

## Chapter 74

# Exploring the Potential of Mobile Applications to Support Learning and Engagement in Elementary Classes

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### ABSTRACT

*Mobile devices have integrated themselves in society where they are used naturally and invisibly by individuals. Despite the fact that these devices are available to teachers and learners, the traditional style of classes is still the dominant style. This research explores the utilization of mobile applications in traditional classroom settings, and how this affects students' learning and engagement. An action research project was conducted in Bahrain to study the differences between the utilization of mobile applications in a classroom setting in a private school, with more technology exposure, and in a public school, with limited technology exposure. The study found that the use of mobile applications in classrooms increased students' engagement despite differences in the utilization of technology. The study also found that integrating mobile applications in classrooms has the potential to enhance students' performance.*

### INTRODUCTION

Information and Communication Technologies (ICT) have been utilized in many aspects in education since the 1980s (Bigum & Green, 1993). With advancements in technology, the use of ICT in education is continually changing. Currently, smartphones and tablets are the latest forms of

technology to be utilized to support students' learning. The improvements in the features of these devices, such as processing power, interaction and communication styles, location identification, connectivity and memory, have been used by researchers (e.g. Frohberg, Goth, & Schwabe, 2009; Hall & Bannon, 2006; Klopfer & Squire, 2008; Kurti, Spikol, & Milrad, 2008) to provide

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students with innovative learning opportunities, which were not possible with the first generation of mobile devices, nor with the use of personal computers.

Schools and universities around the world are adopting mobile devices to provide students with learning opportunities anytime and anywhere. This is motivated by the continuous technological developments (Blurton, 1999; Beyth-Marom, Chajut, Roccas & Sagiv, 2003) and the fact that mobile devices are widely available to teachers and learners and can be utilized to support learning. In addition, instructors' personal interests in improving teaching and learning (de Boer, Boeze-rooy, & Fisser, 2003) and institutions' changing policies and missions (Fox, 1999) have played an important role in the adoption of mobile devices in education. Mobile devices have been used to assist students' performance and provide them with hands-on learning experiences in both formal (e.g. Young & Heym, 2008; Seol, Sharp, & Kim, 2012) and informal (e.g. Sultan & Mohan, 2011; Sandberg, Maris & de Geus, 2011; Seo et al., 2012) learning contexts with the benefit of expanding learning outside the classroom to the field (e.g. Zurita and Nussbaum, 2004; Gienza, Kuntke & Hoppe, 2010; Perkins & Saltsman, 2010; Mueller, Wood, De Pasquale & Cruikshank, 2012.)

Although mobile devices have woven themselves into society in such a way that they are used naturally and invisibly, and are already owned and available to teachers and learners, the traditional didactic style of lectures, which is based on one-way information flow with limited or no interaction (Reilly & Shen, 2011), is still the main instruction method used in classrooms. Since the classroom environment is vital for motivating students to learn (Stefanou & Salisbury-Glennon, 2002), interest has been growing towards supporting students inside the classroom with mobile devices to benefit from what the technology can offer to aid students' learning and overcome some of the challenges that both students and teachers face in this setting. In this sense, mobile devices are

being thought of as technologies that can become an integral and essential part of the curriculum where students and teachers use them in a routine way (Looi et al., 2011). This supports the transformation of learning from content-centered and teacher-centered to student-centered, which encourages personalized and self-directed learning (Looi et al., 2009). This also lines up with constructivist theories where learners are conceived to construct knowledge rather than just receive and store it through lectures and books (Brown, Collins & Duguid, 1989; Jonassen, 1991.) This encourages students' independent and life-long learning where students take responsibility for their own learning (Holzinger, Nischelwitzer & Meisenberger, 2005.) This also leads to teachers becoming more like facilitators who help students to be responsible for their learning and construct their own understanding and capabilities (Collins, 1991), an approach which is lacking in traditional lectures.

Using mobile applications to encourage a student-centered approach to learning also leads to improved motivation, engagement and performance (Alfassi, 2004; Looi et al., 2010; Garaj, 2010; Reilly & Shen, 2011.) In this sense, many studies have been conducted to improve students' performance and overcome the limitation of the traditional lecture, like improving individual and collaborative learning (e.g. Dillenbourg & Jermann, 2006; Hernandez-Leo, Villasclaras-Fernandez, Asensio-Perez, Dimitriadis & Retalis, 2006; Schweitzer & Teel, 2011; Alvarez et al., 2009), supporting students' inquiry, especially with large groups (e.g. Seol et al., 2011), supporting students' mathematics learning (e.g. Kalloo and Mohan, 2011) and scientific discovery (e.g. Looi et al., 2010; Seol et al., 2012,) enabling students' note taking and increasing their engagement in the classroom (e.g. Reilly & Shen, 2011) and supporting students' English language learning (e.g. Kumar et al., 2012; Sandberg et al., 2011; Lu, 2008.) Mobile devices have also been used to provide students with a wide variety of interac-

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