Scientific Electronic Archives
Issue ID: Sci. Elec. Arch. Vol. 17 (3)
Mai/Jun 2024
DOI: http://dx.doi.org/10.36560/17320241918
Article link: https://sea.ufr.edu.br/SEA/article/view/1918

ISSN 2316-9281

Interview as a research method in teaching: a case study

Corresponding author
Jelisavka Bulatovic
Academy of Technical - Art Professional Studies, Belgrade, Serbia
jelisavka.bulatovic@gmail.com

Abstract. Although the application of modern technologies in the education system of Serbia shows signs of progress in the last few years, it is still not at a satisfactory level. Hence the demands for improvement of learning methods and means are imposed.In order to determine to what extent each form of work is represented in the teaching of informatics and computer science, we conducted an interview with teachers of informatics and computer science in elementary schools in the territory of the cities of Belgrade and Novi Sad. The sample includes 19 teachers. The teachers answered 23 questions, which we divided into five groups.The research was conducted in two phases in May 2022 and June 2023. Contemporary conditions require a change in the content and methods of organizing the education process, and the transformation of the traditional school into a research unit ready to accept innovations.
Keywords*:*Interview, teacher, teaching, forms of work, students.

Introduction

The importance and role of the teacher, as one of the key factors of the quality teaching process, has always attracted the attention of various authors and has been the subject of numerous theoretical considerations and empirical research, both in the field of informatics and computing and beyond. Considering the scope and breadth of problems in the teaching process, the role of teachers and methods of teaching work are studied within different areas, such as, for example: school age of students, level of student achievement, type of school, teaching subjects, teaching methods, forms teaching work...In this paper, the role of informatics and computer science teachers was studied in relation to general questions about forms of work in this subject. The research was carried out with the aim of determining the actions of teachers who realize their professional role in the most important areas of teaching activities (organization and implementation of teaching; developing students' motivation and interest in learning IT content; achieving quality communication and interaction in the teacher-student relationship, as well as to their connection with the achieved level of student success in the teaching of informatics and computer science is determined.For research purposes, a semi-structured interview was used, when the researcher asks a series of formulated but open questions; which enables more control over the direction and content of the conversation, than in the situation of an unstructured interview; during the interview, the researcher can obtain data that is not expected, and illuminates the given phenomenon from a different angle, and also allows asking additional questions, which did not exist in the preparation of the interview, which makes this type of interview flexible and suitable for research in which a phenomenon needs to be looked at in depth and where the personal experience of the respondents is very important(seeAyres, 2008).Based on the above-mentioned summary, it can be said that one of the basic questions, as emphasized by Maksimović (2012), about which they argue is: are teaching and learning understood as complementary, interdependent processes within the teaching process? That is, should and can teaching be understood as something that the teacher deals with, or as a process in the center of which are students who also have an active role in it?Therefore, at the center of consideration of these different understandings of teaching methods is the relationship between the learning and teaching process, as well as the question of what is the ultimate goal of teaching, what should it achieve? Considering that the forms of work in teaching are

multiple, and the learning styles are diverse, it can be said that the problem of choosing the form of work in teaching is further complicated because this indicates the need to use more forms of teaching in work, depending on what one wants to achieve.

Analysis and discussions

In order to determine to what extent each form of work is represented in the teaching of informatics and computer science, we conducted an interview with teachers of informatics and computer science in elementary schools in the territory of the cities of Belgrade and Novi Sad. The interview was related to the teachers' experiences, that is, their attitude towards certain forms of teaching. The sample included 19 teachers. The teachers answered 23 questions, which we divided into five groups. The research was conducted in two phases in May 2022 and June 2023 for the purposes of creating the publication "Teaching aids in the teaching of informatics and computer science".Due to the incompleteness of the data, in this text we provide only partial results related to "Interview as a research method in teaching: a case study". In the naturalistic paradigm, which assumes the individual as the basis of society, the interview is one of the indispensable methods. Human interaction is one of the central ways to exchange information, including knowledge(Kvale, 1996). However, not every communication and not every conversation is an interview. The difference between an interview and an ordinary conversation is that the interview serves a specific purpose other than the conversation itself (e.g. to learn something about a certain topic or a certain experience of the participants), and in most cases it is a one-way dialogue, where the researcher asks questions, and the respondent answers them(Brinkmann, 2008).Qualitative research as a basic requirement must meet the criteria that make up the naturalistic paradigm: the natural environment is the place where data is collected; the context of the whole situation is inseparable from the experiment; the researcher is part of the milieu he examines; the data are important for the given social context and situation; the only real instrument for measuring human behavior is man himself as such, the researcher is the key instrument of research; the data is descriptive; the focus of research is more processes than final products; categories are generated by induction; the data are presented from the perspective of the respondent and not the researcher(Lave and Kvale,1995In the text of the research itself, we relied on the many years of experience of the authors of these lines in teaching informatics and computing and in conducting survey research (see Bulatović, 2002; Bulatović, 2008; Bulatović, 2011a; Bulatović, 2011b; Bulatović, 2011c; Bulatović, 2013a; Bulatović, 2013b; Rajovic and Bulatovic, 2016; Rajovic and Bulatovic, 2022; Bulatovic, 2024a; Bulatovic, 2024b).

General questions about forms of work

The first group of questions consists of general questions about forms of work, that is, what form of work do teachers use most often, why do they use that particular form of work in class, what guides them when choosing work, do students understand the content of the lesson - when they work in groups or in pairs , independently or as a whole, whether they use the advantages of expository teaching or the oral presentation method, how they solve the problem of student dominance in a group or pair, and how they solve the passive relationship of students in a group or pair. In regular classes, the traditional form of work dominates: lecture - examination - assessment.However, the demands and expectations that real, modern life sets before students are completely out of step with how we prepare them for that life. Action-oriented teaching implies active acquisition of knowledge. If it is reached in an active way, that knowledge is more permanent and applicable. Students must be shown how to learn, how to search the literature, how to find key words in the text, how to make an overview of the material, how to connect information, how to find those that are not given in advance; then, how to read graphs, maps, drawings, but also how to monitor and evaluate the effectiveness of one's own learning.The ways of presenting teaching content in school should be based on these principles. Students' independence and efficiency in learning can be realized through these parameters, therefore, by mastering these skills and abilities. They are a universal tool that allows handling very different contents. The choice of how to work with the class on some teaching content depends directly on the teacher.The teacher is an irreplaceable figure in the educational process, but his role changes significantly in the new, modern conditions of life and schooling. The evaluation of the teacher's work becomes such an important link in the educational process, but even more, it becomes an assessment of the teacher's responsibility towards himself, towards his personal work and his attitude towards work. It should be an incentive and motivation, it should represent the beauty of the call and constantly call for improvement. Because the only way for students to be constructors of their own knowledge, and not accumulators of facts, is for them to actively work on acquiring their knowledge and for the teacher to be their guide and collaborator.Our research records show us that teachers most often opt for the frontal form of work in combination with the dialogic method with the use of video beams and computers. Mostly, teachers believe that this is the easiest and best way to explain the material and that students understand the contents of the lesson better when they work as a whole. At the same time, they emphasize that by using this form of teaching, they get feedback from the students - whether they understood the material or not. Only five teachers, and that very rarely, apply the group form of work in class and believe that the students understand the material better and connect

the content.As for the problem of student dominance, they are usually given higher-level tasks, while with withdrawn students, teachers emphasize that they try to motivate and involve them in the work, by using the conversation method to determine what they would like to do the most... It is often in apply and individual form, which has its advantages as stated by the teachers, especially with withdrawn students who do not find their place in the group and better understand the content of the lesson when they work independently. The absolute majority of teachers opt for this work when it comes to renewing teaching units or when there is a question of systematizing the material.Teachers state the criteria they are guided by when choosing the form of work, and these are mainly related to the teaching units and the departments themselves (number of students, their occupations). Only three teachers use the method of practical works and the laboratory-experimental method in their teaching, one teacher gladly applies the method of graphic works, while the other teachers have modernly equipped offices, where it is always possible to make presentations, use the internal in class, watch a movie...The method of practical work, as emphasized by these three teachers, means the way teachers and students work on a specific subject. Teachers indicate the stages through which practical work goes: acquisition of theoretical knowledge, application and giving of work tasks and work instructions, division of students into groups, direct execution of tasks (practical activity), analysis and evaluation of completed tasks. The interviewed teachers of the three, who occasionally opt for the laboratory-experimental method in teaching, emphasize that in this case the students independently observe objects and phenomena.Students perform both qualitative and quantitative experiments for the purpose of checking acquired knowledge or for the purpose of proving experiential material, which can serve as a basis for performance, generalization. Students perform such research works in which they independently examine phenomena by varying their conditions, and finally such works in which the examination of phenomena is related to the creation of appropriate devices, models...The method of graphic works is the work of teachers and students, where certain parts of the teaching contents are expressed by drawing. The teacher, who occasionally opted for this form of work, cites the advantages of the method of graphic works: it enables complex phenomena and processes to be simplified and thus easier to understand, and the contents to be remembered and become a permanent property of the students; allows showing only the essential features of a subject and appearances without other details, which directs the student's attention to what is most important; it can be used to show some processes more successfully than on natural objects or large technical devices(production and use of electricity is better understood on the scheme than in the power plant, the structure and function of the blast furnace...); the internal structures are very successfully shown in the drawings; presentation with a drawing also engages the sense of sight, which enables contents to be absorbed better than when they are presented only with living words; it makes students independent and gets them used to showing objects and phenomena graphically.Therefore, the conversation method is very often used in the teaching of informatics, as stated by the absolute majority of teachers. It consists of questions and answers, where the teacher usually asks, and the students answer, but it can also be the other way around. This method is most often used in classes when repeating, practicing and checking knowledge, as well as when processing new material. According to the character of didactic guidance, the conversation, as stated by the teachers, can be: directly led by the teacher - strictly controlled conversation, free - the teacher leaves the initiative to the students, and discussion - a conversation in which opinions are confronted. In a strictly controlled conversation, the role of the teacher is in the foreground.

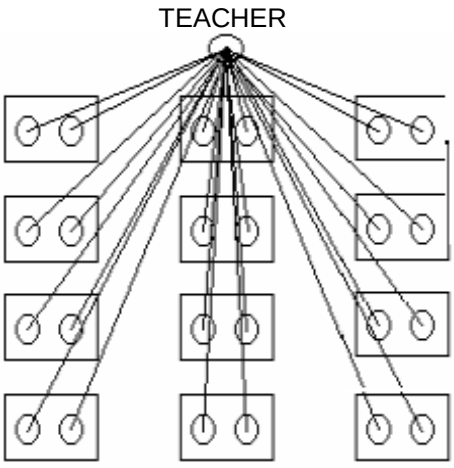

Figure *1.* Frontal teaching form (Voskresenski and Glišic,2007)

The teacher asks questions strictly taking into account the set goal. The class consists of a "question - answer" formula. It is often used in the introductory part of the class, when it is necessary to connect the material covered earlier with new contents and when it is necessary to quickly check the student's knowledge. Students' initiative comes to the fore in the free teaching conversation. The teacher conducts the conversation from a different perspective, helps, advises, directs the class so that it does not deviate from the set goal. Free conversation requires patience, waiting for an answer and reciprocity of listening, explaining one's point of view.Often, incorrect answers are a stimulus for discussion and explanation among students, which can lead to more accurate knowledge of their environment. Discussion improves and develops listening, cooperation and acceptance of different opinions. The application of the discussion method

is appropriate, as the teachers emphasize, if we want to "achieve students' ability to think critically when judging ideas, as well as their language skills in exchanging with others"(see Nias,2002;Ball et al,2009;Qappleton,2013;Asaloei et al,2020;Irkinovich and Izatullaevna, 2022; Gumartifa et al,2023).

Questions for group work

The second group of questions relates to the experience of teachers in relation to group work, whether students are ready for this form of work, how often they use group work in class, how satisfied students and teachers are with this form of work, whether the group functions well, what are the criteria for selecting a group, the number of members in the group, how much each member contributes to the work of the group, what needs to be modified and changed to make the group more successful. The application of the group form of teaching work has its sociological, psychological, pedagogical and didactic justification. Pedagogical values of work are reflected in: creation of social work habits for group work; building the need for joint work, rational use of available time in class; understanding the importance of helping students who are lagging behind; training students for self-education and permanent education - Life Long Learning; realizing greater economy in learning; achieving work discipline and agreement; developing a sense for the division of labor; more efficient use of different sources of knowledge; greater student freedom in all phases of teaching; more effective training of students for independent work and knowledge acquisition; greater freedom in creative expression; complete humanization of teaching.The psychological values of the group form of work in students develop feelings for: togetherness; tolerance; adaptability in society; faster adaptation to new situations; understanding and accepting other people's views and opinions; successful development of all-round thinking activity, ... The sociological values of the group form of work are reflected through: fostering camaraderie and friendships and relationships in smaller and larger groups of students; developing awareness that greater results and work effects can be achieved through association; continuous and organized formation of own attitudes, views, opinions, interests, ambitions; getting to know your "I" better and your own identity...(see Syslo and Kwiatkowska, 2005; Dagienė, 2008; Sabizter et al,2014; Centyru et al,2020). Research records have shown us that group work is rarely used in teaching. As a reason, the absolute majority of teachers emphasize that the students do not have the necessary knowledge, that they do not take this form of work seriously, that they have little time to carry out this form of teaching (they need at least two hours). Also, the teachers claim that only in trial distances, this kind of work can be successful.

Questions for individual form of work

The third group of questions refers to the individual way of working with students. How much time does individual teaching take in class, are the tasks and activities appropriate to the needs of individuals, how often do they make presentations, how much attention do teachers pay to gifted students. When asked how much time it takes to prepare for individual lessons, the teachers answered not too much time. Most of the tasks are suitable for the average student.In addition, teachers hold additional classes, as well as preparations for passing the junior high school diploma. As for presentations, a number of teachers ask for at least two presentations during the year. The individual form of work represents such an organizational form in which each student does a task independently, whether it is the same for all students or different for each student, without exchanging information. Applying an individual form of work gives students the opportunity to rely on themselves, to overcome difficulties with their own effort and progress at their own pace and prepare for self-education. Individual work as a way of working with students has proven to be an excellent approach to individual learning, especially when it comes to the creation of the student's own learning plan, because in this way the student gives input and control over his learning, is active in the entire process and ultimately determines his own pace of learning(see Ros et al,1999;Appelton,2003).However, as the teachers themselves emphasize - the individual form of work has its advantages and disadvantages. The advantage of the individual form of work is that, through the learning process, the student works independently on a specific task that is part of a larger task or project. After completing their task, together with the tasks of other students, the students receive the whole, that is, the final result. In this light, the teaching process itself has a greater educational value for the students because they research the information themselves and read more about the task area itself during the research. Therefore, when it comes to researching information with a textbook, research with the use of a computer is also necessary.The shortcomings of the individual way of working are reflected in the psychophysical area. Likewise, with individual work, very often the teacher creates teaching slips, therefore it is important for the teacher to prepare a sufficient number of slips and to review them thoroughly, which gives the teacher additional work during the preparation itself. In the same way, if the form of individual work is used too much in class, there may be a decrease in the development of spoken expression among students, considering that individual work is often done in written form to save time. In this regard, the lack of verbal communication in the classroom can also lead to poor socialization and communication among students(see Doppenberg et al,2012; Woods and Jeffrey, 2019).

Questions for pair work

The fourth group of questions includes pair work. How many students in pairs are ready to help each other, if not, why not. The questions for working in pairs included answers to the question - if there are a good and a weaker student in a pair - what is the result. Work in pairs is one of the forms of teaching which is defined as the work of students in pairs, as part of which students jointly try to solve a certain problem and in the process exchange and supplement their own knowledge. According to Brüning and Saum (2008), they point out the existence of nine simple strategies according to which it is possible to work in pairs so that it is more productive.The first strategy is summarization, in which one member of the pair tries to tell certain information to the other pair, after which the task of the second member is to recount what he heard, while the first member checks the accuracy of the information recounted by the other member. Furthermore, we have a correction strategy that is based on the presentation of correct and incorrect information to the member of the pair, in which one member of the pair listens to the correct and incorrect information while the other listens to him and points out and corrects the incorrect information. During this time, his other member of the pair listens to him and monitors the correctness of the correction. Then we have the reconciliation strategy. It is based on an agreement between the couple about the presentation of information or a task to the group in order to agree on common solutions.

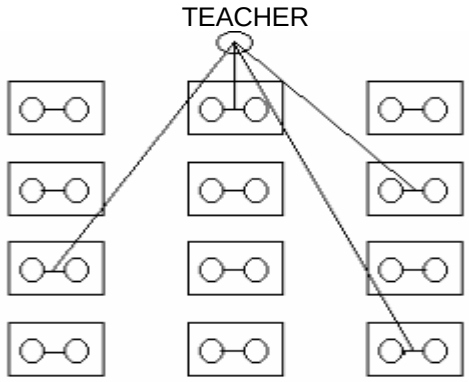

Figure 2 .Pair work as a teaching form (Voskresenski and Glišic,2007)

Next is the strategy of reverse information in which one member of the pair presents the information in a logical order while the other pair is tasked with retelling the same information in reverse order. This way of working is alternately repeated by both members. There is also a continuation strategy in which the members of the pair supplement each other with concepts or information related to a certain topic, while on the other hand, in the supplement strategy, one member initially tells his knowledge about a topic, while the other member supplements it.Then we have a strategy of verbalizing thoughts within which the members present their individual work and the obtained result to their other pair. Then follows the strategy of testing the students - after acquiring certain knowledge, the students are examined together in relation to a certain material and thus learn together about a certain topic. Finally, we have an active listening strategy in which the members of the pair alternately point out information on a certain topic, after which they recount the said information to their partner, who then confirms or supplements what was said (Brüning and Saum,2008).This form of work is rarely used in teaching, because as the surveyed teachers emphasize, they require more independent work. The questions for working in pairs included answers to the question - if there are a good and a weaker student in a pair - what is the result. Teachers who use pair work emphasize that the best results are achieved if both students are average, and if they are weaker students, then the lowest results are achieved.Students mostly help each other, but it is also evident that some students are eager to prove themselves and want to do everything independently. Teachers who use pair work believe that the best results are achieved if both students are average, and if they are weaker students, then the worst results are achieved. Students mostly help each other, but it is also evident that some students are eager to prove themselves and want to do everything independently.

Questions for team teaching

The fifth group of questions is related to team teaching, that is to say which content is the most effective form of teaching and which topics are covered in their school. The definition of teamwork as a form of work in teaching is stated as a cooperative type of work in teaching that is based on the joint work of teachers and students in terms of joint planning of content and work carried out in practice. One of the possible uses of teamwork as part of teaching is if a certain group of teachers agree that they will conduct certain teaching units together, and the teams are therefore formed according to mutual agreement.The contents of informatics and computing classes are excellent for team teaching, whether it is a team of informatics and computing teachers or informatics and mathematics teachers, informatics and geography teachers, informatics and physics teachers... And all the teachers surveyed agreed on this. For example, there are a large number of programs that the aforementioned subject teachers can use, if they decide to use ICT in teaching.In addition to computer operating systems and presentation programs (the most famous of which is MS PowerPoint), there are a number of tools that teachers can use to incorporate information and communication technologies into the teaching process. These are: a blog (an internet journal that can be used for education), a forum (a web application that allows multiple users to discuss a

topic), a wiki (a web page that allows creation, modification and linking to other web pages), Wikipedia (the largest the world's online encyclopedia), podcast (audio or video recordings that are uploaded and downloaded over the Internet), social networks (the most famous of which are Facebook and Twitter), Skype (the most famous program for audio-video communication on the Internet, which combines chat, audio and video conversations , document exchange...), Youtube (a service for uploading and viewing videos on the Internet), as well as websites (pages with texts and multimedia contents) ... correlation of informatics, mathematics and physics through the Python programming language (seeMarić,***).Skupnjak (2018) states that it is important to nurture teamwork not only among students through the form of work, but also in school, but he emphasizes that the most important thing is to have and form a good team in order to achieve the aforementioned. Through the implementation itself, as emphasized by Lavrnja (1998), it is important that there is cooperation among the members, continuous and high-quality communication, teacher responsibility, flexibility, ability to plan, organization of activities and procedures, the possibility of evaluating the results achieved through learning.When implementing teamwork, it is important that the teacher has a good will to work, has the ability to organize time well, and the competence to deal with several tasks at once and to distribute them carefully. It is also important that teachers know and are able to implement the process of meaningful planning. It is also important to emphasize that in the implementation of teamwork, it is not important how much someone invested in the work itself, but what is the motivation and desire for the success of the team itself and how they achieved the given common goal(see Lavrnja, 1998;Kristofić,2016). It should also be kept in mind that each member has both virtues and flaws, and everyone can contribute to the result of a task in a different way and through different ideas and abilities. The final result, according to Cindrić et al (2010), whether it resulted in success or failure, is a reflection of the work of the entire team, therefore it is important that they work together and make decisions together about completing a task. Therefore, it is important for the team to be aware that although each individual is different, as are their skills and knowledge, that this is positive because in this way they are able to complement each other and thus focus on the quality of the task.

Conclusion

Our research record based on similar research by George(2013), Kamaliah(2018), Ruslin et al(2022) points to the following conclusions:

1. That in our educational system, with certain exceptions, the dominant philosophy of knowledge transmission and certain academic-scholastic school organization is still dominant. The teacher is most often in a situation where he sees himself, and at the same time shows it to others (primarily students), as a source of information that students should adopt and later mostly reproduce.
2. This approach to teaching is also reflected in the selection of the teaching method: most often it is verbal, and that is monologue. We are of the opinion that the reasons for this approach to teaching can be found in the traditional way of educating teachers, as well as in the fact that their work in teaching - teachers of informatics and computer science - is mostly caused by the situation on the labor market (the greatest demand for these personnel is precisely in teaching).
3. The choice of the form of work in the teaching of informatics in our educational system is absolutely correlated with the teaching aids. Namely, the logic is as follows: divide how many students we have by the number of computers, and the student: computer ratio is the obtained quotient. Working with large groups of students in the teaching of informatics cannot produce effective results, according to the teacher.
4. Technological development of modern society dictates development in all its segments, including education. Modern education is required and expected to produce a highly educated person, who is able to respond to the demands and follow the trends of modern society. Hence the demands for improvement of learning methods and means are imposed. The only question that arises is how open are we to accept changes?
5. The application of modern teaching tools, especially audio-visual and computer techniques with the use of multimedia and hypermedia, enables students to be significantly more actively involved in the teaching process, which is an indispensable requirement of modern teaching. Modern teaching technology ensures student interactivity, individualization of teaching, stronger student independence and focus on further education (Ibrahimovic,***).
6. Students are particularly interested in the world they live in, and modern technology meets their needs. It largely depends on the teacher whether their interests will be encouraged and further developed or stifled. In this direction, modern technology can become a valuable help and tool for stimulating the motivational sphere of students in the didactic-educational process at higher schools (Ibrahimovic,***).

Despite the importance of introducing technological innovations into the education system, higher education institutions in Serbia do not apply them sufficiently, and the main reason is the lack of financial resources. However, in addition to this reason, in our country there is significant resistance

from professors (mostly older population) when it comes to the introduction of newspapers into educational activities. However, improving technical equipment and digitizing the teaching process (as well as other business functions) should become a priority for all higher education institutions in the coming period. The introduction of every new technological innovation and solution in Serbia is important and affects its positioning on the Global Competitiveness List, where in 2019 it took 72nd place out of a total of 141 observed countries(Miloševic et al,2020).

References

MAKSIMOVIC, A;Teaching methods from the teacher's perspective.*Metodički obzori,* v.7, p.69-82.2012.

AYERAS, L; "Semi-Structured Interview." The Sage Encyclopedia of Qualitative Research Methods. SAGE Publications.2008.

KVALE, S; Interviews. London: Sage Publications.1996.

BRINKMANN, S; "Interviewing." The Sage Encyclopedia of Qualitative Research Methods. SAGE Publications.2008.

LAVE, J; KVALE, S; What is anthropological research? An interview with Jean Lave by Steiner Kvale. *International Journal of Qualitative Studies in Education*, v.8,n.3, p.219 - 28.1995.

BULATOVIC,J;Analysis and software suggestion for project management of introducing information system (IS).*Management - journal for management theory and practice*,v.7,n.26,p.80-87.2002.

BULATOVIC,J; Computer software and their application in design, textile technology and management.*Tekstilna industrija*, v.56,n.10-12, p.25-28.2008.

BULATOVIC,J; Key Issues in Information Systems Management: A Serbia Perspective (Delphi study). *Global Journal of Computer Science and Technology*, v.11,n.1), p.35 -50. 2011a.

BULATOVIC,J; Application of Method of Financial Risk in Serbian Companies - Survey Sample Company, *International Journal of Economics and Financial Issues*, v. 1, n.2, p.54-73.2011b.

BULATOVIC,J;Analysis and risk assessment resources planning project introducing information system, *International Journal of Business Continuity and Risk Management,*v. 2,n.2, p.105-138.2011c.

BULATOVIC,J;Demographic Differences and Professional Stress of College Employees: A Case Study in Serbia, *Kulturai Edukacja*,v.5,n.98,p.153-184.2013a.

BULATOVIC,J;Identification of risk factors that have significantly different degrees of impact on the introduction of IS, a project with virtual teams than traditional project teams: a Serbian perspective. *International Journal of Business Continuity and Risk Management*,v.4,n.3,p.189-210.2013b.

RAJOVIC,G;BULATOVIC,J;Quality of life in rural villages of Montenegro - Gnjili Potok and Vranještica: Case study, *Scientific Electronic Archives*,v.9,n.2,p.23-35.2016.

BULATOVIC,J; RAJOVIC,G; Casestudy of raccretional fishing in Rajova (Rajovic) River (Montenegro) preliminary research - Part II,*Larhyss Journal*, v.51, p.31 - 41. 2022.

BULATOVIC,J;Bulatovic,J;The use of the Internet in the performance of schoolwork: A case study,*Scientific ElectronicArchives*,v.17,n.2,p.64-67.2024a.

BULATOVIC,J;Bulatovic,J;Information technologies in teaching, *Scientific Electronic Archives*,v.17,n.2,p.76-80.2024b.

VOSKRESENSKI,K; GLIŠIC,D;Metodika nastave informatike. Zrenjanin: Tehnički fakultet"Mihajlo Pupin".2007.

NIAS, J; Primary teachers talking: A study of teaching as work. Routledge. 2002.

APPLETON, K; Science activities that work: Perceptions of primary school teachers. *Research in science education*, v.*32*, p.393-410.2002.

BALL, D. L; SLEP, L; BOERST, T. A; BASS, H; Combining the development of practice and the practice of development in teacher education. *The Elementary School Journal*, v.*109*,n.5, p.458-474.2009.

APPELTON, K; Science pedagogical content knowledge and elementary school teachers. In *Elementary science teacher education* (pp. 31-54). Routledge.2013.

ASALOEI, S. I;WOLOMASI, A. K; WERANG, B. R; Work-Related stress and performance among primary school teachers. *International Journal of Evaluation and Research in Education*, v.*9*,n.2, p.352-358.2020.

IRKINOVICH, N. R;IZATULLAEVNA, I. I;Methods for Teaching Reading. *Journal of Pedagogical Inventions and Practices*, v.*15*, p.47-50.2020.

GUMARTIFA, A; SYAHRI, I; SIROJ, R. A; NURRAHMI, M; YUSOF, N; Perception of Teachers Regarding Problem-Based Learning and Traditional Method in the Classroom Learning Innovation Process. *Indonesian Journal on Learning and Advanced Education* (IJOLAE), v.5,n.2, p.151-166.2023.

SYSLO, M. M; KWAITKOWSKA, A. B; Informatics versus information technology–how much informatics is needed to use information

technology–a school perspective. In From Computer Literacy to Informatics Fundamentals: *International Conference on Informatics in Secondary Schools–Evolution and Perspectives*, ISSEP 2005, Klagenfurt, Austria, March 30-April 1, 2005, Proceeedings (pp. 178-188). Springer Berlin Heidelberg.2005.

DAGIENE, V; Teaching information technology and elements of informatics in lower secondary schools: Curricula, didactic provision and implementation. In Informatics Education-Supporting Computational Thinking: *Third International Conference on Informatics in Secondary Schools-Evolution and Perspectives*, ISSEP 2008 Torun Poland, July 1-4, 2008 Proceedings 3 (pp. 293-304). Springer Berlin Heidelberg.2008.

SABIZDER, B; ANTONITSCH, P. K; PASTERK, S; Informatics concepts for primary education: preparing children for computational thinking. *In Proceedings of the 9th Workshop in Primary and Secondary Computing Education* (pp. 108-111).2014.

CENTRY, J; FERRIS, K. A; ZOU, H; Finding time for computer science in the elementary school day: a quasi-experimental study of a transdisciplinary problem-based learning approach. *International Journal of STEM Education*, v.7, p.1-16.2020.

ROS, M; SCHWARTZ, S. H; SURKISS,S; Basic individual values, work values, and the meaning of work. *Applied psychology*, v.48,n.1, p.49-71.1999.

APPLETON, K; How do beginning primary school teachers cope with science? Toward an understanding of science teaching practice. *Research in science education*, v.33,n.1,p. 1-25.2003.

DOPPENBERG, J. J; BAKH, A. W; BROK, P. J. D. (2012). Collaborative teacher learning in different primary school settings. *Teachers and Teaching*, v.18,n.5, p.547-566.2012.

WOODS, P;JEFFREY, B; Teachable moments: The art of teaching in primary schools. Routledge.2019.

BRUNING, L; SAUM, T; Suradničkim učenjem do uspješne nastave: kako aktivirati učenike i potaknuti ih na suradnju. Zagreb: Naklada Kosinj.2008.

MARIC,F;Correlation of informatics, mathematics and physics through the programming language Python. Serbian Academy of Sciences and Arts.pp.8-29.(***).

SKUPNJAK, D;Team work and supervision of school teams. Varaždinski učitelj, v.1,n.1, p.5-15.2018.

LAVRNJA, I;Chapters from didactics. Rijeka: Faculty of Pedagogy Rijeka.1998.

KRIŠTOFIC, K;Characteristics of social forms of work in student-oriented teaching. Zagreb: Teacher Training Faculty in Zagreb.2016.

CINDRIC, M; MILJKOVIC, D;STRUGAR, V;Didactics and curriculum. Zagreb: IEP.2010.

GEORGE, M; Teaching focus group interviewing: Benefits and challenges. Teaching Sociology, v.41,n.3,p. 257-270.2013.

KAMALIAH, N; Use of The Three-Step Interview Technique in Teaching ESL Speaking. English Education Journal, v.9,n.1, p.82-101.2018.

RUSLIN, R; MASHURI, S; RASAKH, M. S. A; ALHABSYUI, F; SYAM H; Semi-structured Interview: A methodological reflection on the development of a qualitative research instrument in educational studies. IOSR Journal of Research & Method in Education (IOSR-JRME), v.12,n.1,p. 22-29.2022.

IBRAHIMOVIC,S;Educational technology and modern teaching. TechnicalFaculty of Science Čačak.(***).

MILOŠEVIC,I;OBRADOVIC,J;DMITROVIC,M;Moder n technologies in the service of modern education. XXVI Meeting Trendsof Development: "Innovationsin Modern Education", Kopaonik, 16 - 19. 02. pp. 1-4.2020.