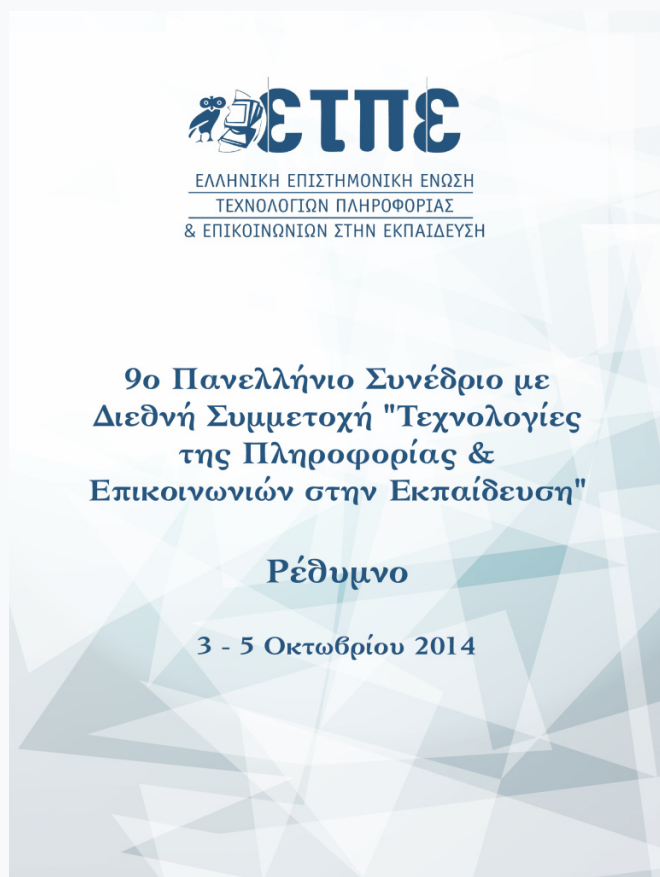


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A “Digital classroom” -An innovation in Education 2.0

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Abstract

This paper explores evidence from prior research already conducted in the field of use Web 2.0 in educational institutes. The aim is to check if social media can be integrated in formal education. The analysis is structured by drawing on the well-established model by Rogers called Diffusion of Innovations. Based on the theory, an Online Educational Social Network, Edmodo, is presented and used in students of the highest level of Greek High School (3rd class of Lyceum), in the subject of Physics, to examine how social media in schools fit the diffusion of innovation theory. The conclusion is that Edmodo can be adapted as an educational tool as it offers to students the required skills in order to perform effectively in Information Society.

Keywords: Digital classroom, Digital Natives, Education 2.0, Innovation, Web 2.0

Introduction

The rise of internet and online communications technologies has changed the life of people in 21st century. It has changed the way they work, communicate, socialize and learn as a network society. Every day many people and especially teenagers, become members in web communities, social media and generally in online spaces which constitute the so-called Web 2.0. One of Web 2.0's tools is social networking websites. They have become an essential part of the daily communication patterns for many individuals. Recently, social networking has been reported to surpass email in use (Perroti & Hair, 2011). The changes that brought Web 2.0 in people's life are summarized in Downes' phrase: “Web 2.0 is not a technological revolution, it is a social revolution” (Rosen & Nelson, 2008).

Education could not remain unaffected by this progress. The students belong to the generation of *digital natives*. This term, coined by Prensky in 2001, means those people who were born after the introduction of digital technologies and through interacting with digital technology from an early age, they have a greater understanding of its concepts. These digital natives, after their graduation will be citizens of the Information Society. Schools mission is not only to learn them subjects like Mathematics, Physics, Chemistry etc. but also to learn students how to learn. They have not get just knowledge but also the required skills like collaboration, critical thinking, problem solving, decision making, in order to perform effectively in a new demanding era (Lazonder, 2012).

New educational products, even with obvious advantages, are being adopted very slowly by educational institutions (Rogers, 1962;2003). However, the new curricula encourage innovations and use of computer technologies, education remains still conservative and doesn't accept easily the changes that the new era demands. Teachers have to be at the head of innovating methods in schools, as early adopters (Rogers, 2003) and then students will follow, in order to turn to a new style of education, called *Education 2.0* (Rosen & Nelson, 2008). They have to introduce the suitable methods, tools and ideas and give their students the inspiration to learn in a different way.

The social revolution of Web 2.0, gave to teachers the motive to use some of them in their lessons. Every college and university in the United States has adopted some form of social media, using it for general outreach, to attract potential students, maintain alumni relations, and increase school pride. Facebook is the most heavily used social media tool in higher education, with over 96 percent of American colleges and universities using it in 2010–2011, a 35 percent increase from the 2006–2007 academic year, when 61 percent used it (Gualtieri et al., 2012). During the Fall of 2009, students who enrolled in Introduction of Technology, a graduate level course at SUNY Institute of Technology, were selected as a target population in order their teacher use Twitter in their lesson (Rath, 2011).

However, in Secondary schools there are fewer applications of Web 2.0 tools and fewer of social media. The results of a research that happened in Greece, in 2013, between 206 teachers of Primary and Secondary schools and was about the factors that affect them in order to introduce social media in their lessons showed that the majority of teachers want to use innovative methods and Web 2.0 tools but they often face concerns from schools directors and parents about them (Georgakainas & Zaharias, 2013). One of the worries about the use of Web 2.0 tools in the classroom is whether they actually generate critical thinking and reflection skills in students rather than merely functioning as a hook to engage them (McClain, 2013). In Greece there is also a preconception in the use of Facebook and Twitter from kids, although some schools have groups in Facebook where there are announcements and discussion of some problems with students' parents.

The use of an Online Educational Social Network may solve these concerns that arise upwards. Edmodo is one of them and is available at www.edmodo.com. It is a challenging idea to encourage non-digital native teachers to be able to start socializing and interacting on learning issues online, with their students, happily and successfully (Kongchan, 2012). It is a free and secure learning platform designed by Jeff O'Hara and Nick Borg in 2008 for teachers, students, parents, schools and districts. This web site looks similar to Facebook but it has more privacy as it allows only teachers to create and manage accounts and only the students, who have received a username and a password from their teacher, can access and join the group which the teacher created. Through this account, a teacher can access numerous tools which facilitate learning and collaboration for students within a classroom and with students from other classrooms, both near and far. In addition, a teacher can connect with other educators to learn more about topics of interest and seek answers to questions about teaching and learning (Dobler, 2012).

Although, in 2011, Edmodo was in the 22nd position through the 100 best educational tools, in all over the World, in Greek schools there are few applications of this Online Social Network. Most of them are in the lower levels of High School and in pilot stage. The aim of this study is to explore if Edmodo could be an innovation in education, using the theory of Diffusion of Innovation of Everett Rogers. For this purpose, Edmodo was used in students of highest level in High School (3rd Class of Lyceum), in a supporting school and in the lesson of Physics.

Diffusion of Innovation

According to Rogers, diffusion is a change to the structure or function of a social system (Rogers, 2003). A social system can be defined as a community of independent people "which work in more or less complementary way toward more or less compatible goals" (Pervin, 1967). Schools can be seen as a social system "in the sense that the parts and goals involve people, with individual and group needs to be satisfied" (Pervin, 1967). An innovation is an idea, a practice, or an object that is either new or perceived as new by

individuals in a social system. The rate of an adoption is determined by the relative advantage, the compatibility, the complexity, observability and trialability (Rogers, 2003). Rogers suggested that 49-87% of the adaptation of an innovation can be explained by how much an innovation fits the above five attributes. As the Rogers' theory is complex, the focus in this paper will be on these attributes:

- Relative advantage: How much is the innovation perceived as being better than what already exists.
- Compatibility: How well does the innovation match existing norms, values, needs, expectations and previous experiences.
- Complexity: How easy is the innovation to use and understand for users.
- Trialability: How easy is the innovation to try out and experiments with without going in all in.
- Observability: How easy is it to observe the advantages achieved from adapting the innovation.

Case study

A "Digital classroom" with the social network Edmodo was decided to be used in students of the highest level of High School (3rd class of Greek Lyceum), for the subject of Physics, in the supporting school "Systima", in Thessaloniki. Its duration was the whole school year, which began at 24/6/2013, there was an interval for summer holidays for one month and it was continued from 25/8/2013 until 25/5/2014. Thirty students took part in this "Digital classroom".

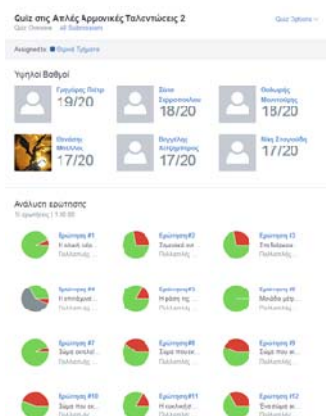
The teacher of Physics created usernames and passwords for each student and delivered them an instruction leaflet, which explained step by step, how to log in and connect the "Digital classroom". At the beginning, there were uploaded the first chapter of the school book and a handbook with Trigonometry formulas that are useful for Physics. The students logged in without problems and downloaded these documents. In the next days the teacher uploaded some applications with virtual labs. The students had to work in virtual experiments and changing some variables to get and elaborate the results. (Pic.1)



Picture 1. A digital experiment with strings and masses and some useful instructions

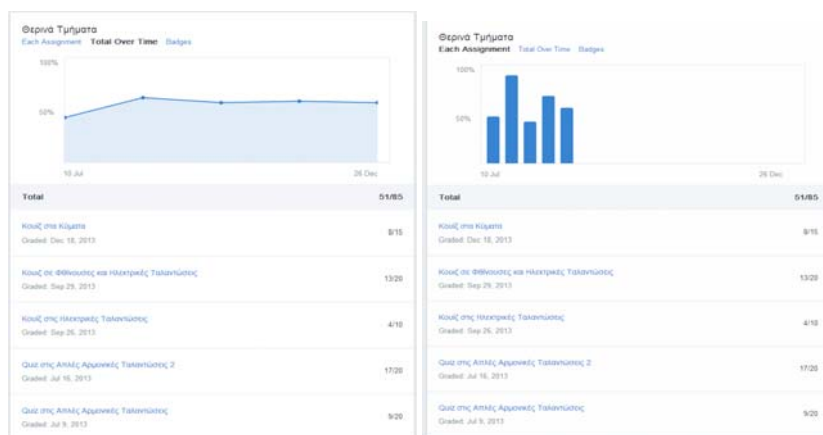
Until the end of the school period there were uploaded many applications and the students had the opportunity to experiment virtually, without place and time limitations. At the same time, the teacher was publishing addresses of YouTube videos, where the students

could watch either experiments or the similar job of other schools. In order to be an assessment of the knowledge the students got, the teacher created quizzes for every section of the lesson. These quizzes were answered from the students when they wanted, as they had plenty of days until the quiz was over. In case that somebody failed and wanted to try the quiz again, there was the possibility the teacher to resend it. After the submission of the answers of all the students, the teacher could have a total view of the students' success and how they faced every question. (Pic.2)



Picture 2. The scores in a quiz and the percentage of success in every question

For each student a portfolio created automatically with the scores in every test and the teacher could watch the progress and show it to student's parents. (Pic.3)



Picture 3. The progress of a student according to the quizzes

During the holidays the “Digital classroom” used as a communication network between the students and the teacher, asking questions about their assignments. They also chatted together, expressing their opinion for the exercises and giving solutions to some problems. (Pic.4)



Picture 4. Solving problems during Christmas vacations

Discussion

By applying Rogers' Diffusion of Innovation model it becomes evident that in a "Digital classroom" using Edmodo almost all the attributes are aligned very well. The use of Edmodo has a relative advantage as the teacher delivers the lessons in a better way. There is the possibility for virtual experiments, for videos, pictures and audio files in order to make the lesson more attractive to the students and give them the motive to participate more actively. There are the quizzes and the assignments without place and time limitations and the students know their grade at the same time that they submit the quiz. The "Digital classroom" helps students to be collaborative and gives them skills, useful for Information Society. The parents can be also be users and have a closer contact with the teacher and get informations about the progress of their kids.

The new curricula encourage the use of computer technologies in classrooms and they adapt the lessons in a way that this use will be compatible. The digital era demands skills like communication, decision making and use of computer technologies. All these skills are given to the students by the use of Edmodo. Often compatibility is also related to what have come before the new innovation, and how well it fits (Nielsen, 2010). Many schools use digital platforms, as Moodle, where teachers publish news, exercises, books, assignments. However, in these platforms students have not an active role. They can probably collaborate through a wiki but a platform doesn't have the characteristics of an online social media and sometimes it is not so friendly to the students. Edmodo is a step forward as it has not only the advantages of a platform but also many features that make it more familiar to the students.

Ease of use is the strongest point of Edmodo. Even non-digital natives, students and teachers can use it without problems. As it looks similar to Facebook it is very familiar to everybody. It is available online so there is not any need of downloading and installing and the minimum demands are a computer and an internet connection. There is also available in mobile version, so students can have access to the "Digital classroom" from their smartphones or tablets. Edmodo is not just an e-learning tool but also an m-learning application. For any problems, there is 'help page' in the website, with FAQ's and a support team that can help whenever somebody asks something. Frequently there are free of charge web seminars, especially when the social media Edmodo updates.

It is easy for a teacher to try Edmodo. Every teacher can create a personal account and search its functions. There is no need to create a group before testing it but everybody can be a part of a community with teachers, chat with them, exchange ideas, express opinions and finally prepare with the best way the creation of the “Digital classroom”. At the same time, the new-user of Edmodo can observe the results of other users, in other schools and in different subjects. So, trialability and observability are verifying perfectly.

Conclusion

The creation of a “Digital classroom” using Edmodo is an easy, costless, compatible and smart way for a teacher to introduce and diffuse an innovation in the lessons. With very few demands the teacher can make lessons more attractive and interesting to students and the teaching style will get better. Students who participate in a “Digital classroom” become more collaborative, develop critical thinking and other skills which prepare them to become ready for the digital era.

According to Rogers’ model, all the attributes are aligned very well and that demonstrates that Edmodo could be an innovation in schools of Education 2.0. However, there is plenty of space for further investigation in schools and other educational institutes in order, the early adopters spread this new idea to vast majority (Rogers, 2003) and become an educational tool that every teacher and every student will use it.

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