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Professional Article

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Original research paper

USING ALTERNATIVE ASSESSMENT DURING THE PANDEMIC BY INDIAN AND UKRAINIAN TEACHERS OF ENGLISH

UDC 616.98(100)::371.671::811.111"2020/2021"; 37.018.43(477):811.111; 37.018.43(540):811.111; 004.738.5::371.3::811.111

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Abstract. *The article aimed to analyze the usage of alternative assessment by teachers of English in India and Ukraine during the pandemic. The actuality of the study is related to making teaching English during the pandemic more effective through alternative assessment. Comparing and contrasting the practices of Indian and Ukrainian teachers of English in terms of using alternative assessment provides the data necessary for planning English courses more effectively. Pedagogical observation, surveys, interviews, and mathematical statistics were used to collect the data. It was established that Indian respondents had a wider range of experience in teaching English. More than half of Indian teachers conducted their lessons online, while Ukrainian teachers mostly had blended lessons. The necessity of training in assessment and learning facilitation was obvious for both Indian and Ukrainian respondents. All the respondents appreciated the students' involvement in choosing alternative assessment tools. Both Indian and Ukrainian teachers acknowledged the usefulness of a variety of alternative assessment tools. The methods of evaluation preferred by Ukrainian respondents were similar to those preferred by Indian respondents, with peer-evaluation used more often by Indian teachers. The results of the study showed that the respondents from both countries were positive about the impact of portfolios on learners' motivation. Curricula limitations hindered the application of alternative assessment for both Indian and Ukrainian teachers of English. However, in contrast to Indian teachers' responses, for Ukrainian teachers, there was one more reason: students' reluctance. The recommendation is to provide more opportunities for professional development in terms of using alternative assessment.*

Key words: *alternative assessment, teachers of English, online, blended, pandemic*

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1. INTRODUCTION

The COVID-19 pandemic affected the lives of people all over the world, but quarantine and other preventive measures, which disrupted the conventional educational process, were especially painful for teachers and students. The pressure of the necessity to continue working and studying online brought fear and anxiety, on the one hand, and an understanding of the need to reconsider existing practices, on the other (Luiz, 2021; Bragg, et al., 2021). Teaching and studying online, as an alternative to the physical classroom in crisis, required effective strategies that could compensate for the lack of face-to-face communication (Paudyal & Rana, 2021; Perifanou, et al., 2021). Looking at avatars instead of human faces caused stress and impeded understanding, experiencing technical problems during video conferences deprived students of active participation in class activities, which made fair and transparent assessment of students' performance problematic. Using alternative assessment as a precondition for the quality of the English course as properly planned and conducted, proposed strategies to deal with the negative effects of uncertainty and lack of control (Etedali, 2021; Pellegrino, 2014; Pilotti, 2022; Karaman, 2021). Enhancing students' learning process awareness, which is one of the aims of alternative assessment, is crucial for empowering their autonomy (Banat, 2022). Alternative assessment evaluates the outcome of learning and learners' ability to apply their knowledge, providing diagnostic feedback to help learners identify gaps and reconsider their strategies (Rousseau, 2018, pp. 2-3). However, little attention is paid to the issue of using alternative assessment in teaching English during the pandemic.

The actuality of the study is related to the necessity of making teaching English during the pandemic more effective through alternative assessment. The unpreceded experience of teachers practitioners under the quarantine restrictions must be documented and analyzed. Comparing and contrasting the practices of Indian and Ukrainian teachers of English in terms of using alternative assessment during the pandemic provides the data necessary for planning English courses more effectively.

2. METHOD

The article aimed to analyze the usage of alternative assessment by teachers of English in India and Ukraine during the pandemic. To achieve this goal, it was necessary to collect teachers' responses, conduct a comparative analysis, and develop strategies for using alternative assessment in teaching English more effectively. In this research, it was hypothesized that:

Hypothesis A: Indian and Ukrainian teachers of English used alternative assessment during the pandemic, there were more similarities than differences;

Hypothesis B: Indian and Ukrainian teachers of English used alternative assessment during the pandemic, there were more differences than similarities;

Hypothesis C: Indian and Ukrainian teachers of English did not use alternative assessment during the pandemic.

The study was conducted at the end of the 2020-2021 academic year, during which online, blended or face-to-face modes of instruction were used because of the quarantine restrictions. The research involved teachers of English who worked in Ukraine (N = 45) and India (N = 17). The survey was conducted by Ukrainian teachers of English first, and then by Indian teachers of English. The study's participants were fully informed about the

anonymity and confidentiality of their responses, as well as the option to withdraw from the study at any time.

The data collection methods (pedagogical observation, surveys, interviews, and mathematical statistics) were used to collect the data. The survey was introduced via Google Forms, and interviews were conducted in Zoom sessions. The survey consisted of multiple-choice prompts No1, No2, No3, No4, and No12; Likert scale prompts No5, No6, No7, and No10; one range prompt No11 and a short response (see Appendix). Providing additional written responses was not obligatory. However, it was an opportunity for participants to add explanations to their responses for multi-choice prompts. For the Likert scale prompts, the median (Mdn) and the interquartile range (IQR) were calculated.

3. Results

Concerning experience, about half of Ukrainian respondents had taught English for more than twenty years (Chugai et. al., 2021). However, Indian respondents had a wider range of experience: about 40% had taught English for 15-20 years, 30% for 5-10 years, and 18% for more than 20 years, while the rest of the respondents had taught English for 10-15 years. Nobody indicated experience of fewer than 5 years. To conclude, all the respondents had experience in teaching English, ranging from five to more than twenty years (see Figure 1).

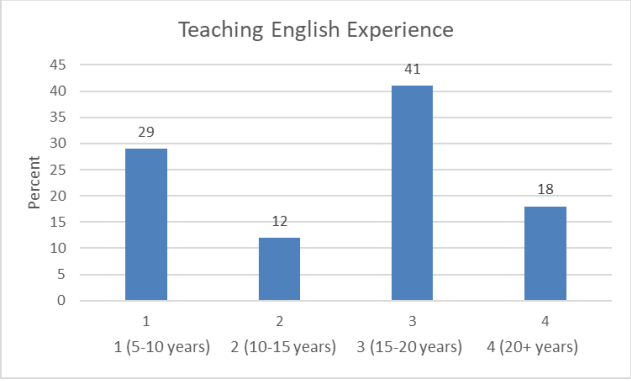

Fig. 1 Teaching English experience of the respondents (India)

According to the responses considering the main place of work, more than half of Ukrainian teachers indicated that they worked at universities, a third were secondary school teachers, and about nine percent were high school teachers (Chugai et. al., 2021). It is important to know that formal assessment in Ukraine is obligatory for school leavers (an external independent test, or ZNO), and bachelors (an external independent test, or EVI). Aimed at providing equal opportunities for students, ZNO and EVI are held each year on fixed dates. More than half of the respondents from India (53%) indicated high school as the main place of work; 47% taught English at secondary school. However, considering the fact that high school is part of the higher education system in India, we concluded that about half of all the respondents were university teachers.

To achieve the aims of the study, it was important to know the frequency of English lessons for one group of students per week in India and Ukraine. The findings of the study showed that about a third of Ukrainian respondents claimed to have two lessons of English for one group per week, 24% of the respondents had about five lessons, and slightly fewer conducted one lesson per week (Chugai et.al., 2021). The number of English lessons in Ukraine varied according to state regulations, the types of schools or universities, and their policies. As a rule, there were more English lessons in private educational institutions than in the public ones. Teachers of English in India conducted one class or two classes per week for one group of students (about 60%), three or five classes were less common (about 36%), and four lessons a week were the least frequent. To conclude, there are a number of differences between the frequency of English lessons conducted by the respondents from India and Ukraine (see Figure 2).

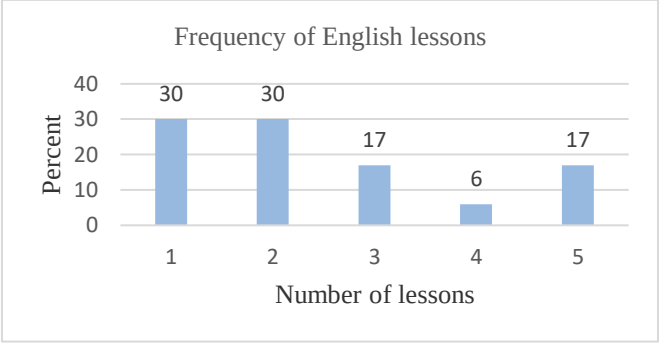

Fig. 2 Frequency of English lessons conducted by the respondents (India)

During the 2020-2021 academic year, Ukrainian teachers of English used three modes of instruction: they mostly had blended English classes (62%), 36% online classes, and just 2% face-to-face classes (Chugai et. al., 2021). The responses of teachers from India were quite different, with 65% teaching online and 35% face-to-face or blended, which could be explained by the government policy concerning pandemic restrictions in each country (see Figure 3).

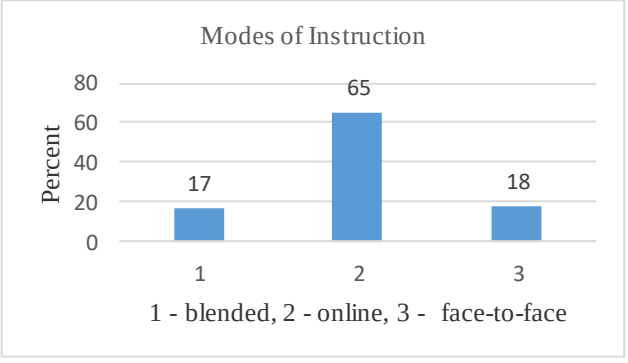

Fig. 3 Modes of instruction used by the respondents during the pandemic (India)

The necessity of training in assessment and learning facilitation was obvious for both Indian (100%) and Ukrainian (98%) respondents (Chugai et al., 2021). In particular, most Ukrainian respondents strongly agreed with the necessity of training (Mdn = 1, IQR = 1), while Indian respondents more tended to agree (Mdn = 2, IQR = 1) (See Table 1).

Table 1 Teachers' perspective on alternative assessment (India / Ukraine)

Prompts	SA	A	N	D	SD	Mdn	IQR
Prompt 5 Ukraine	25	19	1	0	0	1	1
Prompt 5 India	6	11	0	0	0	2	1
Prompt 6 Ukraine	18	24	3	0	0	2	1
Prompt 6 India	3	14	0	0	0	2	0
Prompt 7 Ukraine	3	31	9	2	0	2	0
Prompt 7 India	4	13	0	0	0	2	0
Prompt 10 Ukraine	4	23	17	1	0	2	1
Prompt 10 India	24	13	1	0	0	2	0

The research showed that most Ukrainian teachers agreed with prompt six about the importance of alternative assessment (Mdn = 2, IQR = 1) (See Table 1). The respondents were positive about the importance of alternative assessment in language teaching and learning (93%), with some having doubts (Chugai et. al., 2021). These results differ from the responses of Indian teachers who mostly agreed (82%) and strongly agreed (18%) with that statement.

Prompt seven, about the involvement of students in choosing alternative assessment tools, was the only one with which Ukrainian respondents mostly agreed; their opinions were not polarised (Mdn = 2, IQR = 0) (See Table 1). More than half of the respondents indicated that students had to be involved in the process of assessment (Chugai et. al., 2021). Indian teachers were more decisive in their responses: the majority agreed (77%), and the rest strongly agreed with that statement.

According to the results of the research, Ukrainian teachers used videos the most often, presentations and projects less frequently, while WebQuests were the least frequently used (Chugai et. al., 2021). Indian respondents sometimes used WebQuests, less frequently videos, presentations, and projects. Therefore, both Indian and Ukrainian teachers acknowledged the usefulness of a variety of alternative assessment tools, at the same time expressing preferences for using videos (Ukrainian teachers) and WebQuests (Indian teachers).

Ukrainian responders practiced a traditional way of evaluating, namely evaluation by a teacher, more often than other ways, but sometimes they used self, peer, and group evaluation (Chugai et al., 2021). Indian teachers indicated peer evaluation (as used sometimes), assessment by a teacher (as always used), self-evaluation (as often used), and group evaluation (as always or sometimes). Therefore, we may conclude that the ways in which Ukrainian respondents evaluate are similar to those preferred by Indian respondents, with peer-evaluation being used more often by Indian teachers. The results of the study showed that Ukrainian teachers of English were positive about the impact of portfolios on learners' motivation (Chugai et. al., 2021). Three-quarters of Indian teachers agreed with that statement as well, and one-quarter strongly agreed.

For Ukrainian teachers of English, the most effective strategies were "allowing students to take part in assessment", "choosing learning activities for themselves" and "reflecting on previous learning" (Chugai et.al., 2021). Indian teachers also considered "allowing students to

take part in assessment" first of all, with "making learners aware of curriculum aims" coming next, followed by "allowing learners to choose who to work with" and "reflecting on previous learning". To conclude, all the respondents rated "allowing students to take part in assessment" as the most important, whereas "making learners aware of curriculum aims" was important for Indian teachers, and "choosing learning activities for themselves" for Ukrainian teachers.

For 42.2% of Ukrainian respondents, curricula limitations were detrimental to using alternative assessment; 24.4% were blamed on students' reluctance; for the same percentage, it was a lack of practical knowledge (Chugai et al., 2021). Indian teachers also indicated curricula limitations (47%), and a lack of practical knowledge (41%). Other reasons were not significant. Therefore, curricula limitations hindered the application of alternative assessment for both Indian and Ukrainian teachers of English. However, in contrast to Indian teachers' responses, for Ukrainian teachers, there was one more reason: students' reluctance.

Providing additional comments on their experience of using alternative assessment in their English classes during the pandemic, the Ukrainian respondents were skeptical about the technical problems their students experienced. At the same time, they confessed that some educational institutions had no online tools and that sometimes teachers could not choose appropriate ways of alternative assessment. Nevertheless, a few Ukrainian teachers of English noted that they used alternative assessment, group work, and rubrics regularly (Chugai et. al., 2021). Teachers also wrote about the necessity of creating a friendly atmosphere when conducting an online class. It is true that some students were dissatisfied with online learning for many reasons, like a lack of face-to-face communication or an inability to organize their daily routine. However, they blamed teachers for their failures, claiming that assessment online was not fair. Using alternative assessment methods provided more ways for students to demonstrate their knowledge and develop their skills by encouraging them instead of punishing them.

Some Indian teachers also added their comments and stated that alternative assessment was "the best option in the pandemic period". The respondents confirmed that they had successfully conducted practical classes, taken exams, taught grammar and writing online. One respondent expressed their concern about students' "participation in the learning process". While students' input could be better, teachers did everything possible in this complicated situation: "do your best and very best, do it every day". The respondent added that the combined efforts of teachers, students, and parents were prerequisites for success. Another comment by an Indian teacher indicated the fact that for some students, English could be a third language, and that is why alternative assessment is especially useful, in particular, to discover the hidden potential of students. The respondent also wrote about the role of a teacher in choosing particular elements of alternative assessment and added that alternative assessment was used in teaching English before and during the pandemic, which resulted in better outcomes.

4. DISCUSSION

The results of the research concerning the necessity of training for teachers of English in both countries are in line with Etedali (2021), who wrote about the necessity for teachers of English to master online collaboration tools and applications. Besides the

generation gap, the digital gap may seriously hinder the ability of teachers to demonstrate the visuals, combine different kinds of audio and video materials, provide opportunities for students to communicate online, to use effective tools for evaluation. In addition, lack of knowledge and practical skills of teachers may prevent creating friendly atmosphere at the lessons and result in disruptions. Considering the fact, that assessment is the most demanding and yet vital task, teachers should be trained in such areas as designing assignments and tests that promote student learning, conducting effective grading, as well as minimizing students' dissatisfaction (Mintz, 2009, pp. 49-51).

It is important to remember that the list of tools for alternative assessment includes some others like conferencing, diaries, learning logs, checklists, observations, and rubrics, which recreate real-world environments (Norris, 2000, p. 41). Using rubrics, for example, is necessary for various ways to be assessed, e.g. by a teacher, your peer, or yourself. Besides providing clear guidance for assessing effectively, rubrics minimize stress and dissatisfaction among students (Mintz, 2009, p. 52). The results of this research are in keeping with the conclusion that research also indicated that students positively assessed portfolios as evidence of their achievements (Kırıkkaya et al., 2011).

Difficulties in implementing alternative assessment were noticed in the study done by Aminatus Sa'diyah (2020), who examined emerging strategies and problems in alternative assessment for the teacher while working on the development of speaking skills. The results confirmed the necessity of finding the right combination of assessment techniques to avoid the boredom of students during the lesson and prepare them to use English in real-life situations.

5. Conclusion

It was established that Indian respondents had a wide range of experience in teaching English, ranging from five to more than twenty years, while half of the Ukrainian teachers had more than 20 years of experience. More than half of the respondents from both countries were university teachers of English. Ukrainian teachers conducted mostly two lessons of English per week for one group, while for Indian teachers it was one or two lessons. More than half of Indian teachers conducted their lessons online, while Ukrainian teachers mostly had blended lessons.

To conclude, the results of the research proved the hypothesis, which stated that Indian and Ukrainian teachers of English used alternative assessment during the pandemic, and there were more similarities than differences. The necessity of training in assessment and learning facilitation was obvious for both Indian and Ukrainian respondents. The respondents were mostly positive about the importance of alternative assessment in language teaching and learning, but some Ukrainian teachers had doubts about that. All the respondents appreciated the students' involvement in choosing alternative assessment tools. In addition, they ranked "allowing students to take part in assessment" as the most important. Both Indian and Ukrainian teachers acknowledged the usefulness of a variety of alternative assessment tools, while at the same time expressing preferences for using videos (Ukrainian teachers) and WebQuests (Indian teachers). The methods of evaluation preferred by Ukrainian respondents were similar to those chosen by Indian respondents, with peer-evaluation used more often by Indian teachers.

The results of the study showed that the respondents from both countries were positive about the impact of portfolios on learners' motivation. Curricula limitations hindered the application of alternative assessment for both Indian and Ukrainian teachers of English. However, in contrast to Indian teachers' responses, for Ukrainian teachers, there was one more reason: students' reluctance.

According to the results of this research, teachers of English in both countries are aware of the necessity of training in assessment and learning facilitation, the recommendation is to provide more opportunities for the professional development of teachers of English. As far as curricula limitations hindered the application of alternative assessment, it is recommended for teachers and university officials to initiate the revision of curricula for English courses at their educational establishments.

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KORIŠĆENJE ALTERNATIVNOG OCENJIVANJA TOKOM PANDEMIJE OD STRANE INDIJSKIH I UKRAJINSKIH NASTAVNIKA ENGLESKOG JEZIKA

Rad je imao za cilj da analizira mogućnosti primene alternativnog ocenjivanja od strane nastavnika engleskog jezika u Indiji i Ukrajini tokom pandemije. Aktuelnost studije zasniva se na pronalaženju načina za efektivnije učenje engleskog jezika tokom pandemije kroz alternativno ocenjivanje. Upoređivanjem i suprotstavljanjem praksi indijskih i ukrajinskih nastavnika engleskog jezika u smislu korišćenja alternativnog ocenjivanja dobijeni su podaci neophodni za efektivnije planiranje kurseva engleskog jezika. Za prikupljanje podataka korišćena su pedagoška opservacija, ankete, intervjui i odgovarajući statistički postupci. Ustanovljeno je da su indijski ispitanici imali širi spektar iskustava u nastavi engleskog jezika. Više od polovine indijskih nastavnika je svoje časove izvodilo onlajn, dok su ukrajinski nastavnici uglavnom imali kombinovane časove. Neophodnost obuke za ocenjivanje i olakšavanje učenja bila je očigledna i za indijske i za ukrajinske ispitanike. Svi ispitanici su ocenjivali uključenost učenika u izbor alternativnih alata za ocenjivanje. I indijski i ukrajinski nastavnici su ukazali na korisnost korišćenja raznih alternativnih alata za ocenjivanje. Metode evaluacije koje su preferirali ukrajinski ispitanici su slične onima koje preferiraju indijski ispitanici, pri čemu su vršnjačku evaluaciju češće koristili indijski nastavnici. Rezultati studije su pokazali da su ispitanici iz obe zemlje pozitivno ocenili uticaj portfolija na motivaciju učenika. Ograničenja definisana nastavnim planom i programom ometala su primenu alternativnog ocenjivanja i za indijske i za ukrajinske nastavnike engleskog jezika. Međutim, za razliku od odgovora indijskih nastavnika, za ukrajinske nastavnike postojao je još jedan razlog: nevoljnost učenika. Na osnovu dobijenih rezultata preporuka je da se obezbedi više mogućnosti za profesionalni razvoj nastavnika u smislu korišćenja alternativnog ocenjivanja.

Ključne reči: *alternativno ocenjivanje, nastavnici engleskog, onlajn učenje, pandemija*

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Original research paper

THE ANALYSIS OF TEACHER LEADERSHIP STYLES – PERCEPTIONS OF SECONDARY SCHOOL STUDENTS

UDC 371.13:005.322; 371.213:373.5-057.874(497.11 Niš)

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Abstract. *The aim of this research was to determine which leadership style is perceived as the most dominant by the secondary school students, when the teachers' behaviours are presented through transformational, transactional and passive-avoidant leadership components. The perception of teacher leadership styles was also investigated in relation to various socio-demographic parameters. A total number of 500 secondary school students of final grade from Nis in the Republic of Serbia, participated in the research. Since this research was based on Transformational and Transactional Theories, information about teacher leadership style and leadership factors was collected through the adapted Multifactor Leadership Questionnaire - MLQ (Avolio & Bass, 2004). The research results indicate that, according to the students' perceptions, secondary school teachers practice both transactional as well as transformational leadership style, i.e., in the schools covered by the research a full range leadership model is articulated. Also, the research confirmed that variables such as gender, school type, educational profile, academic performance of the participants affect the perception of teachers' leadership styles.*

Key words: *leadership behavior, transformational leadership, transactional leadership, multifactor leadership questionnaire*

1. INTRODUCTION

Even though the influence of leadership on the effectiveness of the organization has been actively discussed and debated since the twentieth century, not much has been written about its importance for the quality of education in that period. Since the beginning of the 21st century, given the results of some studies, certain initiatives have been launched to consider educational leadership as the key factor in organizational success or failure. However, it seems that during such actions, the analyses of the leadership behaviour of

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those who are in formal or managerial positions within the school organization were “under scrutiny”, while those who directly contribute to the effectiveness and quality of the teaching process and better student achievement remained on the side-lines. Precisely because of linking leadership and hierarchical leadership in schools, and attributing leadership characteristics to directors of educational institutions, supervisors and those with formal titles, not much space was left for teacher leadership in research papers. Over time, progressive schools and districts across developed countries recognized the importance of leadership in those directly involved in the teaching process, and the concept of teacher leadership came to the fore, which was eventually supported by professional and scientific literature, with various theoretical and research perspectives. Thus, it begins to occupy an important place in the scientific research works of numerous authors, discussions and assessments of experts in various working and operational groups, legislative debates and analyses of advisory bodies and professional bodies in the international arena. At both the implicit and the explicit level, modern studies prove that teacher leadership behaviour is crucially important for the effectiveness of student learning, and the quality, effectiveness and efficiency of the teaching process. The influence of teachers' leadership style is reflected in the use of innovative and productive approaches in teaching, developing a productive and favourable school climate, and improving the overall quality of learning and functioning, and creating a modern education policy accompanied by reforms in education. Therefore, teacher leadership is one of the most important concepts of management and leadership in education, and it is especially important that this concept is given more attention in future education reforms in Serbia. Teacher leadership role is just as important, irreplaceable and invaluable as the role of the principal. Unlike globally, in Serbia education, there is an evident lack of systematic initiatives for conducting research that would take into account the characteristics of effective leadership behaviour of teachers. This is also emphasized by authors such as Andevski, Arsenijević and Spajić (2012), noting that there are currently a small number of research papers that deal specifically with studying and determining the leadership characteristics of employees in education, especially teaching staff. Unfortunately, the claim of these authors seems to be especially true about our schools. Also, there is a small number of individual research efforts by several individuals highlight the need to refocus on teacher leadership whose initiative affect the quality, success and effectiveness of the teaching process.

Given that in the education process, teacher is seen as the main figure in planning, organizing and monitoring student activities and consequently is in the position of leader - leadership style could be seen as a type of specific teacher behaviour, special manner and special approach to students through constant adjustment to the requirements of their mutual interactions and education context (Jovanović, 2017). Alibabić (2008, p. 253) also states that leadership style includes aligned activities, processes and leadership tools. Patterns of teacher behaviour, which reflect both the implicit and explicit actions, are slowly but surely gaining their place in the authors’ research interest, and it can be said that they occupy the central place in the analysis of numerous contemporary theories. Among these theories, the relationship theory and the leadership theory are often mentioned as the most effective ones, the most detailed and the most comprehensive in the context of education, according to the results of studies from the international space. As such efforts have not been a priority of research interest in Serbia so far, there is more reason to initiate the first individual attempts to analyze the transformational and transactional style of teacher leadership.

2. Theories of Transformational and Transactional Leadership – Full Range Leadership Theory

In the last 20 years, researchers and practitioners have focused intensively on the paradigm of transformational and transactional leadership. Ever since 1985, when Bass (1985) published his initial work on the theory of transformational leadership, the international space has been flooded with various research ventures that have argued the positive impact of the transformational approach on both subjective and objective performance. Needless to say, such activities covered many spheres from politics, sports, the army, medicine, and later on - education. In order to highlight the far-reaching positive effects of transformational and transactional leadership in the organizational context, several meta-analytical studies have been conducted in which all previous results have been concisely presented.

According to the theory of transformational leadership, both leaders and followers meet higher goals in the process of mutual growth and development. Transformational leadership is defined as a leadership approach that causes changes in the individual but also in the social system. In its ideal form, transformational leadership creates valuable and positive changes in followers with the goal of transforming and developing them into future leaders. This theory primarily focuses on people with a strong ability to anticipate, create, innovate and change, i.e., visionaries, creatives, innovators, and most importantly, on people who are not afraid to initiate radical changes and introduce major innovations. Theorists of the transformational approach claim that the most important thing is for the leader to persuade the members of the organization to believe in his vision of success, but of course the interest of the organization always comes first. According to Burns (1978), transformational leadership is a process in which leaders and followers raise each other's levels of morale and motivation. Transformational leaders with their vision and the strength of their personality become role models for followers and a driving force in changing their own expectations, perceptions and motivation for the purposes of common goals and vision. The crucial segment of Burns' theory of transformational leadership is not to make changes within the environment and meet goals, but rather to change people themselves: leaders and followers. Bass (1985), referring to Burns' interpretations of this type of leadership, gave his view, believing that transformational leadership is a way for leaders to have an effect on followers, in terms of believing, admiring and respecting leaders.

Leader behaviour that this author is talking about is intended to motivate members of the organization in three ways: (1) raising awareness of the importance of tasks and values, (2) focusing on team and organization goals rather than one's own goals, and (3) by awakening higher order needs (Bass, 1985, p. 20). Transforming, motivating and encouraging followers to find new and unique ways to overcome the status quo and face the changing environment to achieve the expected results, transformational leaders achieve through charisma, intellectual stimulation and individual appreciation. Therefore, this type of leadership is focused on possible processes of influencing leaders on the performance and achievements of not only group members, but each member individually to fulfill their full potential (Jovanović & Ćirić, 2016). This is especially important in the school context in the teacher-student relationship. Teachers of transformational leadership style lead by personal example in working with students, and in order to have students involved, they tend to use relationships, inspiration and motivation. They are adorned with courage and self-confidence, and they do not lack the readiness to invest their own sacrifice in work for the common goal.

They provide their students with an inspiring mission and vision and develop their identity, clearly showing commitment, tolerance and focus on goals, but also a willingness to take risks.

On the other hand, the essence of transactional leadership is the exchange. In fact, the leader provides the followers with the necessary resources and reward in exchange for motivation, productivity and effective accomplishment of tasks. Thus, the simplest definition of transactional leadership could be that it is the process of exchange between leaders and followers (Bass, 1985, 1990, 2000; Burns, 1978). Transaction or social exchange is the key to established relationships between leaders and followers. Transactional leaders focus on motivating followers by reward and discipline, i.e., positive and negative reinforcement, and they specify to followers the type of reward they can expect for different types of behaviour. Such a leader does not individualize the needs of followers or focus on their personal development but seeks to focus on short-term needs. As such, transactional leadership style is not enough, but transactional leadership gains its full effect only in combination with transformational leadership. In this regard, research conducted in the school context most often shows the presence of two types of leadership – task-oriented leadership and relationship-oriented leadership. While transactional leadership is task-oriented and linked to expectations, results evaluation, and project planning, transformational leadership refers to behaviours that emphasize engagement in the interpersonal dimension, trust transfer, and conflict resolution. Transformational and transactional theory can overcome the shortcomings of both because research evidence suggests that the same leader can often show both transactional and transformational behaviour in different situations (Avolio & Bass, 2004), but each leader has a little more of one type of leadership style and less of another (Bass, 1999). Thus, through this theory, leader behaviour can be described and adequately evaluated. While transformational leaders are characterized by charisma and shared vision, and encouraging others towards high productivity, transactional leadership is based on a "give and take" relationship, i.e., a relationship between leaders and followers is established through exchange, such as rewarding someone for meeting a goal.

If we understand that leadership has its share in the efficiency, quality and success of the organization as much as 40-50%, and if educational institutions and those who manage them want to provide the consumers of their services – students with the highest quality of education, it is necessary to bring effective leaders in the education groups. It is well known that teachers have received new roles over time, which are constantly changing one year after another, but the latest role attributed to them (and at the same time the most challenging one) is the one concerning leadership in terms of influencing students, involvement in decision-making, exchange of ideas and visions, respect, harmony, motivation… which is achieved through different styles.

It is important to keep in mind, as suggested by other authors such as Bass and Avolio (1993), that one leadership style may not be appropriate in all areas of education. Clearly, leadership styles in the context of education are differently understood, and they first proved to be beneficial in the relationship theory and leadership theory, which are the focus of this research.

3. METHODOLOGY

This study was designed to investigate which leadership style is perceived as the most dominant by the secondary school students, when the teachers' behaviours are presented through transformational, transactional and passive-avoidant leadership components. Also, study was oriented toward exploring correlations between students' perceptions of teacher leadership style and various socio-demographic variables. 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. Since this study is descriptive in nature and aimed to shed light on and determine the relationship between a number of variables in the first stage of the research, the focus was on identifying the characteristics of teacher leadership behaviour. The starting point was the assumption that students perceive the transformational leadership style of teachers as dominant.

3.1. Research sample

The research sample consisted of a total of 500 participants, i.e. students from secondary schools in Nis, Serbia. It included participants of both genders, from different schools, different educational profiles, different economic status and academic achievement. The structure of the sample is presented according to: gender (Table 1), type of school and field of work (Table 2), educational profile (Table 3), economic status (Table 4) and academic achievement (Table 5).

Table 1 Sample structure according to gender of participants

Gender	Frequency	Percent
Male	164	32.8
Female	336	67.2
Total	100	100.0

The research within this paper also included collecting data from the participants on the type of school they attend, i.e., the education profile. The data in the following table refer to the ratio of participants from different Nis schools within the entire sample (Table 2). Speaking about the type of school, the well-known categorization into general education and vocational schools was taken into account. However, in order to better understand the structure of the sample, participants from these two categories of schools were classified into subcategories based on the education profile, and the category of general education schools then included the subcategory of grammar schools, and the category of vocational schools the following subcategories: law, business, medical, tourism schools.

Table 2 Sample structure according to school type and field of work

School type	N	%	Field of work	N	%
General	173	34.6	Grammar school	173	34.6
Vocational	327	65.4	School of Law and Business	77	15.4
			Medical	87	17.4
			Tourism	68	13.6
			School of Economics	95	19.0
Total	500	100.0	Total	500	100.0

The research sample included students from 4 high schools and 4 vocational schools. Data on their educational profile are shown in the following table.

Table 3 Sample structure according to school type and educational profile of students

School name	N	%	Educational profile	N	%
"Bora Stanković" Grammar School	41	8.2	Social sciences and linguistics	21	4.2
			Natural Sciences and Mathematics	20	4.0
"Stevan Sremac" Grammar School	41	8.2	Social sciences and linguistics	21	4.2
			Natural Sciences and Mathematics	20	4.0
"Svetozar Marković" Grammar School	50	10.0	Social sciences and linguistics	28	5.6
			Natural Sciences and Mathematics	22	4.4
"9. maj" Grammar School	41	8.2	General education profile	41	8.2
School of Law and Business	77	15.4	Business administrator	26	5.2
			Legal technician	10	2.0
			Fire protection technician	18	3.6
			Insurance officer	23	4.6
"Dr Milenko Hadžić" Medical School	87	17.4	Nurse/medical technician	17	3.4
			Dental nurse	20	4.0
			Physiotherapist	21	4.2
			Nurse - educator	29	5.8
Tourism School	68	13.6	Culinary technician	56	11.2
			Tourism technician	12	2.4
School of Economics	95	19.0	Economy technician	69	13.8
			Finance technician	26	5.2
Total	500	100.0	Total	500	100.0

In order to avoid unrealistic assessments of the economic status of families that may arise due to the specifics of the developmental period in which the participants find themselves or their subjectivity, it seemed wise that each category of family economic status has its own descriptions. Based on these, students were able to give estimates of the family's economic status, because the assumption was that such descriptions are closer to students and that they will be more objective by using them. Thus, the description "we live pretty badly" refers to the category of low economic status, "we have enough money for the most basic needs" belongs to the category of average economic status, "we have enough not to worry" belongs to the category of high economic status and "we live much better than others" to the category of very high economic status. Data obtained from student ratings are shown in Table 4.

Table 4 Sample structure according to economic status of families

Economic status	Frequency	Percent
Low	11	2.2
Average	239	47.8
High	238	47.6
Very high	12	2.4
Total	500	100.0

The research sample consisted of students of different school achievement. During the research, students were asked for information on the overall average grade at the end of the semester of the previous school year, as they are senior grade students, based on which they are classified as unsatisfactory, satisfactory, good, very good and excellent in school.

Table 5 Sample structure according to school achievement of participants

School achievement	Frequency	Percent	Cumulative %
Unsatisfactory	3	.6	.6
Satisfactory	16	3.2	3.8
Good	52	10.4	14.2
Very good	129	25.8	40.0
Excellent	300	60.0	100.0
Total	500	100.0	
Mean		4.41	
St. deviation		0.85	

3.2. Instrument

Information on the dominant leadership style of teachers and leadership factors was collected with an adapted *Multifactor Leadership Questionnaire* – ***MLQ***[1] (Avolio & Bass, 1995, 2004). In this research, the Rater form was used, i.e., students rated the leadership behaviour of teachers, and it took an average of 15 minutes to complete the questionnaire. Participants in the study answered a total of 45 items of the standard version of the multifactor questionnaire (MLQ 5x-Short), using a five-point scale of behavioural assessment ("never", "rarely", "sometimes", "often" and "always"). Students rated the frequency of certain behaviours described with items in the scale. If we keep in mind that this instrument rates a wide range of leadership types, from passive leaders to leaders who reward those with whom they work, to those who transform followers so that they themselves take on the role of leader, it can be concluded that the essence of the instrument is to rate different leadership styles: transformational, transactional, and passive-avoidant. All subscales of leadership style consist of 4 items and 9 scales contain 36 items that measured the components of: transformational leadership (idealized influence - attribution, idealized influence – behaviour, inspirational motivation, intellectual stimulation and individualized consideration), of transactional leadership (potential/contingent rewards, active management by exception, and passive management by exception), non-leadership (laissez faire).

Since MLQ is protected by copyright, after paying the license to use the questionnaire to an authorized publishing house, consent was obtained which defines more detailed conditions for its use, translation and adaptation to research needs (Agreement No. 487). The permission to use this instrument and the manner of its public display is clearly specified in the agreement between the interested parties. In addition to the MLQ instrument, a scoring key was received (Avolio & Bass, 2004) to evaluate the research findings. The scoring key was used to connect data from each scale with different dimensions, which increases the chances of being able to obtain results from correct measurements.

[1] *Source*: This instrument (Rater form) has been translated and adapted to the cultural and educational context and specific needs of the research. The author received a special permission (*Agreement No. 487*) of the publisher, MIND GARDEN, Inc., www.mindgarden.com from the Multifactor Leadership Questionnaire by Bernard M. Bass and Bruce J. Avolio. Copyright © 1995, 2000, 2004 by Bernard M. Bass and Bruce J. Avolio.

4. Results and Discussion

Table 6 shows the descriptive indicators of each subscale on the scale of teacher leadership styles, i.e., the descriptive indicators of the components of leadership styles.

Table 6 Descriptive indicators of *MLQ* scale

Components of leadership styles	N	Min.	Max.	Mean	St.deviation
Idealized influence* behaviour	500	1	4	2.48	0.88
Idealized influence * attribution	500	1	4	2.45	0.92
Inspirational motivation	500	1	4	2.63	0.88
Intellectual stimulation	500	1	4	2.49	0.91
Individualized consideration	500	1	4	2.43	0.88
Contingent rewards	500	1	4	2.61	0.87
Management by exception*active	500	1	4	2.66	0.93
Management by exception*passive	500	1	4	1.52	0.73
Laissez-faire	500	1	4	1.28	0.81

As the number of items describing each subscale is low, the data in the table above are not surprising, although they go beyond the limits of interpretation (higher degree of agreement AS > 3 and lower degree of agreement AS < 3). However, the values of standard deviation indicate that the data are within the expected range and as such interpretable. Thus, by calculating mean values, it was found that participants had a slightly higher tendency to agree with items related to the following four dimensions/components: active management by exception, contingent rewards (often called conditional rewards), inspirational motivation and intellectual stimulation. As we can notice, the first two places are occupied by the dimensions of transactional leadership style, and the third and fourth places are occupied by the dimensions of transformational leadership style. Regarding the choice of items towards which students were less inclined, i.e., the three less important dimensions are the following ones: idealized influence (behaviour), idealized influence (attribution) and individualized consideration. All three belong to the transformational leadership style. Finally, students show the least tendency to agree with the items in the dimension of transactional leadership (passive management by exception) and non-leadership factor (laissez faire).

After the formation of new variables, the normality of data distribution of newly acquired Kolmogorov-Smirnov variables was examined. The obtained data can be seen in Table 7.

Table 7 Normality test of variables distribution

Leadership style	K-S test	*P*
Transformational	0.082	0.000
Transactional	0.111	0.000
Passive-avoidant	0.612	0.000

Based on the results shown in the table, it can be noticed that the empirical distribution of statistical data deviates significantly from the normal distribution ($p<0.05$) for the examined sample. Since the preconditions for the use of parametric tests were not met, for the purpose of comparison, a non-parametric test was applied, more specifically the Friedman test for dependent samples. Given that the essence of this test is to rank the

data, the mean values of the ranks for all participants are compared with the expected values, and it was assumed that the most common leadership style was the transformational one. Whether the obtained ranks support this assumption or not is shown by the Friedman test data shown in Table 8.

Table 8 Representation of teachers' leadership style

Leadership style	Mean rankings	*P*
Transformational	2.19	
Transactional	2.5	0.000
Passive-avoidant	1.31	

From the data obtained, statistically significant differences can be observed in terms of perceived representation of different leadership styles. Namely, the participants included in this research perceived the transactional leadership style of their teachers as more prevalent compared to the transformational and passive-avoidant. The values of mean ranks indicate the highest representation of transactional leadership style of teachers and the lowest representation of passive-avoidant leadership style. The results of a research conducted in Romania (Cuciac et al., 2015) show that students perceive their teachers (mother tongue and mathematics teachers) as more transactional than transformational in their leadership style. The authors provided two alternative explanations for this perception of teacher leadership style: (1) the average and below-average level of student academic success and (2) the subjective influence of the level of performance and self-confidence of students.

However, the research findings shown above should be interpreted with some caution. Namely, although according to the participants' perception, the transactional teacher leadership style was presented as more prevalent, the difference between the values of mean ranks of the first two separate leadership styles is not large. In both cases, the values of the mean rank exceed 2, which means that the transformational style of teacher leadership does not "lag" behind the transactional one. More precisely, it could be said that high school teachers in Nis use transactional and transformational leadership style, i.e., the schools covered by the research include a model of teacher transformational-transactional leadership. This confirms one of Pounder's (2008) conclusions from a study conducted at the Hong Kong University business school that, despite the fact that the relevant literature (not only pedagogical, but in general) suggests that effective leaders are those who are more active and engaging (transformational) and less passive (transactional), most leaders are likely to be transformational-transactional.

According to the previously presented findings that speak about the potential presence of the model of overall leadership and based on the essence of the transformational-transactional leadership paradigm, it could be said that teachers can apply two different types of behavioural components in trying to influence their students. Moreover, although these two approaches to managing tasks and activities are slightly contradictory, they are not treated in this way, although they have different effects on student motivation and performance. Regardless of a commonly-held view in the literature that these leadership styles primarily concern organizational leaders, this paper is based on Harrison's (2011) thesis that they are sufficiently analogous to instructional leadership to make these leadership theories applicable to educational institutions. Certainly, teachers (as well as organizational leaders) coordinate and direct the activities of the educational group

through communication and control, maintaining the status of superiority due to power and expertise. Their efficiency and effectiveness are assessed in the same way that they manage group dynamics and students, i.e., by outcomes and participation. Also, certain clarifications are necessary when talking about the transactional behaviour of teachers due to the potential negative connotations associated with them. Bolkan & Goodboy (2009) define transactional leadership style as a process of exchange that "reinforces" conformist behaviour of followers in relation to the demands of leaders without necessarily generating enthusiasm and engagement related to tasks and activities. With this in mind, Harrison speaks of the instrumental, task-oriented approach of transactional leaders who extrinsically condition their followers, use rewards to stimulate good outcomes, and critique to prevent poor performance (Harrison, 2011). Although in this style of leadership the emphasis is on transaction or exchange between leaders and followers, in the education context such transactions imply that the teacher together with students identify what is important or necessary and define requirements and rewards for certain tasks.

Although it is well-known, and research results confirm it, that transformational leadership style encourages motivation and performance of followers more than transactional leadership style, high efficiency and effectiveness of teacher leaders is reflected in the combined application and synergy of both styles, and in some respect, one complements the other. Since most of the students from this research perceived the transactional teacher leadership style as more prevalent, and since the transformational teacher leadership style is not far behind it, in order to better emphasize their effects, we could talk about transformational-transactional leadership style. Realistically, these are the predominant (prevalent) dimensions in both styles.

The next group of factors, which was assumed to be important for students' perception of certain components of teacher leadership styles, are various sociodemographic parameters. The research included gender, type of school, education field, academic success and economic status of the participants. The differences in students' perceptions of teachers' leadership styles by gender were first examined. To examine these differences, the Mann–Whitney U test was used. The data are shown in Table 9.

Table 9 Gender differences in perception of teacher leadership style

Leadership style	Gender	N	Mean ranks
Transformational	Male	179	207.35
	Female	352	271.56
	p	0.000	
Transactional	Male	179	213.69
	Female	352	268.47
	p	0.000	
Passive-avoidant	Male	179	279.22
	Female	352	236.48
	p	0.000	

As these are categorical variables, the difference between them actually speaks to their connection, because if students differ in terms of a certain leadership style, then that style is related to gender. Also, as the prevailing opinion was that the comparison by groups will give more precise data on the relations between categorical and continuous variables, techniques were used to compare groups, i.e., samples. Certainly, the data shown in the table indicate that in the opinion of male and female participants, there is a difference in teachers' leadership

style. Female students perceive transformational and transactional leadership style as more prevailing, unlike male students, i.e., male participants. On the other hand, male participants perceive passive-avoidant leadership style as more frequent than female participants. Similar to these results, based on his research, Lashway (2000) came to the conclusion that students are more inclined to evaluate teachers through the manifestation of active forms of management in relation to female students. The boys and girls from his research agreed that "bad" teachers are those who demonstrate passive leadership skills and do not require students to put in the extra effort. All teachers who practiced active leadership and clearly had higher expectations from students, were evaluated more positively by both genders. Finally, the results indicated that boys were more likely to respond favourably to task-oriented transactional leaders who praised and rewarded, but also sanctioned bad behaviour by refraining from rewarding. Examining the effects of student gender on the perception of transformational and transactional leadership of teachers, Walumbwa & Ojode (2000, 2004) came to the conclusion that female students identify themselves with the characteristics that describe transformational leadership, while male students, unlike female students, identify themselves with characteristics of transactional leadership. (Poulson et al., 2011) emphasize that in assessing the leadership style of teachers, student preferences come to the fore. Therefore, a teacher who teaches in a style that matches the student's expectations will be assessed as more appropriate.

After this, gender differences in the perceptions of the frequency of teachers' leadership style components was checked. The obtained data are shown in the following table (Table 10).

The obtained results show that there is a statistically significant difference in the perception of the frequency of teacher leadership practice in relation to student gender. More specifically, female students believe that all components of teacher leadership styles are frequent, except in the case of the passive management by exception where no statistically significant difference was found, and laissez-faire where a statistically significant difference was found but in favour of male participants. More precisely, the table shows that female students perceive intellectual stimulation and inspirational motivation as the most common components of transformational leadership, and not far behind them are active management by exception and contingent rewards as components of teacher transactional leadership. It is interesting to note that male participants most often perceive the non-leadership factor (laissez-faire) as a component of the passive-avoidant leadership style of teachers.

In order to compare the results obtained by examining the perceptions of teacher leadership styles by the participants from different schools (type of school: grammar school and vocational school), the Mann-Whitney U test for independent samples was used. The data are shown in Table 11.

Table 10 Gender differences in the perception of the frequency of teachers' leadership style components

Components [2]	Gender	N	Mean ranks
	Male	179	217.39
II*B	Female	352	266.66
	p	0.000	
	Male	179	223.89
II*A	Female	352	263.49
	p	0.000	
	Male	179	210.19
IM	Female	352	270.17
	p	0.000	
	Male	179	207.11
IS	Female	352	271.68
	p	0.000	
	Male	179	223.38
IC	Female	352	263.74
	p	0.000	
	Male	179	218.52
CR	Female	352	266.11
	p	0.000	
	Male	179	216.50
ME*A	Female	352	267.10
	p	0.000	
	Male	179	257.77
ME*P	Female	352	246.95
	p	0.216	
	Male	179	291.74
LF	Female	352	230.37
	p	0.000	

Table 11 Significance of differences in students' perceptions of teachers' leadership styles from gymnasium and vocational schools

Leadership style	School type	N	Mean ranks
	Grammar school	171	334.42
Transformational	Vocational	360	233.50
	p	0.000	
	Grammar school	171	314.43
Transactional	Vocational	360	243.00
	p	0.000	
	Grammar school	171	253.63
Passive-avoidant	Vocational	360	271.87
	p	**0.200**	

[2] Components of teachers' transformational leadership style: idealized influence (behaviour) – II*B, idealized influence (attribution) – II*A, inspirational motivation - IM, intellectual stimulation - IS, individualized consideration – IC. Components of teachers' transactional leadership style: contingent rewards – CR, management by exception/active – ME*A, management by exception/passive – ME*P, laissez faire – LF.

Data shown indicate that there is a difference in the perception of transformational and transactional teacher leadership style depending on the type of school. If we look at the data related to the perception of transformational and transactional leadership style of teachers, it can be seen that they are somewhat more prevailing in general education schools (grammar schools) compared to vocational schools. These data are underlined in the table. However, when it comes to the perception of the passive-avoidant style of teacher leadership, no statistically significant differences were obtained between schools of different types, which is supported by the data in **bold**. After this step, the next step was to check the differences in perceptions of the frequency of using individual components of teacher leadership styles depending on the type of school. The data are shown in Table 12.

Table 12 The differences in perceptions of the frequency of using individual components of teacher leadership style depending on the type of school

Components	School type	N	Mean ranks
	Grammar school	171	295.78
II*B	Vocational	360	226.97
	p	0.000	
	Grammar school	171	300.30
II*A	Vocational	360	224.62
	p	0.000	
	Grammar school	171	302.02
IM	Vocational	360	223.72
	p	0.000	
	Grammar school	171	306.98
IS	Vocational	360	221.15
	p	0.000	
	Grammar school	171	301.86
IC	Vocational	360	223.81
	p	.000	
	Grammar school	171	296.26
CR	Vocational	360	226.72
	p	0.000	
	Grammar school	171	283.49
ME*A	Vocational	360	233.35
	p	0.000	
	Grammar school	171	243.48
ME*P	Vocational	360	254.15
	p	**0.431**	
	Grammar school	171	237.94
LF	Vocational	360	257.03
	p	**0.159**	

According to the data shown in the table, it can be concluded that there is a statistically significant difference in the perception of the frequency of using certain teacher leadership styles depending on the type of school. All components of teacher leadership styles are rated as more frequent in general education schools compared to vocational schools. Speaking about the transformational teacher leadership style, and judging by the mean rank values, the most prevailing component is intellectual stimulation in general education schools in relation

to vocational schools, followed by inspirational motivation, individualized consideration, idealized influence - attribution and idealized influence - behaviour. Moreover, the situation with transactional leadership is similar, i.e., the prevalence of all components is different based on the type of school. More precisely, the contingent rewarding component in general education schools is more prevailing than in vocational schools, followed by the component of active management by exception. The only exception is in the case of passive management by exception and laissez-faire where no statistically significant difference was observed. Although all components of teacher leadership styles have been rated as common in general education schools, the components of intellectual stimulation, inspirational motivation and individualized consideration stand out.

Furthermore, in order to check the differences in the perceptions of teacher leadership styles among students from schools of different education profiles, and to avoid potential errors of less precise association of variables, and given that these are more independent samples, it is most appropriate to apply Kruskal-Wallis test. The data are shown in the table below (Table 13).

Table 13 Significance of differences in the perception of teacher leadership style based on educational profile

Leadership style	Education profile	N	Mean rank
Transformational	School of Law and Business	77	207.27
	Medical School	88	*205.27*
	Grammar School	172	**312.14**
	Tourism School	68	239.49
	School of Economics	95	223.76
	p	0.000	
Transactional	School of Law and Business	77	*219.23*
	Medical School	88	228.24
	Grammar School	172	**292.92**
	Tourism School	68	241.66
	School of Economics	95	225.91
	p	0.000	
Passive-avoidant	School of Law and Business	77	243.87
	Medical School	88	246.10
	Grammar School	172	*240.10*
	Tourism School	68	**276.74**
	School of Economics	95	259.99
	p	0.434	

From the aspect of the education profile, the data showed that the transformational teacher leadership style is most prevailing in grammar schools and least present in medical schools. Transactional leadership style is also most noticeable in grammar schools and least in law and business schools, while passive-avoidant style is most prevailing in tourism school and least in grammar schools.

Table 14 shows the results of Kruskal-Wallis test, which was used to examine the difference in students' perceptions of the frequency of individual components of teacher leadership styles grouped according to education profiles.

Table 14 The differences in students' perception of the frequency of individual components of teacher leadership style according to educational profiles

Components	Education profile	N	Mean rank
II*B	School of Law and Business	77	*209.37*
	Medical School	88	*219.40*
	Grammar School	172	**296.91**
	Tourism School	68	252.09
	School of Economics	95	227.48
	p	0.000	
II*A	School of Law and Business	77	*219.44*
	Medical School	88	*192.45*
	Grammar School	172	**301.38**
	Tourism School	68	238.04
	School of Economics	95	246.25
	p	0.000	
IM	School of Law and Business	77	*203.21*
	Medical School	88	*224.47*
	Grammar School	172	**303.10**
	Tourism School	68	233.89
	School of Economics	95	229.61
	p	0.000	
IS	School of Law and Business	77	226.36
	Medical School	88	*203.19*
	Grammar School	172	**307.94**
	Tourism School	68	245.40
	School of Economics	95	213.54
	p	0.000	
IC	School of Law and Business	77	*213.69*
	Medical School	88	*213.99*
	Grammar School	172	**301.58**
	Tourism School	68	236.73
	School of Economics	95	231.53
	p	0.000	
CR	School of Law and Business	77	*214.03*
	Medical School	88	225.36
	Grammar School	172	**297.02**
	Tourism School	68	240.66
	School of Economics	95	225.93
	p	0.000	
ME*A	School of Law and Business	77	*228.16*
	Medical School	88	232.19
	Grammar School	172	**284.42**
	Tourism School	68	242.52
	School of Economics	95	229.87
	p	0.005	
LF	School of Law and Business	77	241.10
	Medical School	88	253.88
	Grammar School	172	237.08
	Tourism School	68	277.79
	School of Economics	95	259.75
	p	0.318	
ME*P	School of Law and Business	77	250.59
	Medical School	88	240.28
	Grammar School	172	242.80
	Tourism School	68	266.52
	School of Economics	95	262.36
	p	0.657	

In this table, questions about the perception of teacher leadership styles are elaborated according to the categories of components and education profiles, and the results of the Kruskal-Wallis test show that in the case of the education profile variable, there is at least one group of students who differ statistically from others in the perception of the components of transformational, transactional, and passive-avoidant teacher leadership. More precisely, the obtained data indicate that there are differences in the visibility of the components of different teacher leadership styles from the aspect of the school field of work/education profile.

Therefore, talking about the individual components of transformational leadership, in all these cases, (intellectual stimulation, inspirational motivation, individualized consideration, idealized influence (attribution and behaviour)), the highest average score was given by participants from grammar schools, and the lowest mostly from medical school and law and business school. A similar pattern was observed for the components of transactional leadership - in all of the above cases (contingent rewarding and active management by exception), the highest average value was calculated for grammar school students and the lowest for students from law and business school.

Finally, the results of the applied test regarding the representation of the components of passive-avoidant leadership style indicate that no statistically significant differences were obtained between schools in different fields of work. Although no statistical difference is significant in the observed variables, it is interesting that the participants from the tourism school gave the highest average score to the components of laissez-faire leadership and passive management by exception, and the lowest score was given to these components by students from grammar schools and medical schools.

The link between students' perceptions of certain components of teacher leadership styles and the participants' academic success was also checked. The first step was to check the connection between students' perceptions of teacher leadership styles and students' academic success using Spearman's correlation coefficient. The obtained data are shown in Table 15.

Table 15 Correlation between the perceived teacher leadership style and participants academic success

	Transformational leadership style	Transactional leadership style	Passive-avoidant leadership style
Academic success			
Spearman's rho	.380	.371	-.168
p	.000	.000	.000

The remaining data collected during the survey confirm that the perception of teacher leadership style is in correlation with the participants' academic success. More specifically, there is a statistically significant correlation of low to medium intensity between student school success and perceived level of teacher leadership style. The direction of this connection is positive in the case of transformational and transactional teacher leadership (students with better academic success perceive transformational and transactional teacher leadership as more prevailing), while in the case of passive-avoidant leadership, the correlation is negative (students with lower average grades more often claim that passive-avoidant teacher leadership style is more frequent).

After this analysis, the correlation between the students' academic success and the components of teacher leadership styles was checked. In the first step, correlation between the components of teacher transformational leadership style and students' academic success were calculated. The data are shown in Table 16.

Table 16 Correlation between the components of teacher transformational leadership style and students' academic success

	II*B	II*A	IM	IS	IC
Academic success					
Spearman's rho	.282**	.308**	.331**	.339**	.383**
p	.000	.000	.000	.000	.000

** The correlation is significant at the level of 0.01.
* The correlation is significant at the level of 0.05

The obtained data show that there is a statistically significant positive correlation of low to medium intensity between students' academic success and all components of teacher transformational leadership style. Students with better academic success believe that the components of transformational leadership style are more frequent in teachers. When it comes to medium intensity correlation, the highest values are seen between academic achievement and individualized consideration (r = .383), intellectual stimulation (r = .339), inspirational motivation (r = .331) and idealized influence - attribution (r = .308). A lower level of correlation was found between student achievement and idealized influence - behaviour (r = .282).

After this step, the correlation between the components of teacher transactional leadership style and students' academic success were calculated.

Table 17 Correlation between the components of teacher transactional leadership style and students' academic success

	CR	ME*A
Academic success		
Spearman's rho	.341	.355
p	.000	.000

** The correlation is significant at the level of 0.01.
* The correlation is significant at the level of 0.05

The obtained data indicate that there is a statistically significant positive correlation of medium intensity between students' academic success and all components of transactional teacher leadership style. Students with better performance in school perceive both components of transactional leadership style in teachers as more prevailing. In the next step (Table 18), the correlation between the components of teacher passive-avoidant leadership style and students' academic success were calculated.

Table 18 Correlation between the components of teacher passive-avoidant leadership style and students' academic success

	ME*P	LF
Academic success		
Spearman's rho	-.308	-.241
p	.402	.000

** The correlation is significant at the level of 0.01.
* The correlation is significant at the level of 0.05

Based on the results presented, it can be seen that there is a statistically significant negative correlation of low intensity between school achievement and the laissez-faire component of the passive-avoidant leadership style of teachers. Students with better school performance believe that the laissez-faire component of the passive-avoidant style of teachers is less prevailing. On the other hand, no correlation was found between the passive management by exception component and student achievement in school.

As in the previous case, the correlation between the participants' economic status and their perception of teacher leadership style was examined by calculating Spearman's correlation coefficient. The obtained data are shown in Table 19.

Table 19 Correlation between the participants' economic status and their perception of teacher leadership style

	Transformational leadership style	Transactional leadership style	Passive-avoidant leadership style
Economic status			
Spearman's rho	-.026	-.077	.046
p	.546	.075	.288

No statistically significant correlation was found between the economic status of students and their perceived leadership style of teachers. Differences in students' economic status are not accompanied by differences in their perceptions of teacher leadership styles. This finding was also tested on the components for each of the examined leadership styles and the finding remained largely the same, as we can see from the tables below.

Table 20 Correlation between the components of teacher transformational leadership style and students' economic status

	II*B	II*A	IM	IS	IC
Economic status					
Spearman's rho	-.049	-.013	.015	-.064	-.066
p	.277	.769	.732	.151	.138

** The correlation is significant at the level of 0.01.
* The correlation is significant at the level of 0.05

Based on the data presented in the table, it can be said that no statistically significant correlation was found between the economic status of students and the components of the transformational teacher leadership style. This result indicates that the components of transformational leadership style do not correlate with students' economic status, i.e., the differences in students' economic status do not accompany differences in their perception of all listed components of transformational leadership: idealized influence (behaviour and attribution), inspirational motivation, intellectual stimulation and individualized consideration.

Table 21 Correlation between the components of teacher transactional leadership style and students' economic status

	CR	ME*A
Economic status		
Spearman's rho	-.052	-.110*
p	.248	.014

** The correlation is significant at the level of 0.01.
* The correlation is significant at the level of 0.05

The calculated correlation coefficients shown in Table 21 indicate that there is a significant correlation between the economic status of students and their perception of management by exception active. This result indicates that this component is negatively correlated with the economic status of students, i.e., the more stable the economic status of participants, the less they notice this component of the transactional model in their teachers. Thus, there is a statistically significant negative correlation between the economic status of participants and the observed characteristics of the transactional leadership of teachers, more specifically the presence of active management by exception. It is interesting that in the case of contingent rewarding, no statistically significant correlation was obtained with the estimated economic status of students.

Table 22 Correlation between the components of teacher passive-avoidant leadership style and students' economic status

	ME*P	LF
Economic status		
Spearman's rho	.028	.048
p	.536	.288

** The correlation is significant at the level of 0.01.
* The correlation is significant at the level of 0.05

Based on the results obtained, it's clear that no statistically significant correlation was observed between the estimated economic status of students and the components of passive-avoidant teacher leadership style. This result indicates that the differences in the perception of passive exception management and teacher laissez-faire leadership are not related to the economic status of students.

By examining the relationship between the independent and control variables, the findings shown above could be presented by breaking them down into individual segments of the observed variables, as follows:

- While the transformational leadership components such as intellectual stimulation and inspirational motivation, followed by transactional leadership components such as management by exception - active and contingent rewarding are most often observed by female participants, in the case of male participants such status has the non-leadership style. Generally speaking, based on the obtained data, it can be concluded that the perception of teacher leadership styles depends on the gender structure of the survey participants.
- By analyzing the relationship between the type of school attended by participants and their perception of individual components of teacher leadership styles, a somewhat more detailed picture of teacher leadership practice was obtained. That is, the perception of the components of teacher leadership styles is in a sense

related to the type of school that students attend. Higher mean rank values for the components of transformational leadership were observed in general education schools than in vocational schools. Also, although the mean rank values are somewhat lower, the transactional leadership style components are more frequent in general education schools than in vocational ones. However, such a trend is not present in the case of the components of passive-avoidant teacher leadership style and school type: the mean rank values for the observed components are not only the lowest but there is no statistically significant difference in their presence in general and vocational schools.

- Perception of the components of teacher leadership styles is in a sense related to the type of school students attend. Namely, the findings indicate that the components of transformational and transactional leadership are most frequently seen in grammar schools and are the least frequent in law and business schools. However, when it comes to the passive-avoidant leadership components, the situation is different. More specifically, the data indicate that the observed components of this style are mostly practiced by teachers in the tourism school and least in the grammar school (laissez-faire) and medical school (passive management by exception). In addition, no statistical difference in the frequency of the examined variables is significant. It can be said that there is a certain association between the education profile of students and their perceptions of the components of teacher leadership styles, but it is not at the level of statistical significance in all examined cases, and there are probably other factors that better explain differences in teacher leadership practice.
- The perception of the transformational teacher leadership style is positively correlated with the academic success of students, and although this correlation is mostly of medium intensity, it is still one of the most intense positive correlations when compared to the perception of all other components. The same trend of correlation (medium intensity) is observed in the perception of transactional teacher leadership style and academic success. While the correlation between the laissez-faire leadership style component and students' academic success is negative and statistically significant, the correlation between the management by exception-passive and academic success is not relevant. In general, based on the findings, it can be concluded that the academic success of students can have a significant share in their perception of teacher leadership.
- While the correlation between the perceived components of teacher transactional leadership style (specifically management by exception-active) and students' economic status is negative and statistically significant, all other correlations between the perceived components of teacher transformational and passive-avoidant leadership style and students' economic status are not statistically significant.

5. CONCLUSIONS

Leadership in education is an important field of scientific research and indisputably necessary for the successful education. Although many papers highlight the enormous importance of leadership in education, it is often linked to the hierarchical leadership present in schools, thus leadership characteristics are largely attributed to school principals, supervisors, and those with formal titles. In such papers, teacher leadership gained little

space, so the researchers neglected teacher leadership and its contribution to the quality of the teaching process. Over time, progressive schools and districts across developed countries recognized the importance of leadership behaviour of those directly involved in the process of teaching, so the concept of teacher leadership began to come to the fore, which has eventually been proven by professional and scientific literature, in various theoretical and research studies. In Serbia, unfortunately, such research efforts are very scarce or they are not a priority. Nevertheless, teacher leadership exists and takes place despite the lack of its clear and precise definition and study.

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ANALIZA LIDERSKIH STILOVA NASTAVNIKA – PERCEPCIJE UČENIKA SREDNJIH ŠKOLA

Istraživanje je sprovedeno sa ciljem utvrđivanja koji liderski stil nastavnika učenici srednjih škola percipiraju kao dominirajući kada je ponašanje nastavnika predstavljeno kroz komponente transformacionog, transakcionog i pasivno-izbegavajućeg vođenja. Percepcije liderskih stilova nastavnika ispitivane su i u odnosu na različite socio-demografske varijable. U istraživanju je učestvovalo ukupno 500 učenika završnih razreda srednjih škola u Nišu. S obzirom na to da je ovo istraživanje imalo uporište u teoriji tranformacionog i teoriji transakcionog liderstva, informacije o liderskom stilu nastavnika i faktorima liderstva prikupljene su putem adaptiranog multifaktorskog upitnika liderstva (Multifactor Leadership Questionairre) – MLQ (Avolio & Bass, 2004). Rezultati istraživanja ukazuju da nastavnici srednjih škola u Nišu praktikuju i transakcioni i transformacioni liderski stil, odnosno u školama obuhvaćenim istraživanjem je izražen model liderstva punog opsega. Takođe, istraživanje je potvrdilo da varijable poput pola, tipa škole, obrazovnog smera i školskog uspeha ispitanika participiraju u percepciji liderskog stila nastavnika.

Ključne reči: *liderskо ponašanje, transformaciono liderstvo, transakciono liderstvo, multifaktorski upitnik liderstva*

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Original research paper

EFFECTS OF THE ACROBATIC PROGRAM ON THE BODY COMPOSITION AND FLEXIBILITY OF ADOLESCENTS

UDC 796.012.21:572.512; 796:61; 796.4:371.212 (497.11 Niš)

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Abstract. *The aim of the research was to determine the effects of acrobatics programs (ground floor and skipping) on the body composition and flexibility of adolescents. The sample consisted of 50 male adolescents, seventh grade students of the elementary school "Bubanjski Heroji" in Niš, aged 14 years ± 6 months. The experimental group (n = 25) conducted 2 x 45 min per week experimental acrobatics program (ground floor and skipping) The control group (n = 25) continued with the program of regular physical education classes (handball and volleyball) 2 x 45 min per week. The results of the study showed positive changes in body composition: BMI, %MAT, %MIT and flexibility: PLNL, RANL, ISKP caused by the acrobatics program. Based on these results, it can be concluded that the experimental program of acrobatics lasting 16 weeks is an effective method that leads to a statistically significant improvement in body composition and flexibility of adolescents.*

Key words: *gymnastics, acrobatics, elementary school students, body composition, flexibility*

1. INTRODUCTION

Acrobatics is an anaerobic acyclic activity that consists of various movements and positions, exercises on the ground floor, exercises on devices that, in addition to jumping, also make sports gymnastics. In today's modern society, gymnastics, and especially acrobatics, exists in

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education, competitive sports, other sports, other areas of sports activities and physical activities, kinesitherapy programs, recreational forms of exercise (Broomfield, 2011).

The importance and role of body composition and flexibility in acrobatics is confirmed by studies (Taboada-Iglesias, Santana, & Gutiérrez-Sánchez, 2017; Kravchuk, Sanzharova, Golenkova, & Katrechko, 2020). Taboada-Iglesias et al. (2017) suggested that higher values of body height, minimum belly circumference, fat percentage and small biocrystal width are predictors of good results when acrobatic gymnasts work in pairs rather than in groups. Kravchuk et al. (2020) indicate a statistically significant positive effect of ground floor exercises on the development of flexibility of young gymnasts.

Acrobatics training is present in the teaching of physical education as well as in certain segments of training and phases of sports preparation of individual and collective sports. Numerous studies emphasize significance and role of body composition in gymnastics (Trexler, Smith-Ryan, Roelofs, & Hirsch, 2015; Granacher & Borde, 2017; Dobrosielski et al., 2019; Sterkowicz-Przybycień et al., 2019). Trexler et al. (2015) obtained results on a sample of young gymnasts that show that performance is not positively correlated with total body weight, adipose tissue and body fat assessment. The results of this study indicate that lean body mass can be a predictor of good results of professional gymnasts and recommend that weight loss gain should be given priority out of season. Granacher & Borde (2017) examined the effects of sports training and physical education on body composition, physical fitness and cognitive abilities of adolescents. The results of the study showed that athletes show a higher level of physical fitness with less relative body fat mass, more relative skeletal muscle mass and similar cognitive abilities compared to their non-athlete peers. Dobrosielski et al. (2019) indicate that the total percentage of body fat among gymnasts was 23.5%, and was lower compared to tennis, field hockey, lacrosse, athletics and softball. Similar results are confirmed by (Miletić et al., 2019) where the authors showed that experimental programs of gymnastics and acrobatics have a positive effect on the body composition of adolescents.

Performing numerous and varied movements in acrobatics contributes to better performance of dynamic and static movements and flexibility of the muscles of the whole body. In most girls and boys, the level of flexibility decreases with increasing number of years during childhood and adolescence. On average, girls have more flexibility than boys of all ages (Malina, Bouchard, & Bar-Or, 2004). Therefore, in addition to body composition, flexibility represents a very important component in acrobatics and gymnastics, and in addition it is most often associated with musculoskeletal injuries in gymnastics. Desai, Vance, Rosenwasser, & Ahmad (2019) emphasize that flexibility is an important factor in prevention common injury in acrobatics and gymnastics which include injuries to the spine and upper extremities, such as spondylolysis, shoulder instability, ulnar ligament injuries, capillary osteochondritis, and joint injuries. In general, the most common injuries in gymnastics are injuries of the lower extremity, ie. sprain of the ankle, followed by internal knee injuries, while in young gymnasts shoulder injuries are the most common (Hart, Meehan Bae, d'Hemecourt, & Stracciolini, 2018). One of the mechanisms of increasing flexibility in young gymnasts after the acrobatics program is the high prevalence of dynamic movements with large amplitudes that occur when performing technical elements within acrobatics and gymnastics. In any case, it has been confirmed that dynamic and static stretching, as well as long-term stretching, achieve good results in improving the flexibility of gymnasts (Santos, Lemos, Lebre, & Ávila Carvalho, 2015). In addition to flexibility, the authors of these studies point out that strength and agility are also important

in preventing injuries in acrobatics and gymnastics, and injuries are more common in professional gymnastics than recreational gymnastics. The role of flexibility in recreational gymnastics is especially emphasized after the age of forty due to the declining level of flexibility caused by the aging process. Therefore, it is very important to maintain or improve the level of flexibility, and the best results are achieved if adequate exercise programs are applied.

The aim of the research was to determine the effects of acrobatics programs (ground floor and skipping) on the body composition and flexibility of adolescents.

2. METHODS

2.1. Sample of participants

The sample consisted of 50 adolescents, students of the seventh grade of primary school "Bubanjski Heroji" in Niš, Serbia, aged 14 years ± 6 months, males who implemented a physical education program for the seventh grade of primary schools recommended by the Institute for Educational Improvement and education of the Republic of Serbia. The experimental group consisted of 25 participants, included in the experimental program of acrobatics (ground floor and jump). The control group consisted of 25 participants, included in the program of regular physical education classes (handball and volleyball).

2.2. The measuring instruments

The following variables were used to assess body composition: body height (ATVI), body mass (ATMA), body mass index (BMI), percentage of adipose tissue (%MAT), percentage of muscle tissue (%MIT). Body mass, body mass index, percentage of fat and muscle tissue was obtained using an electronic scale Omron BF511 Body Composition Monitor. Body height was measured with an anthropometer according to Martin.

The following variables were used to assess flexibility: lying on the back (PLNL), lying on the back (RANL), bending with a stick (ISKP). Measuring instruments for assessment flexibility are downloaded (Madić, Nikolić, & Stojiljković, 2015).

2.3. The experimental procedure

The experimental program was realized in the duration of 16 weeks. Physical education classes took place 2 x 45 minutes per week. The experimental group conducted an experimental acrobatics program (ground floor and jump) 2 x 45 min per week. The control group continued with the program of regular physical education classes (handball and volleyball) 2 x 45 minutes per week. The structure of the experimental and control group was divided into four parts: the introductory part of the class (5 min), the preparatory part of the class (15 min), the main part of the experimental group consisted of exercises on the ground and jump, volleyball and handball in the control group (20 min) and the final part of the class (5 min).

2.4. Statistical analysis

Multivariate covariance analysis (MANCOVA) and univariate covariance analysis (ANCOVA) were used to determine the effect of the experimental acrobatics program on adolescent body composition and flexibility, with the calculation of the magnitude of the

impact (Partial Eta Squared). Testing for differences was performed using the F-test. The significance level was set at $p < 0.05$. The data obtained were processed by the SPSS 19 statistical program (Statictical Package for Social Science, v19.0, SPSS Inc., Chicago, IL, USA).

3. RESULTS

Table 1 shows a multivariate analysis of the covariance of the applied variables for the assessment of body composition between the experimental and control groups at the final measurement, with the neutralization of the differences at the initial measurement. It can be stated that there is a statistically significant difference at the multivariate level between the subjects of the experimental and control groups, after the experimental program at the level of significance ($p = 0.03$).

Table 1 Multivariate analysis of covariance of experimental and control groups for body composition

Wilks' Lambda	F	df1	df2	p	Partial Eta Squared
.76	3.00	4.00	39.00	.03 *	0.24

Legend: Wilk's Lambda – Wilks lambda test, F – F approximation, df – degrees of freedom, p – statistical significance of differences * < 0.05, ** < 0.01, Partial Eta Squared – magnitude of impact (* = 0.01 (small impact), ** > 0.06 (moderate impact), *** > 0.14 (high impact)

Based on the partial eta squared (Partial Eta Squared = 0.24), a large influence of the experimental program on the differences between the groups in the final measurement can be stated. More specifically, this means that the difference between the groups, and thus the applied programs, explains as much as 24% of the variance in the results on the final measurement of body composition, ie 24% of the variance in the dependent variable is explained by the independent variable. Thus, it is evident that the experimental program of acrobatics at the multivariate level has significant effects on body composition.

Table 2 shows the univariate differences in the variables for the assessment of body composition between the subjects of the experimental and control groups at the final measurement with neutralization and partialization of the results at the initial measurement. Numerical differences between the mean values are mainly in favor of the better results of the experimental group.

Table 2 Univariate analysis of covariance of experimental and control groups for body composition

Variables	Adj. Mean E	Adj. Mean K	Adj. Mean diff. (EC)	F	p	Partial Eta Squared
ATMA	63.40	64.67	-1.26	1.27	.27	0.03 *
BMI	22.56	23.56	-1.00	4.79	.03 *	0.10 **
%MAT	20.08	23.59	-3.51	7.63	.01 **	0.15 ***
%MIT	37.97	35.90	2.08	9.79	.00 **	0.19 ***

Legend: Adj. Mean – corrected arithmetic mean (E – experimental group, K – control group), Adj. Mean diff. – differences between corrected arithmetic means, F – F test, p – significance level, statistical significance of differences ** < 0.01 * < 0.05, Partial Eta Squared – impact size (* = 0.01 (small impact), ** > 0.06 (moderate impact), *** > 0.14 (high impact)

Analysis of the results shows that statistically significant differences at the univariate level between the subjects of the experimental and control groups, at the level of significance ($p < 0.01$) are observed in the two variables %MIT (.00) and %MAT (.01). At the level ($p < 0.05$) it is observed with the variable BMI (.03), while the experimental program did not give statistically significant differences with the variable ATMA (.27), but a numerical difference was found in favor of the experimental group. In all variables in which a statistically significant difference was found, it was found that the experimental program contributed to large positive differences %MIT (0.19), %MAT (0.15), moderate positive differences BMI (0.10), as indicated by the values Partial Eta Squared. Only for the ATMA variable (0.03) is the difference small. Thus, it is evident that the experimental program of acrobatics at the univariate level has significant effects on the body composition.

Table 3 shows a multivariate analysis of the covariance of the applied variables to assess the flexibility between the experimental and control groups at the final measurement, with the neutralization of the differences at the initial measurement. It can be stated that there is a statistically significant difference at the multivariate level between the subjects of the experimental and control groups, after the experimental program at the level of significance ($p = 0.00$).

Table 3 Multivariate analysis of the covariance of the experimental and control groups for flexibility

Wilks' Lambda	F	df1	df2	p	Partial Eta Squared
.10	117.67	3.00	41.00	.00 **	0.90

Legend: Wilk's Lambda – Wilks lambda test, F – F approximation, df – degrees of freedom, p – statistical significance of differences * < 0.05, ** < 0.01, Partial Eta Squared – magnitude of impact (* = 0.01 (small impact), ** > 0.06 (moderate impact), *** > 0.14 (high impact).

Based on the Partial Eta Squared (0.90), a large influence of the experimental program on the differences between the groups in the final measurement can be stated. More specifically, this means that the difference between the groups, and thus the applied programs, explains as much as 90% of the variance in the results on the final measurement of flexibility, ie 90% of the variance in the dependent variable is explained by the independent variable. Thus, it is evident that the experimental acrobatics program at the multivariate level has significant effects on flexibility.

Table 4 shows the univariate differences in the variables for assessing flexibility between the subjects of the experimental and control groups at the final measurement with neutralization and partialization of the results at the initial measurement. Numerical differences between the mean values are in favor of the better results of the experimental group.

Table 4 Univariate covariance analysis of experimental and control groups for flexibility

Variables	Adj. Mean E	Adj. Mean K	Adj. Mean diff. (EC)	F	p	Partial Eta Squared
PLNL	96.25	82.04	14.21	90.38	.00 **	0.68 ***
RANL	133.67	103.58	30.08	205.54	.00 **	0.83 ***
ISKP	69.45	83.63	-14.19	106.37	.00 **	0.71 ***

Legend: Adj. Mean – corrected arithmetic mean (E – experimental group, K – control group), Adj. Mean diff. – differences between corrected arithmetic means, F – F test, p – significance level, statistical significance of differences ** < 0.01 * < 0.05, Partial Eta Squared – impact size (* = 0,01 (small impact), ** > 0.06 (moderate impact), *** > 0.14 (high impact).

The analysis of the results shows that statistically significant differences at the univariate level between the subjects of the experimental and control groups, at the level of significance ($p < 0.01$) are observed in all three variables PLNL (.00), RANL (.00) and ISKP (00). In all variables in which a statistically significant difference was found, it was stated that the experimental program contributed to large positive differences between RANL (0.83), ISKP (0.71) and PLNL (0.68), as indicated by the values of Partial Eta Squared. Thus, it is evident that the experimental acrobatics program at the univariate level has significant effects on flexibility.

4. DISCUSSION

The primary purpose of the study was to determine the effects of an experimental acrobatics program on the body composition and adolescent flexibility. The obtained results showed that the experimental group, which had an acrobatics program, achieved statistically significantly more progress than the control group, which had teaching units according to the curriculum of the primary school. This means that the experimental program of acrobatics lasting 16 weeks (2 times a week) had positive effects on improving the results between two tests of body composition and flexibility of adolescents. The results obtained in this way can be said to be expected. The reason for such a statement lies in the fact that the participants of the control group, in their classes, implemented a different plan and program, ie. they had a program of regular physical education activities (handball and volleyball teaching units), while the experimental group had an acrobatics program (ground floor and skipping).

The age characteristics of the subjects who underwent the experimental program represent an essential component. The sample of participants in this study consisted of adolescents, seventh grade elementary school students (14 years ± 6 months), whose age is suitable for the use of adequately planned acrobatics exercises. Maturity of the musculoskeletal system is an important component and greatly affects the fitness component (Bosco & Komi, 1981), and the reason for this is the continuous growth of the musculoskeletal system, as well as cartilage on the epiphyseal bone plates in that period (Ruprai, Tajpuriya, & Mishra, 2015). Gymnastics and acrobatics programs are also recommended for younger school-age students, because the skeletal system is in the phase of growth and hardening. This means that the bones are susceptible to external influences, because more intense ossification begins after the ninth year, but not evenly all parts of the body. Muscle mass of this age period increases significantly, especially the mass of larger muscle groups (Smajić et al., 2017). Therefore, experimental programs in gymnastics and acrobatics are fully recommended for elementary school students. On the other hand, Yurchuk-Zuliar, Tulyakova, & Kunshin (2018) indicate that acrobatics and gymnastics trainings cause delays in physical and sexual development in 10-year-old girls. Also, the authors point to a positive effect on anthropometric variables, body fat, body mass, body mass index and thickness of skin folds. Silva, Silva, & Paiva (2018) showed that acrobatic gymnasts have low levels of body fat, short sleep (less than eight hours) as well as inadequate intake of micro and macro elements in the diet. The authors point to the negative effects of overweight and obesity in adolescents. Also, the authors emphasize that proper dietary intake is an important resource for short-term and long-term health and performance of acrobatic gymnasts.

Each lesson in the applied experimental program in the conducted study consisted of a part in which exercises were performed with the aim of warming up the subject's body and raising

the body temperature., ie preparation of muscles, tendons and ligaments, for the realization of tasks in the main part of the class. The results of the study confirmed that there was a statistically significant improvement in body composition and flexibility in favor of the experimental group, as well as the fact that no injuries were observed during the entire experimental program, indicates proper planning and dosing of loads. This is a very important fact, because the age of 11 to 15 is crucial for the occurrence of injuries in acrobatics in adolescents (Purnell, Shirley, Nicholson, & Adams, 2010). The authors of this study showed that 50.7% of participants suffered an injury related to acrobatic gymnastics in the past 12 months of training, with 28.8% of participants receiving a chronic injury during the study. The highest percentage of acute and chronic injuries is in acrobatic gymnasts aged 14, and the most commonly injured anatomical locations are the knee, ankle and wrist. The obtained results can be explained by the fact that in adolescents, due to the appearance of increased growth and development during puberty, vulnerability to injuries can be created if the scope of training is above a certain threshold. However, thanks to biomechanical analyzes, it is possible to follow the sports technique of acrobatic gymnasts, their impact on the performance achieved in the competition, which has a positive effect on reducing the occurrence of injuries in acrobatics (Kyzim, Humeniuk, & Batieieva, 2018).

Bjelica (2020) recommended that training for the development of body composition, flexibility and motor fitness be applied twice a week. This avoids muscle fatigue that affects the quality of work. According to this recommendation, the experimental program in this study was conducted twice a week with an interval of 48 hours between trainings. Recommendation with with an interval of 48 hours between classes in adolescents has been confirmed in other studies in acrobatics (Ionescu, 2016; Mićović, Fulurija, & Ćeremidžić, 2018).

The recommendation for the duration of the experimental program of gymnastics and acrobatics with positive effects on the body composition, flexibility and motor fitness is 16 weeks (Rudd, 2016; Paunović, 2018; Miletić et al., 2019), or 12 weeks and more (Akin, 2013; Mićović et al., 2018). The experimental program of acrobatics in this study lasted 16 weeks, after which the results confirmed the positive impact on fitness components and the recommendations of previous research. However, there are studies that indicate that a shorter experimental acrobatics program may have effects on adolescent motor fitness. Das & Sarkar (2020) in a study aimed at determining the effects of acrobatics on adolescent motor fitness, obtained results showed positive effects of an acrobatics program lasting six weeks. Therefore, further studies are needed to fully clarify the impact of acrobatics programs on the fitness component of adolescents. Also, it would be interesting to examine the effects of acrobatics programs on the fitness component of adolescent girls, which is a recommendation to future researchers on this topic.

5. Conclusion

The results of the study showed positive changes in body composition and flexibility caused by the acrobatics program. Based on these results, it can be concluded that the experimental program of acrobatics lasting 16 weeks is an effective method that leads to a statistically significant improvement in body composition and flexibility of adolescents. Such knowledge can serve as a basis for the development of a supplement to the work program that would be applied in the teaching of physical education, as well as for the supplementation of validated

batteries of tests to assess the physical growth and development of primary school students. Also, trainers and experts in the field of gymnastics need exercises that will contribute to the improvement of body composition and flexibility as soon as possible, as one of the determinants of the success of gymnastics, with a reduced risk of injury.

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EFEKTI PROGRAMA AKROBATIKE NA TELESNU KOMPOZICIJU I FLEKSIBILNOST ADOLESCENATA

Cilj istraživanja bio je da se utvrde efekti programa akrobatike (parter i preskok) na telesnu kompoziciju i fleksibilnost adolescenata. Uzorak ispitanika činilo je 50 adolescenata muškog pola , učenika sedmog razreda osnovne škole "Bubanjski heroji" u Nišu, starosti 14 godina ± 6 meseci. Eksperimentalna grupa (n = 25) je sprovodila 2 x 45 min nedeljno eksperimentalni program akrobatike (parter i preskok) Kontrolna grupa (n = 25) je nastavila sa programom redovne nastave fizičkog vaspitanja (rukomet i odbojka) 2 x 45min nedeljno. Rezultati studije pokazali su pozitivne promene u telesnoj kompoziciji: ITM, %MAT, %MIT i fleksibilnosti: PLNL, RANL, ISKP izazvane programom akrobatike. Na osnovu ovakvih rezultata može se zaključiti da je eksperimentalni program akrobatike u trajanju od 16 nedelja efektivan metod koji dovodi do statistički značajnog poboljšanja telesne kompozicije i fleksibilnosti adolescenata.

Ključne reči: *gimnastika, akrobatika, učenici osnovne škole, telesni sastav, gipkost*

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Original research paper

IS THE REPRESENTATION OF FEMALE ATHLETES IN THE SERBIAN MEDIA GENDER BALANCED? REPORTS FROM THE 2012 OLYMPIC GAMES

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Abstract. *The aim of this paper was to present an analysis of media coverage of athletes during the 2012 London Olympics, to determine whether there is a difference in media coverage between male and female athletes and possibly differences in ideological gender modeling in sport. The sample of the research material consisted of articles published from July 27th to August 12th, 2012, found in the archives of the sports sections of daily newspapers (Politika, Kurir), as well as the portal of the RTS public broadcasting system, which is at the very peak of the most accessed media in Serbia. The results have shown that there was a greater number of articles on men's sport (p=0.01), a greater number of words in articles depicting men (p=0.01) and more photographs depicting male athletes (p=0.01). The analysis of individual compared to team photographs shows that men were represented more in groups than individually, and that women were to a greater extent represented individually. The results indicate that female athletes are represented more on the field than outside of it, and that men are more often represented at higher levels of body exposure (levels three and four). The general conclusion can be drawn that female athletes in the Serbian media were quantitatively less represented, but that their representations in photographs were more gender balanced than expected based on previous research.*

Key words: *sport, gender, the media, content analysis, the Olympic Games*

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1. INTRODUCTION

In a pilot study carried out in Serbia (Živković, Ranđelović, Bojić, 2016) with the aim of quantifying the presence of female athletes in the electronic media in Serbia for the duration of the Olympic Games (OG) in 2012, it was determined that in relation to the number of articles, men's sports are four more times present as women's sports. Since there is a lack of other research in Serbia on this topic, this research should determine the extent to which and the manner in which female athletes are present in the Serbian media, that is, whether the representation of athletes in the media is equal in terms of gender.

Research carried out in other countries provides somewhat more favorable results in favor of female athletes. In the research of Capranica (Capranica, Minganti, Billat, Hanghoj, Piacentini et al., 2005), which included an overview of the representation of female athletes from several countries in the media for the duration of the OG in Sidney in 2000, it was indicated that of the overall number of analyzed articles, those dedicated to female athletes made up 29, 3%, while those dedicated to male athletes is 51, 8%, while 18, 9% of the articles are classified as being of a mixed type. Despite the increased participation of women in sport, the increased number of competitions for women and the increasing popularity or women's sport among the supporters, there is still a lack of media coverage of women's sport. Certain longitudinal studies into the media coverage of women's sport confirm that women's sport is being neglected, and even ignored (Duncan, Messner, & Williams, 2005).

The Olympic Games have proved themselves the primary location for the analysis of gender bias in sport, because men's and women's competitions are contained within a single framework and represent a competition which provides media coverage for all sports for both genders. As a result, several studies have been carried out based on the theory that athletes are generally represented in accordance with their gender stereotypes, where in the greatest number of studies, it can be concluded that female athletes are marginalized in the media reports on Olympic sports (Billings & Angelini, 2007). The electronic media also gives more attention to the male population in the field of sport (Bruce & Wensing, 2012).

The readers of sports newspapers are able to see a significantly greater number of men in photographs (George, Hartley, & Paris, 2001). When it comes to photographs of female athletes, for the duration of the OG we can note that there is a better proportion in the number of published photographs than is the case in everyday reporting. An analysis of the number of photographs from the OG shows that the percentage of female athletes ranges from 33.5 (OG 2000, four European countries) (Capranica, 2005) up to 43.4% (OG 1996, USA, Canada, Great Britain) (Vincent, Imwold, Masemann, & Johnson, 2002). Hardin et al. (2002) analyzed the photographs from the OG in Sidney published in American daily newspapers. It was determined that the photographs of men make up 52%, while those of women make up 48% of the overall number of photographs, which is close to the actual gender representation of American athletes at the OG (55% men and 45% women). Capranica et al. (2005) determined that similar reports were published in several other countries (Belgium, Denmark, France and Italy), where the actual gender representation of athletes was covered in similar percentages in the reports.

Even though the percentages speak in favor of gender equality (if we were to neglect the fact that during the OG the reports on female athletes was increased significantly), underneath the seemingly gender balanced image of the reporting, there are numerous hidden meanings.

The ways in which women are represented in the media send important messages to the consumers of media content, regarding the role and position of women in society. As Lubina et al. stated: "the modern media today, especially the television and internet, are closely bound to the production and embodiment of cultural identities. Namely, through the conscious use and repetition of stereotypes among the recipients of information, on a subtle level archetypical features of men and women which society has already constructed through the category of gender are established" (Lubina, Brkić Klimpak, 2014). Sturken and Cartwright (2001) claim that photographs are a powerful tool for the creation of preferred meaning. Due to the possibility of seeming natural, realistic and authentic, and through selection, composition and manipulation, a seemingly naïve representation of some event can be politically motivated (Duncan, 1990), or can support various stereotypes. In almost every society traditional the social definition of women speaks of the fact that women should be subjected to the dominant, male gender. That is why it is not expected of women to participate in sports which promote competitiveness and physical exertion (Leonard, 1980). In the study of Hardin, Chance, Dodd & Hardin (2002) it was indicated that women's team sports received six hours less of air time on television and had a smaller number of photographs published compared to the female athletes who participated in individual sports in the US for the duration of the OG in Sidney. Lee (1992) cites that in team sports power and control are realized through team work, with the aim of achieving victory. That is why female athletes who take part in sports are often neglected in the media, while more information is reported on female athletes who take part in individual sports (Alston, 1996).

Tuggle & Davis (2012) studied the representation of women in the media during the Olympic Games in Beijing in 2008 and compared them with that of previous years. Olympic media coverage is more important for female athletes than male ones, since they cannot receive great media attention in the period between the games. They determined that the participation of the female athletes improved in the summer games of 2008, compared to the previous years, but still 97% of the media coverage of women's events was dedicated to "socially acceptable" sports. Research which is based on qualitative analyses indicates that women are more often represented in "traditional" non-contact sports, such as: golf, tennis, ice skating, and gymnastics (Bryant, 1980).

Women in sport are represented in non-sport environment, which might be seen as an attempt for their participation in sport to be degraded, or even rendered meaningless. A great problem in representing women in the media is that this representation is virtually missing where it is needed. Women in the media are not as present as are the men, we might even say that they are virtually invisible. When they are represented, they are generalized and represented as mothers-housewives, exclusively good-looking and young, with an indication that their place is in the kitchen or in the bedroom, and their intelligence is questionable. It is a model created by the media and is known as the "normal and desirable woman". The representation of female athletes does not deviate from the established portrayal of women in the media. Furthermore, one part of the photographs representing female athletes does not even refer to their participation in sport (Alston, 1996). Over the last few years, on the sports pages we can find an increasing number of texts on the wives of famous athletes, their families, but also their beauty (Jones, 2006). When it comes to representing female athletes on the front pages of newspapers, we can note that women are rarely represented as active participants in sport, and there is a greater probability that they will be presented in passive or traditionally female poses (Buysse and Embser, 2004). The aforementioned studies also confirm that

the language used by the media is a powerful took in emphasizing gender differences. Descriptions which include sports skills are often excluded from the descriptions of female athletes. Instead, the descriptions emphasize esthetic attributes, and/or the focus is on the femininity or lack of thereof. Male athletes are mostly described as energetic, strong both mentally and physically. Female athletes are instead represented based on stereotypes according to which women are physically weak, and maybe even emotionally weak (Quayle, Wurm, Barnes, Barr, Beal, et al., 2017).

Duncan and Hasbrook (1988) cited in their research that the exclusion of female athletes from media representations is actually symbolic denial of the power of women. Individual sports (combat sports, some athletic disciplines) which require power and endurance, or include elements of risk, are considered inappropriate for women. On the other hand, sports such as tennis, swimming, synchronized swimming, figure skating and gymnastics are traditionally considered women's sports (Pirinen, 1997). Pirinen cites that women's competitions in traditionally male sports are awarded less media attention than purely traditionally male or traditionally female sports. Crossman, Vincent & Speed (2007) also indicate that female athletes receive more media attention if they participate in traditionally female sports.

The belief that women do not belong in sports, or that they are not as important as male athletes was also established on the basis of portraits of female athletes in revealing photographs. In a study carried out by Godoy-Pressland (2014) it was indicated that almost 60% of female athletes have on American national television been presented in leotards or bathing suits in gymnastics, swimming and diving activities. The conclusion of this research was that the official American broadcaster of the Olympic Games present the viewers with images of sports which were not based on gender equality.

2. METHOD

The aim of this paper is to present the analysis of the reports on female athletes in the Serbian media during the Olympic Games in London in 2012, in order to determine the percentage of the media representation of women's sport in the newspapers in Serbia, as well as to determine whether there is a difference in the media representation and coverage of male and female athletes, and possibly in that sense, in the ideological modeling of gender in sport.

Based on the initial assumptions, the following hypotheses were proposed:

H1 – There are more articles and words in the articles written on male athletes, as well as more photographs depicting male athletes and more males authoring the articles.

H2 – Women are more than men represented in individual than in team sports in the media; a significantly smaller number of texts represent the category of the so-called "female" than "male" sports; women are more often depicted in environments that are not sports fields in photographs; women are more often depicted in "inactive poses" in photographs; women are more often depicted individually in photographs; women more often appear photographed from a "below eye level angle" than men.

H3 – Women are more often depicted in strong emotional states on photographs (sorrow, crying, hugging) than men;

H4 – Women in photographs are more often presented in "nude-like" depictions.

The application of both qualitative and quantitative methods was necessary in order to provide data for this research. In order to evaluate hypothes H1, quantitative analyses were used to determine the number of articles, the number of photographs, and the proportions of the studied variables in relation to gender. Hypotheses H2-H4 were tested using the content analysis of selected articles and the photographs published in them.

Content analysis is a "research technique for the objective, systematic and quantitative descriptions of the manifestation of the content of communication" (Berelson, 1952). It enables us to view a large number of texts by means of a systematic quantification of media content, using predetermined categories and providing a statistical analysis of the data (Wimmer and Dominick, 2003). As a quantitative method, content analysis numbers and measures categories such as words, phrases or images (Hesmondhalgh, 2006). Content analysis was a popular method for the study of gender differences in media representations, since it can determine recurring patterns which can shape our attitudes, values and convictions (van Zoonen, 2004). By using content analysis it is possible to make deductions on how the media cover and represent male and female athletes.

Following the data collection procedures and the analysis which Neuendorf (2002) suggests, the researcher primarily identifies the possible content which should be studied, based on the theoretical framework and previous consideration of the information on the media coverage of athletes. In the second step, the coding of the suitable categories is performed, which represent the content of texts in a specific way.

The coding structure as one of the research methods which has proven effective in numerous studies, was also used in the study of photographs, which enhances this kind of study. The material coding methods can determine whether the photographs of female athletes are related exclusively to some sports event or were made on occasions which do not belong to any type of sport or sporting event, and whether they indicate an attempt at degrading their participation in sport. If the photo-material is based on photographs of female athletes depicting them in certain moments of sports competitions and during the active participation in sport, this contributes to the creation of an image of the equality between women with men in terms of media representation and coverage.

The gender of the athlete, the gender of the author of the text, the sport, category of sport, type of sport, the place where the athlete is being depicted, the level of activity, the angle of the camera recording, emotions displayed in photographs, the level of exposure of the body, and the number of words in the text are variables coded for the purpose of this research, and defined with certain changes based on the research of certain authors who dealt with similar problems.

The gender of the athlete is coded (a) male, and (b) female; (c) both; (d) neither.

The gender of the author of the text: (a) male, and (b) female, (c) neither, (d) cannot be determined, (e) does not exist;

The name of the sport: the names of individual Olympic sports;

The category of sport: a) male, b) female, c) gender neutral;

The type of sport: (a) team sport, (b) individual sport;

The place of depiction of the athlete: (a) on the field, (b) outside the field

The level of activity: (a) active (that is, the athlete is on the move and is clearly doing something specific), (b) passive (for example, the athlete kissing a medal or posing);

The angle of the camera: (a) below eye level, (b) at eye level, (c) above eye level;

The emotions displayed in the photographs: (a) sorrow, (b) crying, (c) joy, (d) hugging;

The level of body exposure: (a) level one, (b) level two, (c) level three, (d) level four.

These categories were selected because they enable the analysis of the ways in which certain differences in relation to gender can be emphasized. For example, the difference in the camera angles in relation to gender would reflect the different framing of power (with the "upper" angle which imbues the subject in the photograph with power, while the lower angle is transferred onto the viewer); the differences in the way in which sport, movement and competition are represented in terms of gender would heighten the concepts of sexual differences and abilities if one group would more often be represented as active and competitive, for example, in comparison to another (Hardin, et al., 2004).

Photographs were selected because they are powerful cultural communicators; they are “equally burdened by ideology” as text, which renders them important as a text for critical analysis (Curri et al., 2002). Photographs are also visual magnets which give the readers a more specific impression stronger than the text; they offer a subjective message with the façade of objectivity in a live, unforgettable and “easily readable” format (Duncan, 1990). Also, they are easily accepted through their repetition in the mass media.

2.1. Reliability

In content analysis it is important to determine reliability (Neuendorf, 2002). Intercoder reliability is the extent to which different coders achieve the same results among various characteristics of classification (Lombard, Sinder-Duch & Bracen, 2002). The multiple coding procedure was used to code the articles. Two coders independently coded articles selected both as pilot data and as the actual data. The author was one of the coders. Both coders were trained and acquainted with the coding system through provided instructions which explained how to view elements important for certain variables and which provided certain illustrative examples. Each coder coded 60 articles (which dated from another time period and were not part of the study) for the purpose of training. Intercoder reliability was calculated using a percentage agreement (Kassarjian, 1977). The intercoder reliability for this subsample ranged from 83,3%-100%. The minimal level of 0.80 for the intercoder reliability coefficient was usually the standard (Riffe, Lacy, & Fico, 2005); Using Cohen's Kappa, the extent of agreement between the coders was determined, and had a value of 0.72 for all the variables.

The differences between the coders were solved through a discussion. Then the procedure was repeated for the 60 articles from the group which was set aside for analysis. Intercoder reliability for this sub-sample ranged from 90%-100%. The value of Cohen's Kappa in this case was 0.74 for all the variables.

2.2. The sample of research material

The sample of research material was based on the online editions of the Serbian media. Two daily newspapers were selected (Politika, Kurir), as well as the portal of the RTS public broadcasting system. This focus was determined primarily because newspapers still play an important role in presenting the Olympic Games (Markula, 2009). Newspapers are one of the more advanced media forms, and the sports section is one of the most important and more widely read newspaper sections (Coakly, 2003).

The sample of sub-data consisted of articles taken from the web pages of the aforementioned media. This decision was based on the fact that more and more people are reading news online. What contributes to this is the great number of people who use mobile devices to access newspaper websites by means of smart phones or tablets. As a result,

the newspapers realize great readership through their online services, which makes them a relevant research subject.

For the realization of the research and the performance of the representative analysis, the goal was to select representative Serbian media which have a great national circulation and differ in their format and means of representing media information, in order to study that range of press discourse better. Based on the monitoring system data for the number of visitors to a website, these portals have high numbers of visitors and high numbers of viewed pages.

Thus, the sample was made up of two daily newspapers and one media portal, which differ in the way they represent information and are found at the very top of the most visited media in Serbia. All the articles published from July 27 to August 12 were taken from the archives of the sports section of these media and analyzed. These dates correspond to the dates of the ceremonies of the openings and closings of the Olympic Games in 2012.

2.3. Methods of data analysis

The following methods were implemented in the research: the descriptive method, certain statistical methods, systematization, and quantitative-qualitative content analysis.

3. RESULTS

The obtained results were viewed through the proposed hypotheses.

H1 – There are more articles and words in the articles written on male athletes, as well as more photographs depicting male athletes and more males authoring the articles.

As seen in table 1, the studied media dedicated almost three times as much attention to male athletes than to female athletes, and there is a statistically significant difference between them. A significantly small number of articles refer to both, or are articles where male and female athletes were not the focus.

Table 1 Number of articles (texts)

	Men	Women	Both	Neither	Total	χ^2	df	p
Number articles(Δ)	374 (+230)	132 (-12)	32 (-112)	38 (-106)	576	533.500	3	0.000

Note: Δ is the difference between the noted distributions and expected distributions in theory.

The texts devoted to men's sports and male athletes were on average greater than those which refer to female athletes. The average number of words for articles about male athletes is 299, and about female is 235. The overall volume of texts dedicated to men is three times greater (111 754 words, as opposed to 31 062). However, the texts with the greatest volume were on average those in which there was mention of both. This is a result of the fact that such texts mainly presented a retrospective of sports events or were an indication of upcoming ones, and sometimes both.

More attention was dedicated to male athletes (almost twice as much), in terms of representations on photographs, as compared to female athletes, and this difference is

statistically significant. Considerably fewer photographs showed both of them in focus together. The fewest photographs were related to topics of a more general character.

The female authors of texts are virtually non-existent. What is characteristic of this category is that most of the news is obtained from agencies, or that the author does not exist, or cannot be determined since only the initials have been provided. This difference is statistically significant.

H2 – Women are more than men represented in individual vs. team sports; a significantly smaller number of texts represent the category of the so-called "female" than "male" sports; women are more often depicted in environments that are not sports fields in photographs; women are more often depicted in "inactive poses" in photographs; women are more often depicted individually in photographs; women more often appear photographed from a "below eye level angle" than men.

Table 2 indicates that men are increasingly more present in texts on individual and on team sports than female athletes, and this difference is statistically significant. The distribution indicates that men and women are represented more in individual sports compared to team sports.

Table 2 Individual/team sport

	Men		Women		Both		Neither		Total	
Individual	230	(61.5%)	97	(73.5%)	12	(37.5%)	9	(23.7%)	348	(60.4%)
Team	134	(35.8%)	33	(25.0%)	7	(21.9%)	4	(10.5%)	178	(30.9%)
Neither	4	(1.1%)	1	(0.8%)	3	(9.4%)	13	(34.2%)	21	(3.6%)
Multiple	6	(1.6%)	1	(0.8%)	10	(31.3%)	12	(31.6%)	29	(5.0%)
Total	374	(100.0%)	132	(100.0%)	32	(100.0%)	38	(100.0%)	576	(100.0%)

$\chi^2 = 245.925$; df = 9; P = 0.000; Cramer's V = 0.377

There are more texts labelled "male". However, most of the texts were dedicated to sports which were categorized as gender neutral (as many as 2/3 of all the texts), and that the sports which were categorized as "female" are minimally present and have received the least amount of attention. The difference is statistically significant. Both male and female athletes were significantly more represented on the field in photographs than outside the field, and that the male athletes were significantly more represented than female athletes in both categories, but that the female athletes were more prevalent and, represented in the field more than outside of it. Table 3 indicates that men and women were significantly more present actively, but that the men dominate in this category as well (both in active and inactive representations). The results indicate that this difference is statistically significant.

Table 3 Active/inactive representation

		N	Mean	SD	t	df	sig
Active	men	576	0.8611	1.56199	6.066	1116.797	0.000
	women	576	0.3455	1.31232			
Inactive	men	576	0.2743	0.69615	4.077	929.629	0.000
	women	576	0.1372	0.40895			

Men are more frequently represented as a group than individually, although that difference is not too great, and that women are to a greater extent represented individually than as a group. The difference is statistically significant in both categories.

Table 4 indicates that one of the most represented angles of camera shooting was below eye level for both women and men. Women were mostly represented below eye level and least o above eye level, but the men were also more often represented below eye level and least at eye level. The difference is statistically significant in all three categories.

Table 4 Angle of recording

		N	Mean	SD	t	df	sig
Below eye level	men	576	0.5486	1.25153	3.943	1149.963	0.000
	women	576	0.2587	1.24444			
At eye level	men	576	0.2951	0.58951	4.899	1072.251	0.000
	women	576	0.1441	0.44729			
Above eye level	men	576	0.2969	0.82170	5.467	772.960	0.000
	women	576	0.0938	0.34625			

H3 – Women are more often depicted in strong emotional states on photographs (sorrow, crying, hugging) than men

Table 5 indicates that the most prevalent emotion represented on the photographs was happiness among both men and women. The results indicate that sorrow and crying were more present among the men, but that was primarily because the overall number of photographs of men was greater than that of women. Overall, sorrow and crying as negative emotional states were still not significantly more present in the photographs compared to the other categories. Most photographs belonged to the undetermined category, where certain emotions could have been defined, but were classified in this category since they were not represented as special categories. The differences were not statistically significant, except for the category undetermined.

Table 5 Emotions in photographs

		N	Mean	SD	t	df	sig
Sorrow	men	576	0.0434	0.25679	2.289	879.405	0.022
	women	576	0.0156	0.13743			
Crying	men	576	0.0104	0.13146	0.259	1150	0.796
	women	576	0.0087	0.09284			
Happiness	men	576	0.3802	0.76866	2.407	992.023	0.016
	women	576	0.2396	1.17284			
Hugging	men	576	0.0382	0.25422	2.281	909.876	0.023
	women	576	0.0104	0.14409			
Undetermined	men	576	0.5503	1.24170	4.763	1131.506	0.000
	women	576	0.2222	1.09191			

H4 – Women in photographs are more often presented in "nude-like poses"

Table 6 indicates that men are more often represented in the third and first level of body exposure, and least of all in the fourth.

Table 6 Level of body exposure (nude-like poses)

		N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Level 1	men	576	0.208	0.645	-0.828	860	0.408
	women	576	0.257	1.252			
Level 2	men	576	0.248	0.533	6.759	900	0.000
	women	576	0.076	0.297			
Level 3	men	576	0.519	1.475	5.450	791	0.000
	women	576	0.153	0.652			
Level 4	men	576	0.160	0.603	6.020	597	0.000
	women	576	0.007	0.083			

Women were most often represented in the first and third level of exposure, and least of all in the fourth. The results indicate that men were represented in more exposed levels than women (third and fourth). The reason for this was the large number of articles on water polo players of Serbia who achieved a significant amount of success, and as a result were more photographed, and the photographs, due to the nature of the sport, belong to this category. Statistically significant differences between men and women do not exist only for the first level of body exposure.

4. DISCUSSION

The subject matter of this research were newspaper articles (texts and accompanying photographs) on sport of the online issues of three different sources (POLITIKA, KURIR, RTS), which through their writing could influence the formation of the media image of female athletes and which could contribute to their affirmation and marginalization, depending on the way the information on the sporting events they were participating in was presented. The goal of the research was to represent the analysis of the reports on female athletes in the Serbian media during the Olympic Games in London in 2012. The content analysis of the newspaper articles (texts and photographs) led to some interesting findings and representations of male and female athletes in the media. Bearing in mind the current research into this problem, it was expected that the media coverage of female athletes still represents a problem in contemporary society.

The results of the analysis of a number of articles have indicated that there were almost three times as many articles in which the main actors were men, (65%) compared to women (23%). This research supports the results from previous studies where male athletes were more dominantly represented in the media compared to female athletes (Lumpkin & Williams, 1991; Lee, 1992; Lenskyj, 1998; Pedersen, 2002; Bishop, 2003; Billings & Angelini, 2007; Bruce & Wensing, 2012; Wolff, 2014). The results of the analysis of the number of words (the text volume) have indicated that the texts on men were on average longer than those on women. Taking into consideration the overall number of words, data was obtained that the overall volume of the texts on male athletes was three times higher compared to the texts on female athletes. Some other studies have also confirmed that media attitude to writing about male and female athletes, where the male athletes were allocated more textual space than the female ones (Alexander, 1994; Lavrinc, George, et al., 2001; Doupona-Topič, 2006). The analysis of the articles published in the studied media included photographs as well, depicting male and female athletes. In previous studies, but

also in our analyses, female athletes were most often depicted in a way which primarily enhances their physical appearance. The number of photographs is also an important element in viewing the significance which is associated to certain sports events, but also the actors in these events. The photographs were often more convincing than words. Within this research, and based on the number of photographs, we determined that male athletes were represented more and that they were given more attention (61%) (almost twice as much), when they were photographed than were female athletes (34%). This fact also agrees with the research of Jones (2010).

Certain previous research (Alexander, 1994; Etling, 2002; Lapchick, Brenden, and Wright, 2006) which analyzed the participation of women and men in authoring sports texts indicates that this category may indicate the greatest differences between men and women participating in sport. In our research, men were also more present as the authors of texts, while female authors of texts almost do not exist. Based on the results, a hypothesis H1 can be accepted.

There are certain stereotypes in the stories of male and female athletes. In the cases when the story includes only or predominantly men, attention is focused on the group. The reason for that is probably the popularity of men's team sports. On the other hand, attention in stories on women has a tendency of being focused on the individual, and the reason for that is that the sports in which women participate and which are covered in the media are usually individual sports (Leiknisdóttir, 2006). Team sports are usually experienced as "more male" than individual sports, and the media have the tendency to represent women athletes as competing in individual, and not team sports (Tuggle & Owen, 1999). The analysis of the differences in relation to the prevalence of men and women in individual and team sports in our research indicates that men are more present in texts on individual and on team sports than women, but that female athletes are more represented in texts on individual sports than team ones. Other research also confirm this attitude of the media in this category (Lee, 1992; Jones, 2010).

The categorization of sports into male, female and neutral was made based on a division which was dominant in several similar studies (Hardin et al., 2002; Jones, 2006; Petca, Bivolaru, & Graf, 2013) and which indicate that "male" sports are more often allocated more space in the media than female ones. The analysis has shown that this hypothesis has partially been confirmed, since there are actually more texts in the category labelled as "male" (33%). However, most of the texts were dedicated to sports which were categorized as belonging to the neutral category (58%, almost 2/3 of all the texts), and the sports which were classified as belonging to the category of "female" were minimally represented (1%) and received the least attention.

Within this research we obtained data that both male and female athletes were significantly more represented on the field in photographs than outside of it (a ratio of 83% - 17%) and the male athletes were significantly more present than female athletes in both categories (74% - 26% - on the field, 76% - 24% - outside the field), but that the female athletes were more represented and depicted on the field than outside it (26% - 24%). However, there is still the fact that the women were less present in this research category as well.

In accordance with the dominant patriarchal ideology, men are expected to be active, aggressive, feisty, and women are expected to be passive, emotional, gentle (Berger, 1972). This kind of approach is in a particular way reflected both in sport and in the tendency of women to be represented as less active in the media. In her research, Duncan (1990)

found that men were framed as active subjects, while women were usually framed as inactive or passive objects. These findings agree with those of other studies (George et al., 2001). However, there are studies in which the obtained results were different. The studies of Canadian, South African, British, and American newspapers reported that men and women are usually depicted as active or taking part in sport, and that the percentages differ very little in terms of gender (Lee, 1992). Hardin et al. (2002) determined that 78% of women and 81% of male athletes were represented in "active photographs" in American newspapers. Comparing the media reports from Great Britain, the USA and Canada, Vincent et al. (2002) cite that women and men are most frequently represented in active (competitive) situations (women, 51%; men, 52%). Women were somewhat more often represented in inactive poses, but the men were usually posing for photographs. Within this research, the obtained results indicate that both are represented in more active than inactive poses (a ratio of 78% - 22%), but that men dominate this category as well (both in active and inactive representations).

Women who compete in team sports are insufficiently represented or ignored in sports photographs (Tuggle & Owen, 1999). At the OG in 2004, women participating in individual sports suited to men stood a three-time greater chance of being represented in photographs than women competing in team sports (Jones, 2006). This kind of relationship was found in other similar studies (Đorđić et al., 2013; Godoy-Pressland & Griggs 2014). The analysis of individual as opposed to team photographs within our research indicates that men were represented in groups more than individually, and that women were significantly more represented individually. Based on the results, a hypothesis H2 can be partially accepted.

Duncan (1990) tried to offer an interpretation of sports photographs based on various communicative characteristics of photographs. One of the conclusions was that the cameras represent women below eye level and men in elevated positions, which suggests positions of inferiority and superiority. Hardin et al. (2002), however, obtained results which indicate that a greater percentage of men are represented in the photographs from a lower angle, and in all the newspapers the men had a greater probability of being represented from a lower rather than an upper angle. In our research, the results indicate that the most frequently used angle of recording was below eye level (48%), and the other two were used equally (26%). Women were mostly represented below eye level (32%) and least of all above eye level (24%), but men were also represented from this angle. Based on the results, a hypothesis H3 can be partially accepted.

Some previous studies resulted in a concept that women were often infantilized, represented in highly emotional contexts and unable to control their emotions. Within the research of Petca, Bivolaru & Graf (2013), photographs were analyzed with the aim of determining certain emotional states (sorrow, crying, joy, hugging). Based on the facial expressions of the male (and female) athletes in the photographs, each was ascribed one of the previously mentioned emotions established in the coding schema. If none of the emotions could be identified, it was classified as undetermined. The results have shown that the most widely present emotion in the photographs was happiness, for both the men and women. The results show that both sorrow and crying were more present among men, but that this was primarily because the overall number of photographs of men was greater than that of women. Overall, sorrow and crying as negative emotional states were not to a great extent present in the photographs compared to the other categories. Thus, we could conclude that hypothesis H3 was not confirmed in this research.

Another category which was studied in this research was based on traditional stereotypes but also the results of some research. Petca, Bivolaru & Graf (2013) analyzed whether women in the photographs were more often represented with a higher level of body exposure (nude-like poses). Within our research, the results indicate that men were usually represented in the third and first level of body exposure, and least of all the fourth. Women were usually represented in the first and third level of exposure, and least of all in the fourth. The results indicate that the men were represented in exposed levels (third and fourth) more so than the women. The reason for this is the larger number of articles on water polo players from Serbia who achieved significant success, and because of that were extensively photographed, where due to the nature of the sport they belong to the more exposed category. Statistically significant differences between the men and women do not exist only in the first level of body exposure. Based on that, we can conclude that this hypothesis was not confirmed in this research.

5. CONCLUSION

In the first half of the twentieth century, the modern Olympic Games were still games dominated by men. Sports media reporting in that period also strengthened the perception of male dominance, considering the greater prevalence of men at the OG. However, male dominance at the Olympic Games, as well as the promotion of gender stereotypes, significantly decreased over time. Considering that the involvement of male and female athletes at the Olympic Games in 2012 was 55% to 45%, the quantitative difference in the presence of both genders at the OG is not very significant. However, we can still note the imbalance in the media representation of male and female athletes. The prevalence of male athletes in the media suggests that sport is still dominated by men, while women are still assigned lesser importance. In addition, by presenting a greater prevalence of male athletes in relation to female athletes, the media often strengthen the stereotype that sport is specific to men, and limit women to stereotypical gender roles. Because the media are given great importance in contemporary society, the imbalance in reporting on male and female athletes can contribute to the inequality among men and women in society. This research has led to interesting findings on the representations of male and female athletes in the Serbian media. Based on previous research, which suggested that the amount of media representation of female athletes still represents a problem in society, certain hypotheses were formulated.

The results indicate that male athletes were almost three times more present in sports texts, that significantly more is written about them (more than three times), that they were more visually represented in photographs (almost twice as much), and that there are practically no female authors of sports texts. Male athletes are more present both in individual and team sports in total, and female athletes are followed more in individual sports. Men and women were overall more represented on the field, as well as in active poses, but male athletes are dominant here as well. Women are more represented individually in photographs, and men in group. Female athletes are not as often recorded on camera from above, as men are. The difference in strong emotional states within this research did not confirm previous findings, since there was no expressed difference between men and women in this sense, nor in the case of body exposure (nude-like poses). Viewed in total, the findings of this research in the Serbian media indicate that there is still an imbalance in the way male and female athletes are represented and that in that sense there is a need for certain changes.

This research is one of the rare studies carried out in Serbia on male and female athletes by comparing them based on a combination of quantitative and qualitative elements. The research is based on the previous studies, but was expanded by focusing and guiding analyses towards special cases and a sample which had not previously been studied. This research provides a contribution by giving new data for comparison with previous research. The choice of a particular sample-case for analysis inevitably limits the generalization of the results. Irrespective of that, the research can contribute to the existing body of literature by providing results which indicate the variations in the representations of women and men in sports media. This issue is important because the media have a great influence on how men and women are perceived in society. The representations of athletes (male and female) in the sports media can offer interesting evidence on how men and women are viewed differently. This is certainly important, since sport and the media produce and reproduce the norms of the ideology of gender roles. Thus, the research could contribute to raising awareness on how media representations of athletes play part in the structuring of gender norms which support and promote gender inequality.

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DA LI JE ZASTUPLJENOST SPORTISTKINJA U MEDIJIMA U SRBIJI RODNO URAVNOTEŽENA? IZVEŠTAVANJE SA OLIMPIJSKIH IGARA 2012.

Cilj ovog rada bio je da se predstavi analiza izveštavanja o sportistkinjama u medijima tokom Olimpijskih igara u Londonu 2012. godine, odnosno da se utvrdi da li postoji razlika u medijskom izveštavanju između sportista i sportistkinja i eventualno razlika u ideološkom modelovanju roda u sportu. Uzorak istraživačkog materijala činili su članci objavljeni od 27. jula do 12. avgusta 2012. godine, pronađeni u arhivama sportskih rubrika dnevnih novina (Politika, Kurir), kao i na portalu RTS-a, koji su među najčitanijim elektronskim medijima u Srbiji. Rezultati su potvrdili hipoteze o većem broju tekstova o muškom sportu (p=0,00), većem broju reči u člancima koji prikazuju muškarce (p=0,00) i više fotografija koje prikazuju sportiste (p=0,00). Analiza pojedinačnih u poređenju sa timskim sportovima pokazuje da su muškarci na fotografijama više zastupljeni u grupama nego pojedinačno, a da su žene u većoj meri prikazane pojedinačno. Rezultati pokazuju da su sportistkinje zastupljenije na terenu nego van njega, a da su muškarci češće zastupljeni u višim nivoima izloženosti tela (tri i četiri). Može se izvesti opšti zaključak da su sportistkinje u srpskim medijima kvantitativno manje zastupljene, ali da je prikaz žena na fotografijama rodno uravnoteženiji nego što se očekivalo na osnovu prethodnih istraživanja.

Ključne reči: *sport, rod, mediji, analiza sadržaja, Olimpijske igre*

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Review article

EDUCATION OF JOURNALISM STUDENTS AND THEIR PERCEPTION OF JOURNALISTIC ETHICS

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Abstract. *One of the most important subjects in the education of journalists is Journalistic Ethics. Topics in this area have become especially important since the beginning of the 21st century, because with the development of new media technologies, there have been significant changes in journalism. All over the world, the focus has shifted from quality reporting to the fastest possible publication, sensationalism and earnings. Higher education institutions that educate journalists have an obligation to convey to students the importance of adhering to ethical postulates. The aim of this research is to determine the attitudes of third and fourth year journalism students of the Department of Communication and Journalism at the Faculty of Philosophy in Nis regarding journalistic ethics related to their perceptions of this phenomenon. In accordance with the set goal, a special instrument was constructed - a questionnaire based on the five-point Likert scale. The questionnaire was distributed to students during March and April 2021, and was filled out by 42 respondents. Data were analyzed using descriptive and comparative statistics and SPSS 25.0. The results of the research indicate that although the studies educate a high percentage of students who understand the importance of journalistic ethics, most respondents indicate the existence of objective circumstances in which they think they could not fully adhere to ethical principles.*

Key words: *journalistic ethics, student attitudes, journalism, journalism studies*

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1. INTRODUCTION

Journalistic ethics is a type of professional ethics and as such represents a relationship between moral obligations and special responsibilities that individuals assume when they practice a particular profession (Žaket, 2007, p. 31). In other words, it encompasses moral rules, principles and rights of people who practice journalism. Being familiar with journalistic ethics is one of the fundamental prerequisites for practicing journalism, though in practice, testing the knowledge of ethical codes for becoming a professional journalist is generally not required. It is quite understandable that journalism which does not rely on ethics does not deserve to be referred to as journalism (Nikšić & Davičo, 2004, p. 7). Such journalism derogates the basic postulates of the profession thus becoming tabloid and unprofessional media. And yet, even though there are different regulatory bodies and texts, one bears witness to daily violation of journalistic ethics in all types of media. Spreading untruths, political propaganda, speculations, spinning, publishing unsuitable content, using inappropriate language as well as leaving out important information is becoming conspicuous in the Serbian media and it represents the most blatant violation of journalistic ethics.

There are numerous professional codes, textbooks, recommendations and various organisations that offer instructions and guidelines related to ethical reporting. In Serbia, the Code of Journalists of Serbia was adopted in 2006, and the Code of the Association of Online Media was adopted in 2017, while the Press Council is in charge of supervising implementation of ethical codes and standards since 2009 (Milutinović, 2019, p. 1051). The Press Council is a self-regulatory organization that brings together publishers, print and internet media owners, news agencies, and media professionals, and it was formed to ensure that the Journalists' Code of Ethics was followed.[1] The Press Council annual report on monitoring compliance with the Code of Journalists of Serbia in daily newspapers in the period from July 1 to December 31, 2021 (Press Council, 2022, p. 1) states that a total of 5,715 texts were recorded in which at least one point of the Code was violated, although most cases violated several points. It also states that there is a significant increase in the number of observed violations compared to the same observed period in 2020 (4977[2] compared to 3724 violations in 2020) (Press Council, 2022, p. 1). The same report states that it is not possible to talk about a clear trend of growth or decline in the number of violations of the Code. In the monitoring from 2020, for example, for the first time, after a period of constant growth in the number of violations, there was a decline, and in 2021 there was an increase again. Given the increased number of violations in political reporting, mainly with clear reporting in the interest of the authorities, the current increase in the number of observed violations of the Code could be related to the approaching elections. However, it is evident that the number of violations of the Code that has occurred over the years is significant and violating the ethical code in Serbian media year in and year out seriously diminishes the quality of the media space and threatens to entirely destroy professional reporting and journalistic objectivity. Such a situation is not merely visible in our country. The degradation of journalistic ethics is taking place around the world, especially in the past ten years (Kumylganova, 2017, p. 186).

[1] https://savetzastampu.rs/en/about-us/

[2] The number of 5,715 texts in 2021 is reduced by violations registered in two dailies whose reporting was observed for the first time - Objektiv and Nova

On the other hand, journalistic ethics, as well as ethical and objective reporting, play an important role in journalism students' education. As many as three public universities in Serbia educate professional journalists. Based on an examination of their study programs of bachelor academic studies in journalism, it is possible to conclude that significant emphasis is placed on topics related to journalistic ethics[3]. Table 1 shows the names of the subjects related to ethics, their status and the number of classes in programs for the education of future journalists at public universities in Serbia. Based on the presented data, it is evident that at all three public universities in Serbia that educate future journalists, ethics is studied as a compulsory subject in the initial years of study. The fund of classes is the smallest at the Faculty of Philosophy in Novi Sad, but there are two more elective courses in this study program that additionally deal with topics related to media ethics (Media and medical ethics and Bioethics and media).

Table 1 Subject of journalistic ethics at public universities in Serbia

	Faculty/University	Subject name	Semester	Classes per week	Status
1.	Faculty of Political Science/ University of Belgrade	Media ethics	2	3+0	compulsory
2.	Faculty of Philosophy/ University of Novi Sad	Journalistic ethics	2	2+0	compulsory
3.	Faculty of Philosophy/ University of Nis	Journalistic ethics	4	2+2	compulsory

The aim of this research is to inquire into attitudes of journalism students on the Faculty of Philosophy in Niš who are familiar with the rules of professional ethics with the aim of observing possible causes and reasons that can lead to the Code violation and drawing potential conclusions about possible solutions.

2. Journalism and Unethical Reporting – Justifications, Causes and Effects

There are numerous causes for violating ethical postulates of the profession, and a number of studies can be found in the literature to support this claim. In a study by Fengler et al. (2015, p. 260) the results of a comparative survey of European journalists indicate that compliance with ethical norms cannot be expected in cases where there is insufficient financial stability both at the individual and at the organizational level. All journalists who participated in this research believe that economic pressure is the biggest threat to standards in journalism. In the region, specifically in Croatia, research has shown that there are a number of factors that affect the violation of ethical norms – lack of education, pressure from editors, politicians and advertisers (Ivanuš, 2021). In Serbia, it can be noticed that the ethical principles of the journalistic profession are being violated in favor of the race for profit and the sensationalist way of reporting (Malešević, 2018). Media workers need to bear in mind that every piece of information that reaches the public influences both the public and the persons that they directly or indirectly report about. Unethical reporting affects both groups. Moral responsibility of the media is

[3] https://www.fpn.bg.ac.rs/studije-novinarstva,
http://www0.ff.uns.ac.rs/studije/osnovne/studije_osnovne_medijske_studije.html,
https://www.filfak.ni.ac.rs/studije/osnovne/novinarstvo

reflected in the fact that the media have an obligation to constantly review their actions. The public indeed has the right to know, but they have the right to become introduced to the information that is socially useful and fundamental for the functioning of the society. In order to secure that one needs the skills which result from the knowledge of professional ethics which is crucial for journalists and their ability to decide about what should be published and how. Journalists who are not familiar with ethical principles of the profession cannot understand the notion of moral responsibility and accountability.

Authors Nikšić and Davičo reflect upon the issue of ethical ignorance of journalists in Serbia in their book „Ethical codes“:

„...In spite of long, rich and turbulent history of journalism in Serbia, domestic professional journalists often lack specific knowledge and experiences necessary to act in a real democratic ambience. They lack awareness of the importance of professional organisation, the awareness of the real meaning and significance of basic values upon which one should base the journalistic profession, the awareness of the real meaning of ethically based journalism, of the necessity to establish real and valid ethical codes, and of the meaning and scope of self-regulation in this field “(Nikšić & Davičo, 2004, p. 10).

One of the main reasons for the lack of knowledge and experience can be traced in the fact that „journalism is an open profession that does not require special vocational education or specific diplomas“ (Korni, 1999, p. 17). Journalism can be practiced by virtually anyone, because vocational education is not a precondition to do so (Valić Nedeljković & Pralica, 2020). According to Matić and Milin Perković (2021, p. 13) research, the journalistic cadre in Serbia includes a smaller number of people with a university degree in journalism, with only 72 (28.8%) who have completed journalism studies on a sample of 250 professional journalists in Serbia. It is evident that journalism in Serbia has long been considered an open profession, but it started closing in the recent years (Pralica & Barović, 2012, p. 391).

Nevertheless, the need for media ethics is not an abstract philosophical request. The reasons can be traced in practical problems and the objective harm that unethical reporting can cause to people, institutions and companies (Eberholst, Hartley & Olsen, 2016, p. 3). As a result, ethics is a pragmatic discipline, a kind of a tool that facilitates the work, making it more accountable and professional.

On the other hand, although the lack of knowledge of theories and standards increases problems and pressures of real life, it is quite true that for practical reasons a newsroom is not a suitable place for philosophical discussions, reasoning and debates about every individual case because „the starting point for those issues needs to be the classroom“ (Dej, 2004, p. 15). By taking up this stance Day does not negate the importance of ethics but points to the necessity of studying before entering the real life of the newsroom. Thus, one can draw a conclusion that openness of the journalistic profession is the main enemy of professionalism and that only education can empower it, because education as a central part of the profession provides one with ideals and standards that define the profession (Nygren, Degtereva & Pavlikova, 2010).

2.1. 2.1. Journalism studies and ethics

Contradictory information can be found about the first official school for journalists. Some sources claim that it was the Ecole Supérieure de Journalisme in Paris, France, founded in 1899, which nevertheless issued its first diploma in journalism 11 years later

(Goulet, 2009). Other sources make it clear that the Missouri School of Journalism in the United States awarded her first degree in journalism in 1921 and her first doctorate in 1934 (Weinberg, 2008). In the period that followed the Second World War, the faculties that began to educate future journalists opened up all over the world and by the beginning of the 21st century they had flourished.

In Serbia, the first faculty for the education of journalists at the academic level began operating in 1968 – the Faculty of Political Science at the University of Belgrade, which for many years was the only higher education institution where future media professionals were educated. At the beginning of the 2000s, a large number of higher education institutions appeared, which began to educate future journalists. According to Valić Nedeljković (2010), until 2005, studies in the field of journalism could be enrolled at as many as 12 faculties in the Republic of Serbia, at 3 state universities - in Belgrade, Novi Sad and Niš, as well as at 9 private faculties. Following the year of 2005, when the process of accreditation of higher education institutions and programs officially entered into force, the situation in the field of academic education changed significantly. After the selection, according to the information from the website of the Ministry and the Accreditation Commission, in the first cycle only five higher education institutions received accreditation: University of Belgrade, Faculty of Political Science (160 students), University of Novi Sad, Faculty of Philosophy (70 students), University of Nis, Faculty of Philosophy (50 students), Megatrend University, Faculty of Culture and Media (100 students), Singidunum University, Faculty of Media and Communications (80 students) – means 3 state universities and two privately owned universities (Valić Nedeljković, 2010). However, despite the large number of available programs, a degree in journalism has never become a condition for employment in the field. The problem of uneducated staff in journalistic profession engenders numerous other problems in this profession, including the ethical ones.

It could be assumed that a good education of journalists would reduce ethical violations. An increase in the numbers of educated journalists and their learning about professional ethics could be one part of the solution to the previously stated issue relating unethical actions of media professionals. If future journalists become introduced to the moral principles of the profession early in their media education, it could influence their professional mind-set, which means that they would be aware of moral accountability before they enter newsrooms. However, solving these problems is much more complex. Although ethical education of journalists (and education in general) before they start working is certainly of great importance, many authors claim that students never become fully aware of the significance of professional ethics. Thus, Day as a professor of ethics states that „after thirty years of teaching I am convinced that most students finish their studies without really grasping the true significance of ethics in their profession, or ethics in general“ (Dej, 2004, p. 13). Likewise, courses are often focused on micro instead of macro problems, because every analysed problem is treated as specific while wider, social and ethical dimension is often neglected (Lamberth, Christians & Cole, 1994, p. 21).

Another interesting issue is the problem of the society and media practice which influences students before they even reach the studies. According to the research conducted by Karen Sanders and associates, ethical postulates of journalism students are largely influenced by the current practice in the media and historical conditions of the society in which they grew up (Sanders et al., 2008). This was also indicated by the research by Claudia Mellado and associates who inquired into attitudes of students of journalism and communicology in Australia, Brazil, Chile, Mexico, Switzerland, Spain and the USA towards the professional

role of journalists. The total of 3880 students of public and private universities in seven countries answered researchers´ questions in the period between 2010 and 2012. This research established that in all countries with the exception of the USA students believe that journalists are primarily accountable to citizens, and that the main role of journalists is to provide the public with complete and relevant information to be able to participate in the political life. In contrast, students in the USA put emphasis on the consumer, commercial and entertaining functions of journalism the aim of which is to create more profit (Melado et al., 2013).

Another possible issue is the fact that classroom activities can never replace the real experience of a moral dilemma in practice, i.e. students cannot bear witness to the real consequences of their decisions. At the same time, students are often compelled to solve hypothetical scenarios in a very short period of time. Thus, it is not possible to fully grasp and understand the discussed phenomenon (Campbell, 2020, p. 67). Attitudes and actions of students, regardless of adopted standards, can significantly differ in situations when consequences are real and negative for them. This is one of the main reasons why students as well as media professionals violate journalistic ethics – negative consequences for them or the absence of positive effects.

Therefore, neither education nor emphasis on the importance and validity of ethical norms do not necessarily mean that they will be accepted. An educated journalist does not have to value ethical principles simply because he has university degree in journalism. Students are merely required to understand the ethical principles because they are frequently treated as a means or a goal, and not as a referential form of thinking and acting (Martono, Tiyanto & Surwiti, 2018). Students as human beings have a choice, and moral norms do not have the same meaning to everyone. On the other hand, as prospective professionals they need to abide by them.

2.2. Permanent and changeable dimensions of journalistic ethics among students

Although there are slight differences in journalistic practice of different countries, ethical principles of the profession are virtually universal in every country of the world (Williams, Guglietti & Haney, 2018). These principles represent the basis of education of future journalists, but several research studies indicate that, though they are universal and generally accepted, there are different interpretations among students of journalism.

In Serbia this topic has not been seriously analysed up to this point. However, there are several examples in the region such as a research study by Marko Sapunar, an associate professor on the Faculty of Political Sciences in Zagreb. The aim of this research was comprehending the perception of journalistic profession in enrolled students of journalism on the Faculty of Political Sciences in Zagreb. It has been noted that the largest percentage of respondents had a pretty good understanding of the basic principles of journalistic ethics. However, between 10% and 15% of respondents believe that respect, understanding others and tolerance are not relevant elements of practicing journalism (Sapunar, 2000, p. 197). Ines Jokoš and Igor Kanižaj dealt with issues of differences in the perception of journalism with regard to the enrolled year of study. The data indicate that there are certain standards that all respondent deem valid. Thus, 90% of them agree that a journalist is obliged to criticise irregularities in the society and inform citizens about their rights, 60% of respondents believe that a journalist is obliged to be a link between citizens and politicians, and an interesting piece of information is that as many as 20% of respondents

believe that journalists should be messengers of the Government´s demands. One third of students believe that a journalist should also be an entertainer (Jokoš & Kanižai, 2012).

Thus, the perception of journalistic ethics, its dimensions and significance are not the same in all students of journalism. There are differences caused by different factors. This is precisely the reason why it is necessary to investigate into students´ attitudes in Serbia regarding this important dimension of journalism and observe the manner in which they interpret ethics, its importance and levels to which they would unconditionally abide by it.

3. Methodological Approach

The subject of research is to examine the attitudes of students of journalism on the Faculty of Philosophy in Niš towards the principles of journalistic ethics. The aim of this paper is to establish whether students are familiar with the principles of journalistic ethics, the manner in which they observe journalistic ethics, as well as in which cases they would not abide by it. In accordance with the goals, three research hypotheses were defined:

1. Journalism students are familiar with the principles of journalistic ethics,
2. Students of journalism believe that journalistic ethics is important to be able to practice this profession,
3. There are instances in which, even though they are familiar with the principles of journalistic ethics and its significance, students of journalism would violate the principles of ethics.

The research resorted to a descriptive statistical method of analysis, whereby information was collected by resorting to specially constructed questionnaire. Respondents answered by expressing the degree of agreement with the assertions constructed by means of Likert´s scaling technique with five degrees of assessment, from the lowest termed „I totally disagree "to the highest termed „I totally agree ". Questions/assertions in the questionnaire were divided into three segments. Within the first segment respondents answered to assertions relating to understanding the principles of journalistic ethics, the second segment related to their attitudes towards journalistic ethics, and the third segment inquired into special conditions under which students would allow themselves to violate ethical principles of the profession. The questionnaire was distributed among third- and fourth-year students of undergraduate academic studies in the study programme of Journalism on the Faculty of Philosophy in Niš, bearing in mind that those students completed the course Journalistic ethics. The results were analysed by means of the SPSS software.

4. Interpretation of Results and Discussion

The total number of third- and fourth-year journalism students on the Faculty of Philosophy in Niš who completed the questionnaire was 42, including 64.2% of respondents in the fourth year of studies and 33.8% of respondents in the third year of studies. The largest percentage of obtained answers indicates that the majority of respondents agree with attitudes relating to journalistic ethics.

Thus, as much as 85.7% of respondents believe that they are partly or totally acquainted with the principles of journalistic ethics, while only 4.8% do not have an attitude towards this assertion and 9.6% totally disagree with the stated assertion. All respondents who disagree with this assertion are fourth-year students. Similar statistics was noted in

questions relating to individual principles of journalistic ethics in the work of journalists (Fig. 1). That students have significantly been introduced to the basic principles of journalistic ethics was indicated by the fact that the largest number of respondents (73.8%) totally agree with the assertion *Truthfulness in reporting is one of the main principles of journalistic ethics*, while 16.7% partly agree with this assertion. As with the previous assertion, 9.6% do not agree, and they are fourth-year students. When it comes to journalist accountability, as much as 90.4% of respondents partly agree that journalists are primarily accountable to the public, and only 9.6% partly disagree (4.8%) and totally disagree (4.8%) with this assertion. On the other hand, 90.4% of respondents disagree with the assertion that a journalist is not obliged to abide by the request relating to the anonymity of their source, while 9.6% partly agree with that.

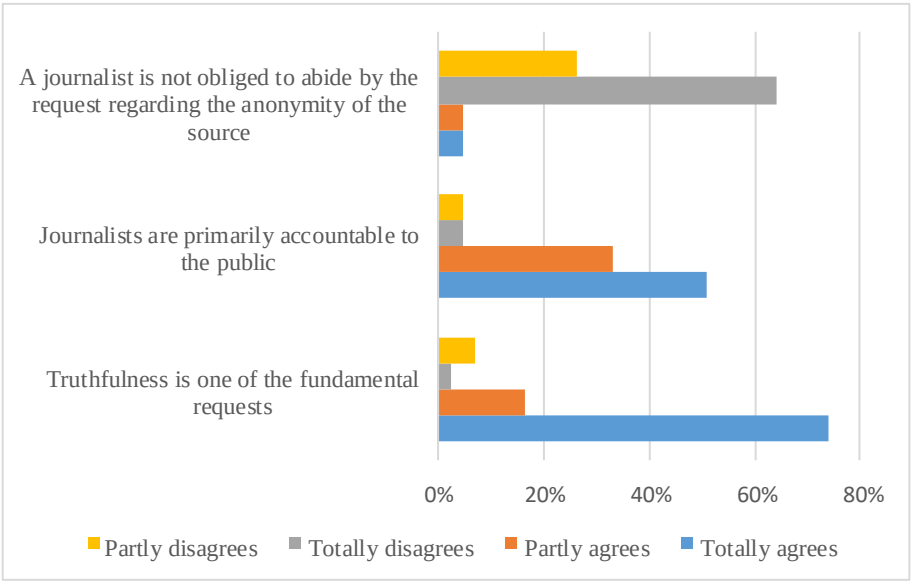

Fig. 1 Students´ attitudes towards the principles of journalistic ethics

A significant percentage of agreement among students with respect to every particular question, as well as the high consistency of total or partial agreement with the principles of journalistic ethics indicate that students who listened to the course Journalistic ethics acquired the knowledge and standards emphasised by it. Simultaneously, respondents are largely aware of their professional ethics which can be deduced on the basis of a high level of agreement with the assertion relating to this issue. From rather homogeneous answers in this part of research one can draw the conclusion that the first hypothesis which states that *Students of journalism are acquainted with the basics of journalistic ethics* has been confirmed.

These results are significant because they indicate that a potential violation of ethical principles of the profession by students of journalism does not have roots in their ignorance of ethics because a large percentage of respondents understands some of its

main principles. However, it is equally important to pay attention to what extent students believe that journalistic ethics is important when one practices this profession.

The results of this part of research also point to a certain compatibility in the largest percentage of responses. Thus, they indicate that as much as 83.3% of responses do not totally agree with the assertion *Being acquainted with journalistic ethics is not a necessary precondition to practice journalism*, and 11.9% partly agree. Only 4.8% partly disagree with this assertion. However, a larger variety of responses has been noted in the assertion that the course Journalism ethics imposes stricter principles than practice requires. Only 4.8% fully agree that ethical principles taught during the course are more rigorous than needed in practice, while as much as 21.4% partly agree, and 19% do not have an opinion. Here one can also observe that the largest percentage of respondents either partly or totally accept the requests of ethics (54.5%) but one can observe certain differences among students (Fig. 2). Comparative analysis has not provided significant differences in terms of the year of study in this set of questions.

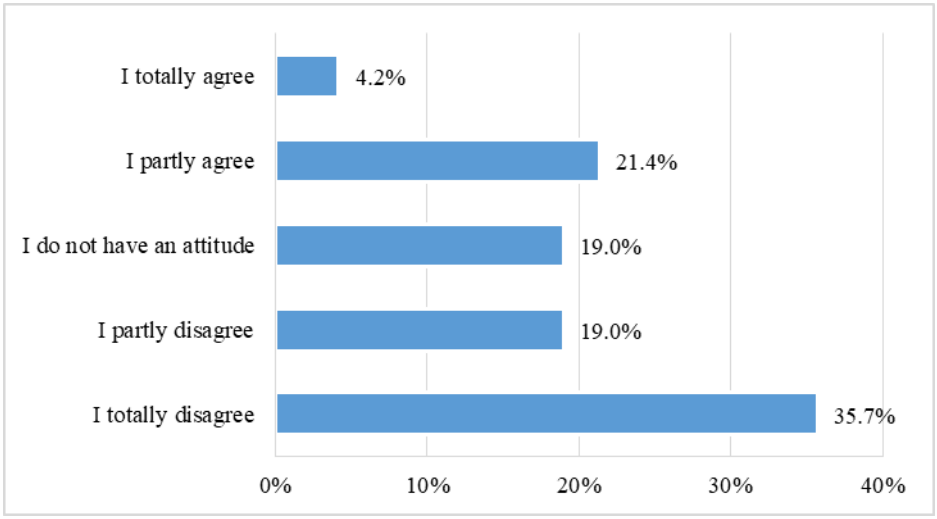

Fig. 2 Students´ responses to the assertion *I believe that the course Journalism ethics imposes stricter principles than required in practice*

In fact, a certain percentage of respondents is aware and understands the requests of ethical journalism, but they do not believe that they need to necessarily abide by it in practice. As previously emphasised by various authors, students need to understands the rules of ethics to be able to successfully pass the exam, but during the course they are not required to internalise these principles (Martono, Tiyanto & Surwiti, 2018). This is indicated by the fact that 19.1% of respondents partly of totally believe that the speed and exclusivity in reporting have the advantage over journalistic ethics.

Therefore, although it has been established that more than 90% of respondents understand journalistic ethics, there is a certain percentage of those among them who do not believe that journalistic ethics is important to the extent they should or they believe that there are certain aspects, such as quick reporting and being the first to report, which allow for ethics to be neglected when it becomes an impediment. As a result, one can

conclude that the second hypothesis *Students of journalism believe that journalistic ethics is important for the profession* has been partly confirmed. The largest percentage of students observe that abiding by journalistic ethics is important, but there is a number of respondents who believe that there are professional requests which are more relevant as well as cases when ethics stops being the most significant guideline.

This is particularly conspicuous in responses to the third part of the questionnaire, where respondents answered in which situations they would be ready to violate professional ethics. The first thing to be observed is that those answers are less homogenous, which indicates that there are different perspectives of the importance of journalistic ethics, as well as readiness of students who attended the same course to abide by it.

The assertion *I would abide by journalistic ethics even though I would be criticised by superiors in the newsroom* was fully supported (45.2%) or partly supported (47.6%) by 92.8% respondents. It should be emphasised that all those who do not have an attitude or disagree with this assertion (7.2% in total) are fourth-year students. The percentage of those who would criticise a colleague if they knew that he/she resorted to unethical means when collecting data is somewhat lower than in the previous assertion, but still rather high – 80.9%. However, it has been noted that there is a wider variety of responses and a lower degree of agreement when it comes to the assertion *I would violate ethical principles of the profession to obtain exclusive information and make progress in my line of work*. Some 16.7% of respondents partly agree with this assertion, while the same percentage has no attitude. Therefore, more than one fourth of students was not explicit in stating that they would abide by ethics if they had an opportunity to advance by violating it. There is even larger percentage of those who would be ready to violate journalistic ethics if that was the only way to keep their job. As much as 28.6% partly agree that in this case they would violate moral principles, while 4.8% totally agree with this. It is significant that 11.9% do not have an opinion, while 31% of respondents partly disagree and 26.2% of respondents would abide by ethics even at the cost of missing the opportunity to advance. Negative financial consequences or the lack of good effects in certain number of respondents is an impediment to abiding by journalistic ethics. It is confirmed by the assertion *As an editor I would allow publishing socially relevant texts which negatively represent the main advertiser in that medium* with which 7.1% of respondents totally disagree, and 26.2% partly agree. Many respondents do not have an attitude (31%), while 35.7% would publish a socially relevant text even at the expense of a potential loss of the largest source of income.

In every response there is a certain percentage of respondents who would abide by professional ethics even at the cost of potential negative effects, but it is observable that the bigger the effects the smaller percentage of respondents, i.e. the larger percentage of those who would not abide by ethical principles of the profession (Fig. 3). This is the most conspicuous in responses to the assertion *I would violate ethical rules if my life was threatened*. As much as 81% of respondents agree with this assertion, half of them partly and half of them totally. There are 9.5% of respondents who do not have attitudes, while only 4.8% of respondents do not partly agree or totally agree.

What is especially interesting is that the group which would abide by professional ethics even at the cost of their own lives were exclusively fourth-year students. This may come as a surprise bearing in mind that in previous answers differences were noted in terms of the year of study and they indicated that fourth-year students were not as attached to journalistic ethics as third-year students. One possible conclusion states that

more time has passed since the moment they listened to the course Journalism ethics, and the principles they mastered lost their significance in time, which is the case with a certain percentage of students. However, the fact that this group comprises those who would be ready to risk their lives for ethical norms points to a wide variety in attitudes among the students of the same generation, ranging from those who believe that journalistic ethics is not necessary to practice journalism to those who would risk their lives for it. Such differences in attitudes are not present in third-year students precisely because they listened to the course about professional ethics more recently, which resulted in more uniform answers. This conclusion does not negate the importance of studying ethics, but points to two things. The first one is that there are huge individual differences in future journalists who attended the same course, and the second is that in time those differences could increase and that it is necessary to constantly reconsider and discuss ethical principles of the profession. This partly refutes the argument that the newsroom is not the place where one should discuss ethics (Dej, 2004, p. 15), because only by constantly discussing this issue one can ensure respect for it and the awareness of its importance.

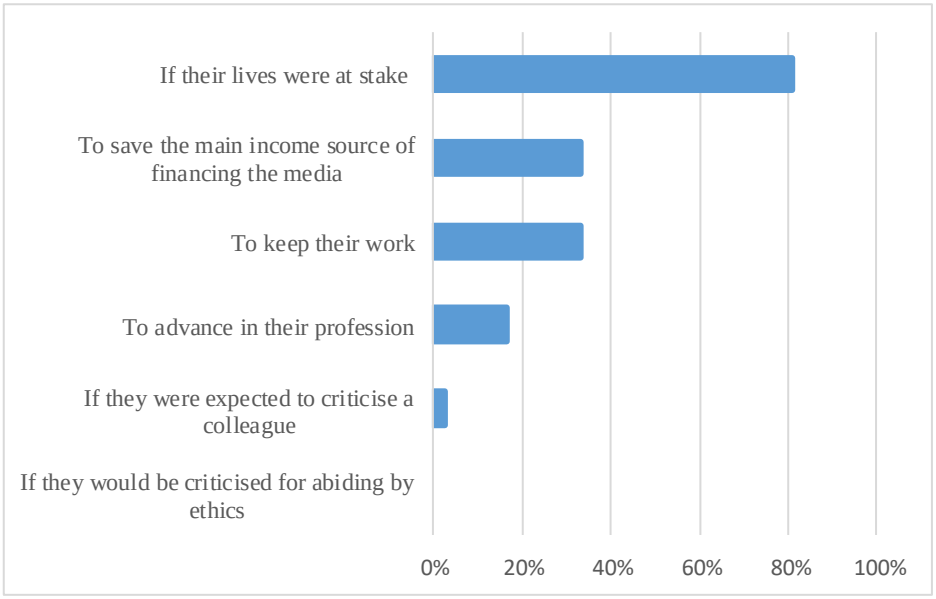

Fig 3. Percentage of students who would not abide by professional ethics in certain situations

One should emphasise that among students who believe that being acquainted with professional ethics is a necessary precondition for practicing the profession there are 15% of those who would violate ethics to advance, 30% of those who would do that to keep their job, and as much as 82.5% of those who would do that to avoid a life-threatening situation. It is even more indicative that among the respondents who believe that ethics they had mastered did not impose stricter principles than necessary in practice, there are

22.7% of those who would violate it to advance, 18% of those who would do it to keep their job, and 86.4% of those who would do it to keep their lives.

All presented results lead to the conclusion that the third hypothesis which asserts. *There are cases in which students of journalism would violate journalistic ethics even though they are acquainted with it and understand its importance* has been confirmed. Although they understand the importance of principles imposed by ethics, those principles are not always the priority. Their priority decreases when the consequence of abiding by them is largely negative, as well as when there is no positive effect which could ensue if the rules of ethics are disregarded.

5. CONCLUSION

Students who attended the course Journalistic ethics are largely acquainted with the principles of journalism ethics and understand its significance. It is best indicated by the fact that 94.2% of respondents totally or partly believe that being acquainted with ethics is a necessary precondition for practicing journalism. However, a quarter (26.2%) of respondents believe that ethics has posed stricter principles than necessary, and almost 20% give precedence to the speed and exclusivity over respecting the rules of ethics. In these results one can notice the problem of priorities of modern tabloid and sensationalist journalism in Serbia, and one can say that they reflect the situation in the society. As to the conditions under which students would stop abiding by journalistic ethics, an interesting regularity can be noticed. With the increase of risk or consequences fewer students opt for honouring journalistic ethics. Thus, ethics would be violated to the least extent if requested by the public (16.7%), somewhat to a larger extent if they could advance in their career (19.1%), and to an even larger extent if they could lose their job (33.4%). If their lives were at stake as much as 81% of respondents would violate ethical rules of the profession.

From the research one can single out the main causes of violating journalistic ethics from the perspective of future journalists which largely reflect the current causes in the society. The lack of (continuous) education in this case has been taken as the main *zero* cause without which one cannot reflect the following:

1. Social and professional environment and the existing practice
2. Fear of criticism
3. Financial stability of individuals and the media they work for
4. Advancement in work and fear of losing job
5. Security and life-threatening situations

From the above stated one can conclude that potential solutions of the problem of violating professional ethics in Serbia lies in creating professional and ethically correct environment in newsrooms in which journalists would not be afraid to state their opinion, securing financial stability and job security of individuals, and the media in which one could not advance by unethical means, and providing a more quality protection of journalists who would not feel threatened due to the manner in which they work. Naturally, the list of causes is not exhausted, nor are the offered solutions final, because it has been stated that understanding ethical principles is individual and changeable. Nevertheless, it is certain that by removing or mitigating the main causes the rate of violating ethical principles in the media reporting would significantly decrease, even with the issue of *openness* of the profession.

The deficiency of this research is a small sample as well as the fact that respondents could not be placed in real situation in order to ascertain the manner in which they react to the researched topic. Likewise, it would be extremely useful if some future research studies included media workers in order to observe differences in attitudes between those two groups.

This research is important because it pointed that the problem of violating journalistic ethics in Serbia does not have roots in universities where journalists are educated. Likewise, attitudes of future media workers point to potential causes, reasons and solutions to violating journalistic ethics in Serbia. They are largely reflected in the problems of finances and existential stability.

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OBRAZOVANJE STUDENATA NOVINARSTVA I NJIHOVE PERCEPCIJE O NOVINARSKOJ ETICI

Jedan od najvažnijih predmeta u obrazovanju novinara je Novinarska etika. Teme iz ove oblasti posebno dobijaju na važnosti od početka 21 veka, jer je sa razvojem novih medijskih tehnologija došlo do značajnih promena u novinarstvu. U celom svetu je fokus pomeren sa kvalitetnog izveštavanja na što bržu objavu, senzacionalizam i zaradu. Visokoobrazovne institucije koje školuju novinare imaju obavezu da studentima prenesu važnost pridržavanja etičkih postulata. Cilj ovog istraživanja je utvrditi stavove studenata treće i četvrte godine novinarstva Departmana za komunikologiju i novinarstvo Filozofskog fakulteta u Nišu po pitanju novinarske etike koji se odnose na njihove percepcije ovog fenomena. U skladu sa postavljenim ciljem konstruisan je poseban instrument – upitnik zasnovan na petostepenoj Likertovoj skali. Upitnik je distribuiran studentima tokom marta i aprila 2021. godine, a popunilo ga je 42 ispitanika. Podaci su analizirani metodom deskriptivne i uporedne statistike i programom SPSS 25.0. Rezultati istraživanja ukazuju da iako studije obrazuju visok procenat studenata koji razumeju značaj novinarske etike, većina ispitanika ukazuje na postojanje objektivnih okolnosti u kojima misle da ne bi mogli u potpunosti da se pridržavaju etičkih principa.

Ključne reči: *novinarska etika, stavovi studenata, novinarstvo, studije novinasrtvas.*

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Review article

STATE OF HIGHER EDUCATION FOR SUSTAINABLE DEVELOPMENT IN THE REPUBLIC OF SERBIA

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Abstract. *An important part of the general agreement on the importance of education in achieving the goals of sustainable development also refers to the function and responsibility of the University. In this context, in recent years, much attention has been paid to advancing the process of integrating sustainability in universities, which is accompanied by the adoption of a transformative approach, linking theoretical with practical discourse and exploring new applications within and between scientific disciplines. The paper will present the concept of sustainable development in the context of education, with special emphasis on the presentation of education for sustainable development in the educational systems of Serbia. The focus of the paper is the analysis of the state of sustainable development in academic education in our country. The aim was to examine the extent to which education for sustainable development is represented at the faculties of social sciences and humanities of the University of Serbia. The selected methodology was based on the content analysis of the curriculum and syllabus with interviews with professors and assistants of selected faculties. Given that professors have been identified as bearers of education for sustainable development, the key to educating students for sustainable development is, and must be, in the education and continuous training of pedagogical staff in this field.*

Key words: *education, Sustainable Development, Environment, curriculum/syllabus, university*

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1. INTRODUCTORY CONSIDERATION

Education is a fundamental precondition and basic precondition for achieving sustainable development. It is clear that the only way to enable people to live and work in accordance with sustainable development is education. In the last ten years, education for sustainable development has become the dominant formula for the development and transformation of educational systems, and is therefore considered the greatest challenge of our time. Education, in the concept of sustainable development, encourages, prepares and involves individuals and social groups in analyzing the way of life and work, in making the right decisions and creating ways of thinking in the direction of sustainable development. Let us remind you that the goal of sustainable development is to meet the needs of the present without fear that future generations will not be able to meet their needs. Such development is permanent, sustainable, capable and open to the future (Prodović, 2014, p. 11).

Sustainability and sustainable development are sources of many misunderstandings, so many refer to the "uncertainty" of this concept (Gidens, 2010, p. 125). What presents a specific difficulty in defining sustainable development, as theories and phenomena, are its generality and universality, but also conceptual inconsistency. First, defining sustainable development, which includes economic, cultural and environmental development, is in itself complex and contradictory, because none of these, let's call them "special" developments, are interconnected in reality to such an extent that we can unite them. and identify in one definition. Therefore, sustainable development can be defined differently within the economic sciences, cultural studies, sociology, political science, social policy and even social ecology; which creates a certain theoretical confusion (for more details on the definitions, see: Marković, 2005, pp. 399-401; Đukić, 2011, pp. 3-25; Đukanović, 1996, pp. 171-172; Nadić, Šuvaković, 2011, pp. 161-167). Sustainable development should not be accepted uncritically. However, that is exactly what is happening. Therefore, in practice, sustainable development is becoming a new type of planetary ideology, or a new planetary religion, which must not be doubted or criticized. That is why, under the influence of modern processes of globalization and transition, which our country is going through, we often wonder whether we should go beyond the fact that the very definition of sustainable development carries so many ambiguities and futuristic-egalitarian phrases, which suggest that it represents a long political, social, economic and environmental process that can only be a postponement of what will inevitably happen in the future, but also a delusion that it is only possible to improve the existing situation. For all its complexity and vagueness, the concept of sustainable development has significant potential for motivating the energy of various social actors, both locally and regionally, and globally. Theoretical implications of the concept of sustainable development and its concept, which has developed particularly intensively in the last forty years and which is often taken as a daily superficially used term without deeper knowledge and possibilities of its application, are extensively given and presented in the theoretical part presented in the defended master's thesis 2014 (for more details see: Prodović, 2014).

Innovative societies as societies where knowledge is valued as a resource, invest in education and science, with a developed information infrastructure in which the individuality, ability and creativity of individuals and organizations are highly valued[1]. Starting from these

[1] In 1980, Japan changed its development strategy, where instead of investing in heavy industry and petrochemistry, they invested in activities based on the human mind and knowledge, which consume little energy and raw materials. For example, in the United States, the number of employees in high-knowledge industries (eg, professional and

attitudes, it is necessary to learn and understand throughout life that the essence of learning means teaching people to think, and not just to accumulate facts.

Starting from these attitudes, it is necessary to learn and understand throughout life that the essence of learning means teaching people to think, and not just to accumulate facts.

Such education for sustainable development and environment is especially reflected in the originality of methods and selected thematic frameworks for studying scientific fields that concern, perhaps, the greatest challenge of today, theoretical and applied interdisciplinary understanding and achieving the principles of sustainable development. Unfortunately, there are not enough scientific and highly educated profiles in this field, which are ready to respond to all the challenges of the upcoming European integration and increasingly demanding European standards in environmental protection. Experts in these fields are necessary in every modern society because they represent a key element in preserving the environment, and thus provide the necessary basis for sustainable development of society as a whole. Through education for sustainable development, experts will be created who will be able to accept the principles of sustainable development and develop skills and competencies for highly professional work in immediate areas that are the focus of sustainable development and acquire competencies for applying sustainable development principles in everyday work. areas. In addition, they will be able to respond to the challenges of global change and launch a number of studies, which would be important for each individual and for society as a whole. We need educated people who learn quickly, who are innovative and creative to change their abilities in accordance with technological development and global development trends. Such education is completely justified and useful for the whole society, because it contributes to the expansion of scientific bases and strengthening of scientific-research capacities and possibilities in areas important for the environment, and especially in the field of sustainable development. In fact, education for sustainable development and the environment would be the training of future researchers for a new society, based on the concept of sustainability, which involves aligning economic growth and development with environmental interests, which encourages and promotes complex training and development through applied research, qualified, critical and self-critical thinking and approach to solving environmental problems.

"It is important to state that education for sustainable development should not be reduced to presenting the theory of sustainable development, but as a realistic, active and effective form of work that allows students not only to acquire knowledge but also their practical application" (Maletaški, 2018). "Education for sustainable development is a modern topic today. Lay people think of it in a politicized way, linking it to the economy or to the traditional understanding of propaganda political ecology" (Previšić, 2008, p. 58). In a time of rapid social change, it is important to develop awareness of the importance of the concept of sustainable development at all levels of education. Therefore, it represents a serious investment. That is why it is necessary to choose the right education, because investing in education means investing in the future.

Hence, there is a growing need to make this notion operational, not only in the context of political declarations, but also in terms of school and university education[2], and that

business services) is equal to the number of employees in industry. In the UK, the main priority of the government is the education of its citizens. This commitment was confirmed by the appointment of the "First Under-secretary of State for Lifelong Learning.

[2] The Enlightenment gave a strong impetus to education in general, and university education in particular, because it discovered one of the most important driving forces of social development in the spread of education.

education in general is confronted with an understanding of integrally sustainable development and its operationalization[3]. As the implementation of the sustainable development program at the University is inevitable, it is a place where knowledge and skills are learned and adopted on the one hand, while on the other hand they serve their critical reflection and re-examination. Only if the abilities of future generations to apply these principles are improved, only in this way will the sustainability of our civilization and way of life be created and achieved.

There are more and more initiatives and efforts to incorporate the principles of sustainable development into as many curricula as possible, rather than treating sustainable development as a separate topic through special subjects. The first and partial insights into the presence of ideas of sustainable development in university education in Serbia show that these processes have begun, but that there is a wide space and an obvious need to significantly expand this field. In addition to changing the syllabus, it is important to change the approach to education, with a change in the techniques and methods of learning and teaching.

2. EDUCATION FOR SUSTAINABLE DEVELOPMENT AT FACULTIES IN SERBIA – RESEARCH METHODOLOGY

Given that Serbia has adopted international documents and strategies that have opted for the development of education for sustainable development, the question arises as to how the provisions of these documents have been implemented in practice. Analyzing the relevant sources, the authors Ch. Desha and Ch. Hargroves provides examples of declarations and action plans that support education for sustainable development at all levels of education, with an emphasis on higher education (Desha, Hargroves, 2014, p. 10)[4].

Having in mind the accepted interpretation of education for sustainable development, the paper gives an analysis of the syllabus of all state and private universities and faculties in Serbia, with the help of which it determines how much sustainable development content is applied in university education in our country.

In the 19th century, universities made a key contribution to industrial development and social progress in every respect. Without the development of natural and technical sciences at universities, social progress in the development of productive forces is inconceivable, as recorded in the so-called era. industrial revolutions. However, the real explosion of university education did not occur until the second half of the 20th century. According to the International Journal of Sociometrics, Infometrics and Bibliometrics, there are 17.036 registered universities today. It is calculated, however, that for less than half, ie. about nine thousand, can be considered to meet all the necessary today's standards of a higher education institution.

[3] Thus, for example, in order to determine the extent to which other national strategies are in line with the NSSD of the Republic of Serbia, the identification was based on key concepts that make up the principles of sustainable development, such as: sustainable development, solidarity, environment, precaution , peace, democracy, etc. Based on the (physical) presence of these key terms in certain strategies, their functional presence was analyzed, ie to whom these terms specifically refer or what they specifically explain and to which other processes they refer. The authors emphasize that they also relied on such a strategy in their research.

[4] On key international and national documents that indicate the need and importance of this issue, that is, they are important for research and understanding of this problem, see: Prodović, 2022: 28-56.

2.1. The subject of the paper

The subject of the paper is aimed at monitoring the integration of sustainable development programs into various student programs. Quantitatively, the research is based on the analysis of the representation of sustainable development in academic education in Serbia. The extent to which education for sustainable development (curriculum content analysis) is present at the faculties of social sciences and humanities of the University of Serbia in the period from 2010. to 2020. was investigated[5]. The place of sustainable development in the curricula of all levels and forms of education was considered. The subject of the research is also the examination of the dissemination of knowledge, which should be connected with the knowledge that the successful development of the economy requires its humanization and taking care of people. On the line of such considerations of contemporary problems, the concept of environmental education was created, ie. disseminating and acquiring knowledge about the environment and the need to preserve it, in order to develop environmental awareness. In the context of this approach, the concept of social development as sustainable development (whose essence is in harmonized social development with environmental opportunities and laws), and environmental education is renamed education for sustainable development.

2.2. Aim of the paper

The aim of this analysis is to consider its place in the curricula of university education within the framework of education for sustainable development. Such education should enable the acquisition of environmental knowledge of different levels that are appropriate to the character and level of education. Hence the goal of the work is twofold. First, it should present the basic features of the concept of sustainable development, as well as the fundamental principles on which this concept is established. Second, the paper seeks to determine how the education system needs to be reformed in order to formulate Education for Sustainable Development. With this analysis, the authors actually wanted to point out the complexity of the concept of sustainable development with a tendency to present normative assumptions for the introduction of sustainable development in university education in Serbia. Their aim is to point out different understandings of the role and function of university education to a more critical understanding of education for sustainable development. This analysis is especially contributed by this analysis of the representation of sustainable development at the faculties of social sciences and humanities of the University of Serbia. The social significance of such an analysis would be reflected in the fact that it will be available to the interested public who will be able to get acquainted with research efforts and research results, which can be an incentive for some social activities, as a guide for educational policy planning. The contribution also lies in the possibility of concrete application of the obtained research results in practice.

[5] It is about the analysis of the syllabus of all state and private universities and faculties in Serbia. It is necessary to mention that this analysis builds on the analysis of the syllabus from 2013 - as a study that is part of the master's thesis of one of the authors (see: Prodović, 2014). The confirmed hypotheses at the time referred to the fact that sustainable development at the faculties of social sciences and humanities was not adequately represented; that higher education institutions pay very little attention to the concept of sustainable development; that higher education institutions do not educate students for sustainable development; that there is no subject in basic studies that contains the term sustainable development in its title; most of the subjects that deal with sustainable development in one way or another are of an elective nature; and that a very small number of students chose and listened to subjects dealing with sustainable development (see: Prodović, 2014).

As a general hypothesis that is set in the paper is that sustainable development at the faculties of social sciences and humanities is not adequately represented. In addition to this, the paper started from special hypotheses: that higher education institutions (in this case, faculties of social and humanistic character) pay very little attention to the concept of sustainable development; and that higher education institutions do not educate students for sustainable development.

2.3. Data source

The methodology is based on the content analysis of the curriculum and syllabus with conversations with professors and assistants of the Faculty of Social Sciences and Humanities of the University of Serbia, for the period from 2010 to 2020. The research population consists of syllabi and curricula of basic academic studies, master's and doctoral studies; namely the Universities of Nis, Pristina, Kragujevac, Novi Sad and Belgrade. The analysis also takes into account universities in the territory of the Republic of Serbia, which are not owned by it. This applied procedure enabled the creation of an experiential basis for testing the set hypotheses on the studied population. The following table (Table 1) shows all analyzed Universities in the territory of the Republic of Serbia, at the time of the research.

Table 1 Universities and faculties on the territory of the Republic of Serbia

Names of universities in the Republic of Serbia	
Universities founded by the Republic	Universities whose founder is not the Republic
Universities in Belgrade	Alfa Braća Karić University, Belgrade
Belgrade University of Arts	University Singidunum, Belgrade
University in Kragujevac	Megatrend University, Belgrade
University in Nis	University Union, Belgrade
University of Pristina with temporary seat in Kosovska Mitrovica	Metropolitan University
University in Novi Sad	International University of Novi Pazar
State University of Novi Pazar	Business Academy, Novi Sad
	European University, Belgrade

Source: Author's personal table

In the focus of the author's analyzes, the faculties of social sciences and humanities were taken into account, namely: Faculty of Economics, Law, Philosophy, Philology, Faculty of Teacher Education, Faculty of Sports and Physical Education, Faculty of Occupational Safety and the Faculty of Arts. In addition to the analysis of the syllabus of these University Centers (Nis, Pristina, Kragujevac, Belgrade and Novi Sad), a special review was made of private faculties (with their headquarters in Belgrade, Novi Sad, Nis and Novi Pazar). The method used - content analysis - implies systematic counting, assessment, interpretation and analysis of the observed research object (for more details on methodological tools see: Bešić, 2019; Branković, 2014; Đorić, Popović, 2000).

3. Results of the Analysis Syllabus of the Social – Humanistic Faculty in Serbia

By analyzing the study programs of the analyzed faculties in the Republic of Serbia, the authors came to the conclusion that all Serbian universities have implemented certain contents that can be related to education for sustainable development, at least some, and some and all, levels of academic studies. We note that the interpretation of the obtained findings will be analyzed in relation to the first cycle of research (see: Prodović, 2014; Prodović, Milojković, Prodović, 2014a). In this context, we can single out a few additional observations.

First, unlike the previously mentioned analysis (Prodović, 2014; Prodović, Milojković, Prodović, 2014a: 121-136), the authors reveal a larger number of newly accredited programs within which can be singled out subjects that are basically dealing with sustainable development. What the authors point out is the increased expansion of new modules/ subjects that deal with the environmental segment within their thematic units. Such a situation is present in both state and private faculties. The list of new subjects in both undergraduate and master's and doctoral studies, within the old and new accredited programs, is given in the table below (see Table 2).

Table 2 New subjects dealing with sustainable development at state faculties in Serbia

	BASIC STUDIES	MASTER STUDIES	PHD STUDIES
	Studies program	Studies program	Studies program
		UNIVERSITY OF NIŠ Faculty of Economics	
NEW(S) SUBJECT(S):	Industrial Economics, Agrarian Management and National Economy		
		UNIVERSITY OF PRIŠTINA Faculty of Philosophy	
NEW(S) SUBJECT(S):	Practicum - Social psychology		Social ecology and environmental policy
		Faculty of Law	
NEW(S) SUBJECT(S):	Fundamentals of economic policy of the European Union; Economic integration and the EU		
		UNIVERSITY OF KRAGUJEVAC Faculty of Economics	
NEW(S) SUBJECT(S):	Economics of agriculture, Economics of natural and economic resources, Theory and analysis of economic policy		
		Faculty of Pedagogy	
NEW(S) SUBJECT(S):	Health education		Contemporary understanding of nature
		Faculty of Philology and Arts	
NEW(S) SUBJECT(S):			Ecological architecture
NEW(S) SUBJECT(S):		Faculty of Pedagogical Science Sustainable development of the environment	
		UNIVERSITY OF NOVI SAD Faculty of Economics	
NEW(S) SUBJECT(S):	European integration, Economic analysis of agricultural programs; Public sector economics		

		Faculty of Philosophy	
NEW(S) SUBJECT(S):	Bioethics; Ecological pedagogy; Sociology of education, City ecology	Philosophy of lifelong learning; Sociology of education	Education for sustainable development; Education and sustainable development
		Faculty of Pedagogy	
NEW(S) SUBJECT(S):	Health education		
		Faculty of Law	
NEW(S) SUBJECT(S):		Land and water law	Environmental law
		UNIVERSITY OF BELGRADE Faculty of Economics	
NEW(S) SUBJECT(S):	Agricultural Economics, Sociology; Theory and planning of economic development		
		Faculty of Law	
NEW(S) SUBJECT(S):	Fundamentals of sociology of law; International public law	Animal rights, Environmental law, European Union environmental law and policy, Access to justice in environmental matters, Liability for environmental damage in the light of international environmental law, Environmental policy and European Union law, Quality management and green procurement, Sustainability and innovation	International law for the protection of the human environment
		Faculty of Philosophy	
NEW(S) SUBJECT(S):	Philosophy of Adult Education, Adult Education for the Environment, Environmental Archeology, Introduction to Sociology; Sociology of rural development	Introduction to sustainable development studies, Migration and sustainable development, Sustainable local development	The sociology of education
		Faculty of Political Science	
NEW(S) SUBJECT(S):	Contemporary Sociological Theories, Contemporary Environmental Policy and Sustainable Development, Globalization and Contemporary Society, Public Relations in Environmental Policy, Environmental Security, Political System and Economic Development, Globalization and Social Policy, Peace and Development	Contemporary Sociological Theories, Contemporary Environmental Policy and Sustainable Development, Globalization and Contemporary Society, Public Relations in Environmental Policy, Environmental Security, Political System and Economic Development, Globalization and Social Policy, Peace and Development	Ecological risks of the modern age
		Faculty of Security	
NEW(S) SUBJECT(S):	Spatial planning and protection, Monitoring in protection; Management in protection systems		Civil protection and environmental protection
		Faculty of Sports and Physical Education	
NEW(S) SUBJECT(S):	Health education		

Source: Author's personal table

Special mention should be made of the *Faculty of Occupational Safety, University of Nis*, as one of the few state faculties that in its organization of teaching content, both in undergraduate and especially in master's studies takes into account the importance of environmental research, protection, environmental risk, sustainable development and environmental education. Among the subjects in undergraduate studies, within the module Protection of the working and environment, the following stand out: *Ecology*; then the subject *Theory and organization of education for protection, Fundamentals of protection systems, Sociology, Economics of protection, Technological systems and protection, Chemical parameters of work and environment*. It is worth mentioning the study program in the third year of the Basic Studies of Environmental Protection, within which this thematic unit is covered in the following subjects: *Energy Processes and Environment, Electromagnetic Radiation in the Environment, Waste Management, Ecology, Environmental Chemistry, Information Technology in Protection, Utilities and Environment, Environment and Health*. In the fourth year we have the module Environmental Protection where we can single out the subjects - *Industrial Ecology, Environmental Noise, Spatial Planning and Environmental Protection, Work and Environmental Quality Indicators, Environmental Protection and Insurance, Environmental Risk, Sustainable Development, Impact Assessment the environment.* In the master's academic studies within the modules of Environmental Engineering and Environmental Management, in addition to subjects that directly deal with sustainable development, we should mention the list of subjects that "bypass" the concept of sustainable development. This list includes the following subjects: *Technological Processes and Environment, Renewable Energy Sources, Environmental Management, Environmental Impact Assessment, Environmental Monitoring, Ecotoxicology, Environmental Psychology and Environmental Chemistry. Urban ecology, Environmental economics, Environment and health, Environmental law, Social ecology, Environmental policy, Business ethics in environmental protection, Education for environmental protection and sustainable development, Local sustainable development* are directly involved in sustainable development[6]. It should not be left out here that the outcome of such learning is based on the possession of a developed system of knowledge in the field of education for environmental protection and sustainable development; understanding the role and responsibilities and considering and considering the possibilities of environmental education in the strategy of sustainable development. In the module Management of the communal system, in addition to the above-mentioned subjects (*Environment and Health, Environmental Protection Law, Environmental Protection Policy and Education for Environmental Protection and Sustainable Development*), the subject *Sustainable Housing* is also highlighted. There are two modules in doctoral studies: a) Safety engineering at work with subjects: *Physical processes in the work and environment and Air Pollution Emission Management*; and b) module Environmental Engineering with subjects: *Environmental Management Methods, Physical Processes in Work and Environment, Chemical Processes in the Environment, Air Pollution Emission Management, Energy Processes and the Environment, Electromagnetic Radiation in the Environment, Pollution and Remediation land, Selected chapters of the theory of sustainable development, Selected chapters of renewable energy sources, Selected chapters of urban ecology, Environmental risk management, as well as Environmental knowledge management* in which direct or indirect calls for sustainable development"[7].

[6] These are just some of the topics covered, others can be found in the syllabi of the subject itself.
[7] *Source*: portal of the Faculty of Occupational Safety in Nis: http://www.znrfak.ni.ac.rs.

In the context of this story, but now among private faculties, we must mention the ***Metropolitan University in Belgrade***, where the ***Faculty of Applied Ecology - Futura*** - stands out, within which subjects that emphasize sustainable development are singled out. as well as master's (with two accredited new modules) and doctoral studies (Prodović, 2014). The list of new subjects at all three levels, within the old and new accredited programs, is given in the table below (see Table 3).

Table 3 New subjects dealing with sustainable development at private faculties in Serbia

	BASIC STUDIES Studies program	MASTER STUDIES Studies program	PHD STUDIES Studies program
	UNIVERSITY Academy of Economics in Novi Sad		
NEW(S) SUBJECT(S):	Biology, Biogeography, Environmental Chemistry, Environmental Monitoring, Protected Areas, Fundamentals of Ecotoxicology, Natural Resources Management, Plant Ecology, Microorganism Ecology, Ecological Energy and Renewable Energy Sources, Economic Aspects of Environmental Protection, Environmental Regulation and Standardization, Agroecology, Social Ecology, Environmental Technology, Human Ecology, Professional Research Project in Ecology, Chemical Environmental Analysis, Waste Management; Ecology management		
	UNIVERSITY OF SINGIDUNUM		
NEW(S) SUBJECT(S):	Modern methods of environmental data processing, New technologies in environmental engineering and management, Modern methods of environmental monitoring, Adaptation and mitigation of the environment, Environmental safety, Sustainable tourism	Sustainable development in tourism and hospitality	
	ALFA UNIVERSITY IN BELGRADE		
NEW(S) SUBJECT(S):	Agro business and agrarian economy; Environmental management	Environmental management standards	
	MEGATREND UNIVERSITY IN BELGRADE		
NEW(S) SUBJECT(S):	Sustainable Development; Ecological management of beef and milk production, Ecological principles of vegetable production, Plant protection in organic agriculture, Land and water management; Natural Resources Management, Fundamentals of Industrial Technologies; Operating procedures and environmental protection	Natural resource management and environmental protection; Economic and economic development management; Sustainable development and green economy	Scientific bases of sustainable development, Economics of natural resources; Rural economy and development

	UNION UNIVERSITY		
NEW(S) SUBJECT(S):	Environmental management and sustainable development		
	UNION UNIVERSITY – NIKOLA TESLA		
NEW(S) SUBJECT(S):	Environmental protection and sustainable development, Environmental management, Sustainable business development; Energetic efficiency	Introduction to the theory and aesthetics of ecologically based architecture, Sustainable Development, Environmental Management Systems; Ecological modeling	Human environment and technologies, Sustainable development in construction
	FEFA UNIVERSITY		
NEW(S) SUBJECT(S):	Economic development		Sustainable Development
	METROPOLITAN UNIVERSITY		
NEW(S) SUBJECT(S):		Risk and environmental impact assessment, Environmental risk modeling, Environmental risk management, Environmental security system, Pollutants from industrial averages, Hazard and environmental disasters, Environmental management system, International environmental law and policy, Global environmental and security monitoring , Science of Climate Change, Socio-Economic Aspects of Climate Change, Climate Change and Biodiversity Conservation, Risk Management in Accordance with Climate Change, Application of Ecological Modeling, Statistics and Processing of Climate Data, Climate Change and Energy Technologies, Adaptation and Mitigation of Climate Change; Application of ecological modeling	Methodology of scientific research, Environmental problems and its degradation, Sustainable development, Sustainable energy, Human ecology, Environmental hazard management, Environmental economics, Experimental testing of environmental processes, Sustainable development in local communities and protected areas, Protection, conservation and improvement of bioresources; Characterization and quantification of pollutants in the environment
	EUROPEAN UNIVERSITY		
NEW(S) SUBJECT(S):	Ecological tourism		

Source: Author's personal table

The *second* observation that the authors single out concerns the ***increased number of syllabi*** of subjects in which the notion of sustainable development is explicitly mentioned. To a greater extent, the concept of sustainable development is present in the syllabi of subjects in Sociology at the Faculty of Philosophy, but they are increasingly noticed and recognized in other Departments. A similar situation is visible at the Faculty of Economics, Law, Pedagogy, Philology and Arts, Faculty of Political Science, Faculty of Security, Faculty of Sports and Physical Education, and especially at the Faculty of Environmental Protection. Here are some examples of new subjects that provide education for sustainable development (this is the Faculty of Environmental Protection): *Fundamentals of protection systems, Sociology, Protection economics, Technological systems and protection, Chemical parameters of work and environment, Energy processes and environment, Electromagnetic radiation in the environment, Waste management, Ecology, Environmental chemistry, Information technology in protection, Communal systems and environment, Environment and health, Industrial*

ecology, Noise in the environment, Spatial planning and environmental protection, Indicators of quality of work and environment , Environmental protection and insurance, Environmental risk, Sustainable development, Environmental impact assessment within which the given topic is addressed.

What the authors single out as the *third* observation is that ***most of the subjects are still of an elective nature***, so that a smaller number of students listen to them. What promises and gives hope is the fact that some of the subjects that were electives have now been renamed and put on the list of compulsory subjects. So this is certainly one of the ways to make information about this complex and important phenomenon equally accessible to all students.

The authors single out another observation from the insight into the current situation - the *fourth*. Namely, it is about the fact that certain courses, although they do not deal with sustainable development, create preconditions for understanding sustainable development. Subjects in *Andragogy* are in some way indirectly related to sustainable development and create preconditions for development and understanding of the social dimension of sustainable development (eg courses Education of the Elderly, Policies and Strategies of Adult Education, etc.), as well as in *Pedagogy* (eg Civic Education Programs), in *Psychology* within the module Psychology of Work, then Urban Anthropology in Ethnology and Anthropology and others. As the authors came to this conclusion during the available content analysis, the set task should and could only be achieved by the newly set rules - and that is to use other key topics of sustainable development in the analysis, such as civil society, poverty reduction, ethics, peace, responsibilities in local and global contexts, democracy and governance, justice, security, human rights, health, gender equality, cultural diversity, rural and urban development, economy, production and consumption schemes, shared responsibilities, environmental protection, management of natural resources and biodiversity, social ecology, human environment, quality of life, environmental crisis, environmental awareness, ethics and culture, environmental policy, environmental movements, the importance of the Millennium Declaration for global peace and sustainable development. These are all topics/issues that are indirectly related to sustainable development.

From all the above, it cannot be concluded that sustainable development is adequately represented. The ***Faculty of Sports and Physical Education, University of Nis***, which is still an example of a faculty where attention is not paid to environmental problems and sustainable development, can serve as a confirmation of this statement; given that based on the insight into the existing curricula, no subject can be identified that at least addresses some of these issues. This is the situation at all levels of study[8]. The situation is similar at the ***Faculty of Philosophy and the Faculty of Arts*** of the same university[9].

However, from all the above, the tendency of spreading the importance of sustainable development in our country is more visible, which for a start is the basis for the vision of a better future. Such insights into the presence of ideas of sustainable development in university education in Serbia show that these processes have begun, but that there is a wide space and an obvious need to significantly expand this field.

[8] The only subject that can indicate the subject of our research, at least in the title, is *Activity in Nature*, which is taught in basic academic studies (source: portal of the Faculty of Sports and Physical Education in Nis: http://www.fsfv.ni.ac. rs).

[9] At these faculties it is mentioned, in almost all departments/modules within the *Pedagogy and Sociology of Education and Upbringing*. The master's academic and doctoral studies of the same faculties are designed so as not to deal with this important phenomenon at all (source: portal of the Faculty of Philosophy http://www.filfak.ni.ac.rs/ and the Faculty of Arts in Nis: http://www. artf.ni.ac.rs).

4. CONCLUSION

In Serbia, and we should not forget that, education for sustainable development is still more present in theory, but not in practice, which justifies the fact that it is still not sufficiently implemented in university education. This was confirmed by research on the representation of sustainable development in the syllabi of the subjects of the Faculty of Natural Sciences, University of Nis[10].

The obtained results clearly indicate that the number of subjects containing the term "sustainable development" in its name has increased in the basic studies of the faculties of social sciences, so there is a larger number of subjects in which sustainable development is mentioned. However, what is worrying, and which confirms the story about the insufficient implementation of the topic of sustainable development in university education, is the fact that most of the newly mentioned subjects are most often elective.

After analyzing the situation, the question arises as to why more attention is not paid to sustainable development in university education (Prodović, 2014). There are several reasons for this. *First*, faculties are independent in creating courses and syllabi, which is why there is no comprehensive approach to creating educational content at the university level. Sometimes programs and new courses are created on the basis of the existing teaching staff and adjusted to the capacities of the lecturers, instead of designing programs for which professional staff would be planned or new ones would be developed. In order to educate as many students as possible for sustainable development, in addition to changing the syllabus, it is necessary to change the dominant approaches to education, as well as the methods and techniques of teaching and learning. The right direction for such a thing should be sought in *the knowledge economy*, in better quality education, building a system of creativity and tolerance. All this actually rests on institutions. Efforts should be made to incorporate the principles of sustainable development into as many curricula as possible, rather than treating sustainable development as a separate topic through special subjects. *Secondly*, it cannot be said that lecturers in higher education institutions have sufficient theoretical and practical knowledge about sustainable development. They are most often acquired during study and research stays at foreign faculties[11]. *Third*, the lack of interest in developing new knowledge and entering new fields of research is noticeable among researchers and lecturers who already have "their" subjects. As sustainable development has become part of the dominant discourse, young researchers should choose more and more topics of their doctoral dissertations in the field of sustainable development, which

[10] Namely, according to Violeta Orlović Lovren, professor of the Department of Pedagogy and Andragogy at the Faculty of Philosophy, University of Belgrade, a review of the integration of sustainable development into study programs speaks of the presence of content aimed at studying sustainable development, mostly in the group of natural sciences. , Geographical, Forestry, Agricultural, Technological, Metallurgical, Architectural, Faculty of Organizational Sciences) and then, much more modestly, the Social Sciences (Political Science, Law, Faculty of Security, Philosophy) (for more details see: https://www.cirsd.org/sr-latn/see-views/odrzivi-razvoj-na-univerzitetu-%E2%80%93-da-li-smo-spremni-za-interdisciplinarno-putovanje-u-buducnost, last visited 15. 03. 2022). There are other researches (see: Lončar, 2011).

[11] A concrete example is the subject Contemporary Problems of Sustainable Development in the master's program in Sociology at the Faculty of Philosophy. Prof. is engaged in this course. Dr. Marija Babović, who spent a semester at the London School of Economics and Politics (LSE) on the South East Europe Faculty Development Program, which aims to contribute to raising teaching and research capacity universities in the region. During their stay at the LSE, visiting professors developed new and improved existing courses at their faculties, after which the creation of a master course Contemporary Problems of Sustainable Development was initiated. Also, during the development of syllabi for this subject, syllabi and literature of related subjects on LSE were consulted.

could have positive effects on the representation of these topics in undergraduate studies. *Fourth*, at the faculties of social sciences and humanities in Serbia, sustainable development is predominantly related to ecology. Lecturers often consider inadequate the question of whether and to what extent students are taught 'about' and 'for' sustainable development in the subjects they teach and refer to environmental subjects (for more details see: Nikolić, Stanković, 2016). However, education for sustainable development expands the concept of environmental education. The UNECE Strategy, adopted by Serbia, emphasizes that "education for sustainable development also includes various elements of development and other targeted forms of education." Therefore, environmental education needs to be developed and complemented with other areas of education in order to obtain an integrative approach leading to education for sustainable development. *Fifth*, the inclusion of sustainable development in education does not only require partial syllabus changes. On the contrary, deeper and more comprehensive changes are needed in understanding the role of education. At the faculties in Serbia, teaching is predominantly conducted *ex cathedra*, while education for sustainable development includes mutual learning, non-formal methods, creative methods, experiential learning, etc. However, this method of learning is inapplicable when one professor has several hundred students in a group, which is the case at most faculties of the University of Belgrade. A potentially good way to introduce students to sustainable development could be through non-formal education, although this form of learning in our faculties is underdeveloped. In that sense, the existence of the *Center for Environmental Policy and Sustainable Development* at the Faculty of Political Sciences, which is a potentially important place of education for sustainable development, is significant. Such education requires an interdisciplinary and holistic approach.

In order to improve education, Jickling and Wals propose the following changes: 1. from passive learning to exploratory learning and creative problem solving, 2. from teacher-centered education to student-focused education, 3. from individual to learning through cooperation, 4. from learning dominated by theory to orientation towards practice, 5. from simple accumulation of knowledge to orientation towards problems, 6. from learning oriented towards content to self-regulatory learning, 7. from learning from employees in educational institutions to learning with and from individuals on the side, 8. from low to higher levels of cognitive learning, 9. from emphasizing only cognitive goals to emphasizing both affective goals and skills (Jickling, Wals, 2002: 229).

We must take sustainable development seriously, because that is the only way to make changes in all areas of life - from consumer habits to awareness in the fields of economy, society and politics. Educational programs must be in the function of the future development of Serbia, which is why the model of sustainable development should have an important place in the school system.

Since the *reform of education* has started in Serbia, the process of implementing education for sustainable development in all educational cycles is underway. Education is an unavoidable factor and a precondition for economic growth and the social, environmental, cultural and ethical vision of Serbia's sustainable development. The progress of society in the future must be based on knowledge that respects the principles of sustainable development of society. Reform of the education system should improve the educational level of the population, with a clear awareness of the importance of sustainable development in the process of European integration. In a narrower sense, spreading knowledge about sustainable development is a prerequisite for decision-making, good governance, promotion of democracy, all with the aim of sustainable development. For something like that, it is

necessary to ensure the integration of knowledge from all relevant sectors (environment, economy, society). In order to establish a sustainable system and manner of education for the 21st century, the Republic of Serbia must, with a strict rationalization of the use of public funds and reform their use:

- increase investment in education to at least 6% of GDP,
- to increase the general literacy of the population,
- reduce the number of unemployed residents and yes
- harmonize the education system with the needs of the labor market and reforms, but also with the needs of future generations based on new technologies and ways of communication, as well as to improve the efficiency of the education system as a whole" (Sustainable Development Strategy).

Therefore, the Strategy recommends sustainable education in the Republic of Serbia, which must be in line with the scientific, economic and technological potential of the Republic of Serbia; accessible to all (children and members of socially vulnerable social groups); adaptable and attractive enough, in line with socio-economic changes and labor market needs; included in the European education system; modern financing based on the model of the European financing system; but also based on a system of modern management, certification, licensing and accreditation.

Two complementary strategies need to be used to implement the ideas of sustainable development through curricula and syllabi at our universities: (a) by integrating topics on education for sustainable development through all relevant subjects, programs and courses in undergraduate and postgraduate studies; and (b) by introducing and developing specific programs and courses focused on the complex issues of sustainable development. With this in mind, universities in Serbia have a task to thoroughly review programs and their contents in the light of the theory and practice of sustainable development, not only in the European Union or the state of Serbia, but also in the sectoral sense of sustainability. Because, developing positive visions of a sustainable future is a way to motivate people to seek and create sustainable lifestyles.

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STANJE VISOKOŠKOLSKOG OBRAZOVANJA ZA ODRŽIVI RAZVOJ U REPUBLICI SRBIJI

Važan deo opšteg slaganja o značaju obrazovanja u dostizanju ciljeva održivog razvoja odnosi se i na funkciju i odgovornost Univerziteta. U tom kontekstu se poslednjih godina velika pažnja posvećuje napredovanju procesa integracije održivosti na univerzitetima, koji je propraćen prihvatanjem transformativnog pristupa, povezivanjem teorijskog sa praktičnim diskursom i istraživanjem novih puteva primene unutar i između naučnih disciplina. U radu će biti predstavljen koncept održivog razvoja u kontekstu obrazovanja, sa posebnim akcentom na prikaz obrazovanja za održivi razvoj u obrazovnim sistemima Srbije. U fokusu rada je analiza stanja održivog razvoja u akademskom obrazovanju u našoj zemlji. Cilj je bio da se ispita koliko je obrazovanje za održivi razvoj zastupljeno na fakultetima društveno-humanističkih nauka Univerziteta u Srbiji. Odabrana metodologija zasnivala se na sadržinskoj analizi kurikuluma i silabusa uz razgovore sa profesorima i asistentima odabranih fakulteta. S obzirom na to da su profesori identifikovani kao nosioci obrazovanja za održivi razvoj, ključ obrazovanja studenata za održivi razvoj jeste, i mora biti, u obrazovanju i kontinuiranom usavršavanju pedagoškog kadra u ovoj oblasti.

Ključne reči: *obrazovanje, održivi razvoj, životna sredina, kurikulum/silabus, univerzitet*

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Review article

REFLECTIVE AND MENTORING PRACTICE – CONDITIONED SEGMENTS OF TEACHING

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Abstract. *Upon completing their initial education, teachers acquire mostly theoretical knowledge and learn how to teach. Whether a teacher will be good and professional depends on the way he works, on whether he continuously improves his knowledge and his competences. Mentoring practice and a reflective approach to professional work are two important segments of a teacher's work with a reciprocal impact on his experience, knowledge and teacher development. The aim of this paper is to highlight the importance of mentoring and reflective practice for teacher education and advancement. In order to achieve this goal, we first define the concept of mentoring and its significance for teacher work; we highlight the types of mentoring; we emphasize the benefits of reflective practice in teaching and finally identify common features of teacher mentoring and reflective practice. The conclusion is that these two segments of teaching - mentoring and reflective practice – are the two skills that experienced, but also future teachers should have.*

Key words: *mentoring, teaching, competences, factors, reflective practice*

1. INTRODUCTION

Teaching is complex and diverse, as it includes working with students, working with learning material, and didactic-methodological organization of lessons. Each of these teacher activities, in addition to the evident effects on students and society as a whole, has a great impact and significance for the professional identity of teachers. Professional development of a teacher, his scope and quality, can best be analyzed by looking at the teacher himself, his personality, professional qualities. In fact, the key to his professional development lies in the teacher himself.

Mentoring and reflective practice are teaching methods, two of the many activities that one teacher can realize and use, and which on the other hand show and say a lot

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about the teacher's personality. Mentoring requires diligence, openness, accessibility and approachability of teachers towards students, but also the will and motivation to selflessly spend their time, invest their knowledge and share experience with less experienced than themselves. Reflective practice as another prominent way of working is a reflection of the teacher's professionalism and it can be recognized only in a teacher who has exceptional self-awareness, self-responsibility and self-initiative.

Although choosing mentoring as a teacher professional development method is not new (Mac Callum, 2007), our pedagogical climate is not abundant in research that speaks of the importance of the connection and mutual influence between teacher mentoring and reflective practice. For this reason, we try to emphasize the significant influence of these two segments of teaching from the aspect of teacher self-awareness and professional identity. Although there are very few scientific papers and pedagogical literature which link teacher mentoring and reflective practice, the analysis of relevant literature highlights their characteristics and features and finds a connection between them.

2. Mentoring as a Segment of Teaching

Mentoring practice allows the teacher to acquire knowledge, skills, competencies and professional development (Li, 2018), and it is an opportunity to use theoretical knowledge in practice (Ligadu, 2012). In education, mentoring practice is based on the relationship between teacher and students, where the teacher guides, monitors and directs students in their learning or independent research work. Our education system is designed so that the mentor can fulfill his true role in higher education institutions, faculties while working with students. When it comes to primary schools, a teacher can get the role of a mentor in working with a fellow teacher who is in the initial phase of a professional relationship. The most common situation is that an experienced teacher accepts, for the needs of the school and the teaching group, and trains a younger colleague who has just finished initial education and entered the classroom without experience. In secondary schools, in addition to the above-mentioned situation of introducing an inexperienced colleague into teaching, the teacher can have the role of a mentor in working with students who are in the final years of secondary education and are preparing and taking the final exam.

Mentoring is a professional relationship with a clearly defined goal and intention to achieve some results that is accompanied by effective communication and constant feedback (Stamatović, Percić, Radojević, and Vukajlović, 2016) and whose quality is determined by a more experienced teacher, mentor (Vizek Vidaković, Brajdić, and Matić, 2014). It is a development process (Antić & Pešikan, 2016) that encourages and directs critical reflection based on active listening, asking questions and providing feedback (Vizek Vidaković et al., 2014). We can emphasize that mentoring is an interactive, collaborative process with the intention of achieving certain goals that both the mentor and the student are aware of.

"Better understanding of roles within the organization, learning from experience, increasing self-confidence, facing others and avoiding conflicts of interest, increased managerial knowledge, promoting goal-oriented activities and career guidance are integral elements of a mentoring relationship" (Lagace-Roy & Knackstead, 2007, p. 10). It is evident that all of the above does not only affect the teacher who is in the role of mentor, on the contrary, all the above moments of the mentoring relationship are reflected on both the student and the education institution which the mentorship takes place in.

By researching the relevant literature, we come across modeling and coaching as terms that are related to the mentoring practice of teachers. Hence the need for a brief clarification of these concepts. Modeling as a way of teaching is actually a relationship in which a more experienced person serves as a model. On the other hand, coaching in the context of teaching is a relationship between two people, usually two teachers in which teaching skills, strategies, techniques are developed (Koki, 1997).

A teacher who accepts the role of a mentor has the will and is ready to transfer and share his knowledge (Radić, 2018). Through a counseling approach, he shares experience, gives instructions and directs learning, research work or career (Kuo, 2009). Mentors are expected to be experts in the field, flexible and reflective (Moores, Holley, & Collen, 2018; Russell & Russell, 2011), active listeners, they need to build relationships of trust, encourage and identify goals and current realities (Phillips-Jones, 2003). A good mentor cooperates, does not dictate, does not command, renounces high levels of control, shares constructive feedback, and accepts differences of opinion (Glenn, 2006).

There is no clearly defined or strictly defined mold of a good mentor other than guidelines and recommendations that as a more experienced and educated partner in a mentoring relationship, mentor should be assertive in his interventions (Pollard et all. 2019). The mentor helps the students to "become aware of their own resources, to discover their knowledge and develop research and reflective autonomy" (Stamatović, Percić, Radojević, and Vukajlović, 2016, p. 4). His role is aimed at "improving the protégé's career through engagement that enables him to share instructions, experience and expertise" (Solomon, 2020, p. 5). Based on the work of the guided student, the mentor receives feedback about his/her own skills, which provides him with the opportunity to develop, improve his professional experience and acquire competencies for progress in the field of counseling (Petrovska, Sivevska, & Popeska, 2018), which is crucial for a quality mentoring relationship and performance.

The scientific, research and pedagogical experience of the mentor are his/her crucial qualities (Stamatović et al., 2016). Mentors are expected to help in formulating the topic of research, in formulating research questions, in finding literature and providing support in improving the academic writing ability (Kuo, 2009). Hudson's describes mentor's pedagogical knowledge (Hudson, 2013) as the knowledge required to plan time for mentoring, prepare work strategies, know the content, effectively solve problems, assess and monitor the progress of the guided student. The knowledge and experience of the mentor reduces the possibility of unnecessary overload of the student and the development of inadequate research and professional competencies (Vizek Vidaković et al., 2014, p. 3).

When speaking about the role and qualities of a good mentor, we have decided to discuss the skills and abilities that a teacher who holds the title of mentor should have. Thus, listening skills, knowledge of learning material, building self-confidence (Ackkey & Gall, 1992), and empathy towards the protégé are important. Thus, the skills needed for effective mentoring are also the skills that enable learning, progress and change in the teacher's work (Phillips-Jones, 2003). In higher education, in order to work with students at higher levels of study, the mentor must meet the described conditions, that is, pedagogical and methodological competence (Radić, 2018). Due to its complexity, the competencies required for mentoring practice can be presented in the simplest way:

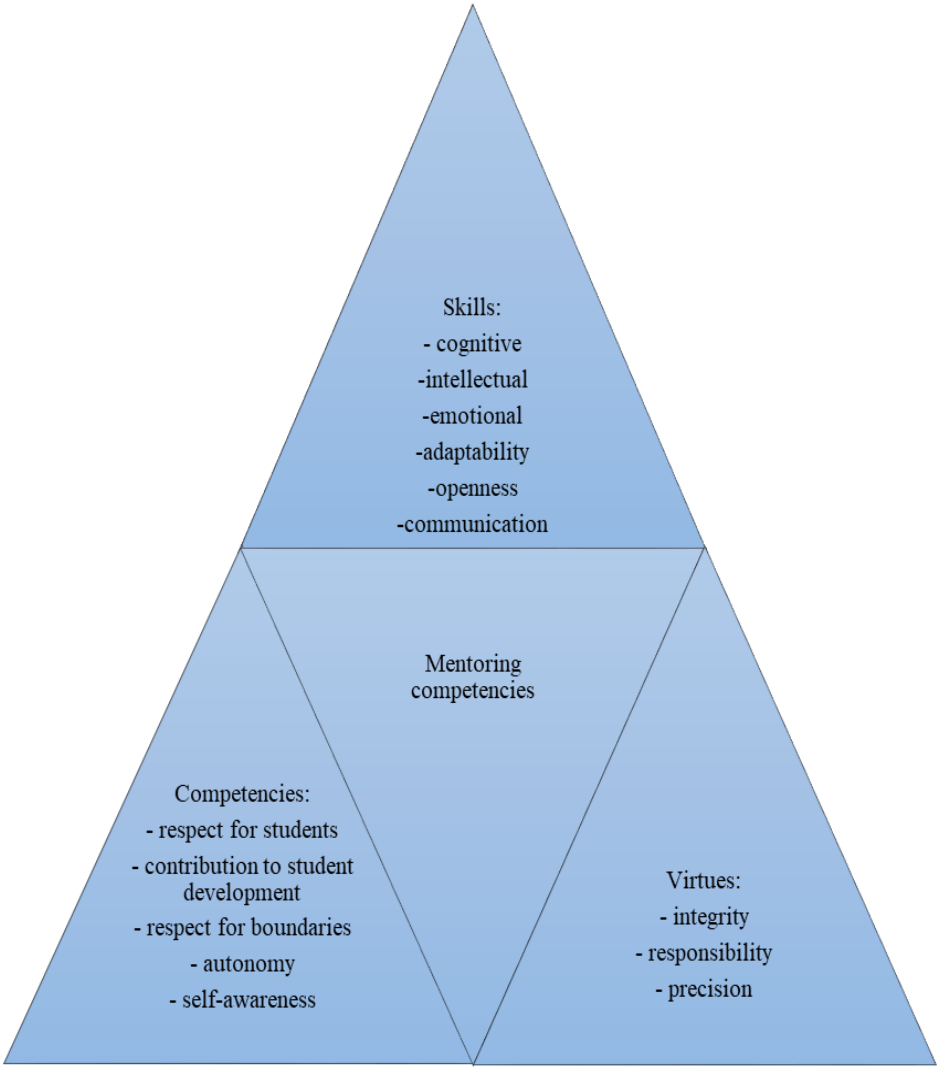

Fig. 1 Mentoring competencies (Adapted based on Johnson, 2003, p. 135)

Mentoring practice, as already mentioned, has multiple effects on the student himself, or the guided party, as well as on the teacher who is in the role of a mentor. There are many benefits that mentoring has for the mentor himself. It is an opportunity to notice the shortcomings and weaknesses in one's own practice, the process of continuous learning and working on oneself. Several authors (Ürün Göker, 2021; Gordon, 2017; Huling & Resta, 2001; Lagace-Roy & Knackstead, 2007; Solomon, 2020; Slavić and Matić, 2016) dealing with this type of teacher-student relationship emphasize the benefits of mentoring for the mentor himself, which allows us to form a list of significant benefits for the teacher which indicates the need for mentoring:

1. Working with students keeps the mentor up to date with new scientific knowledge and maintains a connection with current studies, along with continuous learning and learning material update;
2. Confirms the professional status of a mentor by training new researchers;
3. Assistance to students in establishing academic acquaintances also expands the mentor's circle of associates;
4. A good mentor attracts hardworking and successful students;
5. Personal satisfaction of mentors increases as well as the number of publications;
6. Opportunity to participate in constructive discussions;
7. Sense of personal satisfaction;
8. Exchange of knowledge and experience, both with the guided party and with colleagues, experts from the field of interest;
9. Reflection about personal and professional achievements followed by the development of reflective skills;
10. Understanding the importance of leadership in education
11. Opportunity to inspire and encourage the guided party;
12. Positive impact on younger generations (both students and younger colleagues);
13. Meeting one's own development needs;
14. Improving collaboration and collegiality;
15. Being recognized as a highly regarded teacher by the one who chooses the teacher as a mentor;
16. Long-term gratitude by the mentored student, the opportunity to innovate and improve one's own work and the entire teaching profession;
17. Increases the teacher's sense of efficiency and enables self-evaluation;
18. Development of professional competencies;
19. Improving the managerial skills of teachers;
20. Participation in research projects.

In addition to defining mentoring, emphasizing the qualities of good mentors and the benefits that this segment of professional activity can have for a teacher, it is necessary to point out the factors that encourage and those that hinder mentoring teachers. The authors (Hudson, Skump, & Brooks, 2005; Russell & Russell, 2011) single out the following factors that encourage and help mentoring:

1. Personal traits including teacher's willingness to cooperate, their openness and honesty in working with the student, and to provide professional and emotional support;
2. System requirements set before the mentor by the education system, school or the organization in which they are employed;
3. Pedagogical knowledge or knowledge of the subject, and having didactic and methodological skills;
4. Modeling or planning lessons;
5. Providing feedback to the student, in a timely manner and respecting the results achieved;
6. Teacher's patience;
7. Nurturing the mentoring relationship by the teacher and the guided party, the student.

On the other hand, there are factors that are disruptive for mentoring practice. The entire education system, the curriculum, the readiness of teachers to accept a responsible role as a mentor. Lack of time, lack of closeness to the mentee, lack of knowledge about learning styles, lack of financial satisfaction, and lack of resources (Ackkey & Gall, 1992) can hinder or slow down the teacher, however, the role of the student is very important as well.

3. TYPES OF MENTORING IN THE TEACHING PROCESS

Since there are not many scientific research papers on the topic of teacher mentoring, significant effort has been made to collect and study material in order to be able to single out the type of mentoring that teachers encounter. Hereinafter, we talk about formal, semi-formal and informal mentoring as a general classification, followed by reflective, direct and collaborative mentoring, and finally we describe electronic mentoring, which is considered a modern type of mentoring.

Lagace-Roy & Kneakstead (2007) state that formal mentoring implies that a teacher works with the guided party in order to respond to the needs prescribed by the organization or institution in which the teacher, mentor is employed. This is the most common type of mentoring in a situation where the mentor, who has the necessary competencies, mentors and trains a younger, less experienced colleague or student. Semi-formal mentoring takes place occasionally within a particular organization and is optional to employees. While informal mentoring occurs "accidentally", following a spontaneous agreement between two parties, where the party that needs support and help independently chooses a mentor whose knowledge, experience and abilities he/she believes in and relies on.

Reflexive mentoring was discussed by Kamman and associates (Kamman et al., 2012), stating that this is an increased mentoring efficiency when using one's own resources. The key moment is thinking about thinking, while the long-term goal, in addition to helping the student, is to give the mentor the opportunity to improve his/her skills. Reflexive mentoring provides opportunities for problem-solving and self-improvement by using reflection techniques. This type of mentoring encourages more sophisticated lesson planning and teaching with continuous improvement of one's own practice and helps to develop autonomy in teaching. Direct mentoring requires pedagogical skills from a mentor, relevant experience and knowledge in the field within which he/she teaches. It is considered at a lower level compared to reflective mentoring, and it relies on specific questions and difficulties experienced by the mentored party. Collaborative mentoring, instructional coaching or partnership between a mentor and a student is a relationship in which the mentor initiates a constructive dialogue that encourages reflective thinking on both sides. The mentor does not impose opinions and judgments. The goal of this type of mentoring is to facilitate dialogue and exchange of experience. It implies open, partner communication combining reflective and direct mentoring and takes place in a pleasant, cooperative climate.

The last type of mentoring, electronic mentoring (e-mentoring), no less important than the previously mentioned, is specific for a virtual environment. It involves online interaction in which the mentor has all the characteristics, same as when working face to face with a mentee, less experienced colleague or student (Fong et al., 2012). Therefore, although it takes place under different circumstances, via digital technologies and requires digital competence of both mentors and students, it effectively enables the achievement of previously planned goals. It is the digital competence of teachers that entails the reflexivity of teachers, which is actually the willingness to think and improve teaching. All this is in accordance with the needs of the community, with the interests of students and teachers themselves, which are changing in this time of intensive use of modern technology in teaching and learning.

4. TEACHER REFLECTIVITY

Reflexivity is one of the paradigms of lifelong learning and a component of teachers' professional identity (Maksimović & Osmanović, 2018; Izadinia, 2013). Same as mentoring, reflexivity is a process with multiple meanings. Its benefit is indisputable when it comes to teaching, learning, understanding, but also the professional advancement of teachers. It is based on thinking about experience that leads to new knowledge and discoveries and is the foundation for personal and professional development, combining theory and practice through reflection (Mathew, Mathew, & Peachattu, 2017). "The quality of successful and influential teachers is fundamental" (Frick, Karl, & Beets, 2010, p. 421). The reflective teacher compares the learning and teaching situation with existing experience and knowledge and predicts actions and events in future work (Harrison, Lawson, & Wortley, 2005). All this leads to becoming aware of personal weaknesses but also strengths for improving teaching skills (Ürün Göker, 2021), thus it is important for working with students, and also with less experienced colleagues who need support and help.

Reflexivity is the main feature of mentoring (Ligadu, 2012). This means that a good mentor thinks about his activities, in the initial planning phase, during the mentoring phase, and also at the end when he summarizes the results of the effort in working with the mentee. Methods for reflective practicethat are evident in teacher mentoring, adapted from the strategies identified by the authors (Mathew et al., 2017, pp. 126-132) are as follows: keeping a reflective diary, collaborative learning, recording and taking notes, providing feedback, accepting and analyzing feedback from the student and conducting action research. These strategies keep track of the mentoringperformance, monitor the emotions of students, actions and lead to answers and information that take the student to a higher level of understanding.

The authors (Bezinović, Marušić, and Ristić-Dedić, 2012, p. 22) state the domains of the teaching process where a teacher can act reflexively, highlighting the following:

1. Organization and structure of the lesson,
2. Ways of using technology in the classroom,
3. Clarity in presentation,
4. Teaching style,
5. Rhythm and dynamics of teaching,
6. Climate and discipline in the classroom,
7. Interaction with students,
8. Student activity and commitment,
9. Adapting instruction to individual differences of students,
10. Stimulation of higher cognitive functions in students,
11. Metacognitive knowledge and skills,
12. Recognizing student effort and achievement, and
13. Formative assessment.

By analyzing the domains of the teaching process in which the reflexivity comes to the fore, and in which it improves instruction most, we can conclude that teacher can also act reflexively in the mentoring relationship. Teacher's reflexivity in introducing and bringing students to a professional relationship or scientific research implies the teacher's awareness of the importance of clear communication, interaction with the guided party, thinking when accepting and evaluating performance.

5. Common Features of Teacher Mentoring and Reflective Practice

After the theoretical discussion about the mentoring and reflective practice of teachers, we try to synthesize their common features, which supports how important they are for the teacher's education, activities and personal and professional development. We conclude that these are developmental concepts that deserve a lot of attention and are important for the research of education activities and the teacher's professional advancement.

Reflexivity is an important aspect of mentoring that becomes better through continuous work, self-assessment and teacher self-reflection, where the final and very significant result is encouraged self-reflection in students that the mentors works with (Ligadu, 2012; Pottinger, Dyer, & Acard, 2019). Reflexive approach in mentoring expands the repertoire of teaching strategies, has an encouraging effect on mentors and students in taking the initiative and responsibility for professional development. It deepens their understanding of the complexities of teaching and learning, all with respect for the social, moral and ethical dimensions (Pollard et al., 2019).

As a reciprocal, dynamic and reflective relationship, mentoring involves thinking about success and failure leading to constructive learning and teaching (Ligadu, 2012; Ürün Göker, 2021; Harrison, Lawson, & Wortley, 2005). Thus, there are two ways of reflexive behavior in the relationship between mentor and student: reflexive face-to-face relationship between mentor and student, and reflexive writing (diary keeping and writing scientific papers) (Ligadu, 2012, p. 5), all with the aim of facilitating analysis of various professional scenarios (Petrovska, Sivevska, Popeska, & Runcheva, 2018). Teacher mentoring and reflexivity are developmental processes and possible ways for teacher professional advancement (Pollard et al., 2019; Mathew et al., 2017). Therefore, they should be seen as ways to strengthen competencies and the inevitable processes aimed at keeping and empowering good teachers (Petrovska et al., 2018).

The most important common feature of teacher mentoring and reflexivity is the professional development of teachers who have the opportunity to work with less experienced individuals than themselves, this, at the same time, reflecting on their own work, ways of giving feedback and overall impact a teacher has on the student he mentors. Therefore, professional development should: include teachers in the tasks which will provide them with the opportunity to observe and analyze what has been done; be based on research, reflection and experimentation to be led by students; improve teacher collaboration skills and willingness to share knowledge; be the result of the relationship that the teacher has with students; be continuous and intense; to assist the teacher in modeling, teaching, and collaborative problem solving and to respond to and monitor aspects of other social and education-related changes (Darling-Hammond & McLaughin, 1995, pp. 597-604).

6. Conclusion

The lack of quantitative studies makes it difficult to research mentoring practice as a segment of teaching, although the positive impact of mentoring for the advancement and improvement of teaching is evident and obvious. A teacher who takes on the role of a mentor fits into the context of lifelong learning, bringing with him many other important competencies needed for teaching. Practice shows that there are teachers who gladly accept the role of a mentor, and are ready to selflessly share their knowledge and guide studentsor younger colleagues to a professional relationship or scientific research. There

are also teachers who are reluctant to resort to mentoring, seeing this part of their job as an additional obligation for which they are not sufficiently financially stimulated and motivated by the institution in which they are employed.

In this regard, we will mention the shortcomings that may hinder teacher mentoring mentioned by Petrovska and her associates (Petrovska et al., 2018). These include the lack of instruments and procedures for progress in mentoring career, lack of financial motivation and poor presentation of mentoring as career advancement. Having in mind these shortcomings recognized within the education system of the Republic of Macedonia, it is interesting to emphasize the importance of mentoring in the education system of Australia. The importance of mentoring practice in this country is particularly emphasized and this segment of teaching is approached with specific care, with an awareness of the impact, benefits and long-term impact it has on the education system (MacCallum, 2007).

Effective mentoring practice implies a reflexive approach to the entire relationship the teacher has with the person he leads, monitors and guides. Reflexivity refers to understanding the importance of reflection and analysis of their work, teachers' ability to objectively analyze the things done and assess the effect they have. Thinking about accomplishments, difficulties or failures allows the teacher to anticipate and plan future work in the right way. A reflective approach to mentoring can take place at the individual level (Collin & Karsenti, 2011), when the teacher independently reflects on the relationship he has with the mentee, the results, and the feelings that accompany the entire mentoring process. On the other hand, there is the possibility of a partner reflective approach, in which the teacher teaches the student about the reflexive approach, and at some point, the mentor and the student can together reflect and evaluate the mentoring relationship and the effect it has.

Since there is a relationship between reflexivity, teacher competencies and teacher personality (Bengtsson, 1995), we can conclude that teacher reflexivity affects the mentoring process. Understanding the reflective and mentoring practice of teachers is important for educators and curriculum creators (Tai & Jain, 2019) but above all for the teacher himself who is already in the role of a mentor or will soon be. Teachers should be taught how to be mentors, at least theoretically (Antić & Pešikan, 2016), which would highlight to teachers the importance of mentoring when it comes to guiding young researchers and the importance of mentoring for professional development and strengthening the professional identity of teachers themselves, all through emphasizing the importance of reflection and self-assessment. At the very beginning of their initial education, teachers should be introduced to and acquainted with knowledge and skills about the two crucial segments of the vocation they are studying for – mentoring and reflective practice. This would avoid conflicting differences between what was learned in school and what happens in practice, that is real life, and it would increase teachers' awareness of the complex impact they have on pupils, students and younger colleagues whom they often serve as role models.

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REFLEKSIVNA I MENTORSKA PRAKSA – USLOVLJENI SEGMENTI NASTAVNIKOVOG RADA

Završetkom inicijalnog obrazovanja nastavnik stiče pretežno teorijska znanja i osposobljava se za nastavni rad. Koliko će nastavnik biti kvalitetan i stručan zavisi od načina rada, od toga da li kontinuirano radi na sebi i usavršava svoje kompetencije. Mentorska praksa i refleksivan pristup profesionalnom angažmanu predstavljaju dva važna segmenta nastavnikovog delovanja sa povratnim uticajem na njegovo iskustvo, znanje i značajem za usavršavanje nastavnika. Cilj rada je ukazivanje na značaj mentorskog rada i refleksivne prakse za obrazovanje i usavršavanje nastavnika. Kako bismo ostvarili navedeni cilj, najpre definišemo pojam mentorstva i njegov značaj za nastavnikov rad; ukazujemo na vrste mentorskog rada; naglašavamo benefite refleksivne prakse nastavnika i na kraju identifikujemo zajednička obeležja mentorske i refleksivne prakse nastavnika. Zaključak je da su dva razmatrana segmenta nastavnikovog rada, mentorstvo i refleksivna praksa, povezane komponente iskusnih ali i budućih nastavnika.

Ključne reči: *mentorstvo, nastavni rad, kompetencije, faktori, refleksivna praksa*

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Review article

EFFECTS OF PLYOMETRIC PROGRAMMS ON BIOMECHANICAL PARAMETERS IN TRACK AND FIELD, BASKETBALL AND VOLLEYBALL: A SYSTEMATIC REVIEW

UDC 796.012:371.214; 796.012:612.766; 796.015.132

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Abstract. *Plyometric movement improves athletes' muscular performance and is used in the plyometric training method as an unavoidable principle of explosive power and speed development training. The aim of this study is to determine the effects of plyometric programs on biomechanical parameters, including any differences between them. The study focused on three sports, junior age group athletes, and was based on a systematic analysis of previous results. Electronic databases such as PubMed, MEDLINE, Google Scholar, ScienceDirect, ERIC were searched for studies from 1999 to 2022. The results from 15 studies are summarized in detail. They show the positive effects of the plyometric programs on biomechanical parameters equally in the three sports. Training duration ranges from 20 to 90 min, and is directly related to the intensity of training and the number of jumps. Shorter sessions are of very high intensity with fewer jumps, while longer sessions are moderate and high intensity with fewer jumps (more than 138 to more than 2976). The most frequent training duration is 45 to 60 min, with high intensity and 600 to 900 different jumps. Greater improvements in explosive power and speed are seen in the parameters of sprint and jump tests. High intensity programs lasted from seven to 12 weeks, with a frequency of two to four times a week (CMJ 6,2% to 16,9%, while for SJ 7,6% to 19,8%), while lower intensity programs lasted from three to six weeks (CMJ 6,3% to 9,1%, and for SJ 6,6% to 8,9%). It is concluded that longer programs, of a moderate and high intensity and training sessions from 45 to 60 min, enable the best progress, regardless of sport.*

Key words: *Plyometrics, effects, biomechanics, track and field, basketball, volleyball*

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1. INTRODUCTION

There are numerous types of training programs, with different aims, but programs aimed at developing and improving motor skills attract special attention from researchers and coaches. A key principle of training is the development of explosive power and speed, which requires a plyometric training program (Verkhoshansky & Siff, 2009). According to Komi (1992), plyometric action and "short-stretching cycles" occur in various types of running, jumping, hitting, hurdling, and other takeoff moments in sport; but plyometric training includes plyometric activities as the key modality of training (Komi & Nicol, 2000). Plyometric activity consists of five phases (the initial impulse phase, electromechanical delay phase, amortization phase, rebound phase, and the final phase) (Zatsiorsky, 2008; Chu & Meyer, 2013; Davies et al., 2015). Merging these phases leads to plyometric movement meant to improve the muscle performance of an athlete. The rapid alteration between speeding up and slowing down creates an explosive reaction that increases the speed and power of muscles during a sports activity, which is a precondition for success in every explosively demanding sport at whose core we find rapid body movement and jumps (Zatsiorsky, 2008; Verkhoshansky & Siff, 2009; Siff, 2001; Davies et al., 2015).

In most track and field disciplines the basic criterion of success is the development of the greatest possible reactive force during the shortest possible contact with the surface, known as the contact phase, which is why plyometric exercise is essential in training cycles (Kurelić, 1954; Čoh, 2008). Sprinting is a complex cyclical movement defined by step frequency and length (Čoh & Tomažin, 2005). Sprinting as a movement stereotype involves repeating steps over a unit of time. Step length depends on body height and leg length, as well as the force developed by the extensor muscles of the hip, knee, and ankle during the contact phase. The contact phrase is one of the most important generators of sprint effectiveness (Lehmann & Voss, 1997). It must be as short as possible, approximately 90–100 ms (Mero & Komi, 1985), and marked by an optimum relationship between the stop and start phase (Mero, Komi, & Gregor, 1992). In addition to sprint disciplines, jumping disciplines are based on explosive and rapid movements of the muscle apparatus during the contact phase and the throwing phase, when the muscle no longer exerts force on the object (Kurelić, 1954; Čoh, 2008).

In addition to track and field, collective sports such as basketball extensively rely on plyometric exercise for the development and impact of explosive power and speed (Bobbert, 1990; Željaskov, 2004; Lehnert, Hůlka, Malý, Fohler, & Zahálka, 2014). During a game, basketball players spend 34% of their time running and jumping, 56.8% walking, and 9% standing, while the intensity of movement or its form takes place approximately every 2s (Jakovljević et al., 2011). During a game, a player on average achieves 46 ± 12 jumps (Castagna, Chaouachi, Rampinini, Chamari, & Impellizzeri, 2009), performing as many as 100 different jumps during the entire game (Manojlović & Erčulj, 2013).

Volleyball is also based on explosive power, speed, and the performance of different jumps (Sheppard, Gabbett, & Stanganelli, 2009). When the overall activity during a game is analyzed, approximately 50 – 60% involves various jumps, 30% rapid changes in direction, and 15% falls. A professional volleyball player can make as many as 120,000 jumps during an entire season (García-de-Alcaraz, Ramírez-Campillo, Rivera-Rodríguez, & Romero-Moraleda, 2020). The height of the vertical jump among volleyball players correlates the most with success in volleyball, and is directly linked to the performance of the spike, block, or serve (Sheppard, Gabbett, & Stanganelli, 2009; Ramirez-Campillo, et al., 2021).

In order to improve the height of takeoff, rapid increase in body velocity is needed prior to the jump (Wagner, Tilp, Von Duvillard, & Müller, 2009). The aforementioned confirms that volleyball training is based on the plyometric concept which has been shown to be most successful compared to other types of training aimed at developing and improving explosive power, that is, takeoff height (Silva, Clemente, Lima, et al., 2019).

The applicability of plyometrics in sport is complex and depends on several factors. Therefore, varying results can be found in the relevant literature, all of which depend on the duration of the program, its frequency, type of exercise, type of sport, as well as the age of the athletes (Ramirez-Campillo et al., 2021). Consequently, the aim of this study was to determine the effects of plyometric programs on the biomechanical parameters in three sports, including any differences between the programs. The study involved junior age groups of athletes, and relied on a systematic analysis of existing results.

2. METHODS

To search the existing literature, the following electronic databases were used: PubMed, MEDLINE, Google Scholar, ScienceDirect, ERIC. The search was for papers published from 1996 to 2022, and included the following key terms: *plyometrics, effects, biomechanics, track and field, basketball, volleyball.* The research strategy was modified for each electronic database, where possible, with the aim of increasing sensitivity. All the titles and abstracts were reviewed for potential studies which could be included in the systematic review. In addition, the lists of references of previous reviews and original research papers were also analyzed. The relevant studies were identified following a detailed overview of the inclusion criteria. The exclusion criteria are defined later in the text.

2.1. Inclusion criteria

2.1.1. Type of study

Non-controlled randomized and non-randomized longitudinal studies on the effects of plyometric programs on biomechanical parameters of different athletes, along with studies written in English were all included in the analysis.

2.1.2. The sample of participants

The included participants are sprinters, volleyball players, and basketball players of both sexes aged 15 to 19, experienced athletes (participants in competitions at the international and national level). They were healthy, and had no deformities and artificial aids that affect the normal performance of jumping and movement.

2.1.3. Type of intervention

Studies that assess the effects of plyometric programs on the development of explosive power and speed of the lower extremities of the participants were included.

2.1.4. Type of output results

Studies were included if they showed the assessment, effects, and current state of the explosive power and speed of the lower extremities of the participants.

2.2. Exclusion criteria

The exclusion criteria were the following: 1) lack of plyometric exercise programs; 2) participants under the age of 15 or over the age of 19, due to a lack of studies examining sprinters aged 15 to 19; only studies that examined sprinters under the age of 25 were included; and 3) participants who did not compete in track and field, basketball, or volleyball.

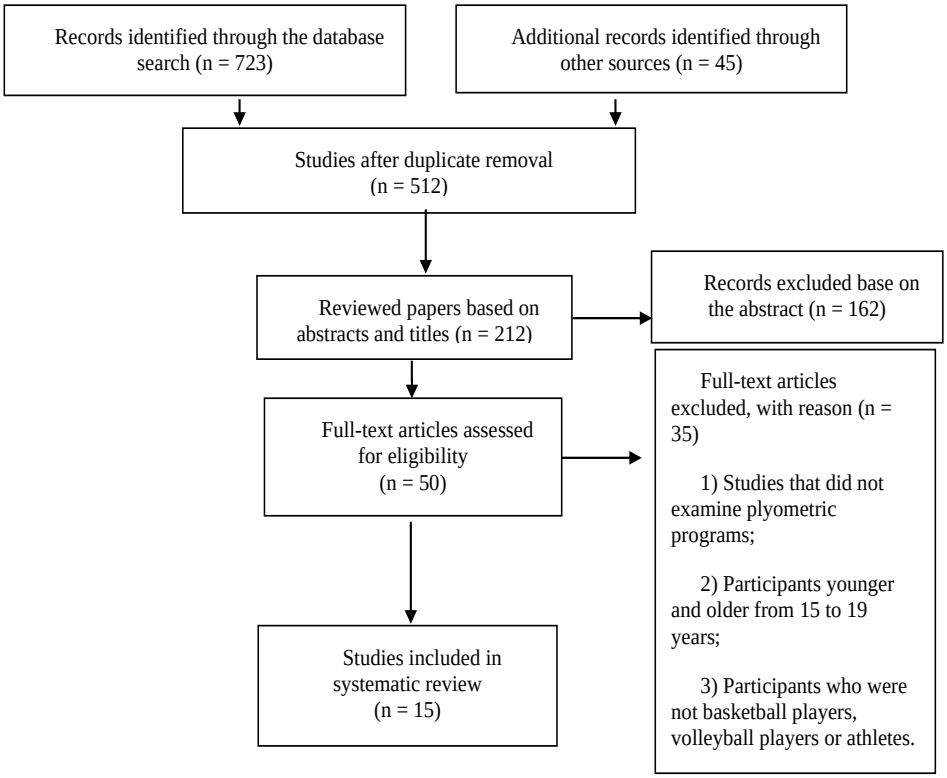

Fig. 1 PRISMA Flow Diagram for Systematic Reviews for the research related to the given topic

3. RESULTS

The final analysis included 15 studies which were compiled and analyzed based on the previously mentioned parameters and methods. The studies included young male and female participants who took part in track and field, basketball, and volleyball. All of the studies had the following aim: to assess the effects of plyometric programs on the biomechanical parameters of junior age groups of participants. The search identified 723 potentially relevant studies, and another 45 were identified by reviewing the references. After the duplicate studies were removed, and the titles and abstracts analyzed, 212 studies remained. By reviewing their entire texts, based on the criteria for inclusion, 15 studies remained.

Table 1 An overview of 15 studies which met the set requirements.

	Reference	Number of participants, sex, age and sport	Group	Program duration, frequency (per week) and training duration	Program characteristics: intensity (%), exercise (type and description) and number of jumps per training	Results	Conclusion
1.	Idrizovic et al., (2018)	n = 47 F 16.6 years Volleyball	G1-13 Pl G2-17 NPl C-17	2/12 Td-40-60 min	L, MOD and H CMJ; DJ (20-60 cm); 20 m sprint and Dr UnS-613 Os-120-300 s	G1-20 m = 5.7% ↑; CMJ = 16.9 % ↑ G2-20 m = 0.2 % ↑ CMJ = 9 % ↑ C-20 m = 0.1 % ↑ CMJ = 8.5 % ↑ G1 ↑- 20 m sprint ($\eta 2$ = .09; small ES), CMJ ($\eta 2$ = .29; large ES), relative to G2.	Pl for 2/12 weeks ↑ all measured parameters.
2.	Martel et al., (2005)	n = 19 F 15 ± 1 years Volleyball	G1-10 Pl C-9 NPl	2/6 Td-40-60 min	H CMJa; DJ (61 cm); and Dr UnS- > 138 Os-30 s	G1-CMJ = 11.1 % ↑, C = 4.0 % ↑, $p < .05$	Combination Pl and volleyball training leads to ↑ in VJ relative to C.
3.	Krističević et al., (2016)	n = 54 F 15 ± 1 years Volleyball	G1-27Pl C-27NT	1/5 Td-40-60 min	MOD and H CMJ; DJ (20-40 cm); SJ; Block jump; Spike and Dr UnS- > 645 Os-x	G1-SJ ↑-Mean = 21.80 cm ± 4.22 to 24.28 cm ± 3.4 relative to C1-Mean = 24.32 cm ± 4.10 to 24.8 cm ± 4.09 and CMJ ↑-Mean = 28.08 cm ± 4.83 to 30.72 cm ± 3.74 relative to C1-Mean = 33.04 cm ± 6.18 to 33.32 cm ± 5.62, $p < .05$	F Volleyball players for 1/5 weeks of Pl ↑ for all measured parameters.
4.	Usman & Shenoy, (2015)	n = 120 M = 60 and F = 60 19.2 years Volleyball	G1-30 Pl G2-30 Pl C1-30 NPl C2-30 NPl	2/8 Td-40-60 min	L, MOD and H CMJa; DJ (30-80 cm); SJ; VJ; and Dr UnS- > 2976 Os-60-300 s	G1-VJ ↑ = 67.33 cm ± 1.64 relative to C1 = 57.22 cm ± 1.06 and G2-VJ ↑ = 50.08 cm ± 1.83 relative to C1 = 42.36 cm ± 1.07, $p < .001$	Pl lower extremities for 2/8 weeks leads to ↑ in VJ and cardiovascular capacity are equally to both sexes.

5. Newton et al., (1999)	n = 16 M 19.2 years Volleyball	G1-8 Pl C1-8 NPL	2/8 Td-40-60 min	MOD and H CMJ; SJ; VJ; DJ (30-80 cm); and Dr UnS- > 576 Os-x	G1-VJ ↑= 5.9 % ± 3.1 relative to C1-1.3 % ± 2.5, p <. 001, G1-CMJ = for kinetic parameters, relative to C1 and for SJ = for kinetic parameters, relative to C1 except for contact time G1 ↑ = 14.6 % ± 9.7 and flight time - 4.7 % ± 3.4, relative to C1 =, p = .006 and p = .01.	Pl for 2/8 weeks leads to ↑ VJ in elite athletes.
6. Arazi & Asadi, (2011)	n = 18 M 18 years Basketball	G1-8 Pl1 G2-8 Pl2 C1-8 NPL	3/8 Td-40 min	MOD and H SJ; 36.5 m and 60 m sprint and Dr UnS- > 1188 Os-30-180 s	G1 and G2-36.5 and 60 m sprint ↑ = 0.67 s and 0.7 s; and 0.8 s and 0.93 s, relative to C1, p < .05.	Both Pl for 3/8 weeks leads to ↑ in basketball players for strength parameters, sprint and balance tests. Also, Pl can lead to injury if due to great external load, which leads to micro trauma in the bones structure, ligaments and tendons.
7. Meszler & Vaczi, (2019)	n = 18 F 15.7 years Basketball	G1-9 Pl C1-9 NPL	2/7 Td-20 min	MOD and H CMJ; sprint; VJ; DJ (25-50 cm); and Dr UnS- > 600 Os-120-300 s	G1-CMJ ↓= 33.52 cm ± 3.89 to 31.96 cm ± 3.48 (-2.0 %) relative to C = 28.72 cm ± 6.66 to 29.06 cm ± 6.81, p < .007 and for kinetic parameters isometric contractions = between G1 and C1.	For 2/7 weeks Pl ↑ contractile ability of quadriceps muscle, agility and jump capacity, and balance ↕ in basketball players. During the season, it is recommended to avoid additional high-intensity training.

8.	Arede et al., (2019)	n = 16 M 15 years Basketball	G1-9 Pl C1-7 NPL	4/8 Td-35 min	MOD CMJ; DJ (30 cm); SJ; 10 m sprint; and Dr UnS- 1120 Os-15-120 s	G1-CMJ ↑= 30.31 cm ± 3.48 to 32.34 cm ± 4.94 (6.2 % 90 % CL = .2; 13.0) relative to C1= 29.45 cm ± 3.27 to 30.56 cm ± 3.40 (3.8 % 90 % CL = 2.1; 5.5), SJ ↑ = 27.24 cm ± 2.91 to 29.37 cm ± 3.72 (7.6 % 90 % CI 0.8; 14.8) relative to C1= 26.92 cm ± 2.95 to 27.45 cm ± 3.22 (1.9 % 90 % CI= 2.0; 6.0), and 10 m sprint ↑= 2.3 s ± 0.11 to 1.95 s ± .07 (-4.9 % 90% CL= 0.9; -8.7) relative to C1 2.03 s ± 0.12 to 2.10 s ± 0.12 (3.7 % 90 % CI= 9.1; -1.5)	During the season, Pl with basketball training leads to ↑ in VJ and sprint relative to C in basketball players.
9.	Bouteraa et al., (2020)	n = 26 F 16.5 years Basketball	G1-16 Pl C1-10 NPL	2/8 Td-45 min	MOD and H CMJ; SJ; 5 m, 10 m, 20 m sprint; DJ (30-60 cm); and Dr UnS- 794 Os-30-90 s	G1-SJ = 20.4 cm ± 3.9 to 22.5 cm ± 3.5, 10.3 % and C1 = 20.4 cm ± 2.5 to 20.0 cm ± 1.9 -1.81 %, and CMJ = 26.8 cm ± 3.8 to 28.8 cm ± 3.3, 7.3 % and C1 25.2 cm ± 2.9 to 24.4 cm ± 3.1, -3.52 % (p = .58, d = .006), relative to C1 for SJ = (p = .19, d = .035) and for CMJ (p = .14, d = .044). DJ ↑ 24.7 cm ± 2.9 to 28.4 cm ± 3.0, 15.2 % and for C1 = 24.8 cm ± 1.9 to 24.6 cm ± 2.8, -0.75 % (p = .02, d = .09) relative to C1, and from beginning to the end in G1-(p = .001, d = 2.1). G1-5 m, 10 m and 20 m sprint = (p = .05; d = .068, .063, and .064), relative to C1.	Additional 2/8 weeks of Pl in season leads to ↑ in DJ, balance and agility in female basketball players relative to effects of only basketball training.
10.	Fontenay et al., (2013)	n = 18 F 15.5 years Basketball	G1-8 Pl1 G2-4 Pl2 C1-6 NPL	3/8 Td-80 min	MOD and H HJ; VJ; and DJ (31 cm); Dr UnS- > 420 Os-20-50 s	G1-VJ ↑ for 12 % relative to G2 and C1, and kinetic parameters = between groups just 36 % ↓ in dynamic vagus.	PL can contribute to a combination of injury prevention and improvement of sport performance, compared to a normal basketball training program.

11.	Mackala & Fostiak, (2015)	n = 14 M 18 years Track and field-sprint	G1-14 Pl	3/2 Td-90 min	H CMJ; SJ; HJ; VJ; 20 m and 60 m sprint; and Dr UnS- 1311 Os-60-360 s	G1-CMJ ↑ Mean = 73.93 cm ± 5.03 to 81.57 cm ± 5.60, dif = 7.643 p = .00 CI 95 % = 9.406 to 5.880, for SJ ↑ Mean = 62.86 cm ± 4.29 to 69.43 cm ± 5.68, dif = 6.571 p = .00 CI 95 % = 8.365 to 4.778, for HJ ↑ Mean = 2.89 m ± 0.11 to 2.96 m ± 0.10, dif = .069 p = .00 CI 95 % = .091 to .048, 60 m sprint ↓ Mean = 7.10 s ± .12 to 7.04 s ± .11, dif = .061 p = .00 CI 95 % = .048 to .075, and velocity of strides ↑ for 1.8 %.	Pl (180 to 250 jumps) in high intensity, for 3/2 is sufficient to lead ↑ in explosive power of lower extremities of VJ and HJ. Improvement in VJ is larger relative to HJ which is visible in 20 m.
12.	Chelly Hermassi & Shephard, (2015)	n = 27 M 12.1 years Track and field-sprint	G1-14 Pl C1-13 NPl	2/10 Td-90 min	H CMJ; SJ; DJ (30 cm); 10 m and 50 m sprint; and Dr UnS- 600 Os-60 s	G1-CMJ ↑ = 0.23 m ± .03 to 0.25 m ± .03 relative to C1= .21 m ± .03 to .22 m ± .03, for SJ ↑= .21 m ± 2.8 to .24 m ± .03 relative to C1= .20 m ± .02 to .21 m ± .02, for DJ ↑= .22 m ± .3 to .25 m ± .02 relative to C1= .20 m ± .02 to .20 m ± .02, p < .01-.001. G1-5 m sprint ↑ = 2.0 m/s ± .5 to 2.2 m/s ± .05 relative to C1= 2.3 m/s ± .6 to 2.4 m/s ± .5, p < .01, and G1-kinetic parameters, strength during DJ relative to BM = 28.5 W ± 5.2 to 33.3 W ± 4.6 relative to C1 = 24.8 W ± 4.2 to 25.5 W ± 4.3, p < .01	Additional Pl during the standard training season, leads to ↑ in sport performance compared to NPl in sprinters
13.	Mackala et al., (2019)	n = 14 M 18.1 years Track and field-sprint	G1-7 Pl G2-7 Pl	2-3/4 Td-90 min	H CMJ; HJ; 20 m, 40 m and 60 m sprint; and Dr UnS-x Os-60-360 s	G1-CMJ- ↑= 76.43 cm ± 4.89 to 82.71 cm ± 5.34, dif = 6.29 cm, p = .00 CI %, −7.862 to −4.709 and in G2-CMJ- ↑ = 81.57 cm ± 2.57 to 87.86 cm ± 1.07, dif = 6.28, p = .001, CI %, −8.189 to −4.382, G1-HJ- ↑ = 2.91 m ± .06 to 2.99 m ± .07, dif = .08 m, p = .002, CI %, −.120 to −.039 and in G2- HJ- ↑ = 3.15 m ± .10 to 3.23 m ± .11, dif = .07 m, p = .007, CI%,	Pl for 2-3/4 is sufficient to lead to ↑ in 60 m and 20 m sprint like as to for lower extremities in explosive power determined through VJ and HJ scores. Concludes that there is larger progress in CMJ for (7.95%) relative to

					−.118 to −.027, and G1-20 m sprint ↓ = .06 s and G2- ↓ = .11 s, G1-60 m sprint ↓ = .08 s, and G2- ↓ = .06 s, $p < .05$.	HJ (2.5–5.3%).
14.	El-Ashker et al., (2019)	n = 18 M 19.5 years Track and field-sprint	G1-18 Pl C1-10 NPl	3/8 Td-90 min	H CMJ; VJ; HJ; 30 m and 60 m sprint; and Dr UnS- >860 Os-x	G1-30 m sprint ↓= F (1, 26) = 55, p = .00, n^2p =.67, HJ ↑= F (1, 26) = 37.3, p = .00, n^2p =.59, VJ ↑= F (1, 26) = 11.5, p = .00, n^2p =.30, and kinetic parameters H and V and t of jump and flight ↑, compared to C1, and, when comparing pre- and post-values.	Pl is more effective ↑ in lower extremities for explosive P and VJ, compared to a traditional jump training program.
15.	Lyttle et al., (1996)	n = 33 M 23.9 years Track and field, swimmers and rugby players	G1-11 Pl1 G2-11 Pl2 C1-11 NT	2/8 Td-45 min	MOD and H CMJ; VJ; SJ; DJ (20-60 cm); 20 and 40 m sprint; and Dr UnS- G1-496 and G2<680 Os-180-300 s	Between G1 and G2 = in all parameters, G1-CMJ ↑ = 50.8 cm ± 9.0 to 54.6 cm ± 8.5, dif = 7.9 % and G2 ↑ = 52.8 cm ± 11.5 to 58.4 cm ± 9.3, dif = 12.9 %, for G1-SJ- ↑= 38.7 cm ± 7.7 to 45.8 cm ± 7.4, dif = 19.8 % and G2- ↑= 40.4 cm ± 10.2 to 47.1 cm ± 10.0, dif = 18.6 %, for G1-40 m sprint ↑ = 5.49 s ± 0.38 to 5.56 s ± 0.22 dif = 1.7 % and G2- ↓= 5.48 s ± 0.22 to 5.44 s ± 0.20, dif = 0.8 %, and Dr parameters and the like kinetic ↑ between G1 and G2 relative to C1, $p < .05$	Both programs have equal effects on different sport parameters such as jumps, sprints, throwing and lifting.

Legends: n – Number of participants; M – Male; F – Female; Dr – Other program; G(1, 2) – Experimental group; C(1,2) – Control group; UnS – Total number of jumps in the program; Td – Duration of training; NT – No training; NPl – Nonplyometric program; Pl – Plyometric program; CMJ – Countermovement jump without arm swing; CMJa – Countermovement jump with arm swing; SJ – Squat jump; DJ – Drop jump; VJ – Vertical jump on box; HJ – Standing long jump; Mean – Mean value; x – No data.; m – Meter; cm – Centimeter; s – Seconds; L – Low intensity; MOD – Moderate intensity; H – High intensity; = – No change or differences; ↑ – Increasing; ↓ – Decreasing; CI – Confidence interval; p – Statistical significance; dif – Differences; BM – Body weight; W – Watt; t – Time.

4. DISCUSSION

The aim of this systematic review was to collect and analyze studies with effects of plyometric programs on the biomechanical parameters of junior age groups of athletes. Table 2 shows the results of 15 studies which met the set inclusion criteria. The duration of the studies ranged from two to 12 weeks. The shortest study lasted two weeks, Mackala & Fostiak (2015), the longest 12, Idrizovic, Gjinovci, Sekulic et al., 2018), while the most frequent duration was eight weeks (nine studies) (Lyttle, Wilson, & Ostrowski, 1996; Newton, Kraemer, & Haekkinen, 1999; Fontenay, Lebon, Champely, et al., 2013; Arazi & Asadi, 2011; Usman & Shenoy, 2015; Arede, Vaz, Franceschi, Gonzalo-Skok, & Leite, 2018; El-Ashker, Hassan, Taiar, & Tilp, 2019; Bouteraa, Negra, Shephard, & Chelly, 2020). There was one study each of four weeks (Mackala, Fostiak, Schweyen, Osik, & Coch, 2019), five weeks (Krističević, Krakan, & Baić, 2016), six weeks (Martel, Harmer, Logan, & Parker, 2005), seven weeks (Meszler & Vaczi, 2019), and ten weeks (Chelly, Hermassi, & Shephard, 2015). The training frequency ranged from one to four training sessions a week, while the duration of the sessions ranged from 20 to 90 min. The most frequent duration was from 45 to 60 min. The training intensity ranged from low to high, and was most often moderate and high. Due to a lack of studies on the topic, a study from 1996 was included in the analysis (Lyttle, Wilson, & Ostrowski, 1996). In addition to targeted factors which studied the level of explosive power and speed, all the studies also included some form of specific exercises which were then measured.

One study indicated weak results of an eight-week plyometric exercise program with a frequency of two times a week (Meszler & Vaczi, 2019). The authors studied 18 female basketball players aged 15.7 years. Even though moderate and high intensity training sessions were carried out with an optimum number of all jumps (600), the duration of the training sessions was only 20 min. The parameters of the CMJ (33.52 cm ± 3.89 cm) decreased by 2.0 % to 31.96 cm ± 3 .48 cm compared to the control group which displayed similar results (from 28.72 cm ± 6.66 cm to 29.06 cm ± 6.81 cm, $p < .007$). The researchers also studied kinetic parameters during isometric contractions, where no significant changes between the groups were noted.

In an eight-week study which analyzed the effect of a plyometric program on 26 junior female basketball players, Bouteraa et al. (2020) noted no significant improvement in the studied parameters of the CMJ, the squat jump, and sprint speed compared to the control group. Even though the training session duration was an optimum 45 min, and the sessions were of moderately high intensity with a greater number of jumps (794) than in the previous study (7), the results from the initial measurement (24.7 cm ± 2.9 cm to 28.4 cm ± 3.0 cm) showed a 15.2 % increase only in the values of the depth jump. The control group followed a different training program without any noted change (from 24.8 cm ± 1.9 cm to 24.6 cm ± 2.8 cm, -0.75 %, $p = .02$, $d = .09$).

Contrary to the length and success of the previous two studies, the plyometric program outlined in Mackala & Fostiak (2015) lasted only two weeks and led to a significant improvement in all the accompanying parameters. The researchers studied 14 junior sprinters who trained at high intensity three times a week for 90 min. Even though the program was shorter, it had a greater overall number of jumps (1.311), which could be a sign of significant progress. The values of CMJ are represented as the means for all the participants, and indicate an improvement of 7.64 cm compared to the initial measuring

(73.93 cm ± 5.03 cm, p = .00). For the squat jump, an improvement of 6.57 cm, p = .00 was noted compared to the initial value of 62.86 cm ± 4.29 cm, and for the standing high jump 2.89 m ± 0.11 m to 2.96 m ± 0.10 m, p = .00. In the case of sprint test times at 60 m, the time was significantly reduced from 7.10 s ± 0.12 s to 7.04 s ± 0.11 s, p = .00, while the speed of the steps improved by 1.8 %, p = .00.

The greatest improvements were noted for the longest study, Idrizovic et al. (2018), which involved 47 junior female volleyball. The program lasted 12 weeks, with training sessions two times a week for 60 min. The plyometric program consisted of a low, moderate, and high intensity exercises, and included 613 different jumps. This led to an improvement in the values of the 20 m sprint by 5.7 %, as well as in the CMJ by 16.9 %, all compared to the control group. When the results are presented in Effect size values, for the 20 m sprint test the plyometric program led to ($\eta 2$ = .09) low ES, and for the CMJ ($\eta 2$ = .29) low ES, compared to the other group that trained following a different type of jump training.

The study with the highest frequency plyometric training of four times a week for eight weeks included 16 junior female basketball players (Arede et al., 2019). With somewhat shorter training sessions, 35 minutes of moderate intensity training, the players reached 1.120 jumps, which led to an improvement in all the accompanying variables. For the CMJ, the initial measurement of 30.31 cm ± 3.48 cm significantly improved to 32.34 cm ± 4.94 cm, that is, increased by 6.2 % compared to the control group which showed a 3.8 % improvement (from 29.45 cm ± 3.27 cm to 30.56 cm ± 3.40 cm). The squat jump showed the greatest improvement of 7.6 % (27.24 cm ± 2.91 cm to 29.37 cm ± 3.72 cm), compared to the improvement of 1.9 % noted for the control group (from 26.92 cm ± 2.95 cm to 27.45 cm ± 3.22 cm). The sprint time test at 10m decreased by 4.9 % (90 % CL -0.9; -8.7), compared to the control group for which a decrease of 3.7 % was noted (90 % CL 9.1; -1.5).

One of two studies that recorded the greatest height of the depth jump of 30 – 80 cm, Newton et al. (1999), noted an improvement in takeoff height of 5.9 % ± 3.1 compared to the control group (-1.3% ± 2.5, p < .001). Eight junior basketball players achieved this improvement during an eight-week plyometric exercise program of moderate and high intensity, exercising two times a week, and performing at least 576 different jumps. Furthermore, the studied kinetic parameters of the CMJ and the squat jump showed no changes except for duration of contact time (14.6% ± 9.7) and flight time (-4.7 % ± 3.4) compared to the control group (p = .006 and p = .01, respectively). Usman & Shenoy (2015), who noted the second greatest height, analyzed mostly junior volleyball players (120) during an eight-week plyometric program which included the highest number of various jumps, more than 2.976. Low, moderate and high intensity exercise led to an improvement in both plyometric groups for takeoff height: 67.33 cm ± 1.64 cm for the first experimental group compared to the control group, 57.22 cm ± 1.06 cm; and 50.08 cm ± 1.83 cm for the second experimental group compared to the control group, 42.36 cm ± 1.07 cm, p < .001. Unlike Usman & Shenoy (2015), whose study recorded the most jumps during training, the fewest jumps were recorded by Martel et al. (2005), only 138 different jumps of high intensity. They recorded one of the greatest improvements for the CMJ (11.1 % compared to the 4.0 % improvement recorded for the control group, p < .05). Ten junior volleyball players achieved this improvement following a six-week exercise program with sessions twice a week. During a single 60 min training session they relied on 30 s breaks between series and optimum height of the depth jump of 61 cm.

Even though Krističević et al. (2016) recorded the fewest training sessions, five during the course of five weeks, significant positive effects were still noted among 27 (of the 54) junior female volleyball players. Through moderate and high-intensity exercise they performed more than 645 different jumps, which led to an improvement in the squat jump. The results were presented as the means of all the jumps: the values for the experimental group at the beginning were 21.80 cm ± 4.22 cm and by the end were 24.28 cm ± 3.48 cm, compared to the control group whose values ranged from 24.32 cm ± 4.10 cm to 24.8 cm ± 4.09 cm. For the CMJ the values were initially 28.08 cm ± 4.83 cm and went up to 30.72 cm ± 3.74 cm, compared to the control group whose values ranged from 33.04 cm ± 6.18 cm from 33.32 cm ± 5.62 cm, $p < .05$.

In addition, the youngest twelve-year-old sprinters managed to improve their performance during a ten-week high intensity plyometric program, where they exercised twice a week and performed 600 different jumps. The CMJ values for the sprinters went from 0.23 m ± .03 m at the initial measurement to .25 m ± 0.03 m at the final, compared to the control group whose values ranged from .21 m ± 0.03 m to .22 m ± .03 m; for the squat jump test the values went from .21 m ± 2.8 m to .24 m ± .03 m, compared to the values of the control group which ranged from .20 m ± .02 m to .21 m ± .02 m; for the 30 cm depth jump the values ranged from .22 m ± .3 m to .25 m ± .02 m, compared to the control group which ranged from .20 m ± .02 m to .20 m ± .02 m, $p < .01$-.001; for the sprint test at 5 m, the sprint speed went from 2.0 m/s ± .5 m/s to 2.2 m/s ± .05 m/s, compared to the control group whose values ranged from 2.3 m/s ± .6 m/s to 2.4 m/s ± .5 m/s, $p < .01$. The kinetic parameter of strength, measured in relation to the weight of the participants, also indicated positive changes during the depth jump: 28.5 W ± 5.2 W to 33.3 W ± 4.6 W, compared to the control group with values of 24.8 W ± 4.2 W to 25.5 W ± 4.3 W, $p < .01$ (Chelly et al., 2015).

Unlike the youngest participants, the oldest, aged 23.9 years, also experienced positive effects following a moderate and high intensity eight-week plyometric exercise program. The optimum number of over 680 different jumps was noted for two groups which were equal in number of participants (11). Various plyometric programs led to an improvement in relation to the control group, but not between the two groups. For the first group, a an improvement of 7.9 % was noted for the CMJ, while for the second group it was 12.9 %; for the squat jump, the first group improved by 19.8 % and the second by 18.6 %; for the 40 m sprint test, the first group improved by 1.7 % while the second by 0.8 %; the kinetic parameters compared to the control group also differed, $p < .05$ (Lyttle, Wilson, & Ostrowski, 1996).

For seven to 12 weeks, two or four times a week, researchers analyzed the performance of basketball players (Arazi & Asadi, 2011; Fontenay et al., 2013; Arede, Vaz, Franceschi, Gonzalo-Skok, & Leite, 2018; Meszler & Vaczi, 2019; Bouteraa, Negra, Shephard, & Chelly, 2020), volleyball players (Newton, Kraemer, & Haekkinen, 1999; Usman & Shenoy, 2015; Idrizovic, Gjinovci, Sekulic et al., 2018), and track and field athletes (Lyttle, Wilson, & Ostrowski, 1996; Chelly et al., 2015; El-Ashker et al., 2019) of both genders, and obtained mixed results. The improvement for the CMJ ranged from 6.2 % to 16.9 %, while for the SJ it was 7.6 % to 19.8 % (the upper values of progress for CMJ were measured in the study which included exercise programs during the off season). Programs of a shorter duration, lasting from three to six weeks, which gave individual results with positive effects in all the parameters, led to a greater improvement in the vertical jump tests compared to horizontal jump tests (Martel et al., 2005;

Krističević et al., 2016; Mackala et al., 2019). The CMJ improved from 6, 3 % to 9, 1 % and the SJ 6, 6 % to 8, 9 %. These studies were carried out during the competitive season of the participants. The duration of training sessions, ranging from 20 to 90 min, is directly related to the intensity of the training and number of jumps. Shorter training sessions are high intensity with a smaller number of jumps, while longer training sessions are moderate and high intensity with a smaller number of jumps (more than 138 in the study of Martel et al., 2005, and up to more than 2976 in the study of Usman & Shenoy, 2015). The most frequent duration of a training sessions is 45 to 60 min, with high intensity, and 600 to 900 different jumps.

5. CONCLUSION

It can be concluded based on the results of 15 included studies that the plyometric way of training has positive effects on the biomechanical parameters of junior age groups of athletes. Greater progress of these athletes was noted following plyometric programs that lasted for more than eight weeks. The weekly training frequency and the intensity of exercise have a decisive influence on improving the performance of athletes. Also, longer programs, of a moderate and high intensity and training sessions from 45 to 60 min, enable the best progress, regardless of sport. No differences in the development of biomechanical parameters between the three sports was noted.

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EFEKTI PLIOMETRIJSKIH PROGRAMA NA BIOMEHANIČKE PARAMETRE ATLETSKIH DISCIPLINA, KOŠARKE I ODBOJKE: SISTEMATSKI PREGLED

Pliometrijski pokret služi za poboljšanje mišićnih performansi sportiste i koristi se u pliometriskom načinu treniranja koji je nezaobilazni princip treninga razvoja eksplozivne snage i brzine. Cilj ovog istraživanja je utvrđivanje efekta pliometrijskih programa na biomehaničke parametre i njihove razlike, u tri sporta juniorskog uzrasta pomoću sistematske analize dosadašnjih rezultata. Za pretraživanje literature korišćene su sledeće elektronske baze: PubMed, MEDLINE, Google Scholar, ScienceDirect, ERIC od 1996. do 2022. Sumirani su rezultati iz 15 uključujućih studija koje su detaljno prikazani u tabeli. Rezultati uključenih studija pokazuju pozitivne efekte pliometrijskih programa na biomehaničke parametre podjenako kod tri sporta. Opseg dužine treninga iznosi od 20 min do 90 min, i u direktnom odnosu je sa intezitetom treninga i brojem skokova. Kraći treninzi su u veoma visokom intezitetu sa manjim brojem skokova, dok su duži treninzi sa umerenim i visokim intezitetom i manjim brojem skokova (više od 138 do više od 2976). Najčešća dužina trajanja treninga je 45 min do 60 min u visokom intezitetu sa 600 do 900 različitih skokova. Veći napredak eksplozivne snage i brzine vidljiv je u parametrima testova sprinta i skokova; programi od sedam do 12 nedelja sa dva do četiri puta u toku nedelje (SMJ 6,2% do 16,9%, dok za SJ i 7,6% do 19,8%), programi sa kraćom dužinom trajanja, od tri do šest nedelja (SMJ 6,3% do 9,1% a za SJ 6,6% do 8,9%). Zaključuje se da duži programi, sa umerenim i visokim intezitetom i trajanjem treninga od 45 min do 60 min daju najbolje napretke bez obzira na sport.

Ključne reči: *pliometrijski trening, efekti, biomehanika, atletske discipline, košarka, odbojka*

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Proffesional article

ONE APPROACH TO THE DEVELOPMENT AND APPLICATION OF ASSISTIVE MULTIMEDIA LEARNING TOOL IN WORK WITH CHILDREN WITH DEVELOPMENTAL DISABILITIES

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Abstract. *The possibility of applying modern multimedia technology as an assistive tool in working with children with learning disabilities is truly immense. The aim of this paper was twofold. Firstly, either to confirm or disprove a view that children with learning disabilities can accept educational content intended for the children of regular population and secondly, to design a learning tool, a multimedia video game especially developed for this occasion. The method of work consisted of the following phases: analysis of developmental limitations of a child and group in the kindergarten, selection of activities and suggestions of models of learning, design and development of the means for the realization of learning, working (playing) with the child in the group in several iterations and analysis of the obtained results. The results obtained indicate that the use of multimedia tools as a help in working with children with developmental disabilities can be crucial for achieving visible results in the mastering of topics usually intended for children of the regular population.*

Key words: *assistive multimedia, learning tool modelling, inclusion, video gaming*

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1. INTRODUCTION

In an effort to introduce inclusion to regular kindergartens, educators and caregivers face new challenges every day. A large number of children with developmental disabilities have difficulties in following methodological activities provided in a form intended for children from the regular population, and many educators try to introduce various sensory and cognitive aids into their daily activities to bring activities closer to children with disabilities.

When performing a regular integrative practice in an educational group with a child with a certain developmental disability, it is possible to resort to a pre-designed learning video game as an assistive tool to master a certain part of the educational programme, such as colour and shape recognition, for example, intended for children from the regular population. This paper provides a brief overview of theoretical foundations, applied practical modelling methods and tools, as well as the obtained results for this model - a learning tool, a multimedia video game especially developed for this occasion.

According to a study conducted in the United States, one in five children surveyed has some form of disability and learning difficulties (Turkington & Harris, 2006), which is characterized by a wide range of problems with speech, language, reading, mathematics, concentration and reasoning.

Inclusive education implies that children with disabilities are full members of institutions in their neighbourhood and they attend classes that are appropriate for their age, with adequate additional help and support services. The initiators of inclusion believe that good educators, teachers and caregivers are able to teach all children, as well as that all of them can be provided with quality education, without being classified into traditional categories of special education.

Play is a basic activity of human childhood (Vygotsky, 1967). Children play for pleasure. For them, play is not merely a matter of fun, but an activity that satisfies their basic needs. Play ensures the unity of a child's physical, intellectual and socio-emotional development in the most comprehensive manner. The nature of children's play is complex, which implies the existence of numerous functions. The first one is educational because a child acquires knowledge, skills, abilities, and experience through play, and adopts hygienic habits, language, cultural and social characteristics of the group in which they live and whose behaviours they accept. Developmental functions refer to the stimulation of a physical, cognitive and socio-emotional development of a pre-school child. According to Jung and Sainato (2015) for the children"play provides opportunities to acquire critical developmental skills as well as to engage in activities with peers during daily routines" (p. 198), and numerous studies resorted to play as a context to enhance the social and communication skills of children with autism spectrum disorder, while others investigated the effects of interventions that directly taught and assessed play skills.

However, due to their inability to participate regularly and in the same way, children with disabilities are often isolated from joint games, and they also face a lack of communication with peers. One of the goals of this research is the need to test the possibilities of digital play as a means of helping children with developmental disabilities.

Assistive technology (AT) implies equipment, product, or system, which is modified and adapted to increase, maintain and improve functional abilities of people with disabilities. All types of assistive technologies have one thing in common, and that is that their goal is to strengthen an individual's ability to live and act. In other words, assistive technology is used to

meet and supplement deficiencies that prevent a person from functioning normally and smoothly (Robittaile, 2010).

The importance of multimedia educational tools is unquestionable today, whether they are children of regular or special population (Gray et al., 2011).

Bodine (2013) stated that:

"Most individuals in this group have not had the benefit of using AT devices because relatively few products to date have been specifically developed addressing intellectual impairments. In addition, families, teachers, and others providing support services for individuals with cognitive impairments have generally not been aware of AT's usefulness" (p. 27).

The previous statement is directly related to the third goal of this research - to check what influence on the world of a child with developmental disabilities can be achieved by assistive multimedia, and through the child's interaction with a specially made video game.

2. METHOD

The basic idea of this research was to confirm or disprove the opinion that children with learning disabilities can master the content of educational programmes intended for children from the regular population. This idea has inspired authors to resort to some of the "Design for All" principles (Borblik et al., 2015) the main characteristics of which are as follows: any group of users should be able to use the product (Equal use); the design should be adapted to a wide range of individual preferences and abilities (Flexibility); the product should be simple to use and understand, regardless of the user´s knowledge, experience, skills and level of concentration (Simple and intuitive); the product must minimize the risks and adverse consequences of accidental or erroneous actions perpetrated by the user (Error sensitivity); the product must ensure easy and comfortable use with minimal effort (Low physical activity); the product must provide sufficient space for the user to manipulate and use it, regardless of the body size, posture, or motor abilities of the user (Size and space for the scope and application) and the software need to take into account the needs of people with impaired vision, hearing, or physical and mental disabilities (Requirements for hardware devices and software).

Baloian, Luther and Sánchez (2002) propose a unified model for creating educational software for people with disabilities. The modelling pipeline is divided into seven sections. According to their proposal:

"The modelling process starts with the definition of cognitive skills the learner has to acquire; then it considers the creation of a virtual environment composed by a navigable world and built by using an adequate modelling language, dynamic scene objects, and acting characters. Scenic objects are characterized by graphic and acoustic attributes; character's actions are based on deterministic and non-deterministic plans as in an interactive hyper story" (p. 119).

Bearing in mind the above mentioned principles, our method of work consisted of the following phases:

- Analysis of the developmental limitations and cognitive skills that learner has to acquire
- Selection of activities and proposal of learning models and
- Design and implementation of tools for the realization of learning

2.1. Analysis of the developmental limitations and skills

Green (2018) stated that:

"Students with challenges with cognition and executive functioning may display the following characteristics:

- reduced attention and difficulty concentrating during a task,
- inability to sequence and organize information,
- poor analytical skills and judgment,
- difficulty figuring out solutions to problems,
- a hard time learning and retaining new information,
- inefficient time management skills,
- slow processing of new information,
- difficulty planning and initiating goal-oriented behaviours,
- lack of motivation,
- limited ability to initiate activities,
- impulsive behaviours, and
- faulty awareness and denial of deficit areas" (p. 138).

During this research, we assumed that children in our target group have mild to moderate difficulties from the autism spectrum disorder (ASD) (Coleman and Gillberg, 2012) such as Asperger syndrome (Mesibov, Shea and Adams, 2002; Gillberg, 2002).

2.2. Selection of activities

As to thematic activity, a combined recognition of colours and shapes was chosen - an activity that is basic and necessary for the realization of more advanced educational concepts (development of speech and verbalization, development of initial mathematical concepts, development of artistic skills, etc.). Additionally, the activity is complemented by recognizing everyday objects that are of specific colours or similar shapes.

2.3. Tools for realisation of learning

As a means of realization of a learning model, the video game "Smart Giraffe" ("Žirafica pametnica" in Serbian) was proposed. The GameMaker:Studio IDE (Figure 1.) was used for the video game design and programming (Tyers, 2018; Cossu, 2019; Vinciguerra and Howell, 2016; Auckett, 2015).

Fig. 1 Game Project in GameMaker: Studio IDE

3. RESULTS

The achieved results are presented and discussed in this section.

3.1. Learning Principles

In the process of design and development, general rules of adopting new concepts and connections have been applied. The primary aim was to make sure that a child was not faced with a task that might be too demanding for his/her current abilities, which would lead to dissatisfaction, frustration and loss of interest to learn.

Learning by using a video game as a tool encompasses five levels (Spasić, 2010):

1. The first level is how to do something, i.e. how to interact with the system.
2. Subsequently, a child must learn what to do and to understand the rules of the game.
3. The third level of learning occurs when a learner understands the causes and effects and begins to develop strategies to achieve the goal of the game.
4. The fourth level of learning through video games is when a child understands the context of the game and its internal system of values.
5. The fifth level in learning occurs when a child is able to make decisions based on the above mentioned system of values.

The main learning principle is based on the system of increasing the requirements and connecting the concepts that are presented in the game.

A digitally synthesized female voice (55 different sentences or words) is used to interact with a child. To interact with the game a child uses the basic mouse/touchpad moves and the left click.

Each level starts with a simple recognition of the pronounced colour, blue for instance, and then a child should recognise the pronounced shape (circle) from the set of moving shapes (Figure 2).

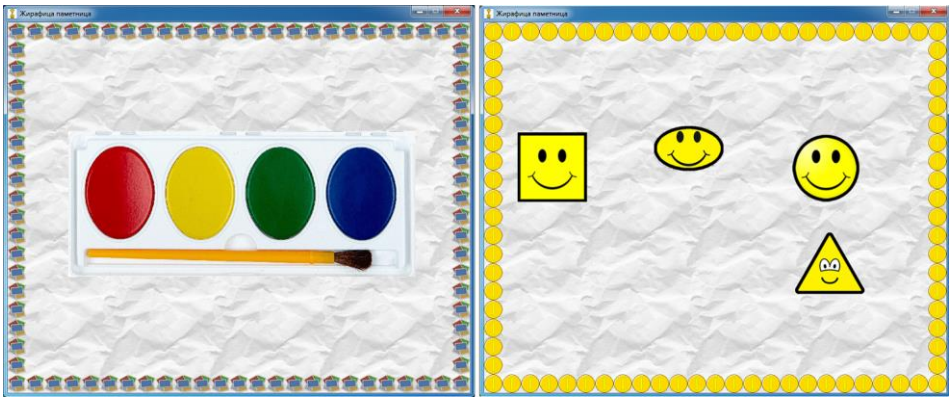

Fig. 2 Colours and shapes

Then, a child should recognise the pronounced shape of the specific, previously recognised colour (blue circle) from the set of the same moving shapes with different colours, as shown in Fig.3.

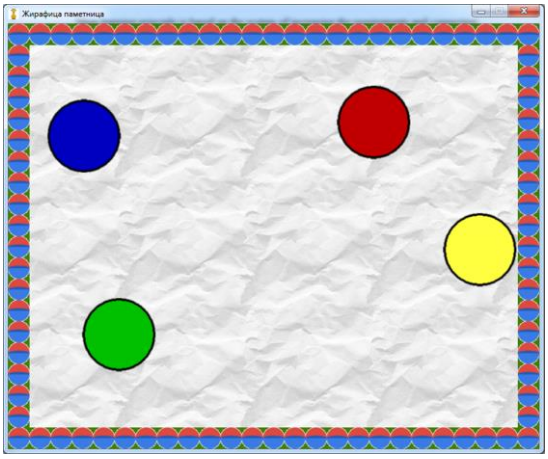

Fig. 3 Same shapes with different colours

As one proceeds from one level to another one can see how simple shapes are placed in a specific context. For example, at the initial levels children acquire the notions of shapes (a yellow triangle from a set of yellow shapes), then colours (a yellow triangle from a set of triangles of different colours), and go further and try to recognise this shape and colour among the real yellow objects such as a sandwich, the Sun, a book or a lemonade (Fig. 4).

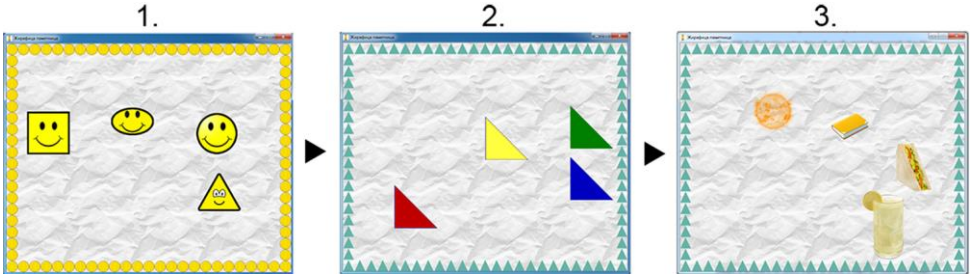

Fig. 4 Shapes and colours placed in concrete contexts

3.2. Design Principles

This video game is designed under the name “Smart Giraffe”. The game currently has 24 levels. A different drawing of a “wise” giraffe appears at the beginning of the game and before each new level, which signals to the child that she/he can start a new level by clicking on the appropriate button when ready (Figure 5).

Fig. 5 A Smart Giraffe character for different levels

The voice communication offers information about the chosen object even when a wrong answer is chosen.

The game can be used by children from the regular population as well as by children with developmental disabilities. It is possible to add new levels or to make the existing ones more complex or intricate.

4. Experiment and Discussion

In order to check the effectiveness of the designed learning support assistive tool, testing of the assistive product was performed in a group of children in the kindergarten in which there is one child with developmental disabilities, and under real exploitation conditions.

4.1. Analysis of Child Developmental Limitations

N.M. is a 5.5 years old boy with developmental disabilities. He has been in the group for two years, and before that he attended a special school. He does not have a precise diagnosis, so the assumption is that he has mild to moderate difficulties from the autism spectrum, probably Asperger's syndrome.

It often happens that young children have no precise diagnosis and Gillberg (2002) explains the reasons as follows:

"Symptoms in younger children are often somewhat more vague and it can be difficult, even for the experienced clinician, to decide which diagnosis within the autism spectrum – or, for that matter within the spectra of attention and tic disorders – is the most appropriate. There is sometimes a need to wait until the school year for 'classical' symptoms to emerge. This is one of the most important reasons why a diagnosis of Asperger syndrome is rarely made with confidence before school age" (p. 40).

Based on his educators' claims, the targeted boy did not interact with other people in his environment, he did not join activities, he did not play with other children, and he mostly looked for a place to isolate himself or a place where he could jump.

He has made significant progress in the period after enrolment in the educational group and at the time when the experiment was conducted he was characterized by the following:

- He addresses words or simple sentences if he needs something; he approaches children to see what is happening with them; he likes to play dice, if he has the opportunity he likes to hug people around him;
- He can answer the question "How are you?" and greet people;
- He enjoys looking at picture books;
- When doing group activities, he participates in a way that suits him, e.g. likes to be in a circle of chairs when playing the game "Music Chairs";
- He does not name all objects, shapes and colours;
- He does not like music if it is too loud, in which case he puts his palms on his ears and leans aside;
- In his group he prefers contact with adults to his peers;
- He was not interested in having any communication with us at the beginning of the research, but two weeks later he started interacting with us.

In order to correctly choose the method and implement the learning tool, the child was first monitored and observed, as was the study room, interactions among children and between children and educators, as well as routines and activities, after which data analysis was performed.

4.2. Course of Activities with the Child

First, it was necessary to set up the environment, furniture and the computer. As all children in the group were naturally interested in planned activities, they were initially given access to the work environment located in the middle of the study room so that all children could see what was being done (Figure 6a).

The targeted boy was not specifically invited to join the group – we wanted to see if preparations were attracting his attention. The child soon came alone and placed himself right in front of the computer, in the lap of the educator involved in the experiment.

The plan for the first time play was that the educator control the computer and video game while the child points his finger to the correct answers on the screen.

The other children expressed their enthusiasm for the game and made noise, which made the targeted boy difficult to concentrate, but he did not show that it bothered him and he wanted to continue interacting with the video game.

In order to determine with certainty how the child copes, what he overcomes with ease, and what slows him down and disturbs him, the educator, the boy and the computer

were isolated from the group and relocated to another room. This time the educator was next to the boy again, and he was at the table in front of the laptop (Fig. 6b).

a) Initial phase within the group b) The phase with isolated environment

Fig. 6 Working environment

During the next session, the child was suggested to try to control the game independently by using the built-in synaptic touchpad on the laptop, which was an additional challenge to his motor skills. He was helped in parts where he would stay longer and he was not sure what to do.

The interaction was interrupted by explaining to the child that the device's battery was empty - by pointing to the laptop's battery status icon and explaining that the game could not work if the battery was not charged enough. The child accepted it immediately and educators involved in this research and the targeted child went back to the group without any problems.

The next day, it was checked whether the learned information were retained and to what extent, and whether the child would ask to regain access to the game. When he finished with the picture book he was flipping through, he came to the educator, grabbed her hands and clearly said the word "giraffe" and asked to go to the room where he had played the game the day before.

4.3. Results Obtained During the Experiment

The experiment that was carried out during the active use of the learning tool proposed in this paper offered the results and the answers to certain assumptions, the most important of which are the following:

- The boy completed all 24 levels of the game.
- Based on the first test, it was noticed that it was easier for a child to give answers to the part about colours than to the part about shapes.
- On the experimental level of the game, where the character of an animal (giraffe, zebra, cow and dog) is chosen instead of the shape, he would always choose another animal (zebra) first.
- It was easier for him to recognize a circle and a triangle than a semicircle and a rectangle.
- When his choice of the answer was correct and when it was confirmed by the sound (a child's laughter), the boy would laugh.
- The shape painted with a certain colour was much easier to find.
- Even when he gave the wrong answer, the boy did not give up. Namely, the game offers a sound interaction even in the case of a wrong answer, so that one can hear the voice with an explanation of what was clicked on (the name of a colour, shape, animal or object).
- At the next attempt, he wanted to do everything by himself. He continued to be confident with the colours, while the giraffe always stayed behind the zebra in response. He continued to express his satisfaction with laughter.
- The return to the game for the third time was followed by a new appearance. The child wanted to know what would happen if he answered the task by marking the wrong answer - it is, by the way a natural reaction of children of the regular population when they master the play environment and when they feel safe interacting with the game. He would stay in certain places and choose the wrong answer until he repeated it frequently enough.
- At the fifth iteration of playing the game, he completed all levels without mistakes in cases where the shape is not connected with an object from everyday life. When connecting shapes and objects from everyday life, he would always choose what he knew first, and then he would concentrate on the correct answer.
- At no time did the child show a desire to stop playing the game or to miss check if he had answered the task well.
- After finishing all levels, he would always ask to return to the beginning.
- When the game was restarted, he would react with excitement each time.
- The boy's focus was completely placed on what was in front of him, and on several occasions we tried to offer him something else, but he would always turn back to the computer and the game.
- The smile and satisfaction one could see on his face while playing the game was an indicator that the initial idea was successfully realized.

5. CONCLUSIONS

The video game proposed in this paper enables the improvement of visual perception, better communication between a child and educator, development of visual-motor coordination and cognitive development.

The game can be used by children from the regular population as well as by children with developmental disabilities.

The results obtained in the kindergarten indicate that the use of multimedia tools as a help in working with children with developmental disabilities can be crucial for achieving visible results in mastering topics usually intended for children from the regular population.

Adding new topics and educational activities that can be taught in this way and the development of applications for other platforms that can be used to work with children (tablet, smartphone etc.) comprise additional possibilities for the continuation of this project.

Efforts towards developing modelling principles of assistive software learning tools are planned for the future.

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JEDAN PRISTUP RAZVOJU I PRIMENI ASISTIVNOG MULTIMEDIJALNOG ALATA ZA UČENJE U RADU SA DECOM SA TEŠKOĆAMA U RAZVOJU

Mogućnost primene savremene multimedijalne tehnologije kao asistivnog sredstva u radu sa decom sa smetnjama u učenju je velika. Cilj ovog rada bio je dvostruk. Prvo, da se potvrdi ili opovrgne stav da deca sa smetnjama u učenju mogu da prihvate obrazovni sadržaj namenjen deci redovne populacije i drugo, da se osmisli alat za učenje, multimedijalna video igra posebno razvijena za ovu priliku. Metod rada se sastojao iz sledećih faza: analiza razvojnih ograničenja

deteta i grupe u vrtiću, izbor aktivnosti i predlog modela učenja, osmišljavanje i razvoj sredstava za realizaciju učenja, rad (igranje) sa detetom u grupi u nekoliko iteracija i analiza dobijenih rezultata. Dobijeni rezultati ukazuju da upotreba multimedijalnih alata kao pomoći u radu sa decom sa smetnjama u razvoju može biti presudna za postizanje vidljivih rezultata u savladavanju tema koje su inače namenjene deci redovne populacije.

Ključne reči: *asistivna multimedija, modelovanje alata za učenje, inkluzija, video igre*

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