

Alena Letina, PhD, Katija Kalinić

Application of Teaching Strategies and Methods in Science and Social Studies Classes

Prejeto 13.12.2022 / Sprejeto 31.03.2023

Znanstveni članek

UDK 373.3.091.3(497.5)

KLJUČNE BESEDE: poučevanje, osredotočeno na učitelja, strategije in metode poučevanja, pogostost uporabe

POVZETEK – Cilj raziskave je bil preučiti preference osnovnošolskih učiteljev pri uporabi učnih strategij in metod, namenjenih učencem in učiteljem, pogostost njihove uporabe pri poučevanju narave in družbe, prav tako pa tudi povezanost med zapisanimi sprememljivkami. Raziskava je bila izvedena na vzorcu 301 osnovnošolskega učitelja z območja Republike Hrvaške. Rezultati kažejo, da imajo učitelji pozitivno mnenje o uporabi strategij in metod poučevanja, namenjenih učencem. Kljub temu učitelji v vsakdanji pedagoški praksi statistično značilno pogosteje uporabljajo na učitelja osredotočene strategije in metode poučevanja, predvsem pri uresničevanju učnih rezultatov, ki jih določa kurikulum v osrednjem delu pouka. Z raziskavo je potrjena pozitivna korelacija med mnenji učiteljev o uporabi določenih strategij in metod poučevanja ter pogostostjo njihove uporabe. V zaključku je obravnavan vpliv pridobljenih rezultatov na prihodnje raziskave na tem področju ter na izboljšanje in nadaljnjo posodobitev pouka narave in družbe.

Received 13.12.2022 / Accepted 31.03.2023

Scientific paper

UDC 373.3.091.3(497.5)

KEYWORDS: frequency of application, student-centred and teacher-centred teaching strategies and methods, primary school class teachers

ABSTRACT – The paper presents the results of a survey which aimed to determine the preferences of primary school class teachers toward student-centred or teacher-centred teaching strategies and methods, the frequency with which they are used in science and social studies classes, and the correlation between these variables. The research was conducted on a sample of 301 class teachers from the Republic of Croatia. The results indicate that teachers prefer student-centred teaching strategies and methods. Despite of that, in their teaching practice they employ teacher-centred teaching strategies and methods significantly more frequently in terms of statistics, especially in the realisation of the learning outcomes set by the curriculum in the main part of the lesson. Moreover, a positive correlation between the teachers' opinion about the application of certain teaching strategies and methods and the frequency of their use has been determined. The implications of the obtained results for future research on this topic, as well as for the advancement and further modernisation of primary science and social studies teaching, are considered in the conclusion.

1 Introduction

The main aim of education is the development of personality autonomy, so teaching and learning should be an interaction in which learners, supported by teachers, will come to new cognitions independently, thus developing their competencies (Klafki, 1992). Such a view of education resulted in a serious criticism of teacher-centred teaching and the actualisation of active learning and student-centred teaching strategies. The weakness of the traditional paradigm of teaching is reflected in the passive role of students, the receptive learning process and the poor applicability of knowledge in everyday life. Such an approach cannot meet students' developmental, biological, social or self-actualising needs, curiosity and desire to act.

According to Polić (2000), the transition from teacher-centred to student-centred teaching primarily implies a change in the methodological procedures, i.e., the application of student-centred teaching strategies and methods. Polić (2000) emphasises five peculiarities of student-centred teaching:

- the cognitive and value unity of the methodical procedure – teaching which promotes the development of students' personalities,
- respect for pupils' educational needs – stimulating students to solve problems and think divergently,
- problematising the existing – inciting students to have a critical relationship with the existing cognition,
- inquiry-based approach – directing students toward individual research and collection of data which enables them to be creative, and
- content and methodical correlation – which enables the holistic study of nature and the students' environment.

Lea, Stephensen and Troy (2003) highlight the following characteristics of student-centred teaching: active instead of passive learning, emphasis on deeper understanding and learning, increased student responsibility and autonomy, teachers' and students' interdependence, reciprocal respect between teachers and students, and teachers' reflective approach to teaching and learning.

Huge differences in the teacher-centred and student-centred approach are especially noticeable in teaching the natural science group of subjects. Shymansky et al. (1984), when studying the possible structures of the science teaching curriculum, defined the teacher-centred curriculum as the curriculum which emphasised the understanding of scientific facts and theories and the application of laboratory exercises as confirmation of the concepts presented in the teacher's oral lecturing. Contrary to that, the basic characteristic of the student-centred science curriculum is the emphasis on the need to develop students' higher cognitive abilities and their adequate relation to science. Such a curriculum emphasises the nature, structure and processes in science, and integrates laboratory activities into the teaching process mainly aiming at the development of the students' scientific competence. The teacher-centred science teaching is characterised by experimentation with outcomes determined in advance. Students are given instructions beforehand in the form of recipes which serve as the verification of results and facts already familiar to students. Using deductive thinking, students apply known principles to confirm certain claims. On the other hand, in the student-centred form of science teaching the results of experiments are not familiar to the students beforehand. Students use inductive thinking and form valid principles based on their personal experience, which is vastly different from the teacher-centred approach to experimentation. In their consideration of the basic features of the student-centred, research-based teaching, Kahn and O'Rourke (2004) concluded that it enabled flexibility in the development of different students' skills and abilities necessary in dealing with the challenges posed by the modern world.

The constructivist theory develops new points of view on both the nature of the learning process and curriculum theory and on the theoretical grounds of the teaching process. The basic principles of the constructivist paradigm implemented in the school practice and teaching have radically changed the teacher-centred school. Starting from

the analysis of the learning process, constructivism positions the student in the place of the subject of the educational process and sets its face against the empirical-reductionist approach which presents learning and teaching with a transmission model of information and content transfer and memorisation. Criticism of the transmission model is based on the constructivist principle that the knowledge acquired by applying such a model is often badly structured and poorly correlated to the formerly acquired knowledge. The sole process of its acquisition makes it suitable only for academic needs and valid only for test purposes, but not for life use (Richardson, 1997).

Discussions about the efficiency of the teacher-centred lecturing and presentation-based approach and the student-centred teaching concepts are still present in the scientific literature. The primary argumentation of advocators of the teacher-centred approach relates to the question of the time and materials distribution necessary for the organisation of teacher-centred and student-centred teaching. In this context teachers usually, due to the pressure to realise all the learning outcomes set by the curriculum in a given period during the school year, turn to teacher-centred forms of teaching and apply teacher-centred teaching strategies and methods (Mastropeiri et al., 2006). Mayer, as one of the most significant advocators of teacher-centred teaching, talked about the “constructivist delusion” (Mayer, 2004, p. 15). In fact, he thought that constructivist learning can be achieved by different approaches to teaching, including teacher-centred teaching, and not exclusively by students’ unguided research. Considering different empirical studies, Terhart (2001) also concluded that the transitional forms in between the purely lecture-based and purely discovery-based teaching led to the greatest successes due to the fact that the application of different methods also enabled the satisfaction of needs of an averagely higher number of students than the specific methodological forms which were advantageous only for a smaller number of students. He is, therefore, an advocator of a diverse, pluralistic teaching-methodical practice.

The main difference between the teacher-centred and student-centred teaching lies in the fact that the teacher-centred approach puts the learning content in the centre of attention instead of the development of students’ competencies with a more frequent use of teacher-centred teaching strategies and methods, such as lecturing and presentation-based teaching, reading, writing, oral presentation or catechetical discussion. Students are directed toward answering with one right answer, while the educational process does not prepare them for lifelong learning, but only for the transition to a higher grade. Teacher-centred teaching has the tendency to create a closed system where students are given only the information which is currently available in the classroom or school. Unlike that approach, student-centred teaching puts an emphasis on the development of the ability to analyse information and solve problems.

2 Research methodology

Research aim

This research aimed to examine primary school class teachers’ preference for the use of student-centred and teacher-centred teaching strategies and methods, determine

their opinion about such strategies and methods, the frequency of their application in everyday science and social studies classes and in certain stages of the lesson, as well as the correlation between the mentioned variables.

Research questions

Based on the set research aim, the following research questions have been posed:

- Do teachers have a stronger preference for the application of teacher-centred or student-centred teaching strategies and methods in science and social studies classes?
- Do teachers apply teacher-centred or student-centred teaching strategies and methods more frequently in science and social studies classes?
- Is there a statistically significant difference between teachers' opinions about the employment of student-centred and teacher-centred teaching strategies and methods and the frequency of their use?
- Is there a correlation between teachers' opinion about the employment of student-centred and teacher-centred teaching strategies and methods and the frequency of their use in science and social studies classes?
- In which stages of a lesson do teachers employ certain teaching strategies and methods?

Sample

The research was conducted anonymously on a convenient sample of 301 female class teachers in 12 primary schools in the Republic of Croatia. Regarding their work experience, they were divided into four categories: up to 10 years of work experience (21.8%), from 11 to 20 years of work experience (20.8%), from 21 to 30 years of work experience (34.7%), and 31 and more years of work experience (22.8%). Regarding their professional qualification, teachers were divided into two categories: college qualification (37.6%) and university qualification (62.4%). Of all the teachers surveyed, 28.7% of them were first-grade teachers, 27.7% were second-grade teachers, 24.8% were third-grade teachers and 17.8% of them were fourth-grade teachers. One percent of them worked in a combined class.

Instrument and procedures

A special questionnaire was created for the purpose of this research. The questionnaire consisted of four parts. The first part of the questionnaire was used to collect participants' demographic data. The second part of the questionnaire consisted of a list of teaching strategies and methods which could have been divided into teacher-centred and student-centred. Using a 5-point Likert scale (1 – never, 2 – rarely (twice a month), 3 – occasionally (3–4 times a month), 4 – often (5–6 times a month), 5 – always), teachers estimated the frequency of their use in science and social studies teaching. The third part of the questionnaire examined the teachers' tendency toward and opinion about

teacher-centred and student-centred teaching strategies and methods. This part of the questionnaire consisted of 22 statements, 11 of which described teacher-centred teaching strategies and methods positively, while the remaining 11 statements did the same for student-centred teaching strategies and methods. Teachers expressed their agreement with the statements on a five-point Likert scale (from 1 – I completely disagree to 5 – I completely agree). The fourth part of the questionnaire examined which teaching methods were most frequently used by teachers in certain stages of a science and social studies lesson. The identified internal consistency and reliability of the used scales (Cronbach's alpha coefficient) was at a satisfactory or high level (0.81–0.92) for all the scales used in the questionnaire.

Data analysis

The data were analysed by descriptive statistics procedures to determine the basic indicators for the interpretation of research results. The t-test was used to compare the arithmetic mean of continuous variables in two different groups. The χ^2 test was used to statistically analyse the employment of certain methods in various stages of a science lesson, and the Pearson correlation coefficient was used to determine the correlation among the said variables.

3 Research results

To determine whether teachers more frequently employ teacher-centred or student-centred teaching strategies and methods in science and social study classes, the arithmetical means of participants' answers and their appertaining standard deviations were calculated.

Table 1

Frequency of teacher-centred (TC) teaching strategies and methods employed in science and social studies teaching

<i>Science and social studies teaching</i>		<i>M</i>	<i>SD</i>
TC teaching strategies	Lecturing and presentation	3.53	0.88
	Direct teaching	3.58	0.85
	Programmed teaching	3.09	0.89
TC teaching methods	Reading method	4.11	0.92
	Drawing method	4.28	0.69
	Writing method	4.31	0.72
	Oral presentation of content	4.10	0.89
	Catechetical conversation	4.05	0.89
Total		3.88	0.54

The analysis of the obtained arithmetical means values for the participants' answers (Table 1) determined that teachers employed teacher-centred teaching strategies and methods frequently (5–6 times a month) ($M = 3.93$; $SD = 0.54$), while student-centred ones were used only occasionally (3–4 times a month) ($M = 3.27$; $SD = 0.54$). Regarding the teacher-centred teaching strategies, teachers often use direct teaching ($M = 3.58$; $SD = 0.85$) and lecturing with presentation ($M = 3.53$; $SD = 0.88$), while they occasionally use programmed teaching ($M = 3.09$; $SD = 0.89$). The most frequently used methods are writing ($M = 4.31$; $SD = 0.72$) and drawing ($M = 4.28$; $SD = 0.69$). Teachers often use catechetical conversation ($M = 4.05$; $SD = 0.89$) directed toward specific answers. It does not offer students enough possibilities to think and reach conclusions, but stimulates the production of previously acquired knowledge. When it comes to student-centred teaching strategies (Table 2), teachers often use correlation and integration teaching ($M = 4.30$; $SD = 0.77$), cooperative learning ($M = 3.76$; $SD = 0.83$) and discovery learning ($M = 3.69$; $SD = 0.82$), while they occasionally employ project-based ($M = 3.24$; $SD = 0.94$), research-based ($M = 3.33$; $SD = 0.91$) and problem-based learning ($M = 3.39$; $SD = 0.92$). The employment of these teaching strategies is made difficult by the strictly determined lecture time (45 minutes), the material conditions necessary for their realisation, and the insufficiently developed teachers' competencies necessary for the realisation of such teaching.

Table 2

Frequency of student-centred (SC) teaching strategies and methods employed in science and social studies teaching

<i>Science and social studies teaching</i>		<i>M</i>	<i>SD</i>
SC teaching strategies	Project-based learning	3.24	0.94
	Cooperative learning	3.76	0.83
	Problem-based learning	3.39	0.92
	Correlation-integration teaching	4.30	0.77
	Learning by discovery	3.69	0.82
	Inquiry-based learning	3.33	0.91
SC teaching methods	Brainstorming	3.28	0.86
	Clusters	2.66	0.95
	Conceptual KWL table	2.67	0.99
	Rotating review	2.54	0.86
	Venn diagram	2.76	0.97
	Performing experiments	3.10	0.99
	Debate	3.45	1.06
	INSERT method	2.95	1.01
	Heuristic conversation	3.95	0.93
	Simulation of real-life situations	3.34	0.92
Total		3.27	0.54

Of the student-centred teaching methods, the least frequently used one is the technique of the rotating review ($M = 2.54$; $SD = 0.86$) which is occasionally employed by teachers, and with a tendency to be used rarely. The possible reasons for the rare employment of this student-centred method are: not being familiar with the method and the psychophysical characteristics of 1st to 4th grade students. Namely, this method demands from students to have developed writing skills and the cooperative learning competency, but these still need to be worked on with students of this age. Furthermore, clusters are sometimes used ($M = 2.66$; $SD = 0.95$), as well as conceptual KWL tables ($M = 2.67$; $SD = 0.99$), Venn diagrams ($M = 2.76$; $SD = 0.97$) and the INSERT method ($M = 2.95$; $SD = 1.01$). Although these methods result in a number of positive learning outcomes, the reasons for their insufficient employment could be explained by the lack of knowledge of the aforementioned teaching methods or the insufficiently developed teachers' competencies for their application.

The t-test was done to determine the differences between the frequency of use of teacher-centred and student-centred teaching strategies and methods. A statistically significant difference ($t = 11.52$; $p < 0.01$) was determined in favour of teacher-centred teaching strategies and methods. The dominance of the teacher-centred paradigm unfortunately indicates that the participants' teaching is still oriented toward the teacher, not the students. Hismanoglu and Hismanoglu (2010) came to similar results. Their study showed that language teachers preferred employing teacher-centred classroom techniques, such as dictation, reading aloud, and dialogues to a great extent to teach pronunciation to their students. Moreover, Saido et al. (2015) found that the most popular strategy for acquiring knowledge among 7th grade science teachers was the strategy which focused on memorising the basic concepts in science, while the strategies for applying knowledge that were least used by science teachers were problem solving and hands-on activities. Serbessa (2006) found that although the employment of innovative teaching and learning was emphasised in the Ethiopian education policy, the teacher-centred lecture methods, in which teachers talk and students listen, dominated most classrooms. The common obstacles and barriers to the employment of active learning in Ethiopian primary schools are the Ethiopian tradition of teaching and learning, a lack of institutional support and learning resources, the teachers' lack of expertise, inappropriate curricular materials, and students' lesser preference for actively participating in learning due to a lack of prior experience.

In analysing the value of the obtained arithmetical means of participants' answers in the third part of the questionnaire, which determined the teachers' inclination toward the employment of student-centred or teacher-centred teaching strategies and methods, it can be noticed that teachers usually agree with the given statements in favour of the employment of student-centred teaching strategies and methods in science and social studies teaching ($M = 4.12$; $SD = 0.45$). Teachers show the highest tendency toward correlation and integration teaching ($M = 4.50$; $SD = 0.72$) which is the most frequently used student-centred teaching strategy. Teachers expressed a strong positive attitude toward student-centred teaching strategies, such as inquiry-based teaching, discovery learning and project teaching ($M > 4$), although these were only occasionally employed (Table 3).

Table 3

Teachers' preference for the employment of student-centred teaching strategies and methods in science and social studies classes

<i>Statements</i>	<i>M</i>	<i>SD</i>
Heuristic conversations enable students to have a better understanding of contents.	3.69	0.66
Problem-based teaching motivates students to be more active in the cognition of new teaching contents.	4.16	0.70
The employment of brainstorming in science and social studies classes enhances students' creativity and self-confidence.	4.18	0.75
Correlation and integration teaching represents a more natural way of learning than teaching strictly divided into different school subjects.	4.50	0.72
Inquiry-based teaching ensures a deeper understanding of nature and the processes occurring in it, and stimulates students' curiosity.	4.39	0.71
Discovery learning will enable students to observe and define problems more easily, and to develop the ability to solve them.	4.34	0.65
Cooperative learning contributes to the development of students' social competencies.	4.29	0.71
Project teaching motivates students, involves them intensively into the active learning process, and contributes to a better correlation of different concepts' learning outcomes.	4.33	0.71
Conceptual KWL (I know, I want to know, I have learnt) tables stimulate students' curiosity and interest in learning about science.	3.58	0.80
Debates develop students critical thinking and have an important educational role.	4.16	0.74
In science teaching Venn diagrams are an excellent visual tool for the comparison of concepts and to separate similarities and differences.	3.74	0.89
Total	4.12	0.45

In the analysis of teachers' preference for teacher-centred teaching strategies and methods it can be noticed that teachers mostly hesitate in expressing their preference for them ($M = 3.24$; $SD = 0.34$), except for the drawing method, which they usually prefer to employ in science and social studies classes ($M = 4.03$; $SD = 0.75$) (Table 4).

The t-test was used to determine the differences between the teachers' preference for the employment of teacher-centred or student-centred teaching strategies and methods. A statistically significant difference was determined ($t = 20.71$; $p < 0.01$) in teachers' attitudes in favour of student-centred teaching methods and strategies. Further analysis determined a statistically significant difference between teachers' preference for the employment of teacher-centred or student-centred teaching strategies and methods, and the frequency with which they are employed.

Teachers use teacher-centred teaching strategies and methods more frequently ($t = 13.12$; $p < 0.00$), although their opinion about them is undetermined. It has also been determined that they have a higher opinion of student-centred teaching strategies and methods ($t = 16.05$; $p < 0.00$) although they use them less frequently in their

teaching practice. Sen and Sari (2018) came to similar results. Their study showed that while teachers may have student-centred beliefs, they may still adopt a teacher-centred approach in their classroom practices. Kaymakamoğlu's study (2018) showed that although the teachers expressed their positive opinions of constructivist learning and teaching, their perceived practice was teacher-centred. The subject-school hour system usually demotivates teachers from using student-centred teaching strategies and methods, even though they are aware that teacher-centred teaching strategies and methods are not the best answer to students' educational needs.

Table 4

Teachers' preference for the employment of teacher-centred teaching strategies and methods in science and social studies classes

<i>Preference for teacher-centred teaching strategies and methods</i>	<i>M</i>	<i>SD</i>
Using the oral presentation method, teachers can present contents more quickly and effectively.	3.19	0.86
Working with a course book will enable students to acquire the key concepts and form the most important cognisance better.	3.37	0.88
Students will be better at understanding the teaching topics if the teacher uses catechetical conversation during the cognition process.	3.43	0.80
Programmed teaching is the easiest way to achieve the teaching aims and the set educational outcomes.	3.68	0.66
Direct teaching enables the teacher to control and maintain students' attention.	3.29	0.79
In the lecturing and presentation-based teaching, teachers facilitate the understanding of new contents because they can systematise the key concepts and terms more easily.	3.27	0.84
Preparation for inquiry-based teaching takes up too much of the teacher's time.	2.59	0.99
Science and social studies concepts are not adequate for the realisation of project or inquiry-based teaching.	3.59	1.14
The drawing method helps students to master abstract terms and concepts of science and social studies.	4.03	0.75
Working without the teacher's direct guidance is not a safe path to achieving the aim.	2.50	0.92
During cooperative learning it is more difficult for teachers to check the realisation of learning outcomes and the level of students' understanding.	2.73	0.90
Total	3.24	0.34

To determine whether there is a correlation between the teachers' preference for the employment of certain strategies and methods, and the frequency of their use, the pertaining correlation coefficients were calculated. The correlation between teachers' preference for the employment of teacher-centred or student-centred teaching strategies and methods and the frequency of their employment is significant ($r = 0.44$; $p < 0.01$), whereas the correlation between the preference for the employment of teacher-centred

teaching strategies and methods and the frequency of their employment is weak to mild ($r = 0.27$; $p < 0.01$). In line with these results, the teachers who showed a higher preference for one group of teaching strategies and methods used that group of strategies and methods more frequently in their teaching practice, as was expected.

In the third part of the questionnaire, the χ^2 test was used to statistically analyse the use of certain methods in different stages of a science and social studies lesson. The test has established that there is a statistically significant difference between the use of these two groups of teaching methods in the introductory part of the lesson and during the motivation and inclusion of students in the learning process ($\chi^2 = 7.46$; $p < 0.05$), when student-centred teaching methods are used more. Moreover, there is a statistically significant difference between the use of teacher-centred and student-centred teaching methods in the central part of the lesson when the basic learning outcomes set by the subject curriculum are realised ($\chi^2 = 9.60$; $p < 0.05$). During this stage of the lesson, teacher-centred teaching methods are used more frequently than student-centred ones. It has also been determined that during the stages of doing exercises and revision, which aim to implement the acquired knowledge and further develop students' acquired competencies, there is no statistically significant difference in the frequency of employment of teacher-centred and student-centred teaching methods. However, when it comes to the last stage of the lesson, when the formative assessment of students' achievement is conducted, a statistically significant more frequent use of teacher-centred assessment methods was determined in comparison to student-centred ones ($\chi^2 = 13.64$; $p < 0.01$).

4 Discussion

The implementation of student-centred teaching strategies and methods into the everyday teaching practice depends on numerous elements which are under the teachers' control. One of them are the beliefs teachers have about their application, i.e., their preference for the use of teacher-centred or student-centred teaching strategies and methods (Allen and Jackson, 2017). Teachers' beliefs are a mighty indicator of the way they teach students, assess them, and implement the curriculum (Chang, 1997; Sun, 1991; Guo, 1970, as cited in Chan, 2000). Previous research has confirmed that the way a teacher teaches is strongly connected to his or her belief system (Clark and Peterson, 1986; Richardson, 1997; Tobin et al., 1994) and that they make decisions about their lessons based on a complex interpenetration of their beliefs and knowledge (Bryan and Abell, 1999).

The aim of the research was to determine the class teachers' preference for student-centred or teacher-centred teaching strategies and methods, and the frequency of their employment in science and social studies classes, as well as the correlation between these variables. Numerous studies explored the effects of student-centred teaching strategies and methods on the development of students' competencies, and most of them have deduced the positive effects of such strategies and methods on the development of learners' competencies (Veselinovska and Kirova, 2014; Letina, 2016). It is therefore extremely important to analyse and examine the representation of the employment of

student-centred teaching strategies and methods in the educational practice in order to determine their potential impact on the quality of the educational process.

The school subject Science and social studies has been chosen for the research due to the interdisciplinarity of the subject, encompassing the synergy of natural (biology, chemistry, physics), social (sociology), humanistic (history, philosophy) and interdisciplinary sciences (geography). In this case, interdisciplinarity enables the application of a wide range of student-centred teaching strategies and methods, such as inquiry-based learning, discovery learning, problem and project teaching, methodical games and cooperative learning, which include students in the active learning process. This research has determined that teachers prefer student-centred teaching strategies and methods in science and social studies teaching, and consider them effective in achieving the numerous learning outcomes set by the subject curriculum. They also consider them stimulating for the development of students' knowledge, skills and attitudes, but nevertheless employ them only occasionally in science and social studies classes. On the other hand, they prefer teacher-centred learning strategies and methods, especially in the central part of the lesson, when the realisation of the learning outcomes is most intensive, and during the assessment of students' achievements. All that occurs in spite of previous research (Markuš and Čagan, 2017; Markuš and Hus, 2018; Maksimović et al., 2020; Jukić Matić et al., 2020) which showed that student-centred teaching methods, especially in primary school science classes, contribute to a better understanding of teaching contents, the development of higher-order thinking skills and in general to the development of a number of student competencies necessary for lifelong learning.

It is still not possible to fully claim that teachers show a positive preference for the use of student-centred teaching strategies and methods since they employ them only occasionally. Such results are quite disturbing seeing that the educational documents dealing with the principles of student-centred science and social science teaching promote the employment of the strategies and methods of active learning (Ministry of Science and Education, 2019). Some prior research studies came to similar results, so it can be determined that the discrepancy between attitudes and practice is not so rare an occurrence among educational workers (Serbessa, 2006; Hismanoglu and Hismanoglu, 2010; Karanezi, 2014; Sen and Sari, 2018; Kaymakamoğlu, 2018). Although teachers' attitudes have a strong impact on the way they teach, in this case it did not turn out to be a sufficient predictor for a more frequent use of student-centred teaching strategies and methods, in spite of the established statistically significant positive correlation between teachers' beliefs and the frequency of their employment.

In light of these results, it is necessary to conduct a more systematic analysis of the reasons for the existence of such a discrepancy, and determine the possible difficulties and challenges teachers face during the organisation of student-centred teaching. It is also necessary to analyse the reasons why teachers still employ teacher-centred teaching strategies and methods more frequently than the student-centred ones. We recommend taking appropriate steps in the educational policy to bring about a change in the present conditions. Mynbayeva, Sadvakassova and Ashalova (2018) concluded that the application of innovative teaching methods depended on the teacher's personality, methodological competence and pedagogical skills. In this context, further steps could be directed toward the development of teachers' competencies in the employment of teaching strategies and methods which put the student in the centre of the teaching pro-

cess. The Republic of Croatia has undergone a curricular reform which has resulted in new subject curricula enhancing the use of active learning methods and student-centred teaching, but it is doubtful whether the curricular and educational policy change has really come to life in the teaching practice.

This research has confirmed that teachers' beliefs and their positive opinion about student-centred teaching are very important since there is a correlation between their opinion about a certain group of teaching strategies and methods and the frequency of their employment. Therefore, further promotion of the development of teachers' positive opinions as part of their professional development is necessary and includes the aforementioned development of professional competencies for the employment of active learning strategies.

5 Conclusion

In spite of the relatively affirmative conception of student-centred teaching and learning strategies and methods, what can be noticed is a disbalance between teachers' opinions and their practical employment in teaching. The teacher-centred teaching strategies and methods are still predominant, especially in the central part of the lesson, during the realisation of new learning outcomes. Such a finding is probably the result of a still dominant class-subject-school hour system and a routine teaching practice not inclined toward the introduction of innovations in the educational system. Although the research results show the teachers' awareness of the importance and significance of conducting student-centred teaching, the frequency with which they employ it is still not at a satisfactory level. During science and social studies lessons, an active student can usually be noticed during the motivation stage when teachers employ student-centred teaching methods more frequently. On the other hand, the stages of the realisation of new learning outcomes and assessment are usually still conducted by the teachers employing teacher-centred teaching methods. Thus, it is necessary to re-examine the reasons why the teacher-centred paradigm is still dominant. In light of these findings, it is important to remove the obstacles which prevent a more frequent employment of student-centred teaching strategies and to implement them in everyday teaching practice in the first educational cycle.

Dr. Alena Letina, Katija Kalinić

Uporaba učnih strategij in metod pri poučevanju narave in družbe

Skladno s kritično-konstruktivno didaktiko je razvoj avtonomije osebnosti temeljni cilj izobraževanja, zato naj bi bilo poučevanje in učenje interakcija, v kateri učenci ob podpori učiteljev samostojno pridobivajo nova znanja in s tem razvijajo svoje kompetence (Klažki, 1992). Takšen pogled na izobraževanje je sprožil precejšnjo kritiko tradicionalnega poučevanja, osredotočenega na učitelje, ter aktualizacijo aktivnega učenja

in poučevanja, osredotočenega na učence. Poskusi odpravljanja pomanjkljivosti pri poučevanju, osredotočenem na učitelja, demonstracijskem poučevanju in šoli pomnjenja se kažejo v uporabi sodobnih strategij poučevanja, kot so raziskovalno, problemsko, projektno poučevanje in učenje z odkrivanjem, ter z njimi povezanih metod poučevanja. Takšne učne strategije v središče pozornosti postavljajo proces učenja, katerega osnovni cilj je razvoj učenčeve občutljivosti za vprašanja in probleme ter njegove sposobnosti divergentnega mišljenja, apliciranja pridobljenega znanja, pregledne uporabe znanja, samorecepcije in kritičnega mišljenja, vključno z intelektualnimi in čustvenimi izkušnjami učencev. Intelektualna izkušnja se nanaša na miselne dejavnosti, kot so opazovanje, zaznavanje, mišljenje, abstrakcija, posploševanje, analiza, sinteza, primerjava, medtem ko se čustvena izkušnja nanaša na dejavnost učenca in njegov odnos do dela. Učna strategija in metode, ki bodo to omogočale, s svojimi osnovnimi značilnostmi postajajo ena najpomembnejših determinant sodobnega pristopa k izobraževanju.

Izvajanje sodobnih učnih strategij in metod v vsakdanji pedagoški praksi je odvisno od številnih elementov, ki so v pristojnosti učiteljev. Eden izmed njih so mnenja, ki jih imajo učitelji o njihovi uporabi, torej ali dajo preferenco uporabi nizu učnih strategij in metod, ki so usmerjene na učitelja, ali tistim, ki so usmerjene na učence (Chang, 1997; Sun, 1991; Guo, 1970, v: Chan, 2000). Dosedanje raziskave so potrdile, da je način poučevanja močno povezan z učiteljevim prepletom prepričanj (Clark in Peterson, 1986; Richardson, 1996; Tobin, Tippins in Gallard, 1994) in da odločitve pri poučevanju temeljijo na zapletenem prepletanju njihovih prepričanj in znanj (Bryan in Abell, 1999).

Cilj raziskave je bil preučiti preference osnovnošolskih učiteljev pri uporabi učnih strategij in metod, namenjenih učencem in učiteljem, ugotoviti mnenje učiteljev o tovrstnih strategijah in metodah ter pogostost njihove uporabe pri vsakodnevem poučevanju narave in družbe ter v posameznih etapah pouka, prav tako pa tudi povezanost med zapisanimi spremenljivkami. Za namen raziskave smo izbrali poučevanje narave in družbe zaradi interdisciplinarnosti predmeta, ki vključuje sinergijo naravoslovja (biologija, kemija, fizika), družboslovja (sociologija), humanistike (zgodovina, filozofija) in interdisciplinarnih ved (geografija). Interdisciplinarnost v tem primeru omogoča uporabo širokega spektra učnih strategij in metod, kot so raziskovalno učenje, učenje z odkrivanjem, problemsko in projektno poučevanje, didaktične igre in sodelovalno učenje, ki učence vključuje v proces aktivnega učenja.

Raziskava je bila izvedena na vzorcu 301 osnovnošolskega učitelja z območja Republike Hrvaške. Rezultati kažejo, da imajo učitelji pozitivno mnenje o uporabi strategij in metod poučevanja, namenjenih učencem, in vidijo njihove prednosti pri doseganju ustreznih učnih rezultatov v primerjavi s tradicionalnimi strategijami in metodami učenja in poučevanja, ki so namenjene učiteljem. S *t*-testom smo ugotavljali razlike med mnenji učiteljev o uporabi omenjenih skupin učnih strategij in metod pri pouku narave in družbe. Statistično značilna razlika ($t = 20,71$; $p < 0,01$) je bila pri mnenjih učiteljev zaznana v prid učnim metodam in strategijam, namenjenim učencem.

Kljub temu učitelji v vsakdanji pedagoški praksi statistično značilno pogosteje uporabljajo na učitelja osredotočene strategije in metode poučevanja, predvsem pri uresničevanju učnih rezultatov, ki jih določa kurikulum v srednjem delu pouka, medtem ko je pogostost učnih metod, ki so namenjene učencem, pri pouku narave in družbe le občasna ($t = 11,52$, $p < 0,01$).

Poleg tega so nadaljnje analize pokazale, da obstaja statistično značilna razlika med preferencami učiteljev pri uporabi učnih strategij in metod, osredotočenih na učenca in učitelja, ter pogostostjo njihove uporabe, s čimer potrjujejo rezultate podobnih raziskav (Sen in Sari, 2018; Kaymakamoğlu, 2018). Učitelji pogosteje uporabljajo učne strategije in metode, osredotočene na učitelja ($t = 13,12$; $p < 0,00$), čeprav je njihovo mnenje o njih neopredeljeno. Ugotovljeno je bilo tudi, da imajo bolj pozitivno mnenje o strategijah in metodah poučevanja, osredotočenih na učenca ($t = 16,05$; $p < 0,00$), čeprav je manj verjetno, da jih bodo uporabljali v pedagoški praksi. Predmetni učni sistem učitelje pogosto demotivira pri uporabi strategij in metod poučevanja, osredotočenih na učenca, kot so raziskovalno učenje, učenje z odkrivanjem ali problemsko poučevanje, čeprav se zavedajo, da takšne strategije in metode poučevanja niso najboljši odziv na potrebe sodobnega izobraževanja.

Z raziskavo je potrjena pozitivna korelacija med mnenji učiteljev o uporabi določenih strategij in metod poučevanja ter pogostostjo njihove uporabe, kar kaže, kako pozitivno mnenje o uporabi učnih strategij in metod, namenjenih učencem, pozitivno vpliva na njihovo pogostost uporabe.

V tretjem delu vprašalnika je bil za statistično analizo uporabe določenih metod v različnih fazah pouka narave in družbe uporabljen χ^2 test. Ugotovljeno je bilo, da obstaja statistično značilna razlika med pogostostjo uporabe učnih metod, osredotočenih na učenca, in tistih metod, ki so namenjene učiteljem v uvodnem delu ure, pri motiviranju ter vključevanju učencev v učni proces ($\chi^2 = 7,456$; $p < 0,05$) in pri katerih se uporabljajo metode poučevanja, osredotočene na učence. Prav tako je statistično značilna razlika med uporabo teh skupin učnih metod pri učenju novih učnih vsebin v osrednjem delu pouka, pri katerem poteka uresničevanje temeljnih izobraževalnih učnih ciljev, podanih z učnim načrtom ($\chi^2 = 9,601$; $p < 0,05$). V tej fazi pouka se pogosteje uporabljajo učne metode, osredotočene na učitelja.

Poleg tega je bilo ugotovljeno, da med fazami vaje in ponavljanja, katerih glavni cilj je implementacija pridobljenega znanja in nadaljnji razvoj pridobljenih kompetenc učencev, ni statistično značilne razlike v pogostosti uporabe teh oblik poučevanja, kar pomeni, da učitelji v tej etapi enako izbirajo učne metode, usmerjene na učenca, in tiste, ki so usmerjene na učitelja. Za sklepno fazo pouka, v kateri se izvaja formativno vrednotenje učenčevih dosežkov, pa je bila ugotovljena statistično značilna razlika, ki se kaže v pogostejši uporabi tradicionalnih metod evalvacije v primerjavi s sodobnimi.

Zaključimo lahko, da imajo učitelji pozitivno mnenje o uporabi učnih strategij in metod, usmerjenih na učence, pri poučevanju narave in družbe, saj menijo, da so učinkovite pri doseganju številnih učnih rezultatov, določenih s predmetnim kurikulumom, ter spodbujanju razvoja znanja, spretnosti in sposobnosti učencev. Uporabljajo jih, čeprav dajejo prednost učnim strategijam in metodam, osredotočenim na učitelja, predvsem v samem osrednjem delu pouka, ko je realizacija učnih rezultatov najbolj intenzivna, in pri ocenjevanju učenčevih dosežkov. Čeprav so prejšnje raziskave (Markuš in Čagran, 2017; Markuš in Hus, 2018; Maksimović idr., 2020; Jukić Matić idr., 2020) pokazale, da strategije poučevanja, kot so raziskovalno učenje, problemsko učenje, učenje z odkrivanjem, in z njimi povezane metode poučevanja prispevajo zlasti pri primarnem poučevanju naravoslovja k boljšemu razumevanju učnih vsebin in naravoslovnih konceptov, višji ravni razmišljanja in na splošno k razvoju številnih učenčevih

kompetenc, potrebnih za vseživljenjsko učenje. Vendar je s to raziskavo potrjeno, da te učne strategije in metode še vedno niso dominantne pri pouku narave in družbe.

Takšna ugotovitev je verjetno posledica še vedno prevladujočega razredno-predmetnega učnega sistema, ki omejuje razpoložljivi čas poučevanja, in uveljavljenih pedagoških praks, ki ne omogočajo uvajanja novosti v izobraževalni sistem, ali premalo razvitih kompetenc učiteljev za uporabo tovrstnih učnih strategij in metod. Čeprav so rezultati raziskave pokazali zavedanje učiteljev o pomembnosti in pomenu poučevanja, osredotočenega na učenca, pogostost njegovega izvajanja še vedno ni zadovoljiva. Uporaba učnih strategij in metod, osredotočenih na učenca, prispeva k sodobnemu strukturiranemu poučevanju, v katerem je učenec aktiven udeleženec učnega procesa. Aktiven učenec se v izobraževalnem procesu uči iz lastnih izkušenj, v izvorni realnosti, razvija kritično mišljenje ter preizkuša socialne in komunikacijske veščine. Skozi poučevanje narave in družbe aktivnega učenca najlažje in najpogosteje opazimo ob motivaciji, v kateri uporabimo sodobne učne metode. Po drugi strani pa fazo učenja novih učnih vsebin in vrednotenja učitelji še vedno najpogosteje uresničujejo z uporabo tradicionalnih učnih metod, namenjenih učiteljem, kar žal podpira tradicionalno strukturirano poučevanje. Takšno poučevanje ne ustreza potrebam današnjega izobraževanja, ne omogoča ustreznega razvoja kompetenc učenca, potrebnih za vseživljenjsko učenje, in ga je treba spremeniti. Zato je potrebno ponovno preučiti razloge, zakaj kljub razviti zavesti o pomenu in učinkovitosti na učenca osredotočenih strategij poučevanja še vedno prevladuje tradicionalna paradigma učenja in poučevanja. Glede na ugotovitve je pomembno odstraniti ovire, ki ovirajo pogostejšo uporabo učnih strategij in metod, usmerjenih na učenca, in jih implementirati v vsakodnevno pedagoško prakso v prvem izobraževalnem obdobju.

REFERENCES

1. Allen, R. N. and Jackson, A. (2017). Contemporary Teaching Strategies: Effectively Engaging Millennials Across the Curriculum. *University of Detroit Mercy Law Review*, 95(1), 1–34.
2. Blažič, M. (2021). Prispevek visokošolskega učnega okolja h kariernemu razvoju študentov. *Didactica Slovenica – Pedagoška obzorja*, 36(1), 93–113.
3. Hismanoglu, M. and Hismanoglu, S. (2010). Language Teachers' Preferences of Pronunciation Teaching Techniques: Teacher-Centered or Modern? *Procedia Social and Behavioral Sciences*, 2(2), 983–989. Available at: <https://doi.org/10.1016/j.sbspro.2010.03.138> (retrieved 05.05.2022).
4. Jukić Matić, L., Moslavac Bičvić, D. and Filipov, M. (2020). Characteristics of Effective Teaching of Mathematics. *Didactica Slovenica – Pedagoška obzorja*, 35(3–4), 19–37.
5. Kahn, P. and O'Rourke, K. (2004). *Guide to Curriculum Design: Enquiry-Based Learning*. Higher Education Academy, 30(2), 3–30.
6. Kaymakamoğlu, S. E. (2018). Teachers' Beliefs, Perceived Practice and Actual Classroom Practice in Relation to Traditional (Teacher-Centered) and Constructivist (Learner-Centered) Teaching. *Journal of Education and Learning*, 7(1), 29–37. Available at: <https://doi.org/10.5539/jel.v7n1p29> (retrieved 15.05.2022).
7. Klafki, W. (1992). Didaktika kao teorija obrazovanja u okviru kritičko-konstruktivne odgojne znanosti. In: Gudjons et al. (Eds.). *Didaktičke teorije* (pp. 85–134). Zagreb: Educa.
8. Lea, S. J., Stephensen, D. and Troy, J. (2003). Higher Education Students' Attitudes to Student Centred Learning: Beyond "educational bulimia" *Studies in Higher Education*, 28(3), 321–334.
9. Letina, A. (2016). Effectiveness of Inquiry-Based Science and Social Studies Teaching in the Development of Students' Scientific Competence. *Croatian Journal of Education*, 18(3), 665–696. Available at: <https://doi.org/10.15516/cje.v18i3.1735> (retrieved 25.05.2022).

10. Maksimović, J., Stanković, Z. and Osmanović, J. (2020). Application of Didactic Teaching Models: Teachers' and Students' Perspectives. *Didactica Slovenica – Pedagoška obzorja*, 35(3–4), 71–86.
11. Markuš, N. and Čagran, B. (2017). Primerjava raziskovalnega pristopa s tradicionalnim pri spoznavanju okolja. *Didactica Slovenica – Pedagoška obzorja*, 32(1), 33–46.
12. Markuš, N. and Hus, V. (2018). Uveljavljanje raziskovalnega pouka pri predmetu spoznavanje okolja in predmetu družba. *Didactica Slovenica – Pedagoška obzorja*, 33(1), 18–30.
13. Mastropieri, M. A., Scruggs, T. E., Norland, J. J. et al. (2006). Differentiated Curriculum Enhancement in Inclusive Middle School Science: Effects on Classroom and High-Stakes Tests. *American Psychologist*, 40(3), 130–137. Available at: <http://dx.doi.org/10.1177/00224669060400030101> (retrieved 15.05.2022).
14. Mayer, R. (2004). Should there be a Three-Strikes Rule Against Pure Discovery Learning? The Case for Guided Methods of Instruction. *American Psychologist*, 59(1), 14–19. Available at: <https://doi.apa.org/doi/10.1037/0003-066X.59.1.14> (retrieved 10.05.2022).
15. Ministry of Science and Education (2019). Croatian National Curriculum Framework Documents. Zagreb: Ministarstvo znanosti i obrazovanja.
16. Mynbayeva, A., Sadvakassova, Z. and Akshalova, B. (2018). Pedagogy in 21 Century: Innovative Teaching Methods. In: Caverro, O. B. and Llevot-Calvet, N. (Eds.). *New Pedagogical Challenges in the 21st Century: Contributions of Research in the 21st Century* (pp. 3–20). IntechOpen.
17. Polić, M. (2000). Spoznajne osobitosti suvremene nastave. *Metodika*, 1(1), 27–39.
18. Richardson, V. (1997). Constructivist Teaching and Teacher Education: Theory and Practice. In: Richardson, V. (Ed.). *Constructivist Teacher Education: Building New Understandings* (pp. 3–14). Washington, DC: Falmer Press.
19. Saido, G. A. M., Siraj, S., Nordin, A. B. et al. (2015). Teaching Strategies for Promoting Higher Order Thinking Skills: a Case of Secondary Science Teachers. *Malaysian Online Journal of Educational Management*, 3(4), 16–30.
20. Sen, O. F. and Sari, U. (2018). From Teacher-Centered To Reform-Based Teaching Beliefs and Classroom Practices of Elementary Science Teachers. *International Journal of Innovation in Science and Mathematics Education*, 26(6), 76–95.
21. Serbessa, D. D. (2006). Tension Between Teacher-Centered and Modern Teaching-Learning Approaches in Ethiopian Primary Schools. *Journal of International Cooperation in Education*, 9(1), 123–140. Available at: <http://doi.org/10.15027/34244> (retrieved 25.05.2022).
22. Shymansky, J. A., Kyle, Jr. W. C. and Albert, J. M. (1984). The Effect of New Science Curricula on Student Performance. *Journal of Research in Science Teaching*, 20(5), 387–404. Available at: <https://doi.org/10.1002/tea.3660200504> (retrieved 05.05.2022).
23. Stevanović, M. (2003). *Modeli kreativne nastave*. Rijeka: Andromeda.
24. Šimec, M., Erjavec, K., Blažič, M. (2022). Inovativna didaktična metoda: međuniverzitetno online projektno delo. *Didactica Slovenica – Pedagoška obzorja*, 37(3–4), 3–22.
25. Terhart, E. (2001). *Metode učenja i poučavanja*. Zagreb: Educa.

*Alena Letina, PhD (1977), Associate Professor at University of Zagreb, Faculty of Teacher Education.
Naslov/Address: Borčec 10, 10000 Zagreb, Croatia
Telefon/Telephone: (+385) 098 135 75 23
E-mail: alena.letina@ufzg.hr*

*Katija Kalinić, MA (1992), Primary School Teacher at Primary School Pavlek Miškina, Zagreb.
Naslov/Address: Sveti Duh 24, 10000 Zagreb, Croatia
Telefon/Telephone: (+385) 098 135 75 23
E-mail: katija.kalini@gmail.com*