



## Full length article

# Exploring the use of educational technology in primary education: Teachers' perception of mobile technology learning impacts and applications' use in the classroom



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## ABSTRACT

Mobile technology has become popular worldwide with a broad range of users, including students from all levels of education. Although the impact of mobile technology in classrooms has been extensively studied, less is known about teachers' perceptions of how mobile technology impacts in learning and its relation to Applications (Apps) use in the classroom. This state of affairs is problematic since we know that teachers' perceptions have a great influence on their teaching practices. This study used survey data gathered from 102 teachers of 12 different primary schools in Spain. The questionnaire collected data about teachers' individual information, teachers' perceptions on the impact of mobile technology in learning, and use of a set of selected Apps in the classroom. Findings suggest that facilitating access to information and increasing engagement to learning are the two main impacts of mobile technology in the classroom. Findings also show that the choice of Apps is related to the teachers' perception of how mobile technology impacts in learning. Findings could help teachers to take advantage of the combination of affordances of mobile technology and Apps that actually improve some aspects of learning practice.

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## 1. Introduction

Mobile technology, such as Tablet and Smartphone, has become popular worldwide with a broad range of users in classrooms, including students from all levels of education (Dhir, Gahwaji, & Nyman, 2013; Kinash, Brand, & Mathew, 2012). The success of Smartphone and Tablet computers is one example, strongly related to remarkable growth of Internet applications specially developed for those devices.

Increased affordability and functionality have been highlighted as partly explaining the attractiveness of mobile devices in education (Kinash et al., 2012). Although the potential positive impact of mobile technology on learning in schools has been widely acknowledged (Falloon, 2013), more research is needed to design appropriate guidelines for new curricula and pedagogy to support and assess the use of mobile technology in schools (Dhir et al., 2013).

In consequence, the purpose of the present research is to explore in depth the teachers' perceptions of the impact of mobile technology in learning in primary education, and how these perceptions could influence the use of specific Apps in the learning process.

## 2. Theoretical background

### 2.1. Adoption of new media to facilitate knowledge sharing in classrooms

According to user commitment theory and continuous adoption of technology (Zhang, de Pablos, Wang, et al., 2014), usefulness, ease of use, personalization and learning cost are the main variables that affect people's adoption of new media. Social media possesses some of these features, in addition to immediacy. For this reason, this new media combined with mobile learning becomes a good instrument for pedagogical transformation (Agichtein, Castillo, Donato, Gionis, & Mishne, 2008; Cochrane & Rhodes, 2013; Zhang, Wang, de Pablos, Tang, & Yan, 2015). This relation between learners' perception and the adoption of new media could be

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clearly observed in a classroom setting. Chen and Huang (2010) found out that perceived ease of use of mobile knowledge management learning systems can positively predict perceived usefulness by learners, and perceived usefulness is the key factor for learners' willingness to be guided through a system's learning process.

For institutions that have decided to adopt social media, it has been proved that it could become an excellent instrument to promote knowledge sharing among members. Social media has brought great challenges and wonderful opportunities for organizational learning. With support of social media, organizations facilitate the knowledge management process by encouraging employees to promote collaborative learning behaviours from e-learning to social learning (Zhang, Gao et al., 2015). In multi-national virtual classes, two intrinsic benefits in sharing knowledge have been identified: a) Self-efficacy: when participants contribute their useful knowledge, they will have higher confidence in themselves; and b) Enjoyment: when participants' contributions are found useful and even adopted by others, they will experience higher levels of happiness (Zhang, de Pablos, & Xu, 2014).

It has also been shown that the adoption of mobile learning in classrooms promotes knowledge sharing among students. Mobile learning proved to be useful in helping learners to share knowledge and create social interaction (Suanpang, 2012), and the use of Mobile learning Mindtools was demonstrated to be useful in improving learners' knowledge structure as well as their learning achievements.

## 2.2. Mobile technology learning impact in classrooms

Teachers' perceptions about the impact of mobile technology in learning reflect their beliefs about how this technology influences learning processes (Ertmer, 2005). Whereas teachers' knowledge about the use of technology in classrooms generally refers to factual propositions and understandings, beliefs refer to suppositions, commitments, and ideologies about the impact of technology in learning. Understanding teachers' perceptions of mobile technology provides a means for promoting a more meaningful use of this technology in the classroom setting.

An extensive body of research determines that teachers' perceptions of positive impact of technology, that is, the instructional benefits of technology are significant and positively correlated with the use of technology in classrooms (e.g., Badia, Meneses, Sigalés, & Fàbregues, 2014; Inan & Lowther, 2010; Van Braak, Tondeur, & Valcke, 2004), and also with the use of mobile technology in classrooms (Boticki, Baksa, Seow, & Looi, 2015; Churchill & Wang, 2014; Furió, Juan, Seguí, & Vivó, 2015; Gerger, 2014; Jahnke & Kumar, 2014; Lu, Meng, & Tam, 2014; Murphy, 2011; Yang, Li, & Lu, 2015).

Providing new ways to learning has been demonstrated to be one of mobile technology learning impact. Furió et al. (2015) argue that thanks to mobile technology, children have the opportunity to explore what they are learning from a variety of different perspectives. Moreover, Boticki et al. (2015), highlight that mobile technology provides a range of new ways to learn, such as promoting authentic learning environments in the classroom thanks to mobile technology, allowing students to make connections to their classroom lessons on learning (Murphy, 2011).

Results showed that students are more engaged when learning is performed through mobile technology use (Lu et al., 2014). The level of engagement of students and their interest to accomplish educational tasks had increased in classes that used mobile technology (Gerger, 2014). In addition, since the mobile technology results in high motivational effects, it could be used as a tool in

primary schools to reinforce students' learning process (Churchill & Wang, 2014).

Mobile technology has also been found to generate autonomous learning (Gerger, 2014). Moreover, mobile technology encourages pupils to take control of their own learning, allowing students to establish from their own learning goals until the final assessment of their own learning (Boticki et al., 2015). It has been demonstrated that mobile technology helps learners to manage their self-directed learning (Lu et al., 2014). Furthermore, mobile technology encourages students to be active leaders in the design of curriculum and instruction, as well as supportive coaches for their classmates (Gerger, 2014).

Facilitating access to information has been mentioned as an important mobile technology learning impact (Yang et al., 2015). Students' immediate access to internet resources, as well as capturing, storing, and managing everyday events as images and sounds are tasks empowered by the use of mobile technology (Churchill & Wang, 2014; Murphy, 2011). Moreover, mobile technology has shown to support the emergence of relevant thoughts or ideas to students' contribution in class (Furió et al., 2015).

Yet another important impact of mobile technology is its promotion of collaborative learning (Murphy, 2011). Mobile technology encourages interactivity and instant feedback, which facilitates cooperative learning and promotes peer collaboration, and collaborative feedback during the learning process (Jahnke & Kumar, 2014). Besides, it has been observed that mobile technology increases communication between pupils and teachers in the classroom. Students learn better because the mobile technology encourages student group work, helpful comments and rich discussions (Boticki et al., 2015). Moreover, students have shown to be simultaneously able to communicate and share the learning material found with classmates and with the world (Churchill & Wang, 2014).

In summary, the above-mentioned studies indicate that teachers' perceptions focused in five different kinds of impacts of mobile technology in learning (See Table 1): Providing new ways to learn, increasing engagement to learning, fostering autonomous learning, facilitating access to information, and promoting collaborative learning.

## 2.3. Types of applications used by primary pupils in the classroom

In our time, hundreds of thousands of specialized Apps are available to extend the functionality of mobile technology (Johnson et al., 2013). Apps in schools range from educational games to science and art Apps that enable users to explore outer space, the Louvre, and many other places that they may not ever get to see in person in their lifetimes.

It is this transformative nature of Apps that has helped mobile technology become a popular and powerful tool in education. Since 2010 some research investigating the use of Apps as an educational tool has been conducted, focussing the attention on different kind of Apps at different levels of education.

Falloon (2013) investigated the design and content features of forty-five Apps selected by an experienced teacher. From the broad range of Apps selected, 27 of them were considered educational Apps, which focused on content learning, such as: solving math tasks (e.g. Bubbling Math), improving numeracy skills (e.g. Connect the dots), reinforcing spelling (e.g. Rocket Speller Smarty Pants School), acquiring new vocabulary (e.g. Smarty Pants School), and improving phonetic (e.g. Mr. Phonics), among others. The rest of the Apps selected in the research were considered to be learning skills tools, allowing students to develop a variety of activities, such as: practicing writing skills (e.g. Magnet ABC), performing oral skills (e.g. Talking Tom and Ben News), rehearsing reading skills (e.g. Cat

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