Teaching and learning through the use of screencasting tools in teaching informatics and computing

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Abstract: In this paper was conducted a research of success of the implementation the screencasting tools in teaching of computer science in the elementary school and the impact on improving the areas of evaluation teaching and learning, based on the quality standards of work the school. Through the testing of students in order to determine the impact on the level of student achievement; evaluating the quality of lessons by teachers and interviewing teachers and students in which they expressed their views to relevant questions for their target groups, it comes to results which show that teaching aided by using screencasting tools excels compared to traditional classes. Survey results of both target groups indicate that the use of screencasting tool in teaching computer science is zarecognized as the quality of the work and influence on the improvement of the teaching process. Identified the potential for application in other cases. It comes to the conclusion that combining e-learning with traditional teaching and the use of electronic tutorials teaching contributes to ensuring the quality of work the school.

Keywords: screencasting tools; improvement of teaching and learning; e-learning;

1. INTRODUCTION

The trend of development of information and communication technology is the strongest stimulating factor for new potentials that contribute to improving the quality of teaching. In the modern concept of learning based on learning and the student it is not just desirable, but also requires that teachers in the classroom apply the tools and technologies that ensure the success of the learning process.

Continuous recording running software applications on the screen with the possibility of adding audio comments represent screencasting and thus forms a material that can be used for creating multimedia instructions (Richardson, 2006) [1]. The concept of screencasting is relatively new and was first mentioned in 2004 when a columnist Jon Udell used him, which introduces a new approach to creating documentation and user education. The desirability of using the multimedia instructions definitely is in the fact that an increasing number user-oriented tools for their making provide opportunities of application both in combination with traditional teaching, as well as a solution for e-learning.

Screencasting tools are increasingly used in education as a source of learning materials. There more numerous studies about using of this form of teaching materials, and one of the study (Winterbottom, 2007) [2] shows that students have a high positive thinking of application screencasting media where the highest priority emphasizes great flexibility, but also the possibility of re-watching lessons.

2. APPLICATION OF SCREEN CASTING TOOLS IN TEACHING

There is a wide range of applications screencasting tools for teaching. Particularly these Interactive contents are interesting   because of the possibility of personalization and customization specifics of the students' in terms of selection of dynamics and the time required for the appropriate the knowledge that being placed this way.

These videos provide a simple tool to expand the facilities of the subject that is studing, suitable for students in remote locations, students with special needs, as well as all others who can benefit from the presented content, and are not able to attend classes. Tutorials adds an active visual element to teaching, which remains available for students after the end of the class. In addition to virtual classroom with the tendency of distribution of ICT in teaching also screencasting tools get more space in a traditional classroom.

The popularity of interactive teaching materials in the form of tutorials is largely represented on the use of the readymade materials available on the internet, but thanks to the fact that these tools are very easy to use, more teachers create their own interactive content in accordance with the outcomes of the teaching unit. An additional relief in the creation of these contents are online screencasting tools that do not require the installation of software on your computer, but also provide the ability to create online materials on the site which can be placed directly on the internet. Simplified user-oriented software provides the ability to use screencasting tools and by the students. Although there is no direct interaction between teachers and students this way created teaching materials promote the aspect of individualized teaching, where students gain an impression of work one-on-one.

3.THE AREA OF EVALUATION TEACHING AND LEARNING AS A FRAMEWORK FOR EVALUATION OF THE TEACHING CLASS

The formal framework and instrument for evaluating and monitoring the flow of teachers class in schools in our education system is the area of evaluating teaching and learning. This is a key area of evaluation within the Quality Standard of school work (Rules on the work quality standards of school "Off. messenger RS", no. 7/2011).

Teaching and learning is based on defined standards and individual indicators (standardized statements) achievement of individual segments of the teaching process as a prerequisite for the successful realization teaching. This standardized instrument for periodically evaluating used in self-evaluation and external evaluation of the quality of school. They are also daily used in the both for self-evaluation of teachers class, as well as monitoring and evaluation by other teachers. The area of evaluating the quality of teaching and learning is defined through 7 standards, each of them with a several quality indicators. The importance of standards in this area of evaluation is reflected in the fact that they can serve for monitoring the actions and behaviors of both, teachers and students. On this way the we get the information about what happened at the class, about quality of the processes and results of learning. In evaluating the quality of the field teaching and learning particularly focuses on

the following aspects of teaching: the different techniques of learning, construction of knowledge at the the class, adaptation of teaching to the different educational needs of the students, managing the process of learning, evaluating in the function of learning.

The area of teaching and learning consists 38 of quality indicators which are grouped in 7 standards. Evaluation of the quality field of teaching and learning is achieved through the monitoring and evaluation of the teaching class, during which it is assessed achievement of quality indicators in this area. As a formal instrument for monitoring and evaluation of the teaching class is used the form for monitoring of the class that was developed for this purpose. By summing the assessment of achievement of quality indicators within individual standards leads to the the final evaluation in the field of teaching and learning, and assessment of the quality of the teaching class.

Considering that teaching and learning is the key area all of 7 in the quality standards of school, the effects of successful achievement of other areas are indirectly reflected on the teaching process. Ensuring the quality standards also represents the ensuring of educational achievement outcomes and the student achievement standards aligned with the educational policy of the Education System.

4. THE RESEARCH METHODOLOGY

This part of the paper refers to the concrete results of research of teachers and students, as well as the level of student achievement results and evaluating of teaching informatics and computer science. The research was conducted in the primary school "Selakovac" from Novi Pazar, by the author of this work and colleagues who teach technical and information education and mathematics. The research included 56 students (8th grade students of two classes of these schools) and 17 teachers and school expert associate (1 associate, 9 teachers from groups of subjects of natural sciences, 4 teachers from a group of community-linguistic sciences and 4 teachers from classroom teaching).

At the beginning the survey conducted for teachers and students, and then was held a training for teachers (Screencasting tools and application possibilities in the classroom), which were implemented in classes with the experimental test group of students.

The first survey that was conducted among teachers was aimed at examining the attitudes of teachers in terms of readiness for aplication ICT in teaching, knowledge terms such as e-learning, ICT, screencasting tools, tutorials, innovative teaching methods, etc. This survey was done total of 18 subjects (17 teachers and associate). The second survey was conducted among students to examine the attitudes of students in terms of how successful they find the current way of teaching informatics and computing, providing proposals for improvement connectivity options of the acquired knowledge in informatics and computer science with other subjects, how them helps acquired knowledge from informatics and computing in learning of other subjects, how much lessons learned in informatics and computing helps in everyday life, etc. This survey was done 54 of students, or 96.43% of the total number of students who are taking part in the research.

After sorting the results of surveys for teachers, they have shown that teachers expressed positive attitudes on mostly all issues, after that was a training for these teachers. A training was held at the school for a period of 4 school classes, where teachers were inroduced with the basics of pedagogical e-learning, possibilities of applying ICT in teaching, the concept of screencasting tools and application possibilities in the classroom.

 video tutorials were made for the teaching unit HTML and they placed on the Internet. Students of the the experimental group (29 of them) had the opportunity for a week before

the experimental class to access the tutorials, and in this way they have prepared for the class which would be based on the concept of "flipped classroom". For those students who did not have the ability to access to the Internet from home or from their smartphone every day was allowed the access at the school in the digital classroom.

In both classes (experimental and control group) was held by one class of informatics and computing, in the first group was held a traditional class of processing the new material, while the experimental group was held class of processing of the same teaching unit, but on the principle of "flipped classroom " and applying screencasting tools in the classroom. In both groups the classes were attended by teachers and expert associate who have followed the course of classes and evaluate them through the evaluation list (form for monitoring of teaching class). After finalizing of the classes conducted a discussion and analysis by teachers and expert associates who have made a general observation that in the experimental group in addition to being fully realized education outcomes was clearly expressed self-regulation of students in the work, it was more encouraged peer learning and teaching, more successful were the activities that encourage the development of critical thinking and discussion among students, as well as that was clearly expressed by stimulating atmosphere for work on the class.

Arranging results of these evaluation list from classes in both groups, it was found that the class held by the experimental group teachers estimated for 23% more effective as compared to the traditional class. Class, which was held in the control group was graded 3.19 (maximum of 4 ratings), while the class held in the experimental group estimated an average score of 3.92.

At the following class both groups (classes) had a control exercise that came to check the level of student achievement. Results of the knowledge test in the experimental group showed a better average level of student achievement for 27.48%, whose average score was 4.35, compared to the average achievement of the control group in which the average score on the knowledge test was 3.42 (Figure 1).

A second survey was conducted for teachers and students after the control exercise. In the second survey the teachers (attended by all 17 teachers and 1 expert associate) tested following attitudes:

To the question what extent the application of screencasting tools contributes to improvement of the field teaching and learning the teachers gave ratings: on a scale from 1-4 was rated 4 72.22% or 13 respondents, with grade 3 or two of them 11,11%, while the grade 2 also gave two of them that is 11.11%, and only one respondent rated 1, which is 5.56% of the total number of respondents. To the question whether they consider that the application of screencasting tools in the classroom contributes to the development concept based on learning 94.44% answered with yes. It is interesting that 100% of them considered that this innovation in teaching contributes to self-regulated learning and creating a stimulating atmosphere. 77.78% of teachers believe that in this way, in addition to developing digital competences comes to developing competences for lifelong learning. 66.67% of teachers believe that there is a possibility for application of these tools in the teaching of other subjects. 100% of them think that in addition to of informatics and computing application of these tools contributed most to the teaching of mathematics. 55.56% of the teachers thinks that in their subject there is at least one teaching a theme that would be suitable for use screencasting tools.

94.44% of the teachers expressed a wish for professional training in the application of screencasting tools and other e-tools in the classroom. In the second survey conducted among students of the experimental group 96.55% taking part, or 28 of 29 students. At the

repeated question from the first survey which related to the success of the teaching of informatics and computer science occurred was a positive difference for 21,42% from 75% to 96.42% on repeated testing. 92.85% of students think that it should provide support for each teaching unit in the form of tutorials. 85.71% of the students expressed a wish that through leisure activities - computer section learns to work with screencasting tools, the same number would be like to does the homework in informatics and computing in this way. 92.85% of students believe that their achievements ware accelerated when if in other subjects apply these tools. To the question in which subject in addition to the information technology and computing they like to have support in the form of tutorials 100% answered in mathematics.

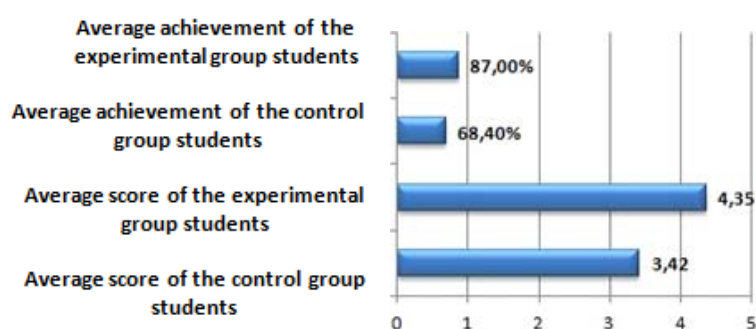## The difference in the level of student achievement 27,48%

Figure 1. *The difference in the performance of the class with the implementation of screencasting tools compared to traditional class*

5.CONCLUSION

Through the research it was noted that there many possibilities for applying screencasting tools in teaching. It comes to the knowledge that the special good effects provides a combination of this way created interactive teaching materials with traditional teaching, whereby in particular comes to encouraging self-regulated learning in of students.

The research has clearly demonstrated in addition to the application of screencasting tools in teaching informatics and computing provides the realization of educational outcomes of sabject, contributions and raising the quality of teaching, and therefore the introduction of these innovations into the teaching comes to improving the quality work of the school. Also there was performed , the influence in reliance with regard to the development of cross-curricular competencies in teaching informatics and computer science, which is in the course of their training necessary to develop in students the knowledge acquired to be functional and used in the context of lifelong learning.

Possibilities for application of screencasting tools in teaching informatics and computing are enormous, both in the context of regular classes, as well as extra-curricular and leisure activities so that there is space to support the students in this way in terms of personalization and individualization of instruction. In the majority of subjects there is also

the possibility of applying these tools, which would significantly impact on improving the quality of teaching and improve student achievement levels. An interesting fact is that besides mathematics and objects belonging to the group of natural sciences, also ideas for implementation next coming of classroom teaching and socially-language sciences with the subjects. A positivee climate in the field of educational policy encourages the use of ICT in education   and professional training and development of teacher competencies in that direction. The conclusion that the potential lies not only in the application by teachers in the classroom, also the   enabling students to create material using screencasting tools also accelerate the achievement of educational outcomes of teaching informatics and computer science and other subjects and so lead to the improvement of students achievement levels. The systemic recognition of needs of teaching and schools for improving quality through the use of ICT in teaching contributes to the development of a positive climate in our schools. Terms such as e-learning, ICT, Web tools becomes everyday life and increasingly lead to combining elements of e-learning with the tradicional teaching in our classrooms.

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