.00 ± 1.38 (1 – 5)
to love and respect themselves and others	3.89 ± 1.41 (1 – 5)
they are there to educate students	3.83 ± 1.25 (1 – 5)
these subjects allow students to improve their personality in the moral and spiritual sense	3.60 ± 1.38 (1 – 5)
allow students to acquire skills to peacefully solve conflicts and issues	3.53 ± 1.34 (1 – 5)
no benefit from attending a compulsory elective course	2.80 ± 1.59 (1 – 5)

Abbreviations: M ± SD (Min – Max) = Mean ± Std. Deviation (Minimum – Maximum).

The research also includes the opinions of eighth grade students, in regards to how much the school pays attention to the activities important for the education of students. Students estimate that the school pays the most attention to sports activities (4.26 ± 1.08). It is followed by learning about behavior (3.96 ± 1.01), then, acquiring the necessary knowledge and skills for further education (3.95 ± 0.91). Lower scores are occupied by the following items: developing the skills to socialize with peers (3.76 ± 1.12), respecting the elderly (3.76 ± 1.22), developing environmental culture (3.74 ± 1.04), fighting addiction 3.58 ± 1.51), developing creativity and imagination (3.56 ± 1.16). Students believe that the school pays the least attention to learning about beauty and aesthetic values (3.28 ± 1.17). The results of the research are shown in Table 2.

Table 2 Eighth grade students' opinions of aspects that affect the education and development of young people's personalities

Students' opinions of aspects that affect the education and development of young people's personalities	M±SD (Min – Max)
family	7.56 ± 1.07 (1 -8)
class teacher	5.88 ± 1.56 (1 -8)
school	5.77 ± 1.78 (1 -8)
teachers	5.55 ± 1.89 (1 -8)
peers	5.19 ± 2.01 (1 -8)
social media (internet)	4.49 ± 2.59 (1 -8)
social groups (sports clubs...)	3.62 ± 2.21 (1 -8)
media (TV, print press...)	3.16 ± 2.14 (1 -8)
Student opinion about peer values	
socializing, helping others	3.69 ± 1.30 (1 – 5)
attitude towards elders, teachers	3.62 ± 1.31 (1 – 5)
respect for the rights of others, religious tolerance	3.57 ± 1.22 (1 – 5)
development of positive moral values	3.55 ± 1.08 (1 – 5)
being active within the class community	3.47 ± 1.33 (1 – 5)
attitude towards learning and school obligations	3.42 ± 0.95 (1 – 5)
creativity	3.33 ± 1.08 (1 – 5)
observing, experiencing and expressing aesthetic values	3.28 ± 1.03 (1 – 5)
discipline, respect for the rules of conduct	3.28 ± 1.39 (1 – 5)
Students' opinion of how much the school pays attention to activities important for educating students	
sports activity	4.26 ± 1.08 (1 – 5)
learning about proper behavior	3.96 ± 1.01 (1 – 5)
acquiring the necessary knowledge and skills for further education	3.95 ± 0.91 (1 – 5)
developing the skills to socialize with peers	3.76 ± 1.12 (1 – 5)
developing respect for the elderly	3.76 ± 1.22 (1 – 5)
developing an environmental culture for nature conservation	3.74 ± 1.04 (1 – 5)
fight against addiction: smoking, alcoholism, drug addiction, internet	3.58 ± 1.51 (1 – 5)
developing creativity and imagination	3.56 ± 1.16 (1 – 5)
learning about beauty and aesthetic values	3.28 ± 1.17 (1 – 5)

Abbreviations: M±SD (Min – Max) = Mean±Std. Deviation (Minimum – Maximum).

Within the third research task, the students attending the eighth grade of primary school had the opportunity to express their satisfaction with certain aspects of school activity, as well as the teacher-student relationship.

The obtained results of the research related to the satisfaction of eighth grade students with certain aspects of school activity indicate that students are most satisfied with the attitude of classmates (4.37 ± 0.93) and the commitment of the class teacher (4.00 ± 1.22), and they are the least satisfied with the organization of students' leisure time (cultural and entertainment school activities) (3.02 ± 1.39) and the orderliness and hygiene of schools (2.79 ± 1.22). The following aspects are in descending order according to the expressed satisfaction of students: participation of parents in school activities (3.79 ± 1.19), success in learning (3.79 ± 1.19), activities of the class community (3.76 ± 1.09), cooperation with pedagogue and psychologist (3.67 ± 1.29), organization of school events (3.66 ± 1.34), climate within the class (3.60 ± 1.19), attitude of the majority of teachers (3.56 ± 1.17), various projects (3.54 ± 1.09), the way students are praised and rewarded (3.40 ± 1.12), helping students with professional orientation (3.34 ± 1.19) and school equipment (3.14 ± 1.04).

As part of the research, eighth grade students expressed their satisfaction with the teacher-student relationship. Students' satisfaction with teachers' attitudes towards them is as follows: first of all, students notice that teachers demand responsibility and work discipline in students (3.95 ± 0.99) and strive to develop students' proper worldview (3.66 ± 1.04), respect different opinions of students and provide good communication (3.63 ± 1.05), respect the personality of students - respect their opinion, do not underestimate and do not insult students (3.56 ± 1.32), pay more attention to knowledge rather than the behavior of students (3.53 ± 1.04), teach the material professionally and with interest (3.51 ± 1.00), allow the discussion about issues not related to the learning material (3.46 ± 1.16), dedicate special attention to gifted students (3.42 ± 1.42), they say one thing but behave quite differently in real life (3.40 ± 1.44), successfully overcome conflict situations with students (3.38 ± 1.10), can serve as a role model to their students (3.31 ± 1.19), but they are mostly dissatisfied with the fact that teachers have their “class pets” and pay less attention to other students (3.19±1.63). The results are shown in Table 3.

The next research task examined the opinions of eighth grade students on problems in primary school, who students turn to when they have a problem, as well as students' opinion on schools’ ability to address negative student behavior, followed by student satisfaction with the school environment.

The research was focused on learning about the opinions of students about the problems that occur in primary school. Statistical data show that the problems faced by eighth grade students in school are as follows: 71 (23.0%) students think that discipline is poor in some classes, 63 (20.4%) students think that there are bad relations in the class, 50 (16.2%) students believe that the biggest problem is learning and understanding the learning material, 46 (14.9%) students said that there is disrespect for students by teachers, 29 (9.4%) students believe that discipline is sometimes too strict, 23 (7.4%) students believe that their personal problems prevent them from meeting their obligations to the school, 13 (4.2%) students believe that the biggest problem in school is the safety and security of students, and 12 (3.9%) students think that the biggest problem in school is the inability to show their knowledge and express their opinion.

Table 3 Satisfaction of eighth grade students with certain aspects of school and the teacher-student relationship

Satisfaction of students with certain aspects of school	M±SD (Min – Max)
peer to peer relationship	4.37 ± 0.93 (1 – 5)
commitment of the class teacher	4.00 ± 1.22 (1 – 5)
parents' participation in school activities	3.79 ± 1.19 (1 – 5)
students' academic achievement	3.79 ± 1.19 (1 – 5)
activities of the class community	3.76 ± 1.09 (1 – 5)
cooperation with pedagogue and psychologist	3.67 ± 1.29 (1 – 5)
organization of school events	3.66 ± 1.34 (1 – 5)
climate within the class	3.60 ± 1.19 (1 – 5)
attitude of the majority of teachers towards students	3.56 ± 1.17 (1 – 5)
various projects	3.54 ± 1.09 (1 – 5)
the way students are praised and rewarded	3.40 ± 1.12 (1 – 5)
helping students with professional orientation	3.34 ± 1.19 (1 – 5)
school equipment	3.14 ± 1.04 (1 – 5)
cultural and entertainment school activities	3.02 ± 1.39 (1 – 5)
orderliness and hygiene of schools	2.79 ± 1.22 (1 – 5)
Student satisfaction with the teacher-student relationship	
teachers demand responsibility and work discipline in students	3.95 ± 0.99 (1 – 5)
strive to develop students' proper worldview	3.66 ± 1.04 (1 – 5)
respect different opinions of students and provide good communication	3.63 ± 1.05 (1 – 5)
respect the personality of students - respect their opinion, do not underestimate and do not insult students	3.56 ± 1.32 (1 – 5)
pay more attention to knowledge rather than the behavior of students	3.53 ± 1.04 (1 – 5)
teach the material professionally and with interest	3.51 ± 1.00 (1 – 5)
allow the discussion about issues not related to the learning material	3.46 ± 1.16 (1 – 5)
dedicate special attention to gifted students	3.42 ± 1.42 (1 – 5)
they say one thing but behave quite differently in real life	3.40 ± 1.44 (1 – 5)
they successfully overcome conflict situations with students	3.38 ± 1.10 (1 – 5)
they can serve as a role model to their students	3.31 ± 1.19 (1 – 5)
teachers have their "class pets" and pay less attention to other students	3.19 ± 1.63 (1 – 5)

Abbreviations: M±SD (Min – Max) = Mean±Std. Deviation (Minimum – Maximum).

Students who have some kind of problem at school most often turn to the class teacher, more precisely 236 (76.4%) of them; 64 (20.7%) students turn for help to the teacher they trust the most, and the same number of students 64 (20.7%) would turn to any teacher, 53 (17.2%) students would choose pedagogue and psychologist, 39 (12.6%) students would turn to the attendant teacher, and 21 (6.8%) would entrust the problem to the school principal.

The students of the eighth grade of primary school spoke about the extent to which the school successfully addresses negative student perceptions and behavior. According to the eighth-grade students, the school most successfully addresses endangering the rights of others (3.76 ± 1.25), indiscipline (3.72 ± 1.26), disrespect for authority (3.67 ± 1.24), aggressive behavior (3.59 ± 1.15), skipping classes (3.56 ± 1.40), and it is the least successful in suppressing student smoking (2.96 ± 1.58). The following items show less success in addressing negative phenomena: irresponsible attitude towards learning and school obligations (3.34 ± 1.28), drug addiction (3.24 ± 1.73), internet addiction (3.10 ± 1.48) and alcoholism (3.0 ± 1.62).

In order to improve the school environment and make it favorable for educational activities and for students to be happy in school, eighth grade primary school students suggested the following: reduce school obligations 165 (53.4%) students, 154 (49.8%) students believe it is necessary to organize free time for students, 98 (31.7%) students think that students should be allowed to realize their interests, 72 (23.3%) students think that students should be allowed to exercise their rights and obligations, 61 (19.7%) students think that undisciplined students should be sanctioned and thus the position of students would be improved, 51 (16.5%) students think that teamwork should be improved, 48 (15.5%) students believe that teachers' work and their attitude towards students should be monitored, 23 (7.4%) students believe that extracurricular activities should be modernized. The results of the research are shown in Table 4.

Table 4 Opinions of eighth grade students on the problems they face in primary school

Students' opinions on problems in primary school	n (%)
poor discipline in some classes	71 (23.0%)
bad relations in the class	63 (20.4%)
problems in learning and understanding the material	50 (16.2%)
disrespect of students by teachers	46 (14.9%)
too strict discipline in some classes	29 (9.4%)
personal problems that prevent students from committing to school obligations (family problems, health problems, etc.)	23 (7.4%)
safety and security at school	13 (4.2%)
inability to show your knowledge and express your opinion	12 (3.9%)
When faced with a problem in school, students most often turn to	n (%)
the class teacher	236 (76.4%)
any teacher	64 (20.7%)
teacher they trust most	64 (20.7%)
pedagogue and / or psychologist	53 (17.2%)
attendant teacher	39 (12.6%)
school principal	21 (6.8%)
The extent to which the school successfully addresses negative student behavior	M±SD (Min–Max)
endangering the rights of others	3.76±1.25 (1 – 5)
indiscipline	3.72±1.26 (1 – 5)
disrespect for authority (teachers, parents, adults)	3.67±1.24 (1 – 5)
aggressiveness	3.59±1.15 (1 – 5)
skipping lessons	3.56±1.40 (1 – 5)
irresponsible attitude towards learning and school obligations	3.34±1.28 (1 – 5)
drug addiction	3.24±1.73 (1 – 5)
internet addiction	3.10±1.48 (1 – 5)
alcoholism	3.02±1.62 (1 – 5)
smoking	2.96±1.58 (1 – 5)
Student satisfaction with the school environment	n (%)
reduce school obligations	165 (53.4%)
organize free time for students	154 (49.8%)
students should be allowed to realize their interests	98 (31.7%)
students should be allowed to exercise their rights and obligations	72 (23.3%)
undisciplined students should be sanctioned	61 (19.7%)
teamwork should be improved	51 (16.5%)
teachers' work and their attitude towards students should be monitored	48 (15.5%)
increase student discipline	37 (12.0%)
extracurricular activities should be modernized	23 (7.4%)

Abbreviations: M±SD (Min – Max) = Mean±Std. Deviation (Minimum – Maximum).

After the descriptive analysis of the data, it was found that eighth grade primary school students differ statistically significantly in regards to individual activities with a dominant educational component, and with regard to independent variables (gender, roles in the class community, participation in extracurricular activities, membership in student parliament), which was the next task within this research.

We have listed several activities related to student behavior in order to find out what attitude students have towards these activities: sports activity, learning about behavior, acquiring the necessary knowledge and skills for further education, developing peer skills, developing respect for older people, developing environmental culture for nature conservation, learning about beauty and aesthetic values, developing creativity, fighting addiction (smoking, alcoholism, drug addiction, internet).

Table 5 Opinions of eighth grade students about school activities

	Gender		p	Involvement in the class community		p
	Male	Female		Yes	No	
	N=138	N=167		N=80	N=214	
A1	4.51 ± 0.78	4.04 ± 1.24	0.001	4.53 ± 0.50	4.13 ± 1.22	0.004
A2	3.84 ± 1.05	4.03 ± 0.97	0.116	3.68 ± 1.27	4.06 ± 0.90	0.006
A3	3.19 ± 1.09	3.34 ± 1.25	0.275	3.21 ± 0.96	3.36 ± 1.24	0.326
A4	4.02 ± 0.70	3.89 ± 1.06	0.214	4.07 ± 0.92	3.91 ± 0.93	0.180
A5	3.69 ± 1.11	3.48 ± 1.20	0.122	3.88 ± 1.15	3.51 ± 1.12	0.083
A6	3.76 ± 1.01	3.73 ± 1.22	0.826	3.73 ± 1.05	3.80 ± 1.17	0.632
A7	3.93 ± 1.12	3.61 ± 1.30	0.026	3.77 ± 1.14	3.74 ± 1.28	0.868
A8	3.66 ± 1.00	3.76 ± 1.07	0.414	3.87 ± 0.91	3.67 ± 1.10	0.147
A9	3.67 ± 1.42	3.48 ± 1.58	0.276	3.47 ± 1.55	3.56 ± 1.51	0.658
	Involvement in extracurricular activities		p	Membership in the Student Parliament		p
	Yes	No		Yes	No	
	N=109	N=195		N=46	N=263	
A1	4.19 ± 0.78	4.30 ± 1.21	0.374	4.33 ± 0.47	4.26 ± 1.16	0.685
A2	3.95 ± 1.02	3.96 ± 1.01	0.935	4.02 ± 0.99	3.61 ± 1.08	0.010
A3	3.32 ± 0.98	3.26 ± 1.27	0.674	3.24 ± 0.67	3.29 ± 1.25	0.785
A4	4.07 ± 1.06	3.89 ± 0.82	0.099	4.02 ± 0.91	3.61 ± 0.91	0.005
A5	3.51 ± 1.17	3.60 ± 1.15	0.535	3.39 ± 0.74	3.60 ± 1.22	0.260
A6	4.00 ± 1.07	3.62 ± 1.14	0.066	3.80 ± 1.07	3.76 ± 1.14	0.803
A7	3.90 ± 1.29	3.68 ± 1.18	0.124	3.46 ± 1.19	3.82 ± 1.23	0.066
A8	4.00 ± 0.97	3.59 ± 1.06	0.001	3.52 ± 0.78	3.78 ± 1.08	0.125
A9	3.86 ± 1.26	3.43 ± 1.62	0.019	3.70 ± 1.23	3.57 ± 1.57	0.600

Abbreviations: A1 = sports activity, A2 = learning about behavior, A3 = learning about beauty and aesthetic values, A4 = acquiring the necessary knowledge and skills for further education, A5 = developing creativity, A6 = developing skills of socializing with peers, A7 = developing skills for respect for the elderly, A8 = developing an environmental culture for nature conservation, A9 = fighting addiction: (smoking, alcoholism, drug addiction, internet).
Note: Student's t-test was performed; Mean±Std. Deviation are shown in the table.

Unlike girls, boys mostly believe that school actively organizes sports activities for students (4.51 ± 0.78 vs. 4.04 ± 1.24, $p < 0.001$), and that it also works on developing skills to respect the elderly (3.93 ± 1.12 vs. 3.61 ± 1.30, $p = 0.026$). Students who have responsibilities in the class community believe that the school implements activities that contain an educational component by organizing sports activities for students (4.53 ± 0.50), $p = 0.004$, while participants who do not have special responsibilities within the class community to a

greater extent than others believe that the school pays attention to learning about behavior (4.06 ± 0.90), $p = 0.006$.

Students involved in extracurricular activities believe that the school is engaged in developing the environmental culture of its students (4.00 ± 0.97), $p = 0.001$. The school's activities in the fight against addiction were also rated higher by those students who are involved in extracurricular activities (3.86 ± 1.26) compared to eighth grade students who are not involved in these activities (3.43 ± 1.62), $p = 0.019$.

Students who are members of the Student Parliament are of the opinion that good behavior is taught in school (4.02 ± 0.99), $p = 0.010$, as well as that the necessary knowledge and skills for further education are acquired there too (4.02 ± 0.91), $p = 0.005$.

5. CONCLUSIONS

The paper examined the opinions of senior primary school students on the educational function of school in order to obtain data on how the educational role of school is seen by those for whom it is intended, as well as to determine whether aspects of educational work implemented in schools meet the needs students.

The results of the research show that the eighth-grade students recognized different aspects of the educational activities in primary school. The largest number of surveyed eighth grade students (64.7%) are involved in extracurricular activities, and the most common reason for students to opt for certain extracurricular activities organized in primary school is that students can choose them themselves (31.3%). The involvement of students (27.1%) in the class community activities is rather low, and in addition, eighth grade students are of the opinion that the obligations and duties of students in school in are most often discussed in the class meeting (4.15 ± 0.99) followed by disciplinary measures and sanctioning of students (4.00 ± 1.09). A high percentage of students (42.7%) states that in class meetings, the class teacher addresses peer problems within the class, and there is also a high percentage of students (36.2%) who believe that in these classes the class teacher discusses absenteeism and completes other administrative tasks. Students gain different experiences, communication skills, leadership and teamwork, get acquainted with the opportunities, strengths and weaknesses through activities in the student organization - Student Parliament (14.9%). According to students, the Student Parliament allows students to be involved in the decision-making process at school (26.2%) and to the development of students' freedom of opinion (22.3%). In regards to compulsory elective courses, eighth grade students point out that they like the most that they learn how to communicate properly with other people (4.00 ± 1.38), to love and respect themselves and others (3.89 ± 1.41), that the course content contribute to the education of students (3.83 ± 1.25) and that they have the opportunity to enrich their personality in the moral and spiritual sense (3.60 ± 1.38).

The statistical data in this research, which refer to the opinions of eighth grade primary school students on aspects that affect the education and personality development of young people, peer values and how much the school pays attention to activities important for educating students, show that students highlight the following things from the aspect of school context and the developmental needs of adolescents: the factor that primarily influences the education and development of young people in the opinion of eighth grade students is family (7.56 ± 1.07), students value socializing and helping others the

most in their peers (3.69 ± 1.30), attitude towards the elderly, teachers (3.62 ± 1.31), followed by respect for the rights of others and religious tolerance (3.57 ± 1.22). Students are of the opinion that school pays most attention to sports activities (4.26 ± 1.08), followed by learning about behavior (3.96 ± 1.01), and to acquiring the necessary knowledge and skills for further education (3.95 ± 0.91).

The results of the research have shown that eighth grade students have a positive opinion about satisfaction with certain aspects of school life. The results show us that, when it comes to school environment, students are most satisfied with the attitude of classmates (4.37 ± 0.93) and the work and commitment of the class teacher (4.00 ± 1.22). How students experience school largely depends on what kind of relationship teachers and students have built. Students notice that teachers primarily demand responsibility and work discipline from students (3.95 ± 0.99) and try to develop a proper view of the world in students (3.66 ± 1.04), which speaks in favor of students' satisfaction with the teacher-student relationship. Teacher's professionalism, way of working and communication with students have a positive effect on their attitude towards school.

Students' perception of the problems they face in school pose a risk for functioning well with peers and being successful in school academically. The problems that eighth grade students face in school are poor discipline in some classes (23.0%) and bad relations in the class (20.4%). Students who have some kind of problem at school most often turn to the class teacher (76.4%), which opens up space for improving relationships in the school. Also, in the opinion of students, the school most successfully addressed endangering the rights of others (3.76 ± 1.25), indiscipline (3.72 ± 1.26), disrespect for authority (3.67 ± 1.24), aggressive behavior (3.59 ± 1.15) and skipping classes (3.56 ± 1.40), which is encouraging and points to the possible conclusion that students perceive school as an educational environment. In order to feel more satisfied in the school environment, eighth grade primary school students suggest reducing school obligations (53.4%) and organizing free time for students (49.8%).

The obtained research results show that eighth grade students have a positive attitude towards school. After descriptive data analysis, it was found that students differ statistically significantly in regards to individual activities with a dominant educational component, and with regard to independent variables (gender, roles in the class community, participation in extracurricular activities, membership in student parliament).

Unlike girls, boys mostly believe that school actively organizes sports activities for students (4.51 ± 0.78 vs. 4.04 ± 1.24, $p < 0.001$), and that it also works on developing skills to respect the elderly (3.93 ± 1.12 vs. 3.61 ± 1.30, $p = 0.026$). Students who have responsibilities in the class community believe that the school implements activities that contain an educational component by organizing sports activities for students (4.53 ± 0.50), $p = 0.004$, while participants who do not have special responsibilities within the class community to a greater extent than others believe that the school pays attention to learning about behavior (4.06 ± 0.90), $p = 0.006$.

Students involved in extracurricular activities believe that the school is engaged in developing the environmental culture of its students (4.00 ± 0.97), $p = 0.001$. The school's activities in the fight against addiction were also rated higher by those students who are involved in extracurricular activities (3.86 ± 1.26) compared to eighth grade students who are not involved in these activities (3.43 ± 1.62), $p = 0.019$. Students who are members of the Student Parliament are of the opinion that good behavior is taught in

school (4.02 ± 0.99), $p = 0.010$, as well as that the necessary knowledge and skills for further education are acquired there too (4.02 ± 0.91), $p = 0.005$.

From the perspective of eighth grade students, the hypothesis of this research was set, which reads: it is assumed that eighth grade primary school students recognized school as an educational environment, and this hypothesis has been proven.

The obtained research results offer a clearer picture of the educational role of school from the perspective of senior primary school students in the Republic of Serbia. The research findings can be used for a deeper observation of this very important pedagogical problem, in order to work on greater engagement, involvement in creating and maintaining a more positive attitude of students towards the school environment.

REFERENCES

Dymara Dziecko B. (2009). *Podstawy uczenia się kompleksowego nowe kształty i wymiary edukacji*. Kraków: Impuls.

Bear, G. G., Gaskins, C., Blank, J., & Chen, F. F. (2011). Delaware School Climate Survey – Student: Its factor structure, concurrent validity, and reliability. *Journal of School Psychology*, *49*(2), 157-174.

Bird, J. M., & Markle, R. S. (2012). Subjective well-being in school environments: Promoting positive youth development through evidence-based assessment and intervention. *American Journal of Orthopsychiatry*, *82*(1), 61.

Borkar, V. N. (2016). Positive school climate and positive education: impact on students well-being. *Indian Journal of Health & Wellbeing*, *7*(8), 861-862.

Cohen, J., McCabe, L., Michelli, N. M., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers college record*, *111*(1), 180-213.

Fredricks, J. A., & Eccles, J. S. (2006). Is extracurricular participation associated with beneficial outcomes? Concurrent and longitudinal relations. *Developmental psychology*, *42*(4), 698.

Holtappels, H. G., & Meier, U. (2000). Violence in schools. *European Education*, *32*(1), 66-79.

Kutsyuruba, B., Klinger, D. A., and Hussain, A. (2015). Relationships among school climate, school safety, and student achievement and well-being: a review of the literature. *Rev. Educ., 3*, 103–135. https://doi.org/10.1002/rev3.3043

Lombardi, E., Traficante, D., Bettoni, R., Offredi, I., Giorgetti, M., & Vernice, M. (2019). The impact of school climate on well-being experience and school engagement: a study with high-school students. *Frontiers in psychology*, *10*, 2482.

Marsh, H., & Kleitman, S. (2002). Extracurricular school activities: The good, the bad, and the nonlinear. *Harvard educational review*, *72*(4), 464-515.

Marshall, M. L. (2004). Examining School Climate: Defining Factors and Educational Influences. Georgia: Georgia State University Center for School Safety, School Climate and Classroom Management.

Milosavljević Đukic, T., Bogavac, D., & Radovanović, I. (2020). School as an educational environment from the pupils' perspective. Educational space. Selected theoretical and practical approaches. Nowy Sacz: State University of Applied Sciences and Belgrade: Teacher Education Faculty.

Perkowska-Klejman A., & Górka-Strzałkowska *A.* (2016). *Szkoła jako instytucja, system społeczny i organizacja*, (w:) A. Minczanowska, A. Szafrańska-Gajdzica, M.

Pužić, S., Baranović, B., & Doolan, K. (2011). Školska klima i sukobi u školi. *Sociologija i prostor*, *49*(3), 335-358.

Sabra, H. E., Hassan, A. M., & Mohammed, H. M. (2018). Relation between Students' Perception of Teaching Styles and Students' Academic Engagement in South Valley and Assiut Universities. *Egyptian Journal of Health Care*. *9*(1) 187-204. https://doi.org/10.21608/ejhc.2018.13953

Seligman, M. E., Ernst, R. M., Gillham, J., Reivich, K., & Linkins, M. (2009). Positive education: Positive psychology and classroom interventions. *Oxford review of education*, *35*(3), 293-311.

Tapia-Fonllem C., Fraijo-Sing B., Corral-Verdugo V., Garza-Terán G., & Moreno-Barahona M. (2020). School Environments and Elementary School Children's Well-Being in Northwestern Mexico. *Frontiers in Psychology*, *11*, 1-8. https://doi.org/10.3389/fpsyg.2020.00510

Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of educational research*, *83*(3), 357-385.

Tian, L., Zhao, J., & Huebner, E. S. (2015). School-related social support and subjective well-being in school among adolescents: The role of self-system factors. *Journal of adolescence*, *45*, 138-148. https://doi.org/10.1016/j.adolescence.2015.09.003

Tian, L., Tian, Q., & Huebner, E. S. (2016). School-related social support and adolescents' school-related subjective well-being: The mediating role of basic psychological needs satisfaction at school. *Social Indicators Research*, *128*(1), 105-129.

Wang, M. T., & Degol, J. L. (2016). School climate: A review of the construct, measurement, and impact on student outcomes. *Educational Psychology Review*, *28*(2), 315-352.

Zullig, K. J., Koopman, T. M., Patton, J. M., & Ubbes, V. A. (2010). School climate: Historical review, instrument development, and school assessment. *Journal of Psychoeducational Assessment*, *28*(2), 139-152.

ŠKOLA KAO VASPITNA SREDINA IZ PERSPEKTIVE UČENIKA STARIJEG ŠKOLSKOG UZRASTA

Polazeći od toga da osnovna škola predstavlja veoma bitan činilac za vaspitanje i obrazovanje mladih, zanimalo nas je kako učenici starijeg školskog uzrasta vide školu kao vaspitnu sredinu, što je i cilj našeg istraživanja. Istraživanje je realizovano na uzorku od 309 učenika osmog razreda osnovne škole u deset gradova republike Srbije. U ovom istraživanju primenjena je deskriptivna metoda, a od instrumenata konstruisan je Upitnik za procenu vaspitne funkcije škole iz perspektive učenika starijeg školskog uzrasta. Od statističkih postupaka korišćeni su frekvencije i procenti, aritmetička sredina sa pripadajućom standardnom devijacijom. Razlike su testirane Studentovim t-test. Dobijeni rezultati istraživanja doprinose potpunijoj slici vaspitne uloge škole iz perspektive učenika starijeg školskog uzrasta u osnovnoj školi u Republici Srbiji. Nalazi istraživanja mogu poslužiti za dublju opservaciju ovog veoma značajnog pedagoškog pitanja.

Ključne reči: *vaspitna funkcija škole, škola kao vaspitna sredina, aspekti vaspitnog delovanja, učenik.*

FACTA UNIVERSITATIS
Series: **Teaching, Learning and Teacher Education** Vol. 5, Nº2, 2021, pp. 153 - 165
https://doi.org/10.22190/FUTLTE211010012D

Exploratory paper

VALUE AND IMPORTANCE OF PHILOSOPHY COURSES WITHIN NON-PHILOSOPHY STUDIES: STUDENTS' PERSPECTIVE

UDC 141:378.4 (497.11); 378.18::141

Zoran Dimić, Slađana Ristić Gorgiev, Milan Jovanović

Faculty of Philosophy, University of Niš, Serbia

Abstract. *Do non-philosophy university students consider philosophy to be important for their education? In this paper, we present the results of the empirical research that we have conducted in order to address this question. The study included 151 participants and was based on an online questionary. Our approach was focused on students' evaluation of the role and significance of the philosophical courses they have attended. The results indicate that students highly regard philosophy as valuable and beneficial not only for general but also for their professional education. We take those results to offer a strong argument against the current trend of decline and reduction of philosophical education in high schools and universities of the Republic of Serbia.*

Key words: *philosophy, education, curriculum, students' attitudes, Educational system in Serbia*

1. INTRODUCTION

1.1. The aim and motivation

In this paper, we present the results of the conducted empirical study concerning the university students' perception and evaluation of philosophical courses. The participants were students from the three University of Niš faculties: Faculty of Education in Vranje, Faculty of Philosophy and Faculty of Economics in Niš, whom all have had philosophical courses within their studies. The research was done through an anonymous online questionary.

One of the motives for our study was the concerning trend of reducing philosophical education in high schools and faculties in the Republic of Serbia. Our idea was to question the justification for that trend, from the university students' perspective. Since

Received October 10, 2021/Accepted December 1, 2021
Corresponding author: Zoran Dimić
Faculty of Philosophy, University of Niš, Ćirila i Metodija 2, 18000 Niš, Serbia
Phone: +381 65 205 8998 • E-mail: zoran.dimic@filfak.ni.ac.rs

they are not philosophy students but instead have different vocations (pedagogy, primary or preschool teaching, economics), and also have educational and intellectual maturity, we considered their opinion and attitudes about the importance of philosophical education to be a valuable contribution to the issue surrounding the decline of philosophy in high school and university curriculums.

1.2. Context and relevant information

It is worth noting that those students from different faculties and departments had attended *different philosophical courses* (with different syllabi, different professors, and in a different year of their study). Hence, to put the results (presented in section 3 of this paper) into a suitable context, we will briefly describe those courses within this introduction.

1.2.1. Philosophy course at the Faculty of Economics

The philosophy course at the Faculty of Economics at the University of Niš is in the curriculum of different subfields, in the first or second year of study. The course is called *Philosophy of Economics* and it is taught with three weekly hours of lectures and three hours of exercises during one semester.

The course aims to acquaint students with the philosophical analysis of methodological issues encountered by Economic theories. As such, the course relies on both the philosophy of science and political philosophy. In order to be able to follow specific topics related to the philosophy of economics, students are first introduced to the general topics of philosophy and history of philosophy.

The syllabus has three parts. The first part is concerned with the introduction to philosophy (which deals with the relationship between philosophy and other sciences), philosophical disciplines and philosophical methods. The second part of the program offers a brief historical overview of the most important philosophers and philosophical movements from the ancient period to the present day, with an emphasis on political philosophy. The third part of the program is dedicated to the relationship between methodology and economics. The idea of that part of the course is to address important problems from the philosophy of science (with the focus on economics) such as induction, deduction, models in the Economic, unrealistic assumptions, Economics imperialism, dogmatism in science, etc.

The teaching was conducted through a monologue-dialogue method, meaning that the lectures were mainly based on the oral presentation of the teacher with the occasional involvement of students in dialogue on certain topics. During the exercise classes, students were analyzing and interpreting original philosophical texts from the political philosophy and philosophy of science, so the dialogical method was mostly represented in that segment. Also, it should be emphasized that in the school year 2020/21, classes were held online.

1.2.2. Philosophy courses at the Faculty of Education

According to the program accredited in 2014. at the Bachelor Academic Studies of Primary School Teaching and Preschool Teaching at the Faculty of Education in Vranje, there are two one-semester philosophy courses, one of which is mandatory and the other is elective. In the first semester of the year, students take *Philosophy* as a mandatory course, while *Ethics in Education* is an elective course. The *Philosophy* course is represented weekly by two hours of lectures and one hour of exercises, while *Ethics in*

Education is represented by only two hours of lectures. Both courses carry an identical number of ECTS credits – 3.

Both these courses have a dual character. Firstly, they are designed as introductory courses, which means that they can be followed by students who did not have any philosophy or ethics courses in their high school.[1] The language and terminology related to both courses are very simple and most directly relate to everyday, colloquial speech. But secondly, since future primary and preschool teachers are educated at this Faculty, the *Philosophy* course has a strong emphasis on educational topics; in other words, in this context the goal was to put philosophy in the function of a better and deeper understanding of education. The leading idea was that philosophy of education can be very useful for students of the Faculty of Education, precisely because it can shed light on the topics of education in a way that no other scientific discipline that is closely related to pedagogy does (for example, sociology, psychology, etc.). Topics of this course cover the key points in the historical development of the philosophy of education from the ancient period to the modern times, and the important figures in philosophy of education: Plato, Aristotle, Locke, Kant, Dewey, etc. The literature consists of the most educationally relevant writings of these philosophers.

Ethics in Education course follows a similar conception. It aims *not only* to deepen the general education of students, but also to help students to better understand their future job and the science they predominantly deal with (pedagogy). With the exception of two introductory topics, all other lessons address ethical issues relevant for education: Virtue and education, Socrates' educational ideal, Ethics of the teaching, Teacher's role in education, Contemporary ethical dilemmas and education, etc. Alongside different introductions to ethics, course literature includes prominent ethical works in the field of education.

1.2.3. Philosophy courses at the Department of Pedagogy

Bachelor Academic Studies of Pedagogy at the Faculty of Philosophy in Niš includes two one semester-long elective courses in philosophy: *Philosophy of Education* and *Ethics*. In the first semester of the first year of their study, students take the *Philosophy of Education* as an elective course, while *Ethics* is an elective course in the second year in the first semester. *Philosophy of Education* course is worth 5 ECTS credits and is being taught with two hours of lectures and one hour of exercises, while *Ethics* (4 ECTS) is delivered by only one weekly hour of lectures and one hour of exercises.

Similar to the philosophical courses at the Faculty of Education, those two courses are not designed only as a form of general education for the students, but instead are organized with the conviction that philosophy can be very useful to students of Pedagogy in order to better understand pedagogy as a science and vocation. The basic topics and literature in the course *Philosophy of Education* concern key points in the historical development of philosophical reflections on pedagogical topics, from the ancient period to modern times, and it is very similar in content to the *Philosophy course* at the Faculty of Education.

And finally, the course of *Ethics* for pedagogy students. This course is slightly different from the three previously mentioned since its most important purpose is the impact on the

[1] In the educational system of the Republic of Serbia, *Philosophy* is an obligatory subject in gymnasiums (general high schools), and in some art high schools. Recently, *Philosophy* ceased to be an obligatory subject in vocational high schools. The subject of *Ethics* is represented only in medical high schools.

students' *general education*. It covers the prominent figures and philosophical schools from the history of ethics, such as Socrates, Plato, Aristotle, Stoicism, Epicureanism, Spinoza, Kant, Nietzsche, etc.

1.3. Literature review

There are some fairly recent studies relevant to the issues that we wanted to investigate. For example, Gardner's paper *Why We Should Require All Students to Take 2 Philosophy Courses* (2018) corresponds to our research interest in two important aspects: it is focused on the university students, and on those students who are not studying philosophy. The same goes for the article *Why Study Philosophy at the Faculty of Law?* (Pohoață, 2017). However, since our method is empirical, our contribution might be seen as somehow complementing these *purely theoretical* papers.

When it comes to *empirical research* relevant to our topic, there is a recently published study (Bialystok et al., 2019) that analyzes the impact of philosophy courses on high school students. This large-scale research has led to the conclusion that "philosophy is a unique, beneficial subject that teachers enjoy teaching and students greatly value, characterizing it as both difficult and rewarding". In addition, the authors emphasized that the study had also shown that "considerable differences exist in how philosophy is taught and learned" (Bialystok et al., 2019, p. 678). Bearing this in mind, and the fact that students from our sample had also been taught different philosophical courses, we have decided to analyze the relevant results of each subgroup separately, and in the context of the specific course.

In addition, in 2021. is published a group of papers (in the special issue of a journal)[2] presenting the empirical study of the effects that certain philosophical courses had on philosophy students' intuitions, beliefs, and attitudes.

Having all these in mind, we have undertaken our research with the idea to offer some novel perspectives and hopefully make some contribution to the topic.

1.4. Expectations

Our roughly defined hypotheses (or rather: expectations) that we had prior to the research were influenced by these previous theoretical and empirical work, but also by the first-hand teaching experience and involvement in the students' educational progress.

Generally speaking, both these sources were – more or less[3] – pushing us into the same directions: that philosophical education is important, it has a significant impact on students' believes, attitudes, and skills. Hence, we expected overall positive students' attitudes towards the claims in our questionary.

Additionally, we believed that the different courses – in accordance with their content and focus, and the environment in which they were taught – would produce different agreement patterns between the subgroups.

Finally, taking into account the importance of high school *exposure to philosophy courses* we expected such students to have even more positive attitudes towards the claims about the need for philosophy in the high school and university curriculums.

---

[2] Each paper addresses a specific course and analyzes its potential impact on students' attitudes. See (introductory paper): Ristić Gorgiev & Blagojević, 2021.

[3] There are some authors questioning or even strongly opposing that direction. The recent and notable examples are Sesardić, 2017; Van Norden, 2015; Schwitzgebel, 2015.

2. METHODS

Our research included 151 participants (138 females, 13 males), all of whom were students at the University of Niš – 77 students from the Faculty of Education in Vranje (51% of all participants), 40 students from the Department of Pedagogy at the Faculty of Philosophy in Niš (26.5%), and 34 students from Faculty of Economics in Niš (22.5%). Around 33% of the participants were students who have attended a philosophy course recently, i.e. in the year when our research was conducted, while near 67% of the participant have finished attending their philosophical courses in some of the previous years.

In order to effectively collect the data (in the light of the Covid-19 pandemic), we had used an online questionary platform *Google Forms*, which was also used for the basic analysis of the gathered data. For the additional analyses, we have used *MS Excel* software.

The questionary designed for this study consisted of 3 groups of questions. The first group contained 5 general questions: faculty, sex, the year of attending philosophy course, and finally whether or not they have had philosophy or logic courses during their high school. The second group contained 11 claims which students were asked to evaluate in accordance with the 5-valued Likert scale (Likert 1932, Cohen et al. 2008, p. 15). Those claims were designed to probe students' attitudes towards specific aspects of the philosophical courses they have attended by asking for the extent to which they agree with the given claim. The predefined values were: 1. Strongly disagree, 2. Disagree, 3. Neutral, 4. Agree, and 5. Strongly agree. Here is the list of the claims given in that part of the questionary:

I I believe that philosophical education is useful for my profession.
II I think that philosophical education is important for my general knowledge.
III Philosophical education has influenced my world views.
IV Philosophical education has affected my understanding of education and upbringing in general.
V Philosophical education has changed my view on science.
VI Philosophical education has had an impact on my views on religion.
VII Philosophical education has influenced my view on art.
VIII I think the philosophical education within my studies helped me build a better understanding of society and politics.
IX Philosophical education during my studies was important to my personal life.
X I think that philosophical education should be part of the educational program of every faculty.
XI I consider philosophy to be important as a discipline and hence I think it should be an obligatory subject in all high schools (including vocational high schools).

The third part of the questionary combines two open questions, asking students to express what competencies (knowledge, skills, and attitudes) they believe they gained through philosophy courses they had attended, and how those courses can be changed in order to be (even) more relevant, important and valuable for them. These two questions were designed for the qualitative analysis and with the idea to shed some light on the specific impact that philosophy has or could have on university students.

Eventually, we have decided to focus only on the quantitative part of the study for this occasion and, in this paper, we will present and discuss the results only from the first two parts of the inquiry.

3. RESULTS

This chapter is organized into 4 subsections, presenting, respectively (in accordance to the size of the subgroups): results for the whole group, results for students of the Faculty of Education in Vranje, for students of the Department of Pedagogy at the Faculty of Philosophy in Niš, and finally results for students from Faculty of Economics in Niš.

3.1. General results

Let us start with the results regarding all participants. Table 1 and Table *2* show the percentages of the participants that have given a certain value (following the 5-valued Likert scale) to the 11 claims (presented in chapter 2 of this paper, in the same order as in this table). In some of the tables, we have also presented the results for answers 4 and 5 jointly ("Agree" and "Strongly agree") in order to get the relevant and important information – how much of the participants *agree with the given claim* rather than *being neutral* or *disagreeing*. In addition to this, the table contains the average value of participants' responses to each of the claims.

Table 1 All participants – *claims I-VI*

Claim	I *profession*[4]	II *general knowledge*	III *world views*	IV *education*	V *science*	VI *religion*
Average value	3.99	4.41	3.81	4.05	3.74	3.23
Value 5	36.4%	56.3%	33.8%	41.7%	26.5%	17.2%
Value 4	40.4%	34.4%	36.4%	34.4%	42.4%	25.2%
Value 4 or 5	76.8%	90.7%	70.2%	76.2%	68.9%	42.4%

Table 2 All participants – *claims VII-XI*

Claim	VII *art*	VIII *politics*	IX *personal life*	X *at all faculties*	XI *in all schools*
Average value	3.62	4.23	3.68	4.09	4.17
Value 5	28.5%	45%	29.8%	44.4%	50.3%
Value 4	31.1%	37.7%	32.5%	33.1%	29.1%
Value 4 or 5	59.6%	82.8%	62.3%	77.5%	79.5%

From the first part of the questionary, we have got that 64.2% of all the participants have had philosophy as a high school subject, and 40% of all participants have also had logic within their high school curriculum.[5] We were interested in whether the presence of philosophy and/or logic within a student's high school curriculum had any effect on his/her attitude towards the *claim XI* and *claim X*. The results are presented in Table 3.

[4] For convenience, there is a *short remark* in the tables, below the number of the claim, with the purpose to help the reader quickly recall the given claim.

[5] The logic (as an obligatory subject) is a part of the curriculum only in those high schools that also include philosophy (again as an obligatory subject).

Table 3 *Claims X* and *XI* with regards to having philosophy and logic in high school

Claim	X *obligatory at all faculties*				XI *obligatory in all schools*			
	Value 4	*Value 5*	*Value 4 or 5*	*Avg. value*	*Value 4*	*Value 5*	*Value 4 or 5*	*Avg. value*
Students who didn't have phil. and logic	22.2%	48.1%	70.3%	4.05	27.7%	42.6%	70.3%	3.98
Students who had phil. but no logic	36.1%	38.8%	75%	4.00	30.5%	52.7%	83.2%	4.25
Students who had phil. and logic	40.9%	44.2%	85.2%	4.18	29.5%	55.7%	85.2%	4.30

3.2. Results for the Faculty of Education students

In this section, we will present the specific results concerning the largest subgroup in our sample – students of the Faculty of Education in Vranje. Table 4 and Table 5 show (in detail) their levels of agreement with claims presented within the inquiry.

Table 4 Faculty of Education – *claims I-VI*

Claim	I *profession*	II *general knowledge*	III *world views*	IV *education*	V *science*	VI *religion*
Average value	4.18	4.48	4.01	4.19	3.91	3.51
Value 4 or 5	87%	92.2%	75.3%	80.5%	77.9%	48.1%
Value 5	36.4%	57.1%	37.7%	49.4%	31.2%	18.2%
Value 4	50.6%	35.1%	37.7%	31.2%	46.8%	29.9%
Value 3	7.8%	6.5%	15.6%	11.7%	10.4%	39%
Value 2	5.2%	1.3%	6.5%	5.2%	5.2%	10.4%
Value 1	0%	0%	2.6%	2.6%	6.5%	2.6%

Table 5 Faculty of Education – *claims VII-XI*

Claim	VII *art*	VIII *politics*	IX *personal life*	X *at all faculties*	XI *in all schools*
Average value	3.82	4.25	3.75	4.34	4.10
Value 4 or 5	70.1%	83.1%	61.0%	85.7%	76.6%
Value 5	28.6%	44.2%	31.2%	51.9%	45.5%
Value 4	41.6%	39%	29.9%	33.8%	31.2%
Value 3	18.2%	15.6%	27.3%	10.4%	15.6%
Value 2	6.5%	0%	6.5%	3.9%	3.9%
Value 1	5.2%	1.3%	5.2%	0%	3.9%

We also wanted to take a closer look and compare the attitudes of the students who have just recently attended a philosophical course and those who have finished that in some of the previous years. That comparison is given in Table 6 and Table 7.

Table 6 Faculty of Education – recently attended vs. attended earlier, *I-VI*

Claim		I *profession*	II *general knowledge*	III *world views*	IV *education*	V *science*	VI *religion*
Average value	*recently*	4.24	4.41	3.94	4.00	3.88	3.53
	earlier	4.17	4.50	4.03	4.25	3.92	3.50
Value 4 or 5	*recently*	82.4%	94.1%	76.5%	82.4%	70.6%	58.8%
	earlier	86.7%	90.0%	73.3%	80.0%	78.3%	45.0%
Value 5	*recently*	35.3%	41.2%	29.4%	35.3%	29.4%	5.90%
	earlier	36.7%	61.7%	40.0%	53.3%	31.7%	21.7%
Value 4	*recently*	47.1%	52.9%	47.1%	47.1%	41.2%	52.9%
	earlier	50.0%	28.3%	33.3%	26.7%	46.7%	23.3%

Table 7 Faculty of Education – recently attended vs. attended earlier, *VII-XI*

Claim		VII *art*	VIII *politics*	IX *personal life*	X *at all faculties*	XI *in all schools*
Average value	*recently*	3.53	4.35	3.29	4.18	4.00
	earlier	3.90	4.22	3.88	4.38	4.13
Value 4 or 5	*recently*	64.7%	88.2%	29.4%	82.4%	82.4%
	earlier	71.7%	81.7%	70.0%	85.0%	76.7%
Value 5	*recently*	17.6%	47.1%	17.6%	35.3%	35.3%
	earlier	31.7%	43.3%	35.0%	56.7%	48.3%
Value 4	*recently*	47.1%	41.2%	11.8%	47.1%	47.1%
	earlier	40.0%	38.3%	35.0%	28.3%	28.3%

3.3. Results for the pedagogy students from the Faculty of Philosophy

The results concerning the second-largest subgroup in the study sample – students of pedagogy from the Faculty of Philosophy in Niš (40 participants) – are presented in Table 8 and Table 9.

Table 8 Department of Pedagogy – *claims I-VI*

Claim	I *profession*	II *general knowledge*	III *world views*	IV *education*	V *science*	VI *religion*
Average value	4.28	4.55	3.88	4.13	3.6	2.85
Value 4 or 5	82.5%	95.0%	72.5%	82.5%	67.5%	30.0%
Value 5	52.5%	65.0%	37.5%	42.5%	17.5%	10.0%
Value 4	30.0%	30.0%	35.0%	40.0%	50.0%	20.0%
Value 3	12.5%	2.5%	10.0%	10.0%	12.5%	35.0%
Value 2	2.5%	0.0%	12.5%	2.5%	15.0%	15.0%
Value 1	2.5%	2.5%	5.0%	5.0%	5.0%	20.0%

Table 9 Department of Pedagogy – *claims VII-XI*

Claim	VII *art*	VIII *politics*	IX *personal life*	X *at all faculties*	XI *in all schools*
Average value	3.3	4.33	3.95	3.98	4.43
Value 4 or 5	45.0%	90.0%	72.5%	75.0%	90.0%
Value 5	22.5%	45.0%	40.0%	42.5%	62.5%
Value 4	22.5%	45.0%	32.5%	32.5%	27.5%
Value 3	30.0%	7.5%	12.5%	12.5%	2.5%
Value 2	12.5%	2.5%	12.5%	5.0%	5.0%
Value 1	12.5%	0.0%	2.5%	7.5%	2.5%

3.4. Results for the Faculty of Economics students

And finally, the results for the students of the Faculty of Economics in Niš that depict their levels of agreement with claims from the questionary are given in *Table 10* and *Table 11*.

Table 10: Faculty of Economics – *claims I-VI*

Claim	I *profession*	II *general knowledge*	III *world views*	IV *education*	V *science*	VI *religion*
Average value	3.24	4.09	3.29	3.62	3.5	3.03
Value 4 or 5	47.1%	82.3%	55.9%	58.8%	50%	44.1%
Value 5	17.7%	44.2%	20.6%	23.5%	26.5%	23.5%
Value 4	29.4%	38.1%	35.3%	35.3%	23.5%	20.6%
Value 3	26.5%	5.9%	11.8%	26.5%	29.4%	20.6%
Value 2	11.8%	5.9%	17.6%	8.8%	14.7%	5.9%
Value 1	14.7%	5.9%	14.7%	5.9%	5.9%	29.4%

Table 11 Faculty of Economics – *claims VII-XI*

Claim	VII *art*	VIII *politics*	IX *personal life*	X *at all faculties*	XI *in all schools*
Average value	3.56	4.09	3.21	3.68	4.03
Value 4 or 5	52.9%	73.5%	52.9%	61.8%	73.5%
Value 5	35.3%	47.1%	14.7%	29.4%	47.1%
Value 4	17.6%	26.4%	38.2%	32.4%	26.4%
Value 3	26.5%	14.7%	14.7%	17.6%	14.7%
Value 2	8.8%	11.8%	17.6%	17.6%	5.9%
Value 1	11.8%	0.0%	14.7%	2.9%	5.9%

In the next chapter, we will offer some further analyses and insights, and look for a plausible interpretation of these results.

4. DISCUSSION & CONCLUSION

We will start by analyzing the results concerning the students from the Faculty of Economics in Niš.

From these results, it is evident that the average extent of agreement related to almost all claims is slightly lower than the average value of general results as well as the results for the Faculty of Education students and the students of pedagogy, but still follows the general trend of positive attitudes towards investigated claims. Exceptions are *claims VI* and *VII*, where the average grade is slightly higher than the average grade given by the pedagogy students. Regarding *claim VI* (views on religion), the average grade for students of economics is 3.03 (44.1% of them agreed to some extent with the claim, i.e. rate it with 4 or 5), and for students of pedagogy the average value is 2.85 (30% rate it with 4 or 5). It is similar with the *claim VII* (views on art). Regarding this claim, the average grade for the students of economics is 3.56 (52.9% rated with 4 or 5) and for students of pedagogy is 3.3 (45% answered with 4 or 5).

The reasons for the slightly higher percentage of students with positive attitudes towards *claims VI* and *VII* at the Faculty of Economics may be the fact that philosophy is the only course in their curriculum that deals at least a little phenomenologically with topics from art and religion. While the topics of science and society are present within the content of other courses from their curriculum, the same does not hold for the topics of religion and art. However, it should be noted that even with a slightly higher percentage of positive answers in relation to students of pedagogy, the attitudes of students of economics towards *claim VI* still do not exceed 50% of affirmative answers.

It is important to notice (*Table 10* and *11*) that *claims II*, *VIII*, and *XI* have the highest average score – which is over 4. Also, it should be emphasized that regarding *claim XI* – whether philosophy is needed by all high schools, including vocational high schools – the average grade is 4.03, and the percentage of positive ratings is 73.5%.

With the exception of *claim VI* and *claim I* (the importance of philosophy for the profession), all questions have over 50% affirmative answers. These include investigated *claims II*, *III*, *IV*, *V*, *VII*, *VIII*, *IX*, *X*, and *XI*, which concern broader education, changes in their worldview, education, science, art, society, and the impact on personal life.

From the above results, it can be inferred that students of economics perceived philosophical education primarily as a form of general education (which addresses the questions of religion, art, education, science, society, politics, and personal life) and therefore highly recommend philosophy as an obligatory subject at university and in high school. It should be noted here that the percentage of recommendations for the university level is slightly lower (61.8%), than the percentage for high schools (73.5%).

What is also apparent from these results is that students of economics do not agree in a high percentage that philosophy course taught to them is important for their profession. Namely, only 47.1% of students thought that philosophy course was useful for their profession (average rating: 3.24). These results are lower than those given in the overall results of our research (which stand at 76.8% and 3.99 – for the same two categories).

The reasons for these attitudes can probably be found in the curriculum of the Faculty of Economics in Niš, as well as in the content of the *Philosophy of economics* course. Namely, general education subjects are rarely represented at this faculty, so this subject, which was inherited from the previous curriculum, in its holistic approach and critical methodology differs significantly from the other subjects and their content. On the other

hand, the content of the given philosophy course is such that more than half of the topics are dedicated to the introduction to philosophy and history of philosophy, and only a smaller part of the topics is from the philosophy of economics. This probably gave students the impression that this course does not significantly benefit their profession (in the narrow sense)[6].

In what follows, we will analyze the results of research related to two subgroups of students: students of the Faculty of Education in Vranje and students of Pedagogy at the Faculty of Philosophy in Niš.

According to the results of our research, students of the Faculty of Education in Vranje and the Faculty of Philosophy in Niš highly value the importance of philosophy for their profession, as well as for their general education. Namely, 76.8% of students from all three faculties *agree* (grade 4) or *strongly agree* (grade 5) that attending a philosophy course is useful for their profession (*claim I*), with an average grade of 4.18 among students of the Faculty of Education, and 4.28 among students of pedagogy. Only 10% of students from all three faculties consider philosophy useless for their profession (i.e. rate the claim with 1 or 2). We consider this result, especially bearing in mind considering the content of these courses, to be extremely important, as it confirms our expectation that philosophy courses can be highly beneficial to non-philosophy students for better understanding of the special science they are engaged in, and additionally for better understanding of their vocation.

The results are even better for *claim II*. Namely, 90.7% of students from all three faculties mostly or completely agreed that the philosophy course was important for their wider education, with an average grade being 4.48 for students of the Faculty of Education, and 4.55 for students of pedagogy. Only 2.7% of all participants consider philosophy useless for their general education (i.e. had given the grade 1 or 2). We believe, these results undoubtedly confirm the exceptional importance of philosophy courses for the general education of students at all non-philosophy faculties and departments.

If we have in mind the content of philosophy courses at the Faculty of Education in Vranje and the Department of Pedagogy, we consider extremely important the results concerning *claim IV*. Namely, 76.2% of students from all three faculties generally or completely agree that attending the given philosophy course influenced their general understanding of education and upbringing, with the average grade being 4.19 among students at the Faculty of Education, and 4.13 among students from the Department of Pedagogy. Only 7.3% of students from all three faculties consider philosophy useless for their general understanding of education and upbringing, while 14.5% of them do not have an opinion on this issue. Similar to the answers to the first question, it is shown here that the point or the purpose of teaching philosophical subjects today should not be seen exclusively in their impact on the general education of students, but that it makes sense to adapt programs in philosophical subjects to the specific requirements of the faculty or department where these courses are being taught.

We have found an interesting effect that the *time distance* – or rather: looking back at the philosophy courses with more life experience and educational maturity – has on the students' attitudes. As evident in *Tables 6* and *7*, almost all ratings and percentages are higher for the

[6] The reason for this conception of the course is that the subject teacher thought that it would be difficult for students of economics to follow topics related to the philosophy of economy unless they get acquainted with the basics of philosophy in general.

subgroup of students who have attended given philosophical course some time ago. Apparently, with time passing, one's appreciation of the importance and impact of philosophy predominantly grows.

In the courses in question, the topic of education and upbringing is very closely related to the political nature of man and current social issues, which we expected to be relevant for the students' attitudes towards *claim VIII*. By far the most, as many as 82.8% of students from all three faculties generally or strongly agreed the philosophy course was useful for their better understanding of society and politics, with the average score being 4.25 among students of the Faculty of Education and 4.33 among students of pedagogy at the Faculty of Philosophy. Only 4% of students from all three faculties consider philosophy useless for their better understanding of society and politics (while 13.2% are neutral). These given results indicate the exceptional significance of philosophical education in nurturing and cultivating critical reflection on social and political topics, which is thought to be a very important dimension of modern university education since the founding of the first free university in Berlin in 1810, and which is, unfortunately, being neglected today.

In light of the above, we especially want to emphasize the students' attitudes towards *claim X*. Namely, a very high percentage of respondents, 77.5% of all students generally or strongly agree that philosophy is needed at all faculties and educational profiles (average grade: 4.09). Only 9.9% of students from all three faculties consider philosophy unnecessary at non-philosophy faculties (12.6% are neutral). The results presented here give us strong arguments to insist in the public space on a greater presence of philosophical courses at universities in Serbia.

We also consider the attitudes towards *claim XI* to be especially important for the current position of philosophy in high school education in Serbia. Namely, a significantly high percentage of respondents, 79.5% of all students, generally or strongly agree (with only 8.7% disagreeing) that philosophy courses are needed in all high schools (including vocational high schools) in Serbia, with an average grade being 4.17. The results are even better if we consider those students who have previously had high school courses in philosophy and logic. As shown in *Table 3*, the effect of high school exposure to philosophy and logic is *evident*, with even 85.2% of those students agreeing with *claim XI* (average rating 4.3). In contrast, the relevant results for students without high school philosophy (and logic) stand at: 70.3% and 3.98.

In the context of contemporary negative trends concerning the position of philosophy as a high school subject, these latest results seem particularly encouraging and give us the right to demand a stronger approach in public space in the fight for the better status of philosophy within the educational system of Serbia.

Acknowledgement: *The research had been conducted within the project Philosophical courses at the high school and university level of education: practical and theoretical questions (project number: 100/1-10-10-01). The project was supported and financed by the Faculty of Philosophy (University of Niš) and undertaken by the Department of philosophy during the 2020/21 academic year.*

REFERENCES

Bialystok, L., Norris, T., & Pinto, L. E. (2019). Teaching and learning philosophy in Ontario high schools. *Journal of Curriculum Studies, 51*(5), 678-697.

Cohen, L., Manion, L., & Morrison, K. (2008). *Research Methods in Education* (6th ed.). Routledge.

Gardner, H. (2018, July 9). Why We Should Require All Students to Take 2 Philosophy Courses. *The Chronicle of Higher Education.* https://www.chronicle.com/article/why-we-should-require-all-students-to-take-2-philosophy-courses

Likert, R. (1932). *A Technique for the Measurement of Attitudes*. Columbia University Press.

Pohoață, G. (2017). Why Study Philosophy at the Faculty of Law? *Euromentor Journal, Bucharest, VII*(2), 43-53.

Ristić Gorgiev, S., & Blagojević, B. (2021). Uticaj kurseva iz filozofije na stavove studenata. *Godišnjak za filozofiju*, *3*(1), 9-12.

Schwitzgebel, E. (2015, July 14). Cheeseburger ethics. *Aeon*. https://aeon.co/essays/how-often-do-ethics-professors-call-their-mothers

Sesardić, N. (2017, July 1). Study Philosophy to Improve Thinking – A Case of False Advertising? *Quillette*. https://quillette.com/2017/07/01/study-philosophy-improve-thinking-case-false-advertising/

Van Norden, B. (2015, March 5). Can Studying Philosophy Make You a Better Person? *Philosophy Talk*. https://www.philosophytalk.org/blog/can-studying-philosophy-make-you-better-person

VREDNOST I ZNAČAJ NASTAVE FILOZOFIJE NA NEMATIČNIM STUDIJAMA: POGLED IZ STUDENTSKE PERSPEKTIVE

Da li studenti sa drugih fakulteta i departmana smatraju filozofiju važnom za svoje obrazovanje? U ovom tekstu izlažemo rezultate empirijskog istraživanja koje smo sproveli kako bismo odgovorili na ovo pitanje. Istraživanje je obuhvatalo 151 ispitanika i baziralo se na onlajn upitniku. Naš pristup je bio usmeren na studentsku evaluaciju uloge i značaja filozofskih kurseva koje su pohađali. Rezultati ukazuju na to da studenti visoko vrednuju filozofiju ne samo kao korisnu za svoje opšte već i profesionalno obrazovanje. Prema nama, ovi rezultati pružaju jake argumente za suprotstavljanje trendu umanjivanja i sklanjanja filozofskog obrazovanja iz srednjih škola i fakulteta u Republici Srbiji.

Ključne reči: *filozofija, obrazovanje, studijski program, studentski stavovi, obrazovni sistem Srbije*

FACTA UNIVERSITATIS
Series: **Teaching, Learning and Teacher Education** Vol. 5, Nº2, 2021, pp. 167 - 178
https://doi.org/10.22190/FUTLTE211104013P

Review article

DIGITAL TOOLS IN MUSEUM LEARNING – A LITERATURE REVIEW FROM 2000 TO 2020

UDC 37::069::316.774; 069.12:37.036; 004.738.54:371.64/.69

Dragana Pavlović

Faculty of Philosophy, University of Niš, Serbia

Abstract. *This paper discusses the relationship between new technologies and learning in museums, as a significant issue that is increasingly occupying the attention of many researchers, especially in developed countries. The connection between digital technologies and modernization of the learning process in museums is pointed out, which is more and more present, and is becoming an integral part of formal education. Museums, as institutions for the preservation of tradition and culture, are increasingly using digital media in their practice, as intermediaries in the development of a system of culture and tradition knowledge among the younger generations. The aim of this paper is to provide a chronological overview of new technologies used for learning in museums, based on the review and analysis of selected literature. For the purposes of this paper, all research studies are classified into four time frames in which the application of digital technologies in learning in museums can be monitored, from the first used tools to the appearance of virtual museums. The results of the research show that there is a connection between the development of new digital technologies and learning in museums, ie that the learning process in museums is modernized and changed in accordance with the development of modern digital tools. The paper concludes that today, learning in museums goes beyond existing traditional models, based on visits, lending of exhibits and lessons in museums and is increasingly becoming a modern learning process based on digital technologies.*

Key words: *digital technologies, museums, learning, digital tools, modernization*

1. INTRODUCTION

During the past several decades there have been significant changes in the field of education and upbringing, especially in the field of learning culture. Unlike previous periods when the dominant paradigm was reflected in a mechanistic approach to learning,

Received November 04, 2021/Accepted December 01, 2021
Corresponding author: Dragana Pavlović
Faculty of Philosophy, University of Niš, Ćirila i Metodija 2, 18000 Niš, Serbia
Phone: +381 18 514 312 • E-mail: dragana.pavlovic@filfak.ni.ac.rs

new approaches such as constructivism point to the need of establishing a system of knowledge that would primarily be flexible and founded on principles of transparency, and harmonized with goals and needs of modern education. In that respect, a significant place in the process of learning is taken by formal and informal contexts, as well as modern digital technologies which open new perspectives in the field of education. A large number of authors indicate that using digital technologies improves the quality of learning by bringing forth new characteristics, that learning motivation is significantly increased, as well as that learning efficiency is at a higher level (Cahill et al., 2011; Bayne, Ross, & Williamson, 2009; Hsi, 2008). Accordingly, digital technologies increasingly become an integral part of the learning process in schools as well as in other institutions and informal learning contexts. Consequently, learning in museums by resorting to modern digital technologies becomes an inevitable component part of formal education in all developed countries.

It has long been known that museum learning is of great importance, as well as that museums increasingly recognise teachers and students (both in primary and secondary schools) as their prevalent audience. With modern digital resources, museum learning surpasses traditional models (visits, borrowing of exhibits, lessons in museums, and narratives at exhibitions) and it becomes transformed into a modern learning process based on digital technologies which find their unique expression in the development of virtual museums.

In that context, the subject of this theoretical research is the relationship between new technologies and museum learning based on reviews and analyses of relevant research papers. The aim of this research is to offer a chronological overview of new technologies used for the purpose of museum learning. According to the set goals a general hypothesis has been defined which assumes that museum learning is going through changes when it comes to using digital tools, depending on the development of new technologies.

In order to test the hypotheses, the paper offers an overview of relevant papers dealing with the application of different digital tools in museum learning which led us to the final considerations.

2. MUSEUM LEARNING

In pedagogical theory and practice, museum learning is an issue that arouses the interest of numerous authors who have been dealing with various aspects of museum learning and its organization for many years (Andre, Durksen, & Volman, 2017; Milutinović, Gajić, & Klemenović, 2008; Hein, 1998). When observed through a historical prism, one can assert that museum learning has a series of specificities among which one can single out the possibility of introducing children to real-life objects, thus offering them an opportunity to experience a contextual learning process, through direct contact with objects of knowledge (Milutinović, 2019). In that respect, the practice of museum learning finds its theoretical basis in the constructivist theory, which emphasizes an active positioning of students in the process of learning, and the creation, i.e. construction of a system of knowledge according to a child´s previous experiences and social context. Accordingly, the author Milutinović emphasizes that "a student´s personal activity is of key importance for the process of learning" (Milutinović, 2019, p. 55). Museums are informal learning environments which makes the process of learning quite different than that in formal institutions such as schools. It is believed that

museum learning is self-directed, voluntary, and personal, i.e. it does not depend on external authorities such as teachers. Such an approach provides children with an opportunity to learn in museums according to their own learning styles and to make progress according to their own pace and interests. An important characteristic of museum learning is focusing on the process of learning, rather than on learning outcomes. According to J. Milutinović "key elements of museum learning comprise the creation of a link between the known and the unknown, acquiring an authentic experience by observing and manipulating real objects or experiencing real phenomena" (Milutinović, 2010, p. 220).

During the past two decades museum learning has significantly changed by introducing new technologies, primarily digital ones, which created optimal conditions for modernizing the process of learning in these institutions (Parry, 2007; Morita, 2002). The use of digital technologies in museums has developed in several directions, starting from cataloging and easier search of content, over wireless devices and recorded explanations, all the way to virtual museums and virtual reality which enables virtual representations of exhibits as an addition to the physical museum context. It is believed that museums, lifelong learning, and digital technologies share the same idiosyncrasies because the focus is placed on learning by using objects instead of learning about objects, as well as on strategies for researching and discovering information instead of transferring the necessary information and data. Nowadays, the capacities of digital technologies offer various learning possibilities to museum visitors, primarily an interactive approach to obtaining various information in accordance with their interests and knowledge. Hence, in museums, one encounters a model of learning "for creating digital contents", rather than a model of "offering information" (Loran, 2005). In the past several years the application of such an approach is noticeable in the practice of leading world museums, whereby one can observe an incredible increase in the use of digital learning technologies, both on-site, in the form of digital interactives, and online, by creating increasingly popular websites. It is believed that the use of digital tools in museums has significantly affected the growth in the number of visitors because even during 2002 the number of online visitors to a large number of museum websites was larger than the number of visitors on the spot (Hawkey, 2004).

The use of digital tools in museums introduced new challenges for teachers and curators, as well as for programmers when it comes to creating suitable applications which would make museum learning more efficient and active. With the increase of Internet speed and the development of new digital tools, museum learning becomes increasingly popular, while museums intend to expand their work with the audience and achieve new levels of communication. In that context, one can expect changes in and development of virtual learning environment in order to efficiently use museum platforms and include visitors from all over the world (Moore, 2015).

3. Methodological Approach

The subject of this theoretical research is a study of the impact of new technologies on museum learning by performing an overview and analysis of relevant research papers. According to the defined topic, the main research goal is to offer a chronological overview of new technologies used for the purpose of museum learning. Consequently, research tasks related to an overview and analysis of relevant research papers which study the use of new technologies in the process of museum learning. Thus, one can define the

following research hypotheses: **The general hypothesis** assumes that there are changes in museum learning produced by the development of new technologies. **Special hypotheses** are as follows: (1) It is assumed that in relevant research studies one can single out chronological periods characterized by the application of new technologies in museum learning (2) It is assumed that museum learning changes according to the development of digital technologies, from applying initial digital tools to virtual museums.

The first research step was searching and selecting relevant research papers, while some basic selection criteria were as follows (a) that papers provide the description of new technologies in museum learning; (b) that papers provide a definition or a description of museum learning; (c) that papers are oriented towards younger visitors, children, and youth. For the purpose of this paper, the authors searched through Google Scholar by using the phrase *digital learning in museums*. After analyzing the selected papers some chronological regularities were noticed. Hence, all papers were sorted to encompass four periods: the first period between 2000 and 2005, the second period between 2006 and 2010, the third period between 2011 and 2015, and the fourth period between 2016 and 2020. This research resorted to papers published in English, bearing in mind that by searching the same base one could not encounter papers published in Serbian. A literature search for related articles was conducted during November 2020.

4. RESEARCH OVERVIEW – CHRONOLOGICAL APPROACH

4.1. The first period: 2000 – 2005

In this period one can already encounter ideas that speak in favour of various potentials of digital technologies in museum learning (Paris, 2002; Heath & vom Lehn 2002; Hamma, 2004). These are early phases of the development of digital systems for wide use, including museum use. Thus, these papers are mostly focused on their design and potentials, and rarely on attitudes towards their use. In one of the first papers published on this topic in 2001 (Spasojevic & Kindberg, 2001), the authors pointed to various potentials of digital technologies for museum learning. The authors described the use of wirelessly connected handheld devices in the Museum of Science with the aim of inquiring into the use of technologies to connect the physical and virtual world. Namely, the museum exhibits were enriched by web pages that could be accessed through wireless devices provided to visitors at the entrance. The network-based computer infrastructure provided museum visitors with extended museum experience so it was easier to plan a visit, which created an impact of exhibits and other educational materials on learning activities (Spasojevic & Kindberg, 2001).

A significant advantage of new technologies in museum learning is interactivity which is, according to some authors (Heath & vom Lehn, 2002), a component part of a wide specter of digital tools and technologies which can be used in museums. Sophisticated information systems enable complex forms of interactions between users and exhibits which creates a favourable interactive learning environment. This study confirms that in this period one still lacks concrete results which would inquire into the impact of digital technologies on museum learning, but that there is a clear understanding of such an impact, as well as that further research is necessary.

During 2004 there are numerous research papers that deal with various potentials of digital technologies in museum learning. Authors Prosser and Eddisford (2004) researched into attitudes of children and adults towards virtual representations of museum

objects. By resorting to interviews in this qualitative study authors obtained the data stating that by applying information and communication technologies in museums one can achieve interactions that could contribute to added-value learning. Namely, with these technologies, one can expand and improve their museum experience and this added value signifies that digital exhibits are not an end in itself, but a means to dive deeper into the issue, i.e. to extend the understanding of the past by making the users familiar with the use of certain objects. The paper analyses the examples of a virtual theatre orchestra from Burma and a project from the Victorian era. Authors state that well-thought-out learning activities provide a framework for a better understanding because they add a personal dimension by extending the interaction with exhibits as objects of knowledge. Users are given an opportunity to experience the context in which exhibits were initially used as well as the feelings which cannot be easily aroused in a real-life museum (Prosser, Eddisford, 2004, p. 295).

During 2004 one can encounter papers that deal with an enormous increase in the use of digital technologies in museum learning, scientific centres, galleries, etc. This use is reflected in the form of digital interactions, both on the spot and online, by creating increasingly popular websites (Hawkey, 2004). In that context, it is believed that museums have higher potentials to plan to learn through the following:

- The opportunity to organize learning as a constructive dialogue, not as a passive transfer of information,
- Assuming the role of a privileged participant, and not that of an expert,
- Careful assessment of the significance of a formal curriculum (and its evaluation process)
- Facilitating lifelong learning by creating a learning environment dominated by the principle of free choice allows for different approaches (Hawkey, 2004, p. 2).

4.2. The second period: 2006 – 2010

In the second period, there are papers about new computer paradigms which allow the computers to become installed in exhibits and in new environments in different ways. It is recognized that the development of software technologies could create new possibilities to use computers to improve museum learning. Authors Hall and Bannon (Hall & Bannon, 2006) presented the results of a design process which aimed at researching interactive techniques using ubiquitous computer technology to stimulate active participation, inclusion, and learning of children who visited the exhibition "Re-searching the past" at the Hunt Museum, in Limerick, Ireland. The research included 326 students (aged between 9 and 12). Based on the research results authors created guidelines for modernization of museum learning which included 12 criteria: that there is a narrative structure, that the showroom is attractive, that it includes visitors´ contribution, that the experience is integrated through computers, that it maintains curiosity, that it contributes to formal education, that it supports learning through senses, that it facilitates individual and group interaction, that it supports learning by discovery, that it supports different types of visits, that it includes different activities and that it secures regular and timely intervention (Hall & Bannon, 2006, p. 7).

Apart from new computer technologies, this is the period when mobile technologies are increasingly used and developed, and so it is understandable that there are papers that deal with their use in museums. Authors Gammon and Burch (Gammon & Burch, 2008) point out that the key to efficient use of mobile technologies for museum learning is a detailed understanding of the needs, wishes, expectations, and behaviours of visitors

because with all their potentials mobile technologies also introduce a large number of difficulties. The greatest potential of these technologies is supporting different learning styles, providing authentic experiences, providing the possibility of connecting visitors through different forms and formats, which is especially noticeable in digital games which are interactively connected with museum exhibits and other visitors. The possibility of digital recording through mobile devices is especially important for school children because it is established that activities performed in the school environment after the visit to the museum are especially important for sustainable learning (Gammon & Burch, 2008, p. 37). The advantage of mobile technologies is in a personalized interpretation because users adjusted their mobile devices to their needs, unlike museum devices which are the same for all visitors.

In this period, one can notice the use of social media for the purposes of museum learning because social media as we know them today appeared at the beginning of the new millennium. Social media have the potential to encourage participation in the learning sector which was a one-way process in the past, as well as a transition from knowledge transfer to engagement and participation of the audience. Social networking can play a central part in learning in informal environments such as museums, libraries, and galleries. Social media primarily offer a way of communication to young people, as well as a learning space that was not available earlier in informal environments. In the paper titled "The impact of social media on informal learning in museums" (Russo, Watkins, & Groundwater-Smith, 2009) authors consider transformations in digital literacy and processes through which students can connect with knowledge in informal learning environments and become active cultural participants. Social media (for instance, My Space, Facebook), various blogs, podcasts, and wikis impact learning transformation by securing two-way communication and informal content. This is best illustrated by the example of the MoMA museum in New York where visitors can access comments and podcasts created by other visitors through the ArtMobs3 platform, and not merely through official content created by the museum (Russo, Watkins, & Groundwater-Smith, 2009, p. 159).

More recent research studies in this period indicate the possibility of applying navigation algorithms that could provide efficient results in museum learning. In that sense, such systems are described to enable the organization of visits so that every visitor can go through an optimal experience (Chiou et al., 2010). The research was realized in Taiwan in the museum of butterflies and the results indicate that navigation systems have high learning potentials. In this period, more new technologies are mentioned such as RFID (radio frequency identification), the use of which was described by authors Huang, Chang, and Sandnes (2010).

4.3. The third period: 2011 – 2015

The third period is marked by new developments in the field of digital technologies. Even though Web 2.0 was created in October 2004, its wider application in all fields started in 2010 (Hosch, 2017), so it is understandable that the first papers about museum learning by resorting to Web 2.0 appear in this period. Author Bianca Bocatius (Bocatius, 2011) presented in her paper an analysis of the use of Web 2.0 technologies on the examples of the Jewish Museum in Berlin, the Staedel Museum in Frankfurt, as well as the Brooklyn Museum. Based on the comparison of online services offered in these museums it is concluded that Web 2.0 offers a series of advantages for online learning: it ensures public access to cultural heritage, it allows the visitors to prepare and individually

review their visits, it offers the possibility to participate, communicate and have an active dialogue, it connects and shares the education online and on the spot and it guarantees a communicative and participative relationship between museums and their visitors on the spot and online. The author concludes that Web 2.0 is a cultural and social phenomenon, and not merely a matter of technical development and that museums are increasingly aware of it (Bocatius, 2011).

In this period one is a witness to a growing interest in applying computer games in museums due to an increase in their potentials for learning and education. A paper by Greek authors (Yiannoutsou & Avouris, 2012) researches aspects of museum learning through mobile games, i.e. the games usually played by groups of players by using mobile devices which enable interaction with space and exhibits as well as physical mobility of players. The most frequent model followed by these games is "Treasure hunt", whereby visitors who reach certain exhibits need to provide a correct answer or solve a task to receive guidelines to continue with the game. It is believed that they result in engaging visitors, boosting motivation, and learning about museum exhibitions (Yiannoutsou & Avouris, 2012). The other type of popular games includes narratives and role-playing. Such is, for instance, "Mysteries at the Museum" whereby visitors are guided through a certain story by role-playing thus having an opportunity to deal with details regarding some exhibits and gain a wider knowledge about more exhibits (by combining the depth and width). Authors analysed this game at the Boston Museum of Science and they pointed to various positive learning effects in cases when the plot of the story mentioned in the game is well devised and substantial (Yiannoutsou & Avouris, 2012, p. 80).

Since 2010 the Smithsonian Museum through its Center for Learning and Digital Approach conducted a series of research projects in order to grasp how teachers and their students use museum resources to learn. Authors Milligan and Wadman (2015) analysed the results of five independent studies and offered recommendations for the best practical use of a digital approach in museum learning. Based on teachers´ requirements it is concluded that the most desirable contents on digital platforms for museum learning are either interdisciplinary or multidisciplinary ones, as well as those contents which can be integrated with students´ interests and with established teaching standards and those which can be adjusted to different styles (such as different presentation formats, sharing and exchange). Furthermore, teachers prefer platforms that unite the content from different sources (for instance, not merely in one museum) and which possess better tools for search and presentation (Milligan & Wadman, 2015).

Similarly, in a study conducted at the Museum of Art in Northern Carolina authors established the value of modern pedagogical models which implement new technologies in museum learning. Namely, it is about a programme that is a part of a distance learning initiative that uses the flipped classroom model to acquire knowledge related to museum contents. Based on qualitative and quantitative data provided by secondary school students the paper concludes that the teaching process designed in this way increases learning outcomes, creates emotional bonds, and encourages positive museum experiences for students. Within this study, apart from described experiences, there are also recommendations for the design of future flipped museum programmes (Harrell & Kotecki, 2015).

4.4. The fourth period: 2016 – 2020

During this period, one can observe a conspicuous growth in research studies dealing with learning through digital technologies in museums. Such is, for instance, a study conducted in Saudi Arabia, which investigated the attitudes of primary school students regarding the use of interactive virtual museums for the purpose of developing the knowledge of cultural heritage (Ismaeel & Al-Abdullatif, 2016). The research provided information that the insight into the design and use of virtual museum interactive learning applications raises students´ awareness of the national cultural heritage. Study results are precious for future designs of education policies as well as for curriculum makers as an important component that forms the identity of the young through the process of education in academic institutions. The findings of this study point out the significance of education value provided by virtual museums. They indicate that such museums strengthen the process of education as a new source that complements the curriculum, works on expanding resources of traditional educational institutions, and offers students the knowledge of culture in the context of different activities. It is concluded that virtual museums can take an important place in the future of education, especially when it comes to content that relates to culture and tradition (Ismaeel & Al-Abdullatif, 2016, p. 38).

In this last period, one also encounters the first papers resorting to meta-analysis to show the systematization and a cross-section of previous knowledge from studies that relate to digital museum learning. One of those is the paper titled *Museums as avenues of learning for children: a decade of research* by authors Andre, Durksen, and Volman from 2017. In the section dealing with digital technologies at the museum, it was noted that interactivity is increasingly observed as a key element in children´s experiences in the museum context. The authors established that dominant activities were interactive exhibitions with the help of technology and practical activities led by free or limited choices, whereby the impact of technologies was of key importance for children's interaction with museum exhibits. The focus was placed on the application of the system of mobile guidance and interactive games (Andre, Durksen, & Volman, 2017).

In this period, virtual museums become especially popular, primarily because of a wider use conditioned by the increasing availability of this technology. Apart from availability, the power of computers enabled the use of virtual characters – avatars for a deeper experience of a virtual visit to the museum (Carrozzino et al. 2018). Bearing in mind a tremendous learning potential, working with these technologies is complex and it requires the inclusion of a large number of experts: curators, creative individuals, programmers, as well as pedagogues who have to work together to evolve towards a more efficient connection between visitors, collections and digital applications, and for the purpose of more efficient learning (Pietroni, 2019). That virtual museums can significantly contribute to the development of the learning process in museums was also confirmed by the paper of author Linda Daniela (2020) who analysed virtual museum visits, assessing them from the perspective of learning. To that purpose, the author analysed 36 virtual museum applications in total and it was confirmed that in the previous practice the main focus when creating virtual museums was placed on information architecture, while less attention was dedicated to the educational value of the material. In her conclusion, the author points out the need to change the existing principles of designing virtual museums towards an increasing engagement of the educational dimension by consulting teachers and pedagogues (Daniela, 2020, p. 17).

In this period there are papers that write about the potentials of augmented reality systems – AR. In museum learning, the existing systems have three main parts – public regime (for adults), children´s regime (for primary and secondary students), and environmental management platform (for employees at the museum) and they function on the principles of problem-based learning (Lin et al., 2019). The museum staff can use the platform to manage the environment to easily change the content presented in the application, and users can resort to their smartphones to establish a direct connection and experience museum learning. Regimes for adults and children designed for this system generated different learning experiences according to students´ individual needs. They motivate students, activate interests by using interesting problems and advice or attitudes of other users with the aim of integration into the museum educational environment. This system aims to offer users a large number and width of perspectives through the process of learning in the museum environment. In the future, this system can be applied to various fields of informal education, and it will be possible to implement it in teaching methods at schools through museum visits and theme exhibitions (Lin et al., 2019, p. 546).

A special technological novelty that begins to be recognized in this period when it comes to museum learning digital technologies is virtual reality – VR to show museum exhibits. The difference between virtual and augmented reality is in the fact that VR creates a completely new and separate experience, while AR represents a virtual addition to physical reality. In the VR experience, one explores a completely new world, while in the AR experience one explores the existing, though improved, reality. One needs to single out the combination of computer games and virtual reality environment which can improve learning and training methodology, which is considered to have a promising future strengthened by the wide availability of software and hardware tools for VR environment on the market. Instead of being passive observers the users in those environments are included as active participants allowing for the development of learning paradigms based on research (Checa & Bustillo, 2020). Ćosović and Brkić suggest the application of 3D technologies for a wider approach to exhibition collections with the aim of a more attractive and interesting presentation of the cultural heritage (Ćosović & Brkić, 2020). Namely, they suggest game-based learning as a manner of active learning at the museum. It is believed that presenting cultural heritage increasingly contributes to raising awareness and motivating museum users to learn and educate themselves. According to these authors´ assertions material cultural heritage can be present in virtual worlds, and so 3D technologies are becoming increasingly popular and significant in game-based museum learning. In the paper, the authors pointed out some advantages and disadvantages when using new technologies, as well as their importance for the process of learning in a museum environment (Ćosović & Brkić, 2020).

5. Conclusion

The application of new technologies in museum learning during the past decade is a subject of interest of a larger number of theoreticians of different professions and profiles. It is noticeable that with the development of a larger number of digital tools they become increasingly present in museum learning so that one can assert that there is a connection between the development of digital technologies and their application in museum learning, i.e. that periods in the development of digital technologies are synchronized

with the application of different technological devices for museum learning. By gaining insight into relevant research papers one could reach the conclusion that museum learning follows the development of new technologies, at least in developed countries. In that context, it is a logical sequence of events that there are changes in museum learning caused by the development of modern technologies, which confirms the general research hypothesis.

Based on the overview and analysis of research papers one can assert that there are four periods that chronologically follow the development of new technologies and changes in museum learning, which confirms the first special hypothesis. Namely, for the purpose of this paper, we defined four periods in which one can notice changes in museum learning through the use of digital technologies (the first period 2000/2005; the second period 2006/2010; the third period 2011/2015; and the fourth period 2016/2020).

The analysis of research papers confirms the second hypothesis stating that the process of learning in museums changes according to the application of new technologies which increasingly become an integral part of museum learning. Namely, based on the chronological representation one can conclude that in the beginning, from 2000 to 2005, museums mostly resorted to digital and audio recorders and websites; the second period is characterized by the introduction of RFID technology, improvement of previous tools, the introduction of social media to exchange educational information in museums and first mobile experiences; in the third period one encounters Web 2.0, computer games and the development of a wider specter of mobile services for museum learning; while in the fourth period, previous tools become improved and virtual museums become predominant. Furthermore, one can notice that in the beginning digital tools were applied in a modest way and to a much lesser extent. Unlike that, the last period is characterized by their larger presence and availability, especially when it comes to virtual museums.

The knowledge of applying digital technologies in museum learning, especially their chronology, as well as the potential of virtual museums, constitute the contribution of this paper which can be used primarily by teachers in primary and secondary education for the purpose of modernizing their teaching process, as well as to motivate students to learn about historical and cultural values and development of positive attitudes towards the preservation of tradition and culture. The limitations of this paper relate primarily to a relatively modest number of presented research studies that consider the relationship between new technologies and museum learning.

If one bears in mind the mentioned contributions and limitations, this paper can be a good starting point for future research into the impact of digital technologies on changes in museum learning.

REFERENCES

Andre, L., Durksen, T., & Volman, L. M. (2017). Museums as avenues of learning for children: a decade of research. *Learning Environ Res*, *20*, 47-76. https://doi.org/10.1007/s10984-016-9222-9

Barton, J. (2005). Digital libraries, virtual museums: same difference?. *Library Review*, *54*(3), 149-154. https://doi.org/10.1108/00242530510588908

Bayne, S., Ross, J., & Williamson, Z. (2009). Objects, subjects, bits and bytes: learning from the digital collections of the National Museums. *Museum and society*, *7*(2), 110-124.

Bocatius, B. (2011). Education and learning in Museums 2.0 – German Museums and the Web 2.0. *Kunstgeschichte*, 1-10. https://www.kunstgeschichte-ejournal.net/166/

Cahill, C., Kuhn, A., Schmoll, S., Lo, W. T., McNally, B., & Quintana, C. (2011). Mobile learning in museums: how mobile supports for learning influence student behavior. In *Proceedings of the 10th International Conference on Interaction Design and Children* (pp. 21-28). https://doi.org/10.1145/1999030.1999033

Carrozzino, M., Colombo, M., Tecchia, F., Evangelista, C., & Bergamasco, M. (2018). Comparing different storytelling approaches for virtual guides in digital immersive museums. In *International Conference on Augmented Reality, Virtual Reality and Computer Graphics* (pp. 292-302). Cham: Springer.

Checa, D., & Bustillo, A. (2020). A review of immersive virtual reality serious games to enhance learning and training. *Multimedia Tools and Applications*, *79*(9), 5501-5527. https://doi.org/10.1007/s11042-019-08348-9

Chiou, C. K., Tseng, J. C., Hwang, G. J., & Heller, S. (2010). An adaptive navigation support system for conducting context-aware ubiquitous learning in museums. *Computers & Education*, *55*(2), 834-845. https://doi.org/10.1016/j.compedu.2010.03.015

Chou, L. D., Lee, C. C., Lee, M. Y., & Chang, C. Y. (2004). A tour guide system for mobile learning in museums. In *The 2nd IEEE International Workshop on Wireless and Mobile Technologies in Education* (pp. 195-196). IEEE.

Ćosović, M., & Brkić, B. R. (2020). Game-based learning in museums – cultural heritage applications. *Information*, *11*(1), 22. https://doi.org/10.3390/info11010022

Daniela, L. (2020). Virtual Museums as Learning Agents. *Sustainability*, *12*(7), 2698. https://doi.org/10.3390/su12072698

Gammon, B., & Burch, A. (2008). Designing mobile digital experiences. In L. Tallon, K. Walker (Eds), *Digital technologies and the museum experience: Handheld guides and other media* (pp. 35-62). AltaMira Press.

Hall, T., & Bannon, L. (2006). Designing ubiquitous computing to enhance children's learning in museums. *Journal of Computer Assisted Learning*, *22*(4), 231-243. https://doi.org/10.1111/j.1365-2729.2006.00177.x

Hamma, K. (2004). The role of museums in online teaching, learning, and research. *First Monday*, *9*(3-5). https://doi.org/10.5210/fm.v9i5.1146

Harrell, M., & Kotecki, E. (2015). The Flipped Museum: Leveraging Technology to Deepen Learning. *Journal of Museum Education*, *40*(2), 119-130. https://doi.org/10.1179/1059865015Z.00000000088

Hawkey, R. (2004). *Learning with digital technologies in museums, science centres and galleries*. https://www.nfer.ac.uk/publications/FUTL70/FUTL70.pdf

Heath, C., & vom Lehn, D. (2002). Misconstruing Interactivity. *Interactive Learning in Museums of Art and Design*. http://media.vam.ac.uk/media/documents/legacy_documents/file_upload/5763_file.pdf.

Hein, G. E. (1998). *Learning in the Museum*. New York: Routledge.

Hosch, L. W. (2017). *Web 2.0*. https://www.britannica.com/topic/Web-20

Hsi, S. (2008). Information technologies for informal learning in museums and out-of-school settings. In *International handbook of information technology in primary and secondary education* (pp. 891-899). Boston, MA: Springer.

Huang, Y. P., Chang, Y. T., & Sandnes, F. E. (2010). Experiences with RFID-based interactive learning in museums. *International Journal of Autonomous and Adaptive Communications Systems*, *3*(1), 59-74. https://doi.org/10.1504/IJAACS.2010.030312

Ismaeel, D. A., & Al-Abdullatif, A. M. (2016). The Impact of an Interactive Virtual Museum on Students' Attitudes Toward Cultural Heritage Education in the Region of Al Hassa, Saudi Arabia. *International Journal of Emerging Technologies in Learning*, *11*(4), 32-39. https://doi.org/10.399I/ijet.v11i04.5300

Lin, Y. H., Chang, S. H., Huang, T. C., Lin, Y. T., & Chen, Y. J. (2019). Augmented Reality Enhanced Ubiquitous-Learning in Museum. *International Journal of Information and Education Technology*, *9*(8), 543-547. https://doi.org/10.18178/ijiet.2019.9.8.1263

Loran, M. (2005). Use of websites to increase access and develop audiences in museums: experiences in British national museums. *Digithum*, *7*, 23-8. https://doi.org/10.7238/D.V0I7.540

Milligan, D., & Wadman, M. (2015). From physical to digital: Recent research into the discovery, analysis, and use of museums resources by classroom educators and students. In: *Museums and the Web MW2015*. https://mw2015.museumsandtheweb.com/paper/from-physical-to-digital-recent-research-into-the-discovery-analysis-and-use-of-museums-resources-by-classroom-educators-and-students/

Milutinović, J. (2019). Savremene tendencije u obrazovanju – kritička pedagoška praksa u muzeju. *Teme*, *43*(1), 53-68. https://doi.org/10.22190/TEME181227009M

Milutinović, J. (2010). Učenje u muzeju. *Povijest u nastavi*, *2*(16), 217-229.

Milutinović, J., Gajić, O., & Klemenović, J. (2008). Muzeji kao centri učenja: Umetnička dela u funkciji razvoja percepcije i dečjeg stvaralaštva. U B. Kulić & Đ. Randaco (ur.) *Oseti umetnost: intekulturalno iskustvo u muzejskoj edukaciji* (pp. 119–265). Novi Sad: Galerija Matice srpske.

Moore, C. (2015). Embracing Change: Museum Educators in the Digital Age. *Journal of Museum Education*, *40*(2), 141-146. https://doi.org/10.1179/1059865015Z.00000000090

Morita, T. (2002). Modernization of Libraries and Museums: Can Computers support the Citizens' Right of Learning?. *Senri Ethnological Reports*, *28*, 21-30.
Paris, S. G. (Ed.). (2002). *Perspectives on object-centered learning in museums*. Abingdon: Routledge.
Parry, R. (2007). *Recoding the museum: Digital heritage and the technologies of change*. Abingdon: Routledge.
Pietroni, E. (2019). Experience Design, Virtual Reality and Media Hybridization for the Digital Communication Inside Museums. *Applied Systems Innovationm*, *2*, 1-35. doi: 10.3390/asi2040035
Prosser, D., & Eddisford, S. (2004). Virtual museum learning. *Information Technology in Childhood Education Annual*, *2004*(1), 281-297.
Russo, A., Watkins, J., & Groundwater-Smith, S. (2009). The impact of social media on informal learning in museums. *Educational Media International*, *46*(2), 153-166. https://doi.org/10.1080/09523980902933532.
Schweibenz, W. (2004). The Development of Virtual Museums. *ICOM News*. http://icom.museum/fileadmin/user_upload/pdf/ICOM_News/2004-3/ENG/p3_2004-3.pdf
Spasojevic, M., & Kindberg, T. (2001). *A Study of an Augmented Museum Experience.* Palo Alto: Hewlett Packard.
Yiannoutsou, N., & Avouris, N. (2012). Mobile games in Museums: from learning through game play to learning through game design. *ICOM Education*, *23*, 79-86.

DIGITALNI ALATI U MUZEJSKOM UČENJU – PREGLED LITERATURE OD 2000 DO 2020 GODINE

U radu se razmatra odnos novih tehnologija i učenja u muzejima, kao značajno pitanje koje sve više okupira pažnju mnogih istraživača, posebno u razvijenim zemljama. Ukazuje se na povezanost digitalnih tehnologija i modernizaciju procesa učenja u muzejima, koja je sve prisutnija i danas postaje sastavni deo formalnog obrazovanja. Muzeji, kao institucije za očuvanje tradicije i kulture sve više u svojoj praksi koriste digitalne medije, kao posrednike u razvoju sistema znanja o kulturi i tradiciji kod mladih generacija. Cilj ovog rada je da se pruži hronološki pregled novih tehnologija koje se koriste za učenje u muzejima, na osnovu prikaza i analize selektovane literature. Za potrebe ovog rada sve istraživačke studije su razvrstane u četiri vremenska okvira u kojima se može pratiti primena digitalnih tehnologija u učenju u muzejima od prvih korišćenih alata, pa sve do pojave virtuelnih muzeja. Rezultati istraživanja pokazuju da postoji povezanost između razvoja novih digitalnih tehnologija i učenja u muzejima, odnosno da se proces učenja u muzejima modernizuje i menja u skladu sa razvojem savremenih digitalnih alata. U radu se zaključuje da danas, učenje u muzejima prevazilazi postojeće tradicionalne modele, zasnovane na posetama, pozajmljivanju eksponata i lekcijama u muzeijima i sve više postaje moderan proces učenja baziran na digitalnim tehnologijama.

Ključne reči: *digitalne tehnologije, muzeji, učenje, digitalni alati, modernizacija*.

FACTA UNIVERSITATIS
Series: **Teaching, Learning and Teacher Education** Vol. 5, Nº2, 2021, pp. 179 - 190
https://doi.org/10.22190/FUTLTE211104014L

Review article

THE IMPACT OF SPORT ON THE HEALTH AND IMPROVEMENT OF MENTAL HYGIENE AMONG THE STUDENT POPULATION – A SYSTEMATIC REVIEW

UDC 796:371.3; 791.01:159.913; 613.71/.74-057.875

Ana Lilić, Emilija Petković, Stefan Đorđević, Miljan Hadžović

Faculty of Sport and Physical Education, University of Niš, Serbia

Abstract. *Due to its appeal, sport has always been in the service of various social fields, both in a negative and a positive sense. A sedentary lifestyle has become noticeably dominant among students. The most frequent external barrier for taking part in physical activities among the student population is a lack of time due to their schedules or due to familial or other obligations. The aim of the research was to use a critical analysis of existing studies and a generalization of the results of all the analysed papers which studied the effectiveness of sport to show the effects of sport and physical activity (PA) on the improvement of the mental hygiene among the student population. The literature was compiled by searching the following databases: Medline, Google Scholar, Web of Science and PubMed. The database search resulted in 198 papers of which 15 were included in the systematic review. The participants included in the systematic review were adults who attended class and were university students. An awareness of health and the positive effects of PA can be a decisive factor for motivating people to become physically more active. PA can help in the prevention and continuation of psychological wellbeing.*

Key words: *sedentary lifestyle, depression, suicidal behavior, exercise*

1. INTRODUCTION

The World Health Organization [WHO] defined health in 2006 as an "a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity". As a reminder, physical education (PE), sport and recreation are three segments of the system of PE (Živanović, Ranđelović, Stanković, & Pavlović, 2010). Živanović et al., (2010) define the division of sport based on the aim behind taking part in physical exercise and competition. Based on this criterion, sport can be divided into: school sport, registered sport (amateur, elite, professional), and recreational sport. Taking

Received November 04, 2021/Accepted December 24, 2021
Corresponding author: Ana Lilić
Faculty of Sport and Physical Education, University of Niš, Čarnojevića 10A, 18000 Niš, Serbia
Phone: +381 18 510 900 • E-mail: analilic93@gmail.com

part in organized forms of sport can help shape a child's personality, and his or her moral and social characteristics. The sociology of sport studies the impact of society on sport, but also the reverse, the impact of sport on society, and thus the issue of context and social conditioning of sport (Radenović, 2015). Due to its appeal, sport has always been in the service of various social fields, both in a positive and in a negative sense. Sport is an influential means for the development of personality, which directly creates a positive effect on socialization, whereby each individual in interaction with the social environment learns, develops, and shapes socially relevant models of behaviour (Ban Vlahek, 2019). As such, with its educational impact it affects changes on an individual as a social being by realizing the process of socialization, which is why individuals who take part in some form of sports activities distance themselves from socially undesirable models of behaviour (Bjelajac, 2006; Busija, 2017). Even though it may be the most popular and most attractive, and occupies a central position in modern society, sport certainly does not include all the needs and potential of human PE, just like it does not attract the largest population in the domain of PE. This is why it should not be given an advantage over PE and recreation, as other equally important areas of physical culture (Radenović, 2015). The WHO states that regular physical activity (PA) requires almost daily exercise, at a minimum of three times a week, to achieve positive effects on health in the broadest sense of the word. Almost 2/3 of the population are insufficiently physically active (Trost, Owen, Bauman, Sallis, & Brown, 2002). Health habits during youth can be reflected on health status and risk factors for numerous illnesses during adulthood (Tirodimos, Georgouvia, Savvala, Karanika, & Noukari, 2009). Negative consequences can also be felt on the student population. Studies indicate an increase in the physical inactivity of the student population (Vuillemin et al., 2005, DeVahl et al., 2005, Fogelholm et al., 2006), and it was noted that the sedentary lifestyle has become dominant among students (Gošnik, Bunjevac, Sedar, Prot, & Bosnar, 2002). The most frequent external obstacle for taking part in physical activities among the student population is a lack of time due to scheduled lectures and a lack of time due to familial and social commitments (Arzu, Tuzun, & Eker, 2006). Various forms of PE have a positive effect not only from the physical aspect, but they also affect the mental health of an individual (Busija, 2017). Research shows that physical exercise and sports activities can be a protective factor against depression and deliberate suicide (Lacković – Grgin, 2006). These associations are interesting because depression has been increasingly more diagnosed among the American student population over the past few years (American College Health Association [ACHA], 2007), and numerous students experience symptoms of depression which remain undiagnosed and untreated (Suicide Prevention Resource Center [SPRC], 2004). This trend is all the more unsettling due to the established association between depression, the idea of suicide, and suicidal behaviour (Kisch, Leino, & Silverman, 2005). Miller & Hoffman (2009) concluded that exercise is linked to a decrease in depression, and it would seem that there is an association between the level (medium or high intensity exercise) and type of exercise (strength training or aerobic training). Also, Simon, Powell & Swann (2004) reached the same conclusion, where among a sample of Americans aged 13 to 34, those who attempted suicide had been a lot less physically active in the past month.

The aim of this study was to use a critical analysis of existing research and a generalization of the results of all the analysed studies which focused on the effectiveness of sport to show the effects of sport and (PA) on the improvement of mental hygiene among the student population.

2. METHOD

The literature was compiled by a search of the following scientific databases: Medline, Google Scholar, Web of Science and PubMed. The databases were searched using the following key words in Serbian and English (independently or in combination): behavior, habits, university sport, depression, anxiety. The search strategy was modified for each electronic database, where possible, with the aim of increasing sensitivity. All the titles and abstracts were reviewed for the potential inclusion of papers in the systemic review. In addition, the lists of references of previous review and original research papers were also analysed.

The selection of papers was carried out based on certain criteria. The analysis included papers which met the defined criteria found in Table 1. Furthermore, Figure 1 shows a schematic image of the process of compilation, analysis, and elimination of papers (Moher, 2009).

Table 1 The inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
1. Longitudinal and transversal studies. 2. The student population. 3. Studies published between 2000 and 2017.	1. Abstracts without complete papers. 2. Studies written in languages other than English, Serbian or Croatian. 3. A sample of participants not of the student population. 4. Studies which included professional athletes in the sample of participants.

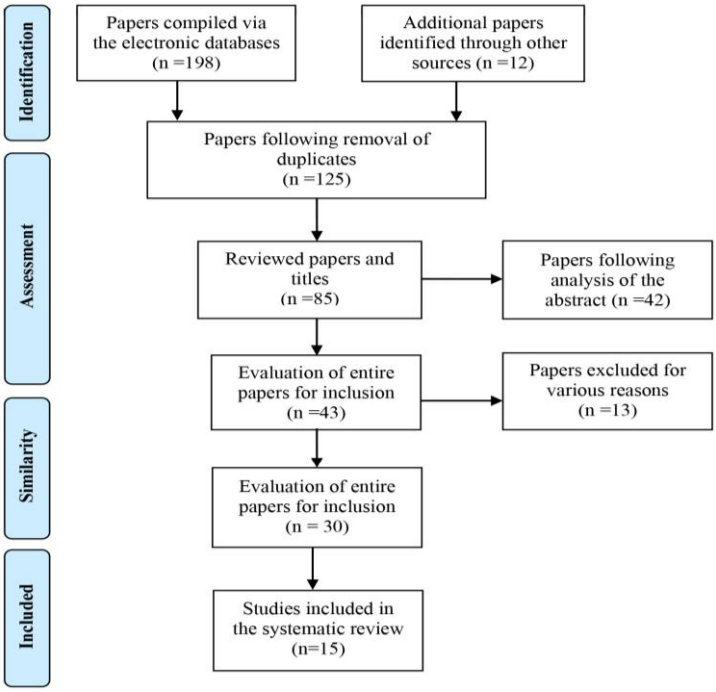


Fig. 1 PRISMA flow chart showing number of records collected and umber of eligible records after the screening process.

Table 2 An overview of existing research

Name of first author, year of publication	Participants			Questionnaire	Variables	Results	Conclusion
	No. of participants	Age	Gender				
Wallace et al. (2000)	937	22 ± 5.6	M-F	Stage of Change questionnaire, CARDIA Physical Activity History questionnaire	Evaluation of self-efficacy for physical activity, the history of physical activity, The stage of change in behavior during exercise.	Among the female participants, the self-efficacy for exercise and social and family support were significant ($p<.001$) predictors and they were the best at presenting the phases and changes which occur during physical activity. Among the male participants, the history of physical activity, support of the environment, and the self-efficacy for physical activity were significant predictors of the stage of change in behavior during exercise ($p<.001$).	The self-efficacy for exercise was connected to social support both from the family and from friends and the environment.
El Ansari et al. (2011)	3706	25.2 ± 7.7	M-F	Self-rated health status, Body image perception, Depressive symptoms (modified - Beck's Depression Inventory), Strengthening or toning muscles, Moderate exercise, Vigorous exercise	Depression and physical activity	Moderate physical activity ($r=0.64$) and a high level of physical activity ($r=0.59$) were inversely related to the results of the evaluation of depression (M-BDI).	The authors concluded that there is an association between the level of physical activity and depression. Moderate and high levels of physical activity can lead to a decrease in the occurrence of depression.

Miller et al. (2009)	791	20.02	M-F	Depression – Center for Epidemiologic Studies Depression Scale Suicide attempt Sport-related identities Perceptions of sport-related identities Individual and team sports participation Sociodemographic measures	The association between sport and depression	Taking part in team and individual sports was associated with lower results for depression ($p<.001$). In addition, athletes have indicated a lower tendency towards suicide.	Sport and physical activity have a positive effect on the level of depression.
Poobalan et al. (2012)	1313	18-25	M-F		Level of physical activity, motivation and barriers.	Positive attitudes towards physical activity have a negative correlation to a sedentary lifestyle.	For participants of this age traditional messages regarding the promotion of health were not the main motive for taking part in a physical activity; instead "feeling good", and "enjoying oneself" were the main reasons for participation.
Brown et al. (2002)	4728	18-25	M-F	NCHRBS questionnaire Youth Risk Behavior Surveillance System (YRBSS)	Physical activity and suicidal behavior.	Men with low levels of physical activity were half as likely (OR=0.54; $P< 0.015$) to report suicidal behavior compared to non-active participants. Women who were not active in sport had 1, 67 times greater odds of reporting suicidal behavior compared to female participants who took part in moderate or high intensity training.	The authors confirmed that there is an association between physical activity and suicide. Taking part in physical activity decreases suicidal behavior.

Alkerwi et al. (2015)	3133	18-69	M-F	IPAQ questionnaire	Age, gender, country of birth, marital status, level of education, employment status, personal anamnesis and intake of medication, self-rated state of health and the importance of physical activity for health.	There is a statistically significant difference ($p<.001$) between participants who perceived their health as good, and who were also physically more active, compared to participants who evaluated their health as poor.	Awareness of positive health and the effects of physical activity could be a deciding factor for motivating individuals to become more physically active.
Stojmenović et al. (2017)	403	Students	M-F	IPAQ questionnaire	Prevalence of attitudes towards physical activity.	What motivates most of the participants (60, 3%) to take part in physical activity is the knowledge of its importance for human health.	Most of the surveyed students are aware of the importance of physical activity for human health, but they still do not devote enough time to it.
Asztalos et al. (2010)	6803	25-64	M-F	Belgian Health Interview Survey (B-HIS) IPAQ questionnaire	Level of physical activity and mental health.	The results indicate that among the men intense physical activity is inversely related depression (OR=0.580), anxiety (OR=0.547), and symptoms of somatization (OR=0.590). Among the women there is an association between physical activity and emotional wellbeing (OR=1.202), while moderate intensity exercise is inversely related to symptoms of somatization (OR=0.737).	The authors concluded that there is a connection between physical activity and mental health. Physical activity can have a positive impact on mental health.

Sabiston et al. (2016)	860	20.4	M-F	Major Depression Inventory (MDI)	Taking part in team and individual sports and symptoms of depression.	Participants who took part in team sports reported lower levels of depression (β = –.09, p = .02).	Based on these findings, participation in team sports can prevent an individual from experiencing symptoms of depression at a young adult age.
Pauline (2013)	871	19.73±1.27	M-F	Godin Leisure-Time Exercise Questionnaire (GLTEQ) Exercise Motivation Inventory-2 (EMI-2)	Physical activity and motivation.	The women, were more motivated to participate in physical activity due to regulation of body weight, appearance, the positive impact on stress, and health benefits ($P< .001$). The motive of men to take part in some physical activity was the challenge, the development of strength and endurance, competition, belonging, and societal recognition ($P< .001$).	The results indicate that there are different motives between men and women when it comes to taking part in physical activity. These data should be taken into consideration when designing programs and offers of physical activity to young people.
Kilpatrick et al. (2005)	233	22.2 ± 4.8	M-F	Exercise Motivation Inventory-2 (EMI-2)	Sport, physical activity, and motivation.	The results indicate that taking part in sports events is more motivated by internal motives such as enjoyment and challenge, while motivation for physical activity focused on body weight, physical appearance, and decrease in stress.	There is a difference in the motives behind taking part in sport and physical activity among the student population.
Ebben et al. (2008)	1044	20.53 ± 5.77	M-F		Physical activity and motivation.	Shared motives for those participants for were physically active included: general health, maintaining fitness levels, decreasing stress, and enjoyment. The motives provided by the participants who were not activity included: a lack of time, laziness and fatigue. The circumstances which would lead to an improvement in their engagement included: the proximity of the exercise facility, group training sessions, more free time.	The authors conclude that we need to understand the different motives young people have and use them to create and offer recommendations with the aim of optimizing physical activity.

Feng et al. (2014)	1106	18.9 ±0.9	M-F	Pittsburgh Sleep Quality Index (PSQI) Self-rating Depression Scale (SDS) Self-rating Anxiety Scale (SAS)	Physical activity, depression, anxiety and quality of sleep.	A high level of physical activity is linked to significantly lower risk of poor quality of sleep (OR=0.48) and depression (OR=0.67). No association was found between physical activity and anxiety.	The level of physical activity decreases the prevalence of symptoms of depression and has a favorable impact on quality of sleep.
Taliaferro et al. (2009)	43499	18-25	M-F		Physical activity, depression, a feeling of powerlessness, suicide.	Men and women who took part in some form of physical activity displayed a decreased risk of powerlessness, depression, and suicidal behavior compared to their non-active colleagues.	The results indicate that there is an association between levels of physical activity and a decrease in risk of depression, powerlessness, and suicide.
Elliot et al. (2012)	61011	20-24	M-F		Physical activity, depression, suicidal behavior.	Physical activity is more often related to lower symptoms of depression and contemplation of suicide, but not attempted suicide. Men more infrequently reported symptoms of depression than women.	Universities should provide a broader approach to and knowledge of the emotional health of students and the psychological benefit of physical activity.

Legend: M – males; F – females

3. RESULTS

Following the search of the available databases, initially 198 papers were compiled. Once insight into the papers was obtained, due to the topic and aim of certain papers, which do not align with the topic and aim of our study, based on the exclusion criteria 85 papers were excluded for not dealing with the problem of the impact of PA or sport on mental hygiene among the student population. The total number of papers which were included in the systematic review was 15, where both female and male population were included, and which refer to the effects of physical exercise on the parameters which include the mental hygiene of the students. The participants included in the systematic review were adults who attended classes and were university students. The analysis of the association between PA and sport, as components of PE, and depression, was one of the main aims of the papers (El Ansari et al., 2011; Miller & Hoffman, 2009; Sabiston et al., 2016; Feng et al., 2014; Taliaferro et al., 2009; Elliot et al., 2012). The studies of (Poobalan et al., 2012; Pauline, 2013; Kilpatrick et al., 2005; Ebben & Brudzynski, 2008) studied the association between PA and motivation. A certain number of authors (Brown & Blanton, 2002; Taliaferro et al., 2009; Elliot et al., 2012) focused on the association between the level PA and suicidal behaviour among the student population.

4. DISCUSSION

In contemporary society the emergence of depression, anxiety, suicidal behaviour, or any other form of destructive behaviour is increasingly more frequent. For that reason, the need emerged for studies which could help prevent and protect human mental hygiene. El Ansari et al. (2011) obtained results which indicate that PA and depression are inversely related. The same authors indicate an association between moderate PA and depression ($r = 0.64$), and a high level of PA and depression ($r = 0.59$). A high level of PA is linked to a significantly lower risks of depression (OR = 0.67) (Feng et al., 2014). These findings were confirmed by Miller & Hoffman (2009) who pointed out that participation in team and individual sports is linked to lower scores for depression. The authors conclude that sport and PA have a positive effect on levels of depression. Sabiston et al. (2016) claim that participants who took part in team sports reported lower levels of depression ($\beta = -.09$). Men and women who took part in some form of PA showed a reduced risk of powerlessness, depression, and suicidal behaviour compared to their peers who were not sufficiently physically active (Taliaferro et al., 2009). However, somewhat different results were obtained by Elliot et al. (2012) who concluded that PA is more often linked to lower symptoms of depression and contemplating suicide, but not attempted suicide. PA and suicidal behaviour were also studied by Brown & Blanton (2002) who reached the conclusion that there is an association between PA and suicide (OR = 0.54). The inclusion of PA decreases suicidal behavior. Asztalos et al. (2010) agree that PA and the parameters which determine mental hygiene are inversely related, and that the inclusion of students in some form of PA can have a positive effect on mental health. Their research results indicate that, among men, intense PA and depression (OR = 0.580), anxiety (OR = 0.547), and symptoms of somatization (OR = 0.590) are inversely related. In the case of women, there is a positive association between PA and emotional wellbeing (OR = 1.202), while moderate intensity exercise and symptoms of somatization (OR = 0.737) are inversely related. There are certain sociological aspects of

the association between and importance of PA for human health, primarily human mental hygiene. Wallace et al. (2000) concluded that the support of the environment, of friends, and family has a significant impact on taking part in some form of PA ($p < .001$). Significant results were also published by Poobalan et al. (2012) who stated that traditional messages for the promotion of health were not the main motives for participation in sports activities. What was most alluring and motivating for the student population was the "enjoyment" of sport and "feeling good". However, the fact is that the positive effects of PA are not negligible. Alkerwi et al. (2015) indicate that there is a statistically significant difference between participants who were more PA compared to non-active participants ($p < .001$). Physically more active students perceived their health as much better and were more satisfied compared to sedentary participants. Awareness of positive health and the effects of PA can be a decisive factor for motivating people to become more PA. Stojmenović, & Milosavljević (2017) agree with these results. Most of their surveyed students (60.3%) were aware of the importance of PA for human health. Students who were physically more active stated that health aspects were their main "motivator", but that fatigue and a lack of time were also barriers that prevented people from becoming more PA (Ebben et al., 2008). When it comes to motives, consideration must be given to the different motives of men and women. Pauline (2013) pointed out that women were more motivated to regulate their body weight, appearance, and health aspects ($p < .001$), while for men the motivation for taking part in PA was the challenge, the development of strength and endurance, competition, and social recognition ($p < .001$). There is also a difference in the motivation behind taking part in sport and in PA. Kilpatrick et al. (2005) point out that taking part in sports events is more motivated by "enjoyment" and "the challenge", while motivation for taking part in PA was more focused on body weight, physical appearance, and a decrease in stress.

5. CONCLUSION

The aim of this systematic review was to study whether sport and PA have any impact on the improvement of mental hygiene among the student population. The results are the following:

Based on the reviewed papers which focused on the effects of PA on the emergence of depression, anxiety, suicidal behavior or some other form of destructive behavior, it was noted that PA has a positive effect on the mental hygiene of students. PA can have a positive effect on the mental health of people.

Awareness of health and the positive effects of PA can be a decisive factor for motivating people to become more PA. Regular PA can assist in the prevention and preservation of psychological health.

REFERENCES

Alkerwi, A. A., Schuh, B., Sauvageot, N., Zannad, F., Olivier, A., Guillaume, M., Albert, A., & Larsson, C. A. (2015). Adherence to physical activity recommendations and its associated factors: an interregional population-based study. *Journal of Public Health Research*, *4*(1), 35-42.

American College Health Association. (2007). American college health association national college health assessment spring 2006 reference group data report (abridged). *Journal of American College Health*, *55*(4), 195-206.

Arzu, D., Tuzun, E. H., & Eker, L. (2006). Perceived barriers to physical activity in university students. *Journal of Sports Science & Medicine*, *5*(4), 615-620.

Asztalos, M., De Bourdeaudhuij, I., & Cardon, G. (2010). The relationship between physical activity and mental health varies across activity intensity levels and dimensions of mental health among women and men. *Public Health Nutrition*, *13*(8), 1207-1214.

Ban Vlahek, B. (2019). *Uloga sporta u socijalizaciji djece na području grada Čakovca* [Doctoral dissertation]. Polytechnic of Međimurje in Čakovec.

Bjelajac, S. (2006). *Sport i društvo.* Split: Fakultet prirodoslovno-matematičkih znanosti i kineziologije Sveučilišta u Splitu.

Brown, D. R., & Blanton, C. J. (2002). Physical activity, sports participation, and suicidal behavior among college students. *Medicine & Science in Sports & Exercise*, *34*(7), 1087-1096.

Busija, S. (2017). *Stavovi učenika prema sportskim aktivnostima i njihova povezanost s uspjehom u školi* [Doctoral dissertation]. Zagreb: Faculty of Teacher Education University of Zagreb.

DeVahl, J., King, R., & Williamson, J. W. (2005). Academic incentives for students can increase participation in and effectiveness of a physical activity program. *Journal of American College Health*, *53*(6), 295-298.

Ebben, W., & Brudzynski, L. (2008). Motivations and barriers to exercise among college students. *Journal of Exercise Physiology Online*, *11*(5), 1-11.

El Ansari, W., Stock, C., Phillips, C., Mabhala, A., Stoate, M., Adetunji, H., Deeny, P., John, J., Davies, S., Parke, S., Hu, X., & Snelgrove, S. (2011). Does the association between depressive symptomatology and physical activity depend on body image perception? A survey of students from seven universities in the UK. *International Journal of Environmental Research and Public Health*, *8*(2), 281-299.

Elliot, C. A., Kennedy, C., Morgan, G., Anderson, S. K., & Morris, D. (2012). Undergraduate physical activity and depressive symptoms: a national study. *American Journal of Health Behavior*, *36*(2), 230-241.

Feng, Q., Qing-le Zhang, Y. D., Ye, Y. L., & He, Q. Q. (2014). Associations of physical activity, screen time with depression, anxiety and sleep quality among Chinese college freshmen. *PloS one*, *9*(6), 1-5.

Fogelholm, M., Malmberg, J., Suni, J., Santtila, M., Kyröläinen, H., Mäntysaari, M., & Oja, P. (2006). International physical activity questionnaire: Validity against fitness. *Medicine & Science in Sports & Exercise*, *38*(4), 753-760.

Gošnik, J., Bunjevac, T., Sedar, M., Prot, F., & Bosnar, K. (2002). Sport experience of undergraduate students. In Milanović, D. & Prot, F. (Eds.), *Proceedings Book 3rd International scientific conference Kinesiology New Perspectives* (pp. 457-461). Zagreb: Faculty of Kinesiology, University of Zagreb.

Kilpatrick, M., Hebert, E., & Bartholomew, J. (2005). College students' motivation for physical activity: differentiating men's and women's motives for sport participation and exercise. *Journal of American College Health*, *54*(2), 87-94.

Kisch, J., Leino, E. V., & Silverman, M. M. (2005). Aspects of suicidal behavior, depression, and treatment in college students: Results from the Spring 2000 National College Health Assessment Survey. *Suicide and Life-Threatening Behavior*, *35*(1), 3-13.

Lacković – Grgin, K. (2006). *Psihologija adolescencije*. Jastrebarsko: Naklada Slap.

Miller, K. E., & Hoffman, J. H. (2009). Mental well-being and sport-related identities in college students. *Sociology of Sport Journal*, *26*(2), 335-356.

Moher, D. (2009). Liberati A, Tetzlaff J, Altman DG, Group TP. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*, *6*(7), e1000097-1000096. https://doi.org/10.1371/journal.pmed.1000097

Pauline, J. (2013). Physical activity behaviors, motivation, and self-efficacy among college students. *College Student Journal*, *47*(1), 64-74.

Poobalan, A. S., Aucott, L. S., Clarke, A., & Smith, W. C. S. (2012). Physical activity attitudes, intentions and behaviour among 18–25 year olds: A mixed method study. *BMC Public Health*, *12*(1), 640-650.

Radenović, S. (2015). Sociologija sporta i/ili sociologija fizičke kulture? – neka razmatranja. *Sociološka luča*, *9*(1), 42-55.

Sabiston, C. M., Jewett, R., Ashdown-Franks, G., Belanger, M., Brunet, J., O'Loughlin, E., & O'Loughlin, J. (2016). Number of years of team and individual sport participation during adolescence and depressive symptoms in early adulthood. *Journal of Sport and Exercise Psychology*, *38*(1), 105-110.

Simon, T. R., Powell, K. E., & Swann, A. C. (2004). Involvement in physical activity and risk for nearly lethal suicide attempts. *American Journal of Preventive Medicine*, *27*(4), 310-315.

Stojmenović, M., & Milosavljević, M. (2017). Stavovi studenata prema fizičkoj aktivnosti. *Racionalna terapija*, 4(2), 29-38.

Suicide Prevention Resource Center. (2004). *Promoting mental health and preventing suicide in college and university settings*. Newton, MA: Education Development Center, Inc.

Taliaferro, L. A., Rienzo, B. A., Pigg, R. M., Miller, M. D., & Dodd, V. J. (2009). Associations between physical activity and reduced rates of hopelessness, depression, and suicidal behavior among college students. *Journal of American College Health*, *57*(4), 427-436.

Tirodimos, I., Georgouvia, I., Savvala, T. N., Karanika, E., & Noukari, D. (2009). Healthy lifestyle habits among Greek university students: differences by sex and faculty of study. *EMHJ-Eastern Mediterranean Health Journal*, 15 (3), 722-728.

Trost, G., Owen, N., Bauman, E., Sallis, F., & Brown W. (2002) Correlates of adults' participation in physical activity: review and update. *Medicine and Science in Sports and Exercise*, 34, 1996-2001.

Vuillemin, A., Boini, S., Bertrais, S., Tessier, S., Oppert, J. M., Hercberg, S., Guillemin, F. & Briançon, S. (2005). Leisure time physical activity and health-related quality of life. *Preventive Medicine*, *41*(2), 562-569.

Wallace, L. S., Buckworth, J., Kirby, T. E., & Sherman, W. M. (2000). Characteristics of exercise behavior among college students: application of social cognitive theory to predicting stage of change. *Preventive Medicine*, *31*(5), 494-505.

World Health Organization. (2006). *Constitution of the World Health Organization – Basic Documents* (45-th ed.). Supplement, October 2006. https://www.who.int/governance/eb/who_constitution_en.pdf

Živanović, N., Ranđelović, N., Stanković, V., & Pavlović, P. (2010). *Teorija fizičke kulture*. Niš: Fakultet sporta i fizičkog vaspitanja.

UTICAJ SPORTA NA ZDRAVLJE I UNAPREĐENJE MENTALNE HIGIJENE STUDENTSKE POPULACIJE - SISTEMATSKO PREGLEDNO ISTRAŽIVANJE

Sport je zbog svoje atraktivnosti uvek bio u službi raznih društvenih područja kako u pozitivnom tako i u negativnom smislu. Zapaža se da je sedentarni način života postao dominantan među studentima. Najčešća spoljašnja barijera za bavljenje fizičkim aktivnostima kod studenata je nedostatak vremena zbog rasporeda predavanja i nedostatak vremena zbog porodičnih i društvenih obaveza. Cilj istraživanja je da se kritičkom analizom dosadašnjih istraživanja i generalizacijom rezultata svih analiziranih istraživanja koja su proučavala efikasnost sporta, prikažu efekti sporta i fizičke aktivnosti na unapređenje mentalne higijene studentske populacije. Literatura je sakupljena pretraživanjem sledećih naučnih baza podataka: Medline, Google Scholar, Web of Science i PubMed. Pretraživanjem naučnih baza prikupljeno je 198 radova od kojih je 15 radova uključeno u sistematski pregled. Ispitanici koji su uključeni u pregledno istraživanje bile su punoletne osobe koje su pohađale nastavu i pripadale nekom Univerzitetu. Svest o zdravlju i pozitivnim efektima fizičke aktivnosti mogu biti presudni za motivisanje ljudi i tako postati fizički aktivniji. Redovna fizička aktivnost može pomoći u prevenciji i očuvanju psihičkog zdravlja.

Ključne reči: *sedeterni način života, depresija, suicidno ponašanje, vežbanje*

FACTA UNIVERSITATIS
Series: **Teaching, Learning and Teacher Education** Vol. 5, Nº2, 2021, pp. 191 - 200
https://doi.org/10.22190/FUTLTE210617015S

Professional article

EXAMPLES OF MATHEMATICAL PROBLEMS IN PRIMARY AND SECONDARY EDUCATION THAT INCLUDE THE ACTUAL CALENDAR YEAR

UDC 512.37; 511::371.3; 371.314.6:51:373.3/4

Dušan Simjanović[1], Branislav Ranđelović[2], Nenad Vesić[3], Aleksandra Penjišević[4]

[1]Faculty of Information Technology, Metropolitan University, Belgrade, Serbia
[2]Faculty of Teachers Education in Prizren-Leposavić, University of Priština-K. Mitrovica, Leposavić, Serbia
[3]Mathematical Institute of the Serbian Academy of Sciences and Arts, Belgrade, Serbia
[4]Faculty of Management, UNION-Nikola Tesla University, Sremski Karlovci, Serbia

Abstract. *It is widely believed that math classes in primary school belong into the category of least favorite classes. Entire teams of psychologists, educators and mathematicians have studied the student aversion (and, to a certain extent, parent antipathy) to math classes, but they have also studied methods and ways to overcome this problem. They have tried to find a way to improve students' activities, to make them more engaged in classes, and to increase their motivation. One of the opinions is that the student success requires their strong will, persistence, diligence and perseverance. Certainly, the competence, motivation and consistency of teachers, who lead them to the world of knowledge, have a great influence. One of the methods of achieving a positive influence of teachers, in the domain of increasing interest in mathematics and reducing aversion to it, is the use of interesting mathematical problems, in which the numerical value of the current calendar year or even the current date appears. The aim of this paper is to point out how the motivation of primary school students to adopt mathematical content can be increased. With concrete examples of interesting algebra problems, which tickle students' fancy and make them think, we show how some lessons can be learned.*

Key words: *mathematics, student, interesting mathematical problems, teaching mathematics, motivation*

Received June 17, 2021/Accepted December 15, 2021
Corresponding author: Dušan Simjanović
Faculty of Information Technology, Metropolitan University, Tadeuša Košćuška 63, 11158 Belgrade, Serbia
Phone: +381 11 203 0885 • E-mail: dusan.simjanovic@metropolitan.ac.rs

1. INTRODUCTION

Even in preschool period, mathematics is presented to the children as some kind of a mild threat. Even then, mathematics becomes something different and something that is already, as a starting point, difficult. It is not exactly like that, but one of the reasons for the loss of motivation to practice mathematics might have roots in preschool period. More information on motivation in teaching mathematics can be found in (Hannula, 2006; Brophy, 2013).

If we try to understand what would draw students to mathematics, we could conclude that most of the answers are woven into the expertise and motivation of primary school teachers, mathematics teachers, secondary school teachers and, finally, professors. The most important initiator of learning in the lower grades of primary school is the teacher, because it depends on them how much students learn in school and how much each student is active in acquiring knowledge and motivated to achieve results. Therefore, "The more the teacher tries to teach their students, the more successful the students will be" (Đorđević i Đorđević, 1992, p. 19).

Education is composed of life contents, scientific contents and artistic contents. Teaching mathematics means finding harmony in that trinity. It is necessary for the teacher to take the role of a guide, and for the students to cross the indicated bridge on their own (Jovanović, 2020; Jovanović & Vukić, 2018). In the internal motivation of students, we should look for an answer to the question where their will is hidden, but their will should also be woken up and could be strengthened with interestingly presented contents, which brings us to the lecturer again. The mathematics teacher, as one of the main role models for their students, must give an example of what attitude towards work their students should have, to be objective in work and assessment, consistent and principled, so that students can properly develop and/or increase efficiency in learning mathematical content (Williams, 1993; Milanović & Novković Cvetković, 2020; Karalić et al., 2020).

As it has already been proven that there are no genetic predispositions for practicing mathematics and that the student's attitude to mathematics is largely dependent on their parents' attitude to mathematics and, in general, to education, in this paper we will give the primary role to the student-teacher interaction (Lalić-Vučetić i Mirkov, 2017). This success would be reflected in students' thorough work, their perseverance and willingness to work, which must not be short-lived. Interestingly presented mathematical problems indisputably arouse students' interest and show that the predisposition to practice mathematics is not the primary point, perhaps only the starting point from which the teacher, with their impeccable work, would disprove the thesis that someone was simply "born to study mathematics," which should remain just an excuse of those who are not willing to be interested in mathematics, and the teacher should wholeheartedly strive to invest energy and creativity in devising new ways to approach mathematical problems, so that they would be more receptive to the age group for which they are intended (Paunović i Gajtanović, 2020). Students like when they immediately receive clear and precise feedback on the solved problem (Kulik and Kulik, 1988), which explains what they did correctly and what needs to be corrected in further work. Even negative feedback regarding a mistake can act as a motive for continued engagement and more detailed work (Clifford, 1990). The most attractive are the problems that can be presented, such as panels with mathematical formulas or models of geometric shapes, which students see as a kind of reward. Stimuli and rewards, encouragement and support are as equally important when students show

success in work as they are when learning difficulties occur, when motivation runs out and when work stops, because "The world of adults has a whole system of incentives such as medals, honors, charters, plaques, awards, recognitions, incentives for employees, etc." (Nikolić, 2004, p. 23). Creativity can be a major driving force for students (Erwin, 2015), as well as the ability for students to choose problems they want to solve (Raméntol, 2011). There is more about the selection of problems, research as part of the cognition and learning process, and parts of each problem in (Vait i Gajtanović, 2017).

One of the important factors in learning process is the motivation for success, especially if it is supported by diligent and daily work. Solving tasks in which appears the number of the current year is a good way and an interesting approach to acquiring functional knowledge, whether in the text of the problem or in the solution. If the features of a given number, like determining simple factors, divisibility, sum of numbers or division of factors into subsets determined by a certain feature, were used, then combinatorial thinking will be encouraged, while joint work with students in composing tasks will certainly strengthen curiosity, need for knowledge and active learning, which are the main carriers of education in the XXI century.

2. Examples of Problems with the Calendar Year Number

Apart from preparing the content and presenting it to the students, the teacher remains aware that they are the one who will build the students' self-confidence and try to remove the fear of mathematics and the aversion to mathematics caused by it. The student is then ready to improve their knowledge easily and acquire new knowledge. Good preparations and an interesting interpretation lead to the fact that what is learned in class will be remembered longer, and, perhaps students will eagerly solve the problems and keep them in their memory longer. With the belief that the teacher's creativity will be in direct proportion to the will that their students will have when solving mathematical problems, as well as with a long memory of such acquired knowledge, in this paper we offer problems that will be especially interesting to students, because they will have a feeling that a mathematics class ended quickly. According to the distinguished mathematician George Polya: „... even when solving the most modest problem, if it arouses interest, if it initiates ingenuity, and if the student solves it using their own strengths, they will experience the tension and triumph of the inventor. Such experiences at an age that is accessible to impressions can create an inclination to mental work and imprint a lifelong stamp on the spirit and personality... because, once they taste the joy of mathematics, they will not forget it easily..." (Polya, 1945).

We will now list several completely new, interesting, unpublished problems, with the participation of the current year number in their formulation and/or solution, and, by solving them, students will improve their concentration, creativity, way of thinking and problem skills, and above all, strengthen the will to work and a love of mathematics.

2.1. Problems for students in lower grades of primary school

1. *The product of two different numbers of the fifth ten is equal to 2021. Determine those numbers.*

Solution: The numbers belonging to the fifth ten are 41, 42, 43…, and 50.
As the last digit of the number 2021 is 1, it can be obtained as the product of numbers whose last digits are 3 and 7. We can conclude that the numbers 43 and 47 are the solution. By multiplying $43 \cdot 47 = 2021$, we show that this solution is correct.

2. *If* $\overline{ABCD} + \overline{ABC} + \overline{AB} + \bar{A} = 2021$, *determine the digits* A, B, C *and* D.

Solution: By a simple check, we can easily conclude that A = 1 and B = 8 must hold, because otherwise the number would be greater than 2021. Now the left side of the equation is equal to $1999 + \overline{CD} + \bar{C}$, from which, from the equation $11C + D = 22$, we obtain that $C = 2$ and $D = 0$.
By checking $1820 + 182 + 18 + 1 = 2021$, we show that this solution is correct.

3. *Determine natural numbers that have the property that their sum is equal to their product and equal to the number 2021.*

Solution: Since, by decomposing the number 2021 into factors, we get that $2021 = 1 \cdot 43 \cdot 47$, we have that

$$43 + 47 + \underbrace{1 + 1 + \cdots + 1}_{1931} = 43 \cdot 47 \cdot \underbrace{1 \cdot 1 \cdot \ldots \cdot 1}_{1931} = 2021.$$

4. *Determine the sum and product of the solution of inequality* $x < 2021$ *(*$x \in N_0$*).*

Solution: The solutions of the inequality are numbers $0,1,2, \ldots, 2020$.
Their product is equal to zero, and their sum

$$0 + 1 + 2 + 3 + \cdots + 2020 = \frac{2020 \cdot 2021}{2} = 2041210.$$

5. *If different letters correspond to different digits, and the same letters to the same digits, determine the unknown digits, so that the equations hold true:*
   a) $\overline{AAA} + \overline{ABA} + \overline{ACC} = 2021$.
   b) $\overline{ABBA} + \overline{CDC} - \bar{C} = 2021$.

Solution:

a) In order for the required sum on the left side of the equation not to be less than 180 or more than 2100, it must be true that $A = 6$.
Now $666 + \overline{6B6} + \overline{6CC} = 2021$, i.e. $\overline{10B} + \overline{11C} = 149$, from which, it is simply obtained that $B = 5$ and $C = 9$.
The obtained result is easily checked, using $666 + 656 + 699 = 2021$.

b) It is easy to see that $A = 1$ and $C = 6$ must be valid. It follows that $1000 + \overline{110B} + 1 + 600 + \overline{10D} = 2021$. From the condition that $\overline{11B} + \overline{D} = 42$ is valid, we obtain that $B = 3$ and $D = 9$.
The obtained result is easily checked, using $1331 + 696 - 6 = 2021$.

6. *Insert symbols for basic arithmetic operations and parentheses in some places of the left side of the equation* $111111111111111111 = 2021$*, so that the equation is correct.*

Solution: We will provide two different solutions to this problem.

$$1111 + 1111 - 111 - 111 + 11 \cdot (1 + 1) - 1 = 2021$$

or

$$1111 \cdot (1 + 1 + 1) - 111 \cdot (11 + 1) + 11 + 11 - 1 - 1 = 2021.$$

In addition to their intellectual abilities, students will, by solving the following problems, adopt the following educational standards that are tested in the final exam: *MA.2.1.3. MA.3.1.1., MA.3.1.2., MA.3.1.3., MA.3.2.1. and MA.3.2.5.*

2.2. Problems for students in upper grades of primary school

1. *By how much is the sum of all proper fractions with an odd numerator and the denominator 2021 less than the sum of all proper fractions with an even numerator and the denominator 2021?*

Solution: The problem setting can be written mathematically as follows:

$$\frac{1}{2021} + \frac{3}{2021} + \cdots + \frac{2019}{2021} + x = \frac{2}{2021} + \frac{4}{2021} + \cdots + \frac{2020}{2021},$$

from where, by expressing the unknown *x* and the fact that we have 1010 addends (parentheses), we obtain

$$x = \left(\frac{2}{2021} - \frac{1}{2021}\right) + \left(\frac{4}{2021} - \frac{3}{2021}\right) + \cdots + \left(\frac{2020}{2021} - \frac{2019}{2021}\right),$$

i.e. we have that $x = \frac{1010}{2021}$.

2. *Determine the natural number n and the prime number p, so that the equation* $\frac{n}{2021} = \frac{1}{p}$ *holds true.*

Solution: Since, by decomposing the number 2021 into factors, we get that $2021 = 43 \cdot 47$, the prime number *p* can be one of the numbers 43 or 47, the number *n* is equal to 47 or 43.
So, the solutions are $n = 47$ and $p = 43$ or $n = 47$ and $p = 43$.

3. *Determine six-digit numbers of the form* $\overline{a2021b}$ *that are divisible by the number 18.*

Solution: A number is divisible by 18 if and only if it is divisible by 2 and 9. The given number will be divisible by 2 if its last digit is even, i.e. $b \in \{0,2,4,6,8\}$ while from the condition that the given number is divisible by 9, we get that it must be valid that $a + 2 + 0 + 2 + 1 + b = 5 + a + b$ is divisible by 9, i.e. that $a + b \in \{4,13\}$.
From the condition that $a + b = 4$, we obtain the following possibilities: $a = 0, b = 4$ or $a = 2, b = 2$ or $a = 4, b = 0$.

From the condition that $a+b=13$, obtain the following possibilities: $a=9, b=4$ or $a=7, b=6$ or $a=5, b=8$.
Numbers: $220212, 420210, 920214, 720216$ and 520218 are the solution.

4. *Determine digits a, b and c so that the number $\overline{a2021bc}$ is the largest possible, divisible by 12 and that all its digits are different.*

Solution: A number is divisible by 12 if it is divisible by 3 and 4. Because of the two-digit ending of the given number, we conclude that the digit c must be even, and, because of the condition of difference of digits, we have that $c \in \{4,6,8\}$, i.e. $b \in \{4,6,8\}$, from where the following possibilities are easily discerned: $b=4, c=8$ or $b=8, c=4$ or $b=6, c=4$ or $b=6, c=8$.
Since, due to the condition of divisibility by 3, it is necessary that the sum of the digits of the given number be divisible by 3, we conclude that $5+a+b+c$ must be divisible by 3. Let us consider the previous four possibilities:
For $b=4, c=8$, we have that $17+a$ should be divisible by 3, i.e. $a \in \{1,4,7\}$.
For $b=8, c=4$, we have that $17+a$ should be divisible by 3, i.e. $a \in \{1,4,7\}$.
For $b=6, c=4$, we have that $15+a$ should be divisible by 3, i.e. $a \in \{0,3,6,9\}$.
For $b=6, c=8$, we have that $19+a$ should be divisible by 3, i.e. $a \in \{2,5,8\}$.
We leave it to the reader to determine the largest of these numbers.

5. *Determine the natural number x, so that the equation $x^{2022}=x^{2021}+2021$ holds true.*

Solution: From the initial equation, we get that $x^{2022}-x^{2021}=2021$. We will consider two cases, when x is an even number and when x is an odd number.
If x is an even number, then both x^{2022} and x^{2021} are even numbers, so the left side of the equation, as the difference of two even numbers, is also an even number. This is in contrast to the fact that the odd number 2021 is on the right side.
If x is an odd number, then both x^{2022} and x^{2021} are odd numbers, so the left side of the equation, as the difference of two odd numbers, is an even number. This is in contrast to the fact that the odd number 2021 is on the right side.
Therefore, there is no natural number that satisfies the given equation.

6. *One number has been removed from a set of 10 consecutive natural numbers. If the sum of the remaining 9 numbers is equal to 2021, determine those numbers.*

Solution: Let us mark the given natural numbers with $x, x+1, x+2, \ldots, x+9$, and the removed number with $x+y, 0 \leq y \leq 9$. According to the condition of the problem, it is as follows

$$x+x+1+x+2+\cdots+x+9-(x+y)=2021,$$

from where we get that $9x=1976+y$. From the condition that $1976+y$ must be divisible by 9, we get that $y=4$ and that numbers 220, 221, 222, 223, 224, 226, 227, 228 and 229 are the solution.

7. *Determine the length of the unknown leg of a right triangle if the following is given:*
   a) The length of the known leg is $a = 180\ cm$ and the length of the hypotenuse is $c = 2029\ cm$.
   b) The length of the known leg is $b = 2\ cm$ and the length of the hypotenuse is $c = 45\ cm$.

Solution:

a) If we apply Pythagoras theorem $c^2 = a^2 + b^2$ to the given right triangle, we obtain that $b^2 = c^2 - a^2 = 2029^2 - 180^2$, from where, by applying the formula for calculating the difference of squares, $b^2 = (2029 - 180) \cdot (2029 + 180) = 1849 \cdot 2209 = 43^2 \cdot 47^2$, so is the length of leg b is $b = 43 \cdot 47 = 2021$.

b) Using the idea from part a), we have that $a^2 = c^2 - b^2 = 45^2 - 2^2 = 43 \cdot 47$, from where the length of unknown leg is $b = \sqrt{2021}$.

2.3. Problems for students in secondary education

1. *Determine the last digit of the number 3^{2021}.*

Solution: Let us look at the first few degrees of the number 3 to discern regularity in the repetition of the last digit. Namely, $3^1 = \mathbf{3}, 3^2 = \mathbf{9}, 3^3 = 2\mathbf{7}, 3^4 = 8\mathbf{1}, 3^5 = 24\mathbf{3}, 3^6 = 72\mathbf{9}$, ... It is clear that the last digit of the degree $3^k, k \in N$, can be $3, 9, 7$ or 1 with a repetition period of 4 numbers. Based on the previous and the fact that $2021 = 4 \cdot 505 + 1$, we have that $3^{2021} = (3^4)^{505} \cdot 3$, so is the last digit of the number 3^{2021} is 3.

2. *Using*

a) exactly 4 different degrees of the form $2^k, k \in \{0, 1, 2, 3, \dots, 11\}$ and addition and subtraction operations, we should obtain the number 2021.

b) exactly 5 different degrees of the form $2^k, k \in \{0, 1, 2, 3, \dots, 11\}$ and addition and subtraction operations, we should obtain the number 2021.

Solution:

a) $2^{11} - 2^5 + 2^2 + 2^0 = 2021$,

b) $2^{11} - 2^4 - 2^3 - 2^1 - 2^0 = 2021$.

3. *Using exactly 8 different degrees of the form $2^k, k \in \{0, 1, 2, 3, \dots, 10\}$ and the addition operation, we should obtain the number 2021.*

Solution: $2^{10} + 2^9 + 2^8 + 2^7 + 2^6 + 2^5 + 2^2 + 2^0 = 2021$.

4. *The height corresponding to the hypotenuse of a right triangle divides the hypotenuse into segments of lengths p = 43 cm and q = 47 cm. Calculate the length of height h_c.*

Solution: The height corresponding to the hypotenuse of a right triangle divides that triangle into two also right triangles that are similar to each other and similar to the given (large) right triangle. It follows from this similarity that $h_c = \sqrt{p \cdot q} = \sqrt{2021}\ cm$.

5. Determine the number of divisors of the number $n = 2020 \cdot 2021 \cdot 2022$.

Solution: By decomposing the factors of the number *n* into simple factors, we obtain the canonical factorization of the number $n = 2^3 \cdot 3 \cdot 5 \cdot 43 \cdot 47 \cdot 101 \cdot 337$, and we conclude that the number *n* has

$\tau(n) = (3+1) \cdot (1+1) \cdot (1+1) \cdot (1+1) \cdot (1+1) \cdot (1+1) \cdot (1+1) = 256$

divisors.

6. Prove that $\frac{1}{2!} + \frac{2}{3!} + \frac{3}{4!} + \cdots + \frac{2020}{2021!} < 1$.

Solution: We discern that each of the addends on the left side of the inequality is of the form $\frac{n}{(n+1)!}$. If we apply to each of them the formula $\frac{n}{(n+1)!} = \frac{n+1}{(n+1)!} - \frac{1}{(n+1)!}$, we get that

$$\frac{1}{2!} = \frac{2}{2!} - \frac{1}{2!}, \frac{2}{3!} = \frac{3}{3!} - \frac{1}{3!}, \frac{3}{4!} = \frac{4}{4!} - \frac{1}{4!}, \ldots, \frac{2020}{2021!} = \frac{2021}{2021!} - \frac{1}{2021!}.$$

From here, having simply arranged the denominators in each parenthesis, we get that

$\frac{1}{2!} + \frac{2}{3!} + \frac{3}{4!} + \cdots + \frac{2020}{2021!} = \left(\frac{2}{2!} - \frac{1}{2!}\right) + \left(\frac{3}{3!} - \frac{1}{3!}\right) + \left(\frac{4}{4!} - \frac{1}{4!}\right) + \cdots + \left(\frac{2021}{2021!} - \frac{1}{2021!}\right) =$
$\left(1 - \frac{1}{2!}\right) + \left(\frac{1}{2!} - \frac{1}{3!}\right) + \left(\frac{1}{3!} - \frac{1}{4!}\right) + \cdots + \left(\frac{1}{2020!} - \frac{1}{2021!}\right) = 1 - \frac{1}{2021!} < 1$, thereby proving the given inequality.

7. Solve the equation $(1 + \frac{1}{x})^{x+1} = (1 + \frac{1}{2021})^{2021}$ *in set Z.*

Solution: We can write the given equation in the form $\left(\frac{x+1}{x}\right)^{x+1} = \left(\frac{2022}{2021}\right)^{2021}$. Since the successive numbers x and x + 1 are mutually prime, the fraction $\frac{x+1}{x}$ is reduced, so the fractions $\left(\frac{x+1}{x}\right)^{x+1}$ and $\left(\frac{2022}{2021}\right)^{2021}$ are as such.

The following transformations apply: $\left(\frac{x+1}{x}\right)^{x+1} = \left(\frac{-2021}{-2022}\right)^{-2021} = \left(\frac{-2022+1}{-2022}\right)^{-2022+1}$, from which it follows that $x + 1 = -2022 + 1$, so is the solution of the equation is $x = -2022$.

8. If for a complex number z, it holds that $z + \frac{1}{z} = 1$, *calculate* $z^{2021} + \frac{1}{z^{2021}}$.

Solution: From the condition of the problem that $z + \frac{1}{z} = 1$, by simple calculation, we get that $z^2 + \frac{1}{z^2} = -1$ and $z^3 + \frac{1}{z^3} = -2$. The initial condition $z + \frac{1}{z} = 1$ by multiplying by z becomes $z^2 - z + 1 = 0$, from where, by multiplying both sides of the equation by $z + 1$, we get that $z^3 = -1$.

Since $z^{2021} = (z^3)^{673} \cdot z^2 = -z^2$ and analogously $\frac{1}{z^{2021}} = -\frac{1}{z^2}$, we have that

$$z^{2021} + \frac{1}{z^{2021}} = -z^2 + \frac{1}{-z^2} = -\left(z^2 + \frac{1}{z^2}\right) = 1.$$

The same solution can be reached by a similar procedure:

$$z^{2021} = z^{2022} \cdot \frac{1}{z} = (z^3)^{674} \cdot \frac{1}{z} = (-1)^{674} \cdot \frac{1}{z} = \frac{1}{z} \text{ and}$$
$$\frac{1}{z^{2021}} = \frac{1}{z^{2022}} \cdot z = \frac{1}{(z^3)^{674}} \cdot z = \frac{1}{(-1)^{674}} \cdot z = z.$$

More interesting examples, to tickle the students' fancy, can be found in (Đarmati, 2006; Petrović, 2012; Stojanović, 2012), as well as in (Simjanović and Vesić, 2016; Simjanović, et al., 2014).

3. Conclusion

It is generally believed that mathematics is one of the most difficult subjects in school. This claim has particularly been instigated by students' parents, who frighten students with its content and strict teachers. Despite the initial, certainly inadequate fear of mathematics, students, even those with lower grades, appreciate this science and understand its importance for schooling and life, primarily expecting enough points in the entrance exam.

The student's interest and their creativity are certainly upgraded with unusual mathematical problems that often require thinking outside the box, engaging all the necessary attention and concentration. This easily leads to progress in learning, increasing motivation and commitment, and, every time students make an effort, it is a challenge and real satisfaction. Attention is always focused on the process of learning and cognition, and mistakes are seen as an integral part of the teaching process, the corrections of which will surely lead to absolute progress. Students will learn to *grow their own seedlings*, not just *pick flowers*.

In this paper, we use mathematical problems, in which the number of the current calendar year appears. We weaved original problems into various areas of mathematics: divisibility, determining an unknown number, decomposing a number into simple factors, solving equations and inequalities, gradation, similarity, and Pythagoras theorem, showing how interesting problems can attract and keep students' attention by turning initial motivation into a regular habit of learning and problem solving.

Acknowledgement: *This paper is financially supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia and the Mathematical Institute of the Serbian Academy of Sciences and Arts. Also, this paper was partially realized within IMP-002 project of the Faculty of Teacher Education in Leposavić.*

References

Brophy, J. E. (2013). *Motivating Students to Learn*. New York & London: Routledge.

Clifford, M. M. (1990). Students need challenge, not easy success. *Educational Leadership*, *48*, 22-26.

Đarmati, Š. A. (2006) *Imate li kefalo 2*. Beograd: Kreativni centar.

Đorđević, B., i Đorđević, J. (1992). *Svojstva univerzitetskih nastavnika*. Beograd: Institut za pedagogiju i andragogiju Filozofskog fakulteta.

Ervin, S. (2014). *Increasing motivation by Promoting Engagement in the Mathematics Classroom. Running head: Increasing motivation by promoting engagement*. USA: University of Georgia.

Hannula, M. S. (2016). Motivation in Mathematics: Goals Reflected in Emotions. *Educational Studies in Mathematics*, *63*, 165-178.

Jovanović, M. (2020). Our School in Eyes of Gamer Generation: How Video Games Expose Deep Problems of Our Education. *Facta Universitatis, Series: Teaching, Learning and Teachers Education*, *4*(2), 157-169. https://doi.org/10.22190/FUTLTE2002157J

Jovanović, M., & Vukić, T. (2018). Types of Support Gifted Students Receive In School. *Facta Universitatis, Series: Teaching, Learning and Teachers Education*. 2(2), 126-135. https://doi.org/10.22190/FUTLTE1802125J

Karalić, E., Djukić, D., i Ranđelović, B. (2020). Vizija i putevi ka kvalitetnom obrazovanju u Srbiji. *Zbornik radova Učiteljskog fakulteta u Leposaviću*, *14*, 293-306.

Kulik, J. A., & Kulik, C. L. (1988). Timing of feedback and verbal learning. *Review of educational Research Journal*, *21*, 79-97.

Lalić-Vučetić, N., i Mirkov, S. (2017). Motivacija za ucenje, opazanje postupaka ucitelja i dozivljaj samoefikasnosti ucenika u matematici i prirodnim naukama. *Inovacije u nastavi*, *30*(2), 29-48. https://doi.org/10.5937/inovacije1702029L

Milanović, A. Novković Cvetković, B. (2020). ICT in Teaching – Once a Choice Now a Necessity. *Facta Universitatis, Series: Teaching, Learning and Teachers Education*, *4*(2), 147-156. https://doi.org/10.22190/FUTLTE2002147M

Nikolić, R. (2004). *Školska i porodična pedagogija: izabrani tekstovi za studente učiteljskih fakulteta*. Užice: Učiteljski fakultet.

Paunović, Lj., i Gajtanović, Z. (2020). Povećanje motivacije učenika u nastavi matematike primenom zanimljivih zadataka u nižim razredima osnovne škole. *Zbornik radova Učiteljskog fakulteta u Leposaviću 14*, 327-336.

Petrović U. (2012). *Zagonetne priče – prva knjiga*. Beograd: Laguna.

Polya G. (1945). *How to Solve It - a system of thinking which can help You solve any problem*. Princeton University Press.

Raméntol, S. V. (2011). Good morning, numbers day: motivating for mathematics. *Australian Primary Mathematics Classroom*, *16*(3), 25-28.

Simjanović, D. J., Vesić, H. (2016). Prost broj u složenim zadacima, *Nastava matematike*, 61(4), 49-58.

Simjanović, D. J., Lapčević, B. V., Radonjić, J., i Stamenković, M. S. (2014). Zanimljivi zadaci o broju. *Matematika i informatika*, *2*(2), 9-24.

Stojanović, V. (2012). *Izoštri um*, Beograd: Matematiskop.

Vait, I., i Gajtanović, Z. (2017). Matematički zadatak kao osnovni sadržaj početne nastave matematike. *Zbornik radova Učiteljskog fakulteta u Prizrenu – Leposaviću*, *11*, 135-143.

Williams, M. D. (1993). Interaction among attributional style, attributional feedback, and learner-controlled CBI. Paper presented at the annual meeting of the American Educational Research Association, Atlanta, GA.

PRIMERI MATEMATIČKIH PROBLEMA U OSNOVNOM I SREDNJEŠKOLSKOM OBRAZOVANJU KOJI UKLJUČUJU AKTUELNU KALENDARSKU GODINU

Usadjeno je mišljenje da časovi matematike u osnovnoj školi spadaju u kategoriju najmanje omiljenih časova. Čitavi timovi psihologa, edukatora i matematičara proučavali su taj animozitet učenika (a u odredjenoj meri i odbojnost roditelja) prema časovima matematike, ali su takodje proučavali metode i načine za prevazilaženje ovog problema. Pokušavali su da pronadju način da podstaknu aktivnosti učenika, da ih više angažuju u nastavi i da povećaju njihovu motivaciju. Jedno od mišljenja je da je za uspeh učenika dovoljna njihova snažna volja, istrajnost i marljivost. Svakako, kompetentnost, motivacija i doslednost nastavnika, koji ih vode u svet znanja, ima veliki uticaj. Jedan od metoda za postizanje pozitivnog uticaja nastavnika, u domenu sve većeg interesovanja za matematiku i smanjenje averzije prema njoj, jeste upotreba zanimljivih zadataka, u Kojima se pojavljuje numerička vrednost tekuće kalendarske godine ili čak tekućeg datuma. Cilj ovog rada je da ukaže na to kako se može povećati motivaijc ulenika osnovnih škola za usvajanje matematičkih sadržaja. Konkretnim primerima zanimljivih problema iz algebre, koji zagolicaju učeničku maštu i podstaknu ih na razmišljanje, pokazujemo kako se mogu naučiti neke lekcije.

Ključne reči: *matematika, učenik, zanimljivi mateamtički problemi, nastava matematike, motivacija*

FACTA UNIVERSITATIS
Series: **Teaching, Learning and Teacher Education** Vol. 5, Nº2, 2021, pp. 201 - 209
https://doi.org/10.22190/FUTLTE210321016C

Professional article

PRESENCE OF EXTRACURRICULAR ACTIVITIES AND THE NUMBER OF STUDENTS ATTENDING EXTRACURRICULAR ACTIVITIES/SECTIONS

UDC 379.8:373.3/4; 371.322.5

Danijela Čolović

Primary School "Danilo Kiš", Belgrade, Serbia

Abstract. *The aim of the research is to explore and compare the participation of students in sections, and their interest (realization, motivation, satisfaction), as well as of parents in extracurricular activities. Google Questionnaires (for students and parents) were used as research instruments. The sample of respondents was formed by surveying 8 students of both genders from each of totally 30 class (N=376 in total), as well as their parents (N=376). Finally, 341 questionnaires were fulfilled by students, and 310 by their parents. The analysis acknowledged that extracurricular activities/sections include significantly more first-class students than second-cycle students. There is more registered students in comparison to those who regularly attend classes, especially at the second cycle of education. In certain aspects of the realization of sections students are satisfied, but there is a possibility for improvements in work. When planning section classes, it is important to envision the ability to place students in the teaching role, developing student self-reliance and self-confidence, but also to encourage peer learning and all students to engage in activities.*

Key words: *questionnaires, realization of teaching, primary school age*

1. INTRODUCTION

The free time of children/students during the primary school attendance period is a time when they are released from their regular school and family obligations. During that time, they should develop and improve their skills and abilities.

Contemporary circumstances bring children a multitude of content and influence, both positive and negative. Therefore, in the time that remains available for students, it is important to organize activities under the supervision of an expert person – a teacher. It is

Received March 21, 2021/Accepted December 26, 2021
Corresponding author: Danijela Čolović
Primary School "Danilo Kiš", Generala Štefanika 6, 11010 Belgrade, Serbia
Phone: +381 11 7856 845 • E-mail: osdanilokisdir@gmail.com

of great importance that activities are realized regularly, according to a certain plan and per the interests of students.

Working in extracurricular activities develops peers interaction and enriches social skills enabling social contacts and relationships that build children's personality in different ways (Previšić, 1987), conditioning less common risky behaviors in students involved in extracurricular activities (Dryfoos, 1997).

Different studies show that organized students' free time through extracurricular activities has a great contribution to the formation of positive attributes for the child and its development in general (Vidulin & Papak, 2018, pp. 15).

Despite many positive effects on students such as better personal perception, augmented self-confidence, developed leadership and communication skills, etc., there are challenges in the realization of extracurricular activities including the burden of students with several classes and regular class hours. The fact is that many of the activities the student attends are undermining the positive influences expected.

In schools outside of educational system (e.g. American schools) various activities are available, but they often exert additional funding, as well as the time needed for the organization. Dance, sports and art sections, as well as reconnaissance or activities such as debates and socio-humanitarian activities dominate (Eccles, 2003).

Hence, extracurricular activities have a predominantly cultural-artistic, sports, technical, recreational and scientific (educational) characteristics gathering students in free extracurricular time at school (Cindrić, 1992).

A school is an ideal place for an educated and planned guidance of the children through their targeted activities.

In addition to regular teachings, the school plans extracurricular activities (sections) to encourage the development of individual preferences and students' interests. Different programs of extracurricular activities contribute to the quality of social life of students, the development of positive human values, and the overall development of students.

Extracurricular activities are possibly already tied to a particular subject and some global educational project, they may have interdisciplinary character, and be in the function of social learning, promotion and encouraging children's play and activities of an active-production nature (Mendeš, 2010).

In the broadest sense of the word, extracurricular activities/sections can be considered anything that students deal with outside the classical school framework or formal classes limited by the strict plan and learning curriculum.

The aim of the research is to explore and compare the participation of students in sections, and their interest (realization, motivation, satisfaction) in extracurricular activities, as well as of their parents.

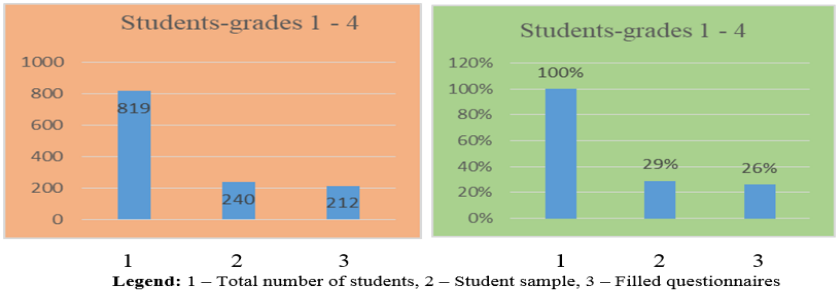
2. METHODS

The initial basis for setting up the research were the standard rules (RS Official Gazette, 2013 a,b), the report conclusions the analysis of the documents i.e., the report on the external evaluation of Belgrade School Administration since May 17, 2017 (Školska uprava Beograd, 2017), the School's Development plan for 2018-2022, the School program for 2018-2022, the school's Annual School plan for 2019/20 and the regulation on the quality standards of the institution's quality (RS Official Gazette, 2018). Common conclusion within above listed documentation emphasize the problem of poor student

involvement in extracurricular activities, and problem of planned measures that have not yet achieved the expected results.

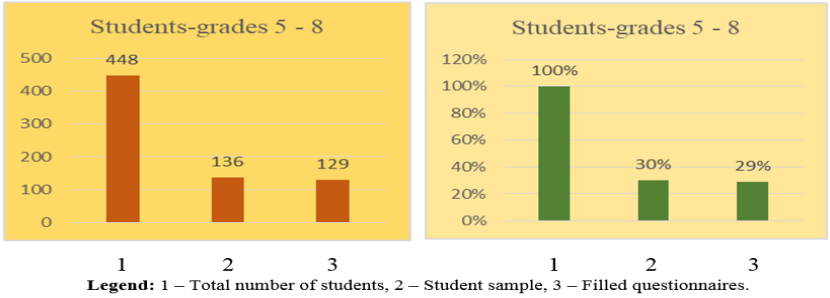
2.1. Sample of the respondents

Actual research was conducted in March 2021, at the elementary school "Danilo Kiš" in Belgrade. The school had 30 classes of the first (grades 1-4) and 17 sections of the second cycles (grades 5-8) of the previous school year (at the time of conducting research). The sample of respondents was formed by surveying 8 students of both genders from each class (N = 376 in total), as well as their parents (N = 376). Finally, totally 341 questionnaires were fulfilled by students, and 310 by their parents.



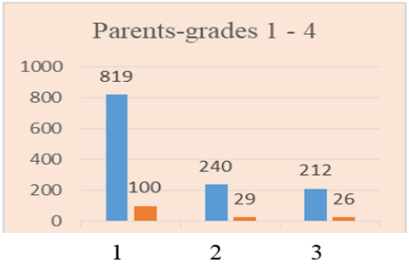
Legend: 1 – Total number of students, 2 – Student sample, 3 – Filled questionnaires

Diagram 1 Student Sample – The First Cycle



Legend: 1 – Total number of students, 2 – Student sample, 3 – Filled questionnaires.

Diagram 2 Student Sample – The Second Cycle



Legend: 1 – Total number of parents, 2 – Parent sample, 3 – Filled questionnaires.

Diagram 3 Parent sample – The First Cycle

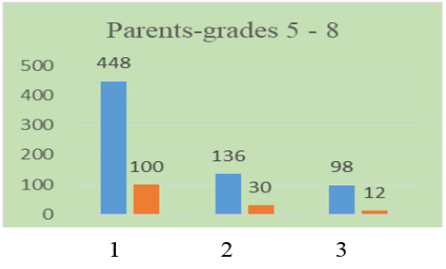


Diagram 4 Parent sample – The Second Cycle

2.2. Statistical analysis

The digital version of Google Questionnaires (for students and parents) was used as research instrument. This tool facilitated distribution, data collection and analysis. All data are mistreated and described by the means of descriptive statistics and XLSTAT Microsoft Excel® data analysis software.

2.3. Questionnaire description

Two questionnaires have been elaborated, for students and for parents (see Appendix 1 and 2, respectively). Each questionnaire initially contains a questionnaire title, an introductory word - instruction, and the aim. In this way, respondents are familiar with the goal of the survey, motivated to give realistic answers, and ascertained that the school take devising measures to improve quality of work. The analysis of the questionnaire of the first and second cycle students, as well as their parents was done separately, considering the different organizational and motivational moments.

2.3.1. Subheading The questionnaire for students

The questionnaire for students included 14 questions, and by answering the same, students had the opportunity to highlight what they like in the work of the section so far, as well as what could change. Most of the questions are related to the research of students' opinions on the organization of sections by teachers, student participation and presentation of these activities. At the beginning, the questions refer to the perception of students' opinions on the implementation of sections in the school so far, personal participation and satisfaction (questions 1 to 4). Questions under ordinal numbers 5 and 6 examine the attitude of students about the importance of the implementation of sections in the school. The set of questions from 7 to 14 refers to the students' views on the manner of realization of the sections in which they participated or were informed about them.

2.3.2. Subheading The questionnaire for parents

The questionnaire for parents contains 15 questions. Questions 1 to 4 examine the level of information of parents about the implementation of sections in school, participation and motivation of the child for these activities. Questions 5 through 8 explore parents' views on the importance of conducting school sections. A set of questions from 9 to 15 shows parents' satisfaction with children's participation in sections, motivation and the impact of this type of activity on student development.

3. RESULTS

Descriptive analysis of all of the questionnaires leads to the following conclusions: the number of students enlisting for participation in sections in the first cycle is 507 (62%) compared to 133 (30%) of those enrolled in the second-cycle (Table 1), with larger number of sections offered to the students at the first cycle.

Table 1 Student Participation in Sections

Variables	No.	Percentage
Total number of students in the first cycle	819	100%
Students signed up for sections-first cycle	507	62%
Students who regularly attend sections compared to the number of registered students-first cycle	480	95%
Total number of students in the second cycle	448	100%
Students signed up for sections-second cycle	133	30%
Students who regularly attend sections compared to the number of registered students-second cycle	72	54%

4. DISCUSSION

The research covered several aspects of extracurricular activities/sections, such as, the realization of activities in section classes, the motivation of students to participate in the activities envisioned in the sections and students' satisfaction.

- The realization of activities in section classes – first-cycle students are significantly more satisfied with the realization of the sections compared to second-cycle students, and a parallel can be drawn comparing the number of students who quit attending these classes. Most students see the importance of participating in sections, realize that new knowledge can expand existing general knowledge and direct them to further education. Students believe that the majority of teachers encourage students to engage in the work of sections, yet point out that teachers do not always allow them to choose topics that will satisfy their interests. Because they feel that section work is not always presented through available media, it can be concluded what affects their satisfaction or discontent;
- The motivation of students to participate in the activities envisioned in the sections – most of the surveyed students are familiar with the sections that are being conducted in the school, however there are students who are not fully familiar with the sections; students are interested in participating in sections, but there is room for encouraging several under-motivated students; the reason for the previously stated can be in the fact that first-grade students and parents don't always have complete information, especially about sections-making teachers, sometimes, because of the uncertainty, students don’t apply and don’t have an interest; students of the second cycle due to their numerous obligations pay no attention to this segment of the school's work;
- Students' satisfaction – it is positively affected by the ability to work together as team members and to use different sources of knowledge. Students suggest that local community resources are not being used sufficiently, which is very important for connecting knowledge gained in the school environment with life-experienced findings.

The obtained results coincide with the results of other researches, which show that children who participate in extracurricular activities understand and express their feelings and attitudes much better, establish positive interactions with the environment, express assertiveness in social contacts, respond effectively to peer pressure and have better success in school (Durlak & Weissberg, 2007).

The analysis acknowledged that extracurricular activities/sections include significantly more first-class students than second-cycle students. There is more registered students in comparison to those who regularly attend classes, especially at the second cycle of education. In certain aspects of the realization of sections students are satisfied, but there is a possibility for improvements in work.

At school, teachers encourage students to apply for participation in sections (mostly talented ones that would certainly achieve their ambitions by attending additional classes). It is important to engage students who want to do so, although they do not tend to a certain curriculum or area in which the section is dedicated.

The results of some research show that children spend most of their time in the company of their peers, looking for contents and ways of life different from family or school ones (Rosić, 2005). This fact should be taken into account together with the other conclusions.

It takes considerably more motivation for second-cycle students to participate in sections, and it is necessary to assist teachers in devising section programs, activities and plans, realization and promotion of section products. Professional collaborators can direct teachers and be an important link in the planning, telling teachers to integrate access to regular instructions and extracurricular activities, goals, and learning outcomes. Teachers should be noted that, in organizing sections, they can exploit inter-class competencies and connect different objects into one section. Curriculum can be linked within the expert council, but not necessarily. More opportunities should be looked at to provide students with the content of different areas, presentation of content that is not intended for regular hours, thus pointing out to students the importance of participating in extracurricular activities.

Parent involvement represent huge motivating factor both for students and teachers.

Gonzalez-DeHass, Willems, & Holbein (2005) determined that elementary school students show a beneficial relationship between parental involvement and the various motivational constructs (school engagement, intrinsic/extrinsic motivation, perceived competence, perceived control, self-regulation, mastery goal orientation, and motivation to read). Teachers' motivation is augmented in case of parental support in schools (Perie, 1997).

5. CONCLUSION

Attention needs to be paid to a variety of sections that can be improved, e.g. by using modern digital tools, which can be a motivating factor for students, and a known working method. When planning section classes, it is important to place students in the teaching role, to develop student self-reliance and self-confidence, but also to encourage peer learning and all students to engage in activities.

Local community's resources could have been used as supplementary funds, allowing students to become acquainted with some important content in an obvious manner. It can also solve to a certain degree the problem of finding terms that are more appropriate for students without directly being associated with regular classes.

It is necessary to set a goal that is wanted to be achieved, to list all the activities that will enable the goal to be achieved, and to ensure that the evaluation indicator is determined.

REFERENCES

Cindrić, M. (1992). *Izvannastavne i izvanškolske aktivnosti učenika osnovne škole (Extracurricular and extracurricular activities of primary school students)*. Osijek: Život i škola.

Durlak, J. A., & Weissberg, R. P. (2007). *The Impact of After-School Programs that Promote Personal and Social Skills*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning

Dryfoos, J. (1997). *The Role of the School in Children's Out-of-School Time.* Princeton University. The Future of Children, Vol. 9, No. 2.

Eccles, J. (2003). Extracurricular activities and adolescent development. *Journal of Social Issues*, *59*(4), 865-889.

Gonzalez-DeHass, A. R., Willems, P. P., & Holbein, M. F. D. (2005). Examining the relationship between parental involvement and student motivation. *Educational Psychology Review*, *17*(2), 99-123.

Školska uprava Beograd (2017). *Izveštaj o spoljnom vrednovanju rada škole OŠ "Danilo Kiš", Beograd* (*Report on the external evaluation of the work of the elementary school "Danilo Kiš", Belgrade*).

Mendeš, B. (2010). *Izvanastavne aktivnosti u suvremenom osnovnoškolskom kontekstu*. Split: Faculty of Philosophy in Split.

Official Gazette of RS-Education Gazette. (2018). *Pravilnik o standardima kvaliteta rada ustanove* (*Rulebook on the quality standards of the work of the institution*). No. 14/2018, August, 02.2018.

Official Gazette of RS. (2013a). *Pravilnik o standardima kompetencija direktora ustanova obrazovanja i vaspitanja* (*Rulebook on standards of competencies of directors of educational institutions*). No. 38, April, 26.2013.

Official Gazette of RS. (2013b). *Zakon o osnovnom obrazovanju* (*Law on Primary Education*). No. 55/2013, 101/2017, 10/2019 and 27/2018-dr.zakon.

Perie, M. (1997). *Job satisfaction among America's teachers: Effects of workplace conditions, background characteristics and teacher compensation*. US Department of Education, Office of Educational Research and Improvement.

Previšić, V. (1987). *Izvannastavne aktivnosti i stvaralaštvo*. Zagreb: Školske novine.

Rosić, V. (2005). *Slobodno vrijeme – slobodne aktivnosti*. Rijeka: Biblioteka Educo.

Vidulin, S., & Papak,P. (2018). *Vannastavne aktivnosti, pogled u budućnost*. Pula: Artefact.

APPENDIX

1. Questionnaire for students

Participation in extracurricular activities-sections in school

Dear student,

It is very important that you read the following questions carefully and express your opinion regarding the implementation of extracurricular activities-sections in our school.

The goal of this questionnaire is to single out everything that you like, but also what could change, in order to improve the work within the extracurricular activities-sections in the coming period.

In order to get the best possible results, I ask you to express your opinion by assessing the claims to the extent that the above is present through a four-point scale.

TRUE / PRESENT

1. incorrect / not present
2. to a lesser extent true / present
3. to a greater extent accurate / present
4. true / fully present

Thanks in advance.

1. I am familiar with extracurricular activities-sections that are organized in the school.
2. I am interested in participating in sections.
3. I am satisfied with the sections in which I participated.
4. I am satisfied with the terms in which the sections are realized.
5. I believe that participation in sections contributes to increasing general knowledge.
6. I think that participating in sections can help in the choice for further education.
7. Teachers encourage all students to get involved in the work of the sections.
8. Teachers present the work of sections through a website, bulletin board or event.

If you have participated in the work of any section so far, please answer the following questions:

9. Participation in the section allows me to satisfy my interests.
10. The teacher gives me the opportunity to choose the topics I will deal with in the section.
11. In the classes of the section, we usually work as a team or in pairs.
12. We always prepare papers in the section classes.
13. In the preparation of papers we use only textbooks.
14. The teacher uses the resources of the local community (museum, gallery, park, library and other institutions) in the implementation of sections.

2. Questionnaire for parents

Realization of extracurricular activities-sections in school

Dear,

It is very important that you read the following questions carefully and express your opinion regarding the implementation of extracurricular activities-sections in our school. The aim of this questionnaire is to see what is important and to what extent it is important for students to join the sections in a timely and purposeful manner, but also what could change in order to improve the work within extracurricular activities-sections in the future.

In order to get the best possible results, please express your opinion by assessing the claims to the extent that the above is present through a four-point scale.

TRUE / PRESENT

1. 1.incorrect / not present
2. 2.to a lesser extent true / present
3. 3.to a greater extent accurate / present
4. 4.true / fully present

Thanks in advance.

1. I have information about extracurricular activities - sections of children in school.
2. I am interested in my child's participation in extracurricular activities.
3. I am familiar with the sections in which my child participates.
4. My child is very motivated to participate in sections.
5. I believe that extracurricular activities are useful for improving general knowledge children.
6. Sections contribute to the improvement of children's specific abilities.

7. Participation in sections improves learning motivation.
8. Participation in sections has a positive effect on increasing work habits children.
9. I actively monitor my child's participation in the sections
10. I think that it is useful for competent external associates to participate in the realization of the sections.
11. I am satisfied with the sections in which my child participates.
12. I am satisfied with the terms of the sections in which mine participates a child.
13. I advise other parents to include their children in the sections schools.
14. I believe that the school should provide students with as much as possible Section
15. Participation in sections can help children choose for further education.

PRISUTNOST VANNASTAVNIH AKTIVNOSTI I BROJ UČENIKA KOJI POHAĐAJU VANNASTAVNE AKTIVNOSTI / SEKCIJE

Cilj istraživanja je da se istraži i uporedi učešće učenika u sekcijama, i njihovo interesovanje (realizacija, motivacija, zadovoljstvo), kao i roditelja u vannastavnim aktivnostima. Google upitnici (za učenike i roditelje) korišćeni su kao istraživački instrumenti. Uzorak ispitanika formiran je anketiranjem po 8 učenika oba pola iz svakog od 30 odeljenja (ukupno N=376), kao i njihovih roditelja (N=376). Na kraju anketiranja, 341 upitnik ispunili su učenici, a 310 njihovi roditelji. Analiza je potvrdila da vannastavne aktivnosti/sekcije uključuju značajno više učenika prvog razreda nego učenika drugog ciklusa. Više je prijavljenih učenika u odnosu na one koji redovno pohađaju nastavu, posebno u okviru drugog ciklusa obrazovanja. U pojedinim aspektima realizacije sekcija učenici su zadovoljni, ali postoji mogućnost poboljšanja u radu. Prilikom planiranja sekcijske nastave važno je predvideti sposobnost postavljanja učenika u nastavnu ulogu, razvijanje samopouzdanja učenika, ali i podsticanje vršnjačkog učenja i svih učenika da se uključe u aktivnosti.

Ključne reči: *upitnici, realizacija nastave, osnovnoškolski uzrast*

FACTA UNIVERSITATIS Series: Teaching, Learning and Teacher Education would like to acknowledge the expertise of the following reviewers, which has helped to set the standard of the journal in 2021

Jelena Stamatović/associate professor/Faculty of Pedagogy, University of Kragujevac, Serbia/Vice Dean for scientific research

Jelena Petrović/associate professor/Faculty of Philosophy, University of Niš, Serbia/

Marija Jovanović/associate professor/Faculty of Philosophy, University of Niš, Serbia/Head of Department of Pedagogy

Milica Ristić/assistant professor/Pedagogical Faculty in Vranje, University of Niš, Serbia/

Siniša Stojanović/full professor/Pedagogical Faculty in Vranje, University of Niš, Serbia/Vice Dean for academic affairs

Aleksandar Stojadinović/assistant professor/Pedagogical Faculty in Vranje, University of Niš, Serbia/

Tatjana Milosavljević Đukić/assistant professor/Pedagogical Faculty in Vranje, University of Niš, Serbia/

Danica Pirsl/associate professor/Faculty of Sport and Physical Education, University of Niš, Serbia/

Bisera Jevtić/full professor/Faculty of Philosophy, University of Niš, Serbia/

Vesna Trifunović/full professor/Faculty of Education, University of Kragujevac, Serbia/

Milena Stojanović Stošić/assistant professor/ Pedagogical Faculty in Vranje, University of Niš, Serbia/

Darko Stojanović/assistant professor/ Pedagogical Faculty in Vranje, University of Niš, Serbia/

Sanja Maričić/full professor/Faculty of Pedagogy, University of Kragujevac, Serbia/ Vice Dean for academic affairs

Srboljub Đorđević/full professor/ Pedagogical Faculty in Vranje, University of Niš, Serbia/

Ivan Nikolić/assistant professor/Faculty of Philosophy, University of Niš, Serbia/

Mladen Živković/associate professor/Faculty of Sport and Physical Education, University of Niš, Serbia/

Saša Bubanj/full professor/Faculty of Sport and Physical Education, University of Niš, Serbia/

Ljiljana Bjelaković/associate professor/Faculty of Sport and Physical Education, University of Niš, Serbia/

Miloš Paunović/assistant professor/Faculty of Sport and Physical Education, University of Niš, Serbia/

Dušan Aleksić/assistant professor/Faculty of Philosophy, University of Niš, Serbia/

Bojan Lazić/associate professor/Faculty of Education in Sombor, University of Novi Sad, Serbia/

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

37

FACTA Universitatis. Series, Teaching, Learning and Teacher Education / editor-in-chief Danijela Zdravković. - Vol. 1, no. 1 (2017)- . – Niš : University of Niš, 2017- (Niš : Atlantis). - 24 cm

Dostupno i na: http://casopisi.junis.ni.ac.rs/index.php/FUTeachLearnTeachEd. - Polugodišnje. - Drugo izdanje na drugom medijumu: Facta Universitatis. Series, Teaching, Learning and Teacher Education (Online) = ISSN 2560-4619
ISSN 2560-4600 = Facta Universitatis. Series, Teaching, Learning and Teacher Education
COBISS.SR-ID 241074956

Co-funded by the
Erasmus+ Programme
of the European Union