

## “CLOUD” TOOLS – ONE OF THE USES OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN TEACHING

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**Abstract:** The paper describes the changes in the education system introduced by the project "Razvionica", such as planning the teaching process based on learning outcomes. The training for the use of information and communication technologies in education is a teacher professional development program which goal is to make learning in school more interesting and efficient. The “cloud” tools were selected in order to avoid the need for the procurement of additional equipment or programs. These tools are always available for creating lessons, testing knowledge, cooperation and communication with other teachers, students and parents. Over 4,000 teachers and school psychologists/pedagogues in primary and secondary schools attended the training in 2014.

**Keywords:** E-Learning, teacher training, cloud tools

### 1. INTRODUCTION

Numerous strategic documents have been enacted in the Republic of Serbia emphasizing the importance of new technologies and their role in enhancing the education system as well as the necessity of incorporating ICT in the teaching/learning process. Special emphasis was placed on modern teaching methods which involve the use of ICT and upgrade the role of the student from a passive observer to an active participant in the teaching process. All decision makers in the education system of the Republic of Serbia are obliged to contribute to the modernization of the teaching process and the development of different kinds of literacy necessary for the 21<sup>st</sup> century education.

In the period from August to December 2014, the Institute for the Improvement of Education implemented the training of 4000 primary and secondary school teachers entitled “The Use of Information and Communication Technologies in Teaching”. The primary goal of this training was to present the pedagogical aspects of the use of information and communication technologies, primarily services and web tools free of charge that can be used in designing, implementing and evaluating the teaching process.

### 2. USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN TEACHING

#### A. *Information and communication technologies and e-learning*

Information and communication technologies (ICT) are the technology tools and resources used for communicating, creating, distributing, keeping and managing information [1]. They include not only computing devices such as desktops and laptops, tablet computers, smart mobile phones, digital cameras, etc., but also different programs, applications and networks.

ICT-based learning is called e-learning. Although technology is not the only factor describing electronic learning, many questions related to this field implicate technology. One of the simplest interpretation of electronic learning called *the continuum of e-learning* was made based on how much technology is at our disposal and how we use it in the teaching/learning process [2].

#### B. *ICT in the classroom*

The use of information and communication technologies in the classroom, as a form of electronic learning is on the left side of the continuum and it implies traditional teaching taking place in the classroom with the limited use of technology. If we use a computer with the Internet access in the class or various teaching materials in electronic form (which may or may not be on the

Internet), we have stepped into the realm of electronic learning.

There are numerous publicly accessible resources on the Internet (teaching materials, class scenarios) that we may use in their original form to modernize teaching or we may modify and expand them in accordance with the specific situation in the classroom.

### C. *Blended teaching and learning*

By means of the Internet, teaching and learning may take place anywhere and anytime. The student is no longer bonded to the classroom or the teaching hours prescribed by law. Blended or hybrid teaching is a form of electronic learning where activities take place both in the traditional classroom and on the Internet: “Blended learning is a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path, and/or pace and at least in part at a supervised brick-and-mortar location away from home” [3].

By modifying teaching materials, selecting a tool or a platform for learning, e.g. Moodle, we provide significant support for our students. They will be able to have access to teaching materials and study them; to check how well they have learned specific teaching contents, to learn at their own pace and in accordance with their abilities. The Internet helps students to develop communication and cooperation skills and boost their creativity. They can publicly present the created products, share and exchange knowledge and experience.

This form of electronic learning should serve as the addition to traditional teaching and not as its replacement. Hybrid teaching should not replace in-class activities that we can do in school.

### D. *Online learning*

Online learning refers to the teaching process taking place exclusively in online environment (over the Internet), without any physical contact between teachers and students. Each student should have at their disposal a computer and a high quality Internet connection at home.

Such a form of electronic learning has not yet taken root in schools in Serbia as its implementation, apart from technical, entails some other prerequisites. However, *the Education Development Strategy until 2020* and *the Law on Primary Schools* foresee the implementation of electronic learning, particularly under specific circumstances.

## 3. WEB 2.0 TOOLS

### E. *Digital citizens*

The Internet has changed education nowadays at least as much as Gutenberg’s press shook the world of manuscript culture. Unlike the Gutenberg’s era of the printed book, when the change was huge but slow and predictable, the Internet forces us to constantly adapt to permanent and fast changes. The technological changes impact our behaviour, mainly of young people, and have influence on theories and reflections in the field of education. Learning is being transferred from the classrooms and schools not only to out-of-school time activities, as we used to call them, but to entirely new fields; not only to old media but to the so-called new media as well; not only to the real world of perception and impressions but also to the virtual world. While so far we have had students and teachers who first belong to a school, settlement, country or nation, continent or planet, nowadays we talk about a different world and “digital citizens”: “Our students today are all ‘native speakers’ of the digital language of computers, video games and the Internet” [4]. Passports and visas are not necessary for digital citizenship; there is no need to travel or even move from one’s room. It is not politics or geostrategy that led to the creation of this visa-free system, but the web.

The web has incredibly quickly gone through the initial phase when we could use it not changing our old habits. The first changes have taken place almost imperceptibly. For example, the blog was created as long ago as 1997 as a form of a web diary but until 2003 it had few users. Nowadays almost everyone using the web writes a blog. Facebook has been in use since 2004, YouTube since 2005 and Twitter since 2006. The number of users far exceeds the number of inhabitants in any city in the world. The only personal document we need for the virtual world is a personal email address. This virtual identification makes it possible for those open to changes to easily enter the digital and virtual world.

When in 2004 the expression web 2.0 was made at a conference to mark a significant change on the Internet, we started talking about two phases of WWW service development: web 1.0 and web 2.0.

### F. *Web 2.0 classroom*

The changes on the web brought about the changes in learning. **Web 2.0 learning is characterised by:**

- Mash up of different social web applications (blogs, wiki, virtual classrooms, etc.) where cooperation plays an important role: students learn from each other, not only from teachers;

- Students search on their own for sources of knowledge, study them and create contents working in groups and having different roles and responsibilities;
- Students use different web tools functionally and highly motivated;
- Teachers and students are partners in socially networked environment.

### C. *Categorisation of web tool 2.0*

There are two reasons for the categorization problems. The first one is the amount of web tools which is being increased on a daily basis making it very difficult to have a comprehensive insight into the whole which we would then categorize. The second reason stems from the fact that web tools have multiple functions and it is difficult to classify them into categories as they usually have overlapping characteristics, which hinders the classification. A unique criterion is necessary for a reliable classification and it is difficult to identify it for web tools.

According to their purpose, web 2.0 tools most frequently used in teaching can be divided into [5]:

- wikis,
- blogs,
- RSS and podcasts,
- Media Sharing Tools,
- Page Bookmarking Tools,
- Social Networking Tools,
- Communication Tools,
- Collaborative and Community Building Tools,
- Online Productivity and Organization Tools.

## II. TOOLS USED DURING THE TRAINING

During the training *The Use of Information and Communication Technologies in Teaching* organized by the Institute for the Improvement of Education, the following tools illustrating certain web service characteristics were used.

- Social networking and virtual communities (Edmodo)
- Online systems for education (Google Apps for Education)
- Creation of web sites (Weebly)
- Presentations of teaching contents (Prezi)
- Collections of teaching materials (Omeka)
- Evaluation of knowledge and questionnaires (Kahoot and Socrative)
- Planning and evaluation (*Linoit*)

### A. *Edmodo*

Edmodo is a safe and secure professional network of educators open for dialogue and cooperation. However, Edmodo does not oblige us to cooperation as it is primarily used as a platform for learning and we can network and socialize only with our students.

On one hand, this service functions like the majority of social networks because we have to: register to use it; edit our profile; join the existing communities or form our own; create our groups and invite other users (other teachers and students); write posts and upload different resources either offered by the service or found in Edmodo market offer linked to other web tools. This does not much differ from Facebook.

On the other side, Edmodo is more than a global social network because it has one clear purpose. As it is intended to be used in the field of education, certain conditions are controlled or, in other words, safe, particularly for students. The danger of wasting time on the Internet with the aim of entertainment is reduced to minimum. Students cannot even communicate with each other without supervision. Namely, Edmodo is a social network for learning which is controlled and self-controlled.

### B. *Google Apps for Education*

*Google Apps for Education* is an integrated solution for cooperation and communication at the level of an education institution with a defined calendar of events, email addresses and communication applications. Each school having a registered *edu.rs* domain can have a registered domain in Google Apps for Education intended for the organization of school activities and cooperation between students and teachers by means of Google applications. The application for the school registration can be accessed at the following address: [google.rs/enterprise/apps/education/](http://google.rs/enterprise/apps/education/). An authorized person from a school registers a Google school domain linking it to the already existing domain (xxxx.edu.rs).

### C. *Weebly*

Creating web sites used to be reserved only for computer programming experts and organizations. The individuals who wanted to present their work had to pay for the services of professionals. Thanks to the development of the Internet and web 2.0, the situation nowadays is entirely different. Anyone can quickly, easily and without any costs create the web site and adapt it to their needs. This is made possible by the dynamic Content Management Systems (CMS), software tools for creating, modifying and publishing different contents such as the text, picture, video, presentations, etc. Weebly is a free

service for creating web sites with different purpose. It belongs to the group of tools *What You See Is What You Get (WYSIWYG)* and it operates on “drag and drop” principle. Everything is automatized, which facilitates the technical aspect of creating a web site but we can still make a structure we want. This is why planning and defing the structure of a web site is the most demanding segment of its creating. In order not to get lost in numerous possibilities offered by the Weebly platform, it is necessary to have a clear vision of what we want to achieve with our web site. The creators of this platform took care of this enabling their users to have a quick access to support services (Site Planner and Support Center).

#### D. Prezi

Prezi (prezi.com) is a program intended for the creation of presentations of different purposes: education, business, entertainment. The possibility of non-linear presentation and collaborative work on the same presentation is very important in education. Prezi caters for various learning styles and enables knowledge construction, multimedia contents, network sharing, collaborative online work as well as the offline presentation. We can use the presentation on webinars, online conferences or on several computers in the classroom by sending the link for “distance presentation” to others. The users who receive the link follow the presentation and listen to us online, alive or as a recorded narration.

#### 4. THE IMPLEMENTATION OF THE TRAINING

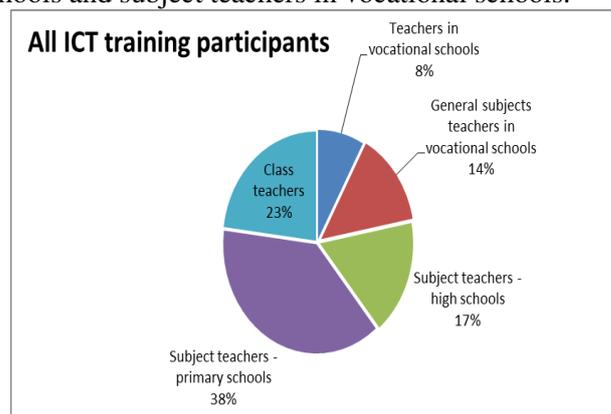
The training “*The Use of Information and Communication Technologies in Teaching*” was implemented as a part of component II: *Training Teachers to Use ICTs in Teaching within IPA 011 project “Support human Capital and Reseach – General Education and Human Capital Development”*. The goal of Component II was to strengthen teacher competencies for using information and communication technologies in the teaching-learning process.

The training was carried out by 40 teachers, experts in the field of ICT in education, who were selected based on their experience in and knowledge of ICT and *not* on their formal qualifications. Out of 40, 18 teacher trainers were not teachers of informatics but class teachers, language teachers, pedagogues, physics teachers, etc.

##### A. Training Implementation Timeframe

The training was implemented in the period August – December 2014 and was attended by 3909 teachers and members of school support staff from 165 schools. A certain number of schools, 41, had two groups of training participants. The majority of

participants were class teachers, subject teachers in primary schools, subject teachers in general high schools and subject teachers in vocational schools.



Picture 1: All ICT training participants

##### B. Implementation and specific characteristics of the training

Before the training, the majority of the participants had had little or no experience in using ICT in teaching. They had not attended online seminars and had no idea of the technology possibilities that teachers have at their disposal. This training introduced them to an entirely new dimension of teaching and learning.

Although they had had no prior experience, they showed a very good level of commitment to the tasks ahead of them. Sometimes they managed to fulfill all demands and sometimes their progress was slower and they needed more time to complete the planned activities. They helped each other and during the training they identified the colleagues that could help them do the homework.

The second group of the participants showed a satisfactory level of prior knowledge and peer learning was present in this group. The practical work in several segments led to the feeling of satisfaction and success at the end of the seminar. The clear and precise explanations as well as the successive steps in mastering new techniques were underscored as a special benefit of the seminar.

##### C. Specific characteristics of the training

**Motivation:** The participants working in primary education best reacted to introducing innovations and using them in the teaching process. When we talk about secondary education, the participants from secondary vocational schools showed much more interest and readiness to professionally develop than their colleagues from general secondary schools.

**Technical problems:** Many locations where the training was organized had Internet connection problems and they were solved during the training.

The classrooms where the training was organized usually had 20 computers but the necessary applications, such as e.g. *Google Chrome*, were not installed everywhere. During the simultaneous access to Prezi web site, computers sometimes “blocked” but such problems were quickly solved.

The digital projectors the host schools provided had different performances so some participants had problems following the instructions as they were not able to see a projected image from their places.

Sometimes the training was implemented in two separate classrooms (10 participants and one instructor per classroom) so the instructors had two very difficult days. Sometimes the instructors were not able to simultaneously explain the techniques and help the underachieving participants.

Pedagogical problems: the participants without prior experience in using ICT in teaching had no idea of the role of technology in the learning process. Some participants did not have a necessary level of the prior knowledge of the Internet. Few teachers in each of the groups did not even have an e-mail account. The participants were not satisfied with the amount of homework they got and with the audio quality of the tutorials offered at the training web site. The general impression was that the participants were interested in the use of ICT in teaching and they performed all tasks with great attention. Certain technical and pedagogical problems were solved with the additional engagement of the teacher trainers.

## 5. CONCLUSION

The use of web tools reduced to the skill “how to” increases the level of computer literacy in students and teachers but web tools can provide much more than technical skills. The competencies imply knowledge, abilities and skills (I know, I understand and I can) and the teacher’s task is not only to provide students with technical and functional knowledge for using web tools. Apart from the high-quality teaching contents and encouraging tasks, the teacher should use the adequate teaching methods to enable students to acquire functional and procedural knowledge and to improve information literacy and

other forms of literacy. Namely, technically speaking, web tools are simple for use and they boil down to the level of skills (I can). The point of integrating ICTs in teaching is not to use web tools for the sake of using them and creating the idea of technological innovation but to make students employ their full thinking capacity and encourage the development of knowledge and abilities (I know, I understand).

Our trainings showed that many teachers accepted ICT and realized the potential of its use. The teachers were especially creative in designing web sites and prezi presentations. Their exemplary work can be found at the official learning objects base *Riznica* (The Treasury) created for the purpose of the training (<http://www.riznica.edu.rs/>).

Some future research would include deciding on the impact our trainings had on the students and to what extent the teachers continued to practice what they learned.

## LITERATURE

- [1] Blurton, C. (2002). *New Directions of ICT-Use in Education*. UNESCO. Retrieved on 20/ 8/ 2015 from <http://www.unesco.org/education/lwf/dl/edict.pdf>
- [2] Јурић, С., Марковић, С., Лулић, Ј., Минић Алексић, Д., & Мијатовић, Г. (2014). *Примена информационо-комуникационих технологија у настави – приручник о веб технологијама у настави за потребе пројекта Развионица*. Београд: Завод за унапређивање образовања и васпитања.
- [3] Staker, H., & Horn, M. (2012). *Classifying K–12 Blended learning*. Retrieved on 20/ 8/ 2015 from Innosight Institute: <http://www.innosightinstitute.org/innosight/wp-content/uploads/2012/05/Classifying-K-12-blended-learning2.pdf>
- [4] Prensky, M. (2001). *Digital Natives, Digital Immigrants*. Retrieved on 20/ 8/ 2015 from <https://edorigami.wikispaces.com/file/view/PRENsky+-DIGITAL+NATIVES+AND+IMMIGRANTS+I.PDF>
- [5] Национални просветни савет. (2013). *Смернице за унапређивање улоге информационо-комуникационих технологија у образовању*. Retrieved on 20/ 8/ 2015 from [http://www.nps.gov.rs/wp-content/uploads/2013/12/SMERNICE\\_final.pdf](http://www.nps.gov.rs/wp-content/uploads/2013/12/SMERNICE_final.pdf)