

Chapter 16

Reflecting on the Results of the Initiative ETiE for Using Tablets in Primary Schools

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ABSTRACT

Mobile devices, such as smartphones and tablets, have taken the world by storm. In education, they have exponentially increased the opportunities for mobile and ubiquitous learning, as their unique features give them a competitive edge over conventional teaching. In light of the above, the chapter summarizes and discusses the findings of a series of short research projects, conducted under the umbrella of the initiative Emerging Technologies in Education, involving the use of tablets for teaching science-related subjects, programming, and Greek mythology to kindergarten and primary school students. All in all, it was found that the learning outcomes, which can be considered as good compared to non-technologically enhanced teaching, are closely related to the teaching method, to certain tablets' features, and to the type of application being used. Then again, the impact on students' misconceptions was minimal. Finally, a number of suggestions to software developers as well as to education administrators and policymakers are being discussed.

INTRODUCTION

Technology is already sweeping through classrooms as the industry creates more and more products with the inherent potential to enhance education. At the same time, traditional educational methods are bound to become obsolete, as there is already an influx of novel teaching/learning models that make use of technology's advantages. The emergence and rapid spread of mobile devices (such as smartphones and tablets) added the element of portability, opening new and previously unexplored paths for research and practice. Indeed, a substantial number of studies concluded that the use of mobile devices can yield

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satisfactory learning outcomes (Bidin & Ziden, 2013). Similarly, a certain type of applications for these devices, described by the term Augmented Reality (AR), seems to be of particular interest.

Several learning theories and instructional methods provide ideas on how these devices can be integrated into education (e.g., mobile and ubiquitous learning). Among the key advantages of both mobile devices and AR are that they can assist the learning process by making it more productive, enjoyable, and interactive (Akçayır & Akçayır, 2017), that they can serve diverse students' learning styles and preferences (Dunleavy, Dede, & Mitchell, 2009), and that they allow a better understanding and visualization of concepts and phenomena. Needless to say, that all the above are among the fundamental requirements for contemporary teaching/learning (Sharples & Spikol, 2017). At the same time, students seem to form positive attitudes towards these tools (Bonds-Raacke & Raacke, 2008). However, as researchers pointed out, we are still in need of a sufficient number of research projects in order, on one hand, to understand, in-depth, the impact of mobile devices on students' learning and, on the other, to find ways to fully exploit their educational potential (Haßler, Major, & Hennessy, 2015).

The initiative Emerging Technologies in Education (ETiE) started about three years ago and although it is not a formal research project, a good number of academics, researchers, graduate, and undergraduate students has already contributed to a substantial number of projects conducted under its umbrella. In short, the objective is to examine the results of the educational use of emerging technologies in primary and junior high schools. As emerging can be considered technologies that either recently became available to the public or older ones that still have a controversial but certainly an unexplored educational potential. Examples of such technologies are drones, virtual reality, 3D printers, and AR. Reasonably enough, a number of ETiE's contributors set as a goal to examine the educational value of mobile devices and AR. As a result, a series of short research projects were designed and implemented over the past year, involving the use of tablets by kindergarten and primary school students for teaching them basic programming concepts, subjects related to plants and animals, geography, the human anatomy, and Greek mythology. Having accumulated a substantial number of such projects, thirteen in total, the chapter at hand re-visits the results and critically re-evaluates them.

BACKGROUND

The emergence of mobile devices, such as smartphones and tablets, liberated education from its spatial and temporal confines, allowing the implementation of what is called mobile and ubiquitous learning. In essence, mobile learning provides ideas on how one can utilize mobile devices in education (Sharples & Spikol, 2017). Respectively, ubiquitous learning refers to the constant opportunity for learning due to the easy access to teaching and other material from anywhere and at any time (Murphy, 2011).

There is a fairly extensive literature regarding the effectiveness of mobile learning; better learning outcomes and increased incentives for learning (Chang, Chang, Hou, Sung, Chao, Lee &, 2014), rich educational experiences (Wilkinson & Barter, 2016), personalization/customization to the learning needs of each student (Clarke & Svanaes, 2014), development of metacognitive skills (Kearney, Schuck, Burden, & Aubussona, 2012), opportunities for continuous self-assessment, greater autonomy and control over one's learning process (West, 2013), are some of its advantages. Also, mobile devices can assist collaborative learning, as they allow interactions and cooperation between students (Bidin & Ziden, 2013).

On the other hand, a number of problems have been reported that can act as barriers to the successful integration of mobile devices in education. For example, the implementation of mixed learning with the

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