



## Mobile Learning and Teaching in Croatia's Schools – Possible Models

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### Abstract

*Mobile learning and teaching is currently becoming more and more interesting to all the participants of the educational process. New technologies are becoming more available and therefore widely present in the society. The possibilities these technologies offer are much greater than so far. Today's teachers realize that mobile technologies offer many possibilities and they are readier to use the advantages of educational technology. Croatian teachers are following the trend of application of educational technology through various school projects or within the community. CARNet (Croatian Academic Research Network), as a leading institution which offers support to the development of education in Croatia, has started E-school project which aims to implement mobile technologies in Croatian schools.*

### 1. Introduction

The environment in which the children grow up and go to school nowadays has changed significantly in the last decade. Mobile technology has opened new perspectives and approaches to the use of technology, information on demand and communication in general. The society as a whole has changed the approach to the communication and information. Business on the go, endless communication, resource sharing and joint project work, are the ways in which today's society exists and develops. Mobile technology enables individuals and social groups continuous amusement and participation in social events, depending on the interests. [1]

Mobile technology in education is preoccupying the scientific and expert community in the last couple of years. All ICT technology used so far never had capabilities or characteristics of today's mobile technology which makes it interesting to all the educational process stakeholders.[2]

### 2. Mobile technologies in education – opportunities and challenges

The interest to use smart phones and tablets in education shown by students is an important opportunity to create new and exciting educational experience in the classroom and in the schools in general<sup>2</sup>.

By realizing the opportunities of the mobile learning, and with the improvement of the educational process as a goal, it is important to take into account all the best characteristics of mobile devices. Today's students are digital natives, as described by Prensky [3] and therefore called NET-generation [4]. Mobile technologies have, through their development and opportunities confirmed the needs and the expectations of digital natives, especially toward the specific models of education and communication. Mobile phones and tablets offer new flexible approach to the information. These technologies prepare content in a „personalized“ way and teach new skills for the future. Therefore, mobile technology has a potential to provide a better education to the new generations of students who perceive the world as an open classroom.

Introduction of the mobile technologies into the educational process is for now limited for two main reasons. First reason is lack of education on the part of the teachers; they are not trained to work with mobile educational technology. Teachers colleges lack a systematic approach to the education of future teachers to use mobile technology in the classroom. Second reason is lack of specific digital learning content which will support the current curricula of elementary and secondary schools. There's also the third reason, and that one is universal: the lack of financial means.

Integration of mobile technology and mobile devices into curriculum is done in two ways. First is the use of basic features of the device. These are all basic application and hardware characteristics of a standard device, such as photography and video application, web based video communication, GPS, access to web resources, audio recorder, etc. [5] These basic features can fulfill the basic needs of the teaching process. Therefore, we can say that the use of these features represents the first step of the introduction of mobile technology as a support in the preparation, implementation and evaluation

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of the teaching process. Use of basic features of mobile technologies is not enough. Their opportunities are far bigger.

The second opportunity would represent the use of existing mobile applications developed for education. Mobile applications enhance and enlarge basic features of mobile devices by providing the students with the possibility to use interactive multimedia learning content, access to knowledge data bases, communication, resource sharing etc.

Google Play, Apple Store and Microsoft Mobile Apps contain a large number of such applications. Almost all available applications are oriented towards two main areas of use in the teaching process. First area is teachers' tools. These are the tools which enable teachers to prepare, and implement the teaching process, communication with students and parents, to evaluate the learning process etc. The most popular applications are Explain Everything<sup>3</sup>, Evernote<sup>4</sup>, Edmodo<sup>5</sup>, GoogleDoc<sup>6</sup> etc. which enable teachers to implement different methodic approaches to the teaching process.

Second area is reserved for readymade content for students in the form of application which process and supports different content, often in accordance with US or British curriculum.

When reviewing the available content it was obvious that other languages were less represented. We hope and believe that the content in other languages will gradually develop due to the large number of mobile users.

### 3. Mobile technologies in Croatia

There are 2071 public elementary and secondary schools in Croatia. The strategy of Ministry of science, education and sport for 2012-2014[6] is emphasizing the importance of development of human resource, inclusive education, innovative approach and the use of technology, while Digital agenda [7] is dedicated to the development of e-skills and the development of broadband access to the Internet. Since the independence of Croatia until the accession to the EU, and after the accession, we can see continuous changes in the approach to the implementation of ICT in education, especially the implementation of new technologies. Similarly to other EU countries, Croatia has accepted various agendas and recommendations of EU Commission aiming the adoption of standards and implementation of digital technologies of other EU countries [8] [9]. Alongside the Ministry of Science, Education and Sport and Teachers colleges in Croatia, an important role in promotion of new technologies in the classroom has CARNet<sup>7</sup>. CARNet is Croatian Academic and Research Network, developed after the independence of the Republic of Croatia. CARNet was founded by the Ministry of Science, Education and Sport. Its basic activities were providing the Internet services to the educational system. With time its role was changing, so today CARNet is developing and providing an array of various services such as: securing the advanced e-infrastructure, promotion of Internet security and other projects in the fields of education and Internet.

Several interesting projects have been conducted in Croatia, and they can be qualified as an introduction into e-schools project. In 2006 CARNet has successfully implemented e-Islands project. This project enabled the delivery of learning content to the schools on Croatian islands, as well as the online classes in order to insure that the students on islands have access to the same knowledge regardless of their location. The project goals were to prevent negative demographic trends on remote islands, increase of education system quality on islands, Internet connection via CARNet network and access to the network services provided by the Ministry of science, education and sport<sup>8</sup>. One of the first projects which encompasses the use of mobile technology in education is e-Diary for schools - e-Dnevnik<sup>9</sup> a project started in 2011. The goal of their project is an electronic diary of classes in schools, development of web application e-Diary which contains all the functions of the classroom diary, provide teachers with quick and simple input into the e-Diary application, provide the teachers with tools to develop various reports for the principle, teachers and, in the end to prevent unauthorized input or destruction of data. By the end of last school year 380 elementary and secondary schools in Croatia have joined the project.

<sup>3</sup> Explain Everything (<http://explaineverything.com>)

<sup>4</sup> Evernote (<https://evernote.com>)

<sup>5</sup> Edmodo (<https://www.edmodo.com>)

<sup>6</sup> GoogleDoc (<https://www.google.com>)

<sup>7</sup> ibid.

<sup>8</sup> [http://www.carnet.hr/e\\_otoci](http://www.carnet.hr/e_otoci)



There are various attempts of introduction of mobile technology into education in Croatia nowadays. First model can be called enthusiastic individual micro projects, second model is school micro project and third model is within the framework of other large system projects.

Enthusiastic teachers are the pioneers of new technologies and methods in their classrooms, and they show by example new opportunities, they lead individual micro projects within their classrooms, or as additional and extra-curricular activities. There are quite a few such teachers in Croatia, but they are seldom accepted and understood. Despite of it all, they are the glaring example of a life-long teacher and researcher who use their classrooms as laboratories for new opportunities.

Except for those teachers, there are also a few schools which have chosen independently to start micro projects of introduction of mobile technology into classrooms. One such school is Elementary school Vežica from Rijeka<sup>10</sup> where iŠkole (iSchool) project have been started. "The goal of the project is to completely change the way we worked so far in the elementary school and to start a new era in education of the students by introduction of new technologies. iSchool is changing the basic concept of the teaching, the role of students, teachers and even parents, who will be directly and indirectly included into the educational process for the first time."

Assisted by Apple technology, financed by parents, the school has in a very short time shown excellent results in the use of mobile technologies. Elementary school Vežica has received numerous awards for its projects and won a title of „Apple Lighthouse School"<sup>11</sup>.

At the beginning of 2015, CARNet has started the e-School project together with the Ministry of Science, Education and sport, and co-financed by the European Union from the European Structural and Investment Funds.

The goal of the project is: *"Overall digitalisation of the school management and learning process in order to create digitally mature schools for the 21st century. Digitally mature schools are schools connected to high-speed network, highly equipped with ICT technologies, with digital management, learning and teaching processes. Digitally competent teachers and students in e-Schools use computers and mobile equipment as well as educational applications and digital learning materials in everyday work."*<sup>12</sup>

E-school projects is anticipating far more than just to introduce the mobile technologies into Croatian educational system: development of digitally competent students with increased motivation for learning and continuation of education, better overall results who will be eventually become competitive on the work force market. The data from CARNet's data base clearly show that less than 17% of Croatian schools can be qualified as high on the digital maturity level.

Our interest lay in the „development of digitally competent teachers who are trained to survey the advances of their profession through all forms of professional e-education and development.“ E-school project is leaning on experiences from similar projects in USA [10] and in Europe, such as projects in Northern Ireland, Scandinavian countries [11] and Denmark<sup>13</sup>

E-school project is mentioned here because it is through this project that the mobile technology is being introduced into Croatian schools. The project is furnishing the classrooms with tablets. The project team has chosen Samsung school<sup>14</sup> solution which encompasses Samsung Galaxy Note and other components which enable interactive learning<sup>15</sup>. For now, it is the only systematic project in Croatia.

#### 4. New perspectives – instead of Summary

The research conducted last year on 450 elementary school students, within the area of Zagreb and its immediate surrounding showed that 94% of students possess a smart phone. Almost 100% of those students said that they were using the smart phone for communication and to access social

<sup>10</sup> [http://os-vezica-ri.skole.hr/i\\_kola](http://os-vezica-ri.skole.hr/i_kola)

<sup>11</sup> On January 22, 2015, teachers from elementary school Vežica gave a 45 minutes presentation entitled “iSchool -iPads in Every Subject” in the renown Primary Theatru. This is the first time that a school outside of the territory of the Great Britain was given such an honour in order to present its work. ([http://os-vezica-ri.skole.hr/?news\\_id=708#mod\\_news](http://os-vezica-ri.skole.hr/?news_id=708#mod_news))

<sup>12</sup> CARNet e-School (<http://www.carnet.hr/e-skole>)

<sup>13</sup> Digitalising Schools - the Challenge of Building Educational Environments for the Future, Bente Meyer, Mads-Bo Kristensen, Aarhus University Denmark, Vejle Digital Schools, Denmark- [http://conference.pixel-online.net/edu\\_future/common/download/Paper\\_pdf/ENT33-Meyer.pdf](http://conference.pixel-online.net/edu_future/common/download/Paper_pdf/ENT33-Meyer.pdf)

<sup>14</sup> <http://www.samsung.com/us/business/by-industry/education-solutions/samsung-school>

<sup>15</sup> Samsung School Solution (One Year or Perpetual) • Samsung Galaxy Tab® 4 Education• Samsung ME75C - ME-C Series 75" Edge-Lit LED Display w/ TV Tuner• Samsung 75" Touch Overlay• Samsung AllShare® Cast Wireless Hub

networks. This information elicits a question: Why is it that available technology, such as smart phones, is not used in the classrooms? Very often, when talking to the principals in the schools, they tell us that the use of mobile technology in their schools is prohibited because it is disruptive to the learning process. The truth is that the schools have the ability to use BYOD model (Bring Your Own Device) – it is obvious that the students are ready, the technology is already in their bags, and all they have to do is start using it for learning.

We have to activate mobile technology within the learning process. In order to do that, it is not necessary to acquire new mobile devices, on the contrary, it is necessary to further develop network infrastructure to enable free access to network resources and communication. In order to enable joint work and the exchange of materials it is necessary to develop joint systems in the cloud. The school should be equipped with mobile tablet laboratory/classroom.

In order to motivate the use of mobile technology within the classroom, it is necessary to educate the teachers and to transform the classes – this can be done with SAMR model<sup>16</sup>. Integration of mobile technology in the curriculum has to be done immediately or parallel to the education of the teachers.

The second phase would entail the production of interactive multimedia contents in a local language. Croatian problem lies in the fact that the number of users is relatively small, and the software developing companies rarely see a financial interest in developing educational applications in Croatian. The situation is even worst when it comes to the specific contents within the curriculum, for which only Croatian publishers may be interested. However, this is insufficient for a systematic use. Therefore, we believe that the Ministry of education should develop a „Repository of mobile digital educational content“. Repository would have a key role in development of interactive digital content for all mobile platforms. Repository could be independent or within CARNet. In accordance to the Croatian national curriculum repository would purchase or subsidize the development of quality mobile educational content for all forms of education in Croatia. We believe that various publishers and software development companies would find their interest and create rich and interactive multimedia learning content applicable to all forms of mobile technologies.

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<sup>16</sup> <http://www.educatorstechnology.com/2013/08/samr-model-explained-through-examples.html>