Smart Primary Schools in Greece. The Family Income Effect to the Reception of Smart Technology from Young Students. Age 6 to 13

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Abstract. The penetration of smart technologies in Greek Primary Schools is at its very beginning, even though we are going through a period of digitization of education practices. Most Greek Public Schools do not own smart learning systems. As a result, lagging in new educational practices that trending on other countries and alternative educational systems. The lack of infrastructure in all public schools is related to the long economic recession that Greece has suffered and the low reserves of the country's local authorities that maintain and equip public schools. Even if a school own any electronic alternative system in educational process, it is not technologically at the cutting edge but at least a decade behind. Greek schools still use conventional writing and reading systems. Rarely Primary schools' own laptops, projectors and smartboards for the teaching prosses. Teachers still communicate with parents in person, about their students' performance during long meetings in the school building and it is not even applicable for parents to register their children on line. All the above is happening in a modern European country that trains and grows tomorrow's millennials. In this essay we focus on Public Primary Schools and on teachers' views on the smart education tools available to them related to the teaching prosses and their acceptance from the student's perspective. We were interested about the effectiveness of the methods, the receptivity of the young students, and the interest they are showing in using smart learning practices. We also involved teachers to indicate their students' concentration, receiving knowledge and ability after using smart devices in learning. Finally, we asked teachers to evaluate students' ability in new technologies in an effort to relate it to family income.
Keywords: Smart Education (SE), Computational Intelligence (CI), Smart Technology Reception.

1 Introduction

Nowadays human activities are entering a digitalization phase. The introduction of information technology along with new forms of communication, influence a variety of forms of human action and focus primarily on the convergence and integration of the digital and physical worlds. The use of more intelligent - digital solutions, improves the lives of people around the world, according to studies carried out on the penetration of new smart technologies. Artificial intelligence nowadays getting more and more attention about the development of smart, digital education. Researchers focus on Computational Intelligence (CI), Machine Learning and developing new techniques of intelligent guidance and teaching. The spread of new technologies and Internet of Things (IoT) provide opportunities creating new web-based smart systems for all levels of education and related educational and learning tasks (Salem A. B., Nikitaeva A., 2019)

Nowadays smart education (SE) should involve services and digital media and should act supportive to teachers. Smart education (SE) encompasses various aspects of educational processes such as guidance, teaching, education, learning, cooperation, communication and pedagogy. (Salem A. B. M, Nikitaeva A., 2019) Artificial intelligence (AI) in education is evolving into a research field area with great opportunities for exploitation (R.Bajaj, V. Sharma 2018), (E. E. Merzon, and R. R. Ibatullin 2016), (A. B. M. Salem 2011), (A. B. M. Salem 2007).

In order to create suitable conditions to use artificial intelligence in education, we first should remodel the existing educational systems and modernize the educational methods. Computer science and technology, it’s been advanced enough that we can have smart software that imitates educators and recognize in real time, their students' assimilation and perception (Salem A. B., Nikitaeva A., 2019).

2 Modern Educational Tools

Handheld devices entered the teaching fields for the good of education. More than a decade ago, laptops entered the classrooms and show positive results for both teachers and students. laptops pushed classes for better learning outcomes. The advantages of laptops are mainly portability, easy and direct access to knowledge so teachers were able to design their lessons “outside the walls of the classroom” using modern technology. (International Society for Technology in Education, 2010), (Khambari Md., Luan W. S., Fauzi Mohd A., 2012).

Technology is used to improve the quality of teaching and effective use of technology as well. The use of computer technology in schools could improve interaction between trainer and trainees and further teamwork between students. Nowadays there are several systems for improving teaching and learning. However, not many of them involved in learning and cooperation between students (Abut H. et al 1997), (Kilmartin L., et al 2000), (Yau, et al., 2003).

Nowadays teachers have the ability to create new pedagogical roles and goals. They have at their disposal a wealth of materials, and activities that they can affect the structure and the content of learning. Teachers hand to hand with technology, new materials, and even the physical classroom (building structure, walls, furniture) can have a significant role in coordinating conditions and learning activities. The development of technological environments can provide support, to teachers, in order to coordinate the tools, the materials, the new environments that can interact with the structures themselves. (Slotta et al., 2013) In that field, new researchers are involving technological infrastructures that bring out new forms of interaction, including computing systems as integral parts of the surrounding environment such as furniture (Dillenbourg, P., et al 2008.), (Mercier, E., et al., 2012), walls (Lui, et al., 2012), (Lui, M., et al., 2011), (Moher, T. 2008) perhaps even a hole floor [Johnson–Glenberg, M.,2012), (Lindgren, R., 2012), (Slotta et al., 2013)

There are classes that share virtual tables and electronic manuals and an effort is made from the student's perspective to actively participate in discussions and conciliation [8]. There are also other learning environments that focus on authenticating students both for their exams and for monitoring student performance. Even in preschool (Smart Kindergarten) uses data, collected through a sensor network in order the educator to know if he or she is needed to reshape the children's program and activities and keep their level of interest and learning outcomes high (Chen A. et al., 2002). At higher levels of education there are multimedia classes for creating digital archives of teaching material (Abowd G.D. 2000), (Yau, et al., 2003).

Collaborative learning encourages students to actively participate in the learning process. In classrooms where collaborative learning is preferred, students could learn from people who are in the same position as them. No student abstains from this process and everyone can contribute to both the lesson and the learning outcomes (Yau, et al., 2003).

3 Correlation Between Family Income and Reception of Smart Technologies by Students

In this work, we tried to investigate a possible correlation between family income and reception of smart technologies by students. For this purpose, we asked teachers of two classes of an elementary school of Cholargos, Attiki to rate each student for the ease of use of the new technologies. At the same time, we asked the students' parents to disclose their annual income.

A simple linear regression was calculated to predict reception of smart technologies by students based on family income. A remarkable regression equation was found ($Y = 2{,}71028 + 0{,}00017X$, where X represents the independent variable of family income and Y represents the predicted reception of smart technologies by students) with an R^2 of 0.639.

Although the above correlation initially seems somewhat significant, the relationship of the two variables should be explored to a greater extent as the data we used are limited and unrepresentative. Firstly, the area of the school is quite uniform in terms of family income. A more divergent sample should be used in the future. Secondly, the teachers' assessment may be subjective. We will have to develop a closed questionnaire in the future that will remove some of the subjectivity.

4 Conclusion

Nowadays various clever learning practices for colleges and universities exist and are designed to work within the walls of a classroom or not. In smart classrooms, smart devices coexist with students and teachers. These parts build and share, unique communication channels between them. The use of smart devices enables teachers to create a new blended teaching system combining technologically advanced devices and traditional teaching methods. In this kind of learning environment, learning is not static. Students use their desks, probably smart screens, a board etc. while simultaneously interacting with their classmates (Shen F., et al., 2018).

In this work we approached elementary schools in order to control the appeal of smart technologies to young students. Then we checked the appeal of smart devices in terms of family income. Although our sample was not representative, our findings are indicative in order to focus on our future work using a larger and more representative sample. We noticed that in general, the appeal of smart devices is high even for young students. At the same time children from higher-income families are more familiar with smart technology. In future work, our goal is to further explore the relationship between family income and students' intimacy with smart technology.

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