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**IMPLEMENTATION OF ELECTRONIC LEARNING IN THE CLASS TEACHING
IN PRIMARY SCHOOL**

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Abstract: *This paper will present the results of an empirical study on the implementation of electronic learning in the class teaching in primary school (ELCTPS). Electronic learning is an interdisciplinary concept. From the aspect of the problem of this pedagogical research, electronic learning involves the use of information and communications technology (ICT) in teaching, and the modernization of its didactics and methodology in order to achieve the expected efficiency of teaching, success in learning and student participation in the classroom. The crucial goal of electronic learning is to enable students to learn more effectively, to be in charge of their learning process and to start learning through research, to develop lesson plans on their own and to be encouraged to exchange information within the learning group; moreover, electronic learning should provide more effective feedback on learning success. The research started from the general assumption that electronic learning significantly influences the effectiveness of class teaching in primary school, and it encourages the students to learn and participate in the class teaching. Specific assumptions have been made that this research would determine that university students taking the Class Teaching Course (CTC) do not have sufficient knowledge to use ELCTPS and that there is a correlation between the opinion of students taking the CTC about the contribution of electronic learning to the effectiveness of the class teaching in primary school, as well as to the learning and participation of primary school students in the class teaching, and the academic success in their studies so far. In order to confirm this, a survey was conducted in the second half of 2019, on a sample of 105 students taking the CTC at the Teachers' training faculty in Prizren (Republic of Serbia), which is presented in this paper. The data collected by using the ELCTPS Scale were analyzed by using descriptive statistics and linear correlation. Descriptive statistics has shown that the CTC students generally believe that they have medium knowledge of ELCTPS, or they felt that they had insufficient knowledge of it. Linear correlation has identified a strong and positive correlation between the CTC students' opinion about the contribution of electronic learning to the effectiveness of lower primary school classes, as well as to the learning and participation of primary school students in the classroom, and the academic success in their studies so far. Based on the critical comparative analyzes presented in this paper, and the results of the empirical research, along with considering the didactic and methodological practice in the Republic of Serbia where electronic learning is still not used sufficiently, it was suggested that the ELCTPS should be more efficient (Table 3; Histogram 1).*

Keywords: *educational software, implementation of educational software, student learning and participation in the classroom, innovative models, reverse design in lesson planning*

I. INTRODUCTION

The intensive technical and technological development, the educational standards, the social environment, imperatives of the educational strategy, achievements of the modern pedagogical science, the innovated teaching models, as well as the educational policies require the teachers' professional growth and development, making this process necessary, obligatory, continuous, dynamic and constant. The professional challenges faced by the 21st century teachers also relate to the effective implementation of modern educational technology in teaching, which should not be the end goal, but rather a tool, a mechanism to achieve the defined learning goals and objectives. It is important to emphasize that by improving e-learning and e-teaching skills, the teachers do not significantly change their role as educators in the process of teaching. Teachers are still lesson planners, organizers, implementers, diagnosticians, therapists, evaluators, etc., but thanks to these new competencies, these roles are accomplished in a more efficient, rational and creative way: What changes is "... the way the lessons are planned, the teaching and learning conditions for both students and teachers are changing, which is why the necessary data and information are presented to the students in a faster, easier, more rational, systematic, more precise and economic way, or more importantly, the students reach such information with their own efforts" [12]. E-learning should be understood as the type of learning that is supported and facilitated by the use of ICT, as a corpus of diverse activities that support learning; at the heart of the e-learning process is the learning process itself, while the innovated ICT solutions are only there to support it... The term "e-teaching" can be understood in two different ways - as a teaching process based on the interaction between teachers and students, but also as the teachers' teaching activity. "The architecture of e-teaching is centered on the teacher, while the architecture of e-learning is centered on the student" [8]. The effectiveness of both e-teaching and e-learning is largely determined by the competencies of teachers.

Teachers' e-competencies are one of the most significant professional competencies of teachers, and they rely on a broad body of knowledge and abilities expressed through the main categories of professional competencies. From the aspect of the achievements of modern didactics and methodology, the professional development of teachers must be directed towards the development of the teachers' e-competences which are based on the respect for the rules of the teaching process, the rules of upbringing and education, as well as of learning and development of students [11]. For example, Dondi believes that e-learning and e-teaching are related to the professional roles and stages of the teaching process [3].

Table 1. The overview of teacher assignments within the four main processes (stages) of electronic teaching

Teaching process (stage)	Examples of traditional teaching objectives – the teacher should:	Examples of specific tasks related to technology and e-learning - the teacher should:
Analysis of the context and students' needs	<ul style="list-style-type: none"> - Designs ad hoc instruments to analyze the educational/learning needs (individual, socio-economic and other needs). - Provides initial information and advice on the course syllabus. - Provides continuous guidance and support to students as they learn. - Uses the results of the learning needs analysis to design or adapt the course curriculum. 	<ul style="list-style-type: none"> - Analyzes and selects virtual media to be used for instruction purposes based on students' educational needs.
Lesson planning and design	<ul style="list-style-type: none"> - Selects and / or develops appropriate supporting teaching material. - Designs the appropriate support system in the classroom among the 	<ul style="list-style-type: none"> - Develops digital/electronic learning materials. - Designs online lectures and course materials (selects the most appropriate media, communication strategies, languages, teaching and learning resources).

Teaching process (stage)	Examples of traditional teaching objectives – the teacher should:	Examples of specific tasks related to technology and e-learning - the teacher should:
	students and with other teachers and school services (tutors, mentors, moderators, etc.). - Identifies the main approaches in assessment and evaluation. - Adapts the suitable learning strategies. - Uses the appropriate communication strategies. - Encourages participation and collaboration.	- Designs an online support system (identifies roles, responsibilities, teaching plans). - Schedules the on-line lessons (uses solutions such as real-time sessions, virtual classrooms, etc.). - Provides technical expertise.
Distribution of learning materials and program within the e-learning framework	- Uses the appropriate assessment techniques. - Manages student effort and help them to overcome potential struggles. - Establishes appropriate relationship with students. - Provides specialized learning materials. - Manages the activities that facilitate learning. - Coordinates different courses.	- Uses websites to communicate with students. - Uses email to communicate with students and tutors. - Uses message boards, discussion boards, texts, video and audio conferences to communicate with students. - Investigates and analyzes student participation (using computer-aided assessment tools).
Monitoring and evaluation	- Tracks student progress. - Evaluates student achievement.	- Develops evaluation tests using computer programs to generate tests. - Analyzes the evaluation data obtained through the on-line system.

Table 1 shows the examples of traditional teaching and learning objectives, and examples of specific tasks related to educational technologies and e-learning that teachers implement within the four main processes of electronic teaching. Based on this comparative analysis, it can be concluded that the successful electronic learning depends on the creative synthesis between the teaching process, the teaching contents, and the material and technical foundations, with the aim of improving the cognitive, psychological, emotional, and social life of all participants in the process of education.

To what extent and in what way the teachers will align the traditional pedagogical values and modern educational technology by using it for the purposes of teaching, learning and student development depends on their preferences and acquired competencies, both during their initial education, the second and third level of education, as well as during the non-formal and informal professional development of teachers.

All of the analyses conducted so far have shown that only certain schools use the correct web-based teaching tools. All the innovations are also mostly based on the use of some form of innovated didactic and methodological models, which are dominant in teaching worldwide. The main difference between their implementation worldwide and in Serbia is reflected precisely in the implementation of ELCTPS. The use of web-based teaching tools in Serbia often puts so much strain on the actual lesson that students simply have very little time to directly engage in learning and participate in the teaching process. For this reason, there is no *student-centred learning*, but it is rather still traditional and involves the dogmatic (verbal) method of teaching.

Greater implementation of ELCTPS would also contribute to greater teaching efficiency. This is indicated by numerous studies of didactic and methodological practice of ELCTPS implementation conducted worldwide. Starting from the effectiveness of their own teaching methods, many teachers around the globe who have been using ELCTPS are trying to encourage as many teachers as possible to apply it in the classroom [4]. Some of them emphasize the need to better equip the schools with ICT for the effective implementation of ELCTPS, which means that this is not only a problem in Serbia,

but also in some of the more economically developed countries and countries with significantly more efficient and affirmed education systems [14]. They also point to the importance and the need to train not only future teachers, but also teachers who are already in the teaching profession, as is the case in China, where educational software has been used effectively for many years, and the most disruptive factor in the implementation of ELCTPS is said to be the lack of training of the current teachers [6].

The current teacher higher education system in Serbia, as well as the Education Strategy until 2030, both offer great opportunities for systematic acquisition of knowledge and skills in the field of e-learning and e-teaching, especially at the second and third level of education.

Have these opportunities been utilized? This paper will try to answer this question at least in part. The examples of good practice can be mostly found in European countries, but also in non-European higher education institutions for teacher education and training, including the specific courses in the field of e-learning and education, as well as the courses in which this topic is included.

II. METHOD

The goal of this research is to identify the extent to which the implementation of e-learning in class teaching has been conducted and what is its contribution to the efficiency of class teaching and learning, and student participation in class teaching in Serbia. The research started from the general assumption that e-learning significantly contributes to the effectiveness of class teaching, and to the effective learning and participation of students in class teaching. Specific assumptions have also been made that this research would determine that university students taking the Class Teaching Course (CTC) do not have sufficient knowledge to use ELCTPS and that there is a correlation between the opinion of students taking the CTC about the contribution of electronic learning to the effectiveness of the class teaching in primary school, as well as to the learning and participation of primary school students in the class teaching, and the academic success in their studies so far.

The survey was conducted in the second half of 2019, on a sample of 105 students taking the CTC at the Teachers' training faculty in Prizren (Republic of Serbia), which is presented in this paper. The Scale of E-Learning Implementation in Class Teaching (ELCTPS Scaler) was used for the purposes of this paper, and it consisted of 10 items with the three-point agreement intensity scale: 1) I agree, 2) I am not sure, and 3) I disagree. It was designed for the purposes of this research. The reliability of the instrument was tested using the Cronbach's alpha score ($\alpha = .825$).

The data collected by the survey were analyzed by using descriptive statistics and linear correlation, and are shown in tables and diagrams.

III. RESULTS

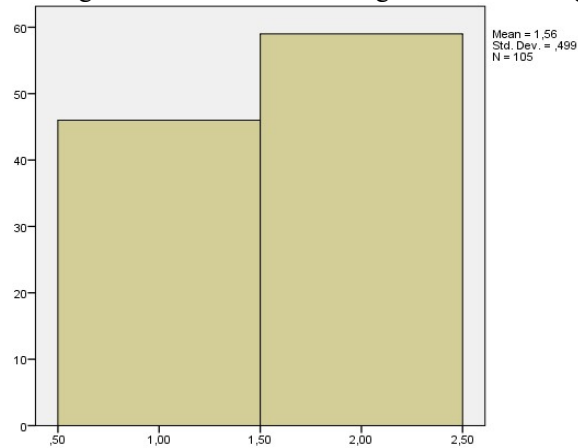
CTC students' knowledge of ELCTPS was investigated through descriptive statistics and based on the calculated frequencies and percentages.

Table 2. E-Learning Knowledge

		N	%	Valid %	Cumulative %
Valid	Bad	46	43.8	43.8	43.8
	Medium	59	56.2	56.2	100.0
	Total:	105	100.0	100.0	

The data show (Table 2) that CTC students generally believe that they have medium knowledge about e-learning, as stated by 59 (56.20%) of them; moreover, 46 (43.80%) of the students surveyed felt that they had insufficient knowledge about e-learning, while there were no students who thought that they had good knowledge of e-learning. This is also indicated by the very low mean value ($M = 1.56$) and standard deviation ($SD = .499$).

Histogram 1. Students' knowledge about e-learning



CTC students' level of knowledge about ELCTPS is also evident in the Histogram 1 columns. This is also indicated by the calculated mean ($M = 1.56$) and standard deviation ($SD = .99$) values, which are very low in both cases.

Table 3. Students' knowledge about e-learning and their opinion on the contribution of e-learning to class teaching (Correlations)

		E-learning	E-Learning Knowledge
E-learning	R	1	.749**
	P		.000
	N	105	105
E-Learning Knowledge	R	.749**	1
	P	.000	
	N	105	105

A strong positive correlation between the students' level of knowledge about e-learning and their opinion about the importance of e-learning implementation in class teaching was calculated: $r = .749$; $n = 105$; $p = .000$, which means that the higher level of students' knowledge about e-learning correlates with their more positive opinion about the importance of e-learning implementation in class teaching (Table 2). The communality for the groups of students according to their level of knowledge about e-learning, in relation to their opinions about the importance of implementation of e-learning in class teaching is 56.10%, based on the calculated coefficient of determination.

IV. CONCLUSION AND DISCUSSIONS

Based on the critical analyses presented in this paper and the results of the empirical research, it can be concluded that the CTC students believe that they do not have sufficient knowledge to apply e-learning in class teaching. During their university studies, the CTC students in Serbia generally do not learn enough about this topic which is why they cannot effectively apply it in the classroom. Moreover, most primary schools in Serbia do not have enough resources for this type of teaching. There are no certified software packages to deliver e-learning lessons. For this reason, it is not possible to talk about efficient e-learning in class teaching in Serbia. It is true that the course called Educational Technology is taught at the Teacher Education Universities in Serbia, and it is a compulsory course at the basic academic studies of most universities, and this is where these students, future teachers, discuss the crucial issues of educational technology in a narrow and broad sense; it is

also true that the objectives, outcomes and course curricula are quite similar at all the universities, especially the ones in Belgrade, Uzice and Jagodina. E-learning and e-teaching are integral parts of this course, however, the curriculum capacities do not allow for a more detailed study of this topic. This is the reason why there was the need to apply for a program based on the application of e-learning and the development of teachers' digital competencies within contest called "Higher Education Development" announced by the Ministry of Education, Science and Technology. As part of the project activities of MFoDCD (Methodological Framework of the Digital Competencies Development) at the Faculty of Education in Uzice, a one-year experimental e-teaching program (hybrid model) for the fourth year of study in the academic year 2018/19 was implemented. The model has proven to be extremely effective, however, the more comprehensive and effective implementation of e-teaching, especially at the second and third level of studies did not happen because this teaching model is not proposed by the accreditation of the university study programs. This is one reason more to take more seriously the possibilities of implementing new courses or study programs focusing on the implementation of e-learning and e-teaching in the modern teaching process.

In the last few years, master's technical and informatics studies have been instituted at the majority of universities for future teachers in Serbia. The above-mentioned courses were not accredited by the National Accreditation Body for Quality Assurance in Higher Education in the Republic of Serbia as per the regular accreditation procedure; they were accredited at the initiative of the Ministry of Education, Science and Technological Development of the Republic of Serbia only at the university level and within the existing study programs of master's academic studies for class teaching. This novelty is more practical in nature and in lack of Informatics teaching staff, these graduates can teach Informatics classes in Serbia primary schools (between the 5th and 8th grade). However, this does not mean that these students are fully qualified for e-learning. They have the courses that are primarily related to the fundamentals of computer science in only one semester during one school year, however, these courses do not talk about ELCTPS. The results of various studies on e-learning, published in the most significant scientific journals in the world show that not only does e-learning have a positive effect on teaching, but actually all teaching should be realized using e-learning. In addition to it being widely used in Western Europe and America, that is, in the countries with developed educational systems, e-learning is also seen as very important in the Middle East countries. In Pakistan, which has been developing in all spheres of social activity in recent decades, special attention is given to improving the quality of education. The increasing use of e-learning in this country has led to the e-learning to govern the system of modern education [1]. In order for this process to be effective, there are different approaches to the design and implementation of e-learning, which include variation in the teaching strategies, different approaches to lesson planning, and innovated didactic and methodological teaching models.

ELCTPS is implemented in other countries in the similar way as well. This is especially the case with China, which has not only developed rapidly in recent decades, but has become the world's leading economic power. China pays particular attention to the education quality improvement [11]. For this reason, one of the China's largest imports is precisely the foreign personnel who are trained to deliver the lessons through the implementation of e-learning. Specific focus is also placed on the education of e-learning staff at numerous universities in China.

Great attention is also being given to e-learning in India. In order for e-learning to be successfully implemented in schools, the teachers are prepared for e-learning at all universities in India, with specific focus on continuous improvement and the development of information technology. The amount of attention given to e-learning in India is shown by the results of some studies conducted in this country. One of them investigated not only the effectiveness of e-learning, but also the quality of the education process which prepares the future teachers for e-learning [2]. Such approach to e-learning is obligatory in the developing countries, which is why these models should be an example of how ELCTPS should be implemented.

Despite the irrefutable facts that e-learning is still not being implemented in Serbian schools, and that during their university studies the future teachers do not acquire the optimum level of knowledge that would make them competent enough for ELCTPS, the CTC students still believe that e-learning can provide a more effective CTC, as well as a more successful learning process and student participation in class teaching. This was also shown by the results of the research obtained by

linear correlation according to which the higher level of students' knowledge about e-learning correlates with their more positive opinion about the importance of e-learning implementation in class teaching. The study also found a strong positive correlation among the compared variables, as well as the high communality of as much as 56.10% (Table 1).

Despite the fact that e-learning is still underutilized in Serbia, the research findings are in line with the results of the studies conducted in those countries where e-learning is an integral part of everyday teaching. This research has shown that students who have more knowledge about e-learning also have more convincing opinions of the importance of e-learning in CTC [9]. Certain studies conducted in Serbia also talked about the importance of ELCTPS. They found that there is a wide range of different e-learning models used worldwide, which indicates the need to model the ELCTPS teaching in Serbia [5]. It was also mentioned that certain social media can contribute to a more efficient e-learning [13], but this is still not real ELCTPS, but only some aspects of e-learning.

Based on the critical analysis presented, it can be concluded that e-learning is designed to facilitate students' learning process. The goal is also to involve students as much as possible in their process of learning, to encourage them to solve problems through independent research, to acquire knowledge that will be useful to them outside the classroom. E-learning also encourages students to create learning plans on their own, and motivates them to interact with other students, that is, to exchange information and ideas within their learning group, but also with other students who are not part of this group. The importance of e-learning is also reflected in The European Framework for the Digital Competence of Educators, where the digital competence is mentioned as one of the nine crucial competencies [10]. Without the necessary knowledge, skills and abilities that characterize digital competence, CTC students cannot be successfully qualified for ELCTPS.

Given the fact that overcoming this problem requires proper preparation of future teachers during their studies, the need for CTC innovation is also required by introducing ICT-based innovations. The already established training programs for future teachers that are used during their studies could effectively serve this purpose after improving them with ICT-based innovations. [7] Teacher training organized in this way has proven to be very effective because it provides future teachers with the knowledge they need to effectively apply ICT and especially ELCTPS in their future teaching profession. Based on the analysis of the implementation of these programs in educating the teachers on how to apply the ICT and ELCTPS, and based on the assessment relying on the study of applying ICT and ELCTPS in Serbia, it is concluded that this approach would lead to the more effective education of future teachers in Serbia if applied in practice. This could certainly be applied in other Western Balkan and South-eastern Europe countries.

In addition to the above-mentioned issues, there is still not enough education software in Serbia. There are electronic atlases, encyclopaedias, textbooks and other multimedia editions. All this can only be classified as supplementary literature and not as actual educational software which can be used in the classroom. Some learning materials related to particular subjects do not contribute to this either. An additional problem is the system itself, because state authorities either do not participate sufficiently or do not participate at all in the modernization and modernization of teaching by applying ELCTPS.

The teachers who have already completed their studies and are working as teachers are also a separate issue. They are certainly not trained to apply ELCTPS in their everyday work. The existing teacher training programs that are currently being implemented by the Institute for the Improvement of Education in Serbia also do not provide help for the teachers to obtain the optimum minimum knowledge for the application of ELCTPS in the classroom. For this reason, there is the need for a more serious approach to addressing this serious problem, which should be addressed without delay, otherwise the introduction and effective application of ELCTPS in teaching is practically impossible without training the teachers who are already working in schools.

Based on the results of this research and of the critical analyzes presented in this paper, numerous pedagogical implications and recommendations to future researchers can be made. First of all, the systematic ELCTPS program is required. It is also necessary to modify the CTC study programs, which need to include new courses which would provide the future teachers with enough knowledge to implement ELCTPS. In regards to the existing teachers, they need to undergo different training, in order to become qualified for ELCTPS, and students have to be taught on how to use

different educational software and applications. In order to investigate and review the theoretical and practical aspects of e-learning, it is necessary to conduct various empirical studies, the results of which should present in greater detail the many problems with e-learning in class teaching. This research, which has focused on ELCTPS, has proven that such studies are truly required.

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