Using Smartphones in the College Classroom

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INTRODUCTION

Some of the earliest research that examined the potential impact technology could have on learning outcomes and motivation to learn was done by Dr. Lorna Uden at Staffordshire University in the United Kingdom (Dai & Uden, 2008; Uden, 2007; Uden & Brandt, 2000). Using technology in the classroom was shown to increase student motivation and engagement. Smartphones represent the evolution of the mobile telephone into a mini computer that can be carried anywhere, which was quite different from simply incorporating technology into course curriculum. A recent overview of this progression (Watts, 2012) indicates that in a period of less than 10 years, individual technological hardware has been incorporated into the mobile phone, often making those original devices unnecessary (e.g., fax machine, a separate digital camera). Smartphones now include the ability to email (creating the new term 'snail mail' as it reduced the need to use the postal service), take photos, create videos, play music, play video games, and access webpages on the internet. The ability to accomplish all of these things in one device has made this technology a new resource that can be incorporated into the college classroom. Activities for inside the classroom and assignments to be completed outside of the classroom have been incorporated into college curriculum with varying degrees of success. An early researcher on the way mobile phones and podcasting could be used to improve learning outcomes was Dr. Dani McKinney at State University of New York – Fredonia (McKinney, Dyck & Luber, 2009). This work indicated that students could learn from podcasts just as well as when attending a live lecture, provided the students listened carefully and took notes over the material in the same way they would during the live class session.

Since this early research, a couple of key researchers have published interesting studies that indicate the best conditions for using mobile technology and smartphones in the classroom. One researcher is Dr. Susanne Voelkle at the University of Liverpool in the United Kingdom. Her work has focused on specific classroom exercises that can help both students and instructors make formative assessments of learning (Voelkle, 2013; Voelkle & Bennett, 2014). Another researcher that is doing cutting edge work on using smartphones in the classroom is Dr. Patient Rambe and his colleagues at the University of the Free State in South Africa (Rambe & Bere, 2013a,b; Rambe & Nel, 2013). His research focuses on using instant messaging in the classroom to increase student engagement. The purpose of this chapter is to give an overview of some current trends in incorporating this new technology into the college curriculum, and focuses mainly on the most recent research (i.e., 2011-2014) in an effort to give a more focused snapshot of the current state of this topic.

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OVERVIEW

As early as 2008, Abilene Christian University was providing iPhones or iPod Touches to incoming freshman (Ash, 2010). At Abilene Christian University (as well as at Seton Hall and Central Michigan Universities), students used these devices to complete in-class polls, to look up information relevant to course content on the internet, and to collaborate with other classmates on class assignments. Uden (2007) indicated that using mobile devices in the classroom increased student motivation and ability to collaborate with other students. Backer (2010) also found increased motivation and interest in peer collaboration using a method similar to Uden's, but adding a social media element (e.g., Facebook). These studies are examples of the desire to incorporate mobile technology into the classroom, even if the devices initially had to be provided to the student. As more students attending college are already equipped with a smartphone, the variety of assignments and activities has increased. In addition, students are now able to access Learning Management Systems (e.g., Blackboard, Canvas, Desire2Learn, etc.) on these devices, enabling them to take quizzes and read e-textbooks free of the need to find a stationary computer with internet access to complete these tasks. The next section focuses on current research on the most common uses for smartphones both inside and outside of the lecture hall. This is not an exhaustive list of all the ways this technology can be used; this is an overview of some of the *most common* uses in the last 3-4 years.

CURRENT SCIENTIFIC KNOWLEDGE IN CLASSROOM SMARTPHONE USAGE

e-Textbook Usage

Several recent studies have examined the use of smartphones by students to access e-textbooks provided by book publishers (e.g., Bromley, 2012; Brown, 2012; Che-Ching, Gwo-Jen, Chun-Ming, & Shian-Shyong, 2013; Chen, Wei, Huang, & Kinshuk, 2013; McCarthy, 2011). Bromley (2012) suggests that the increased elements that textbook publishers place into their e-textbooks (e.g., QR-codes, hyperlinks to videos and other related content) allows for increased understanding of content presented by the textbook authors. Students are more likely to make use of these added resources when they are already accessing the textbook content online through a Learning Management System. Che-Ching et al. (2013) indicated that even if the students are using a physical textbook, students making use of a QR-code feature indicated they like this added feature, and would make use of it again in the future. QR (Quick Response) coding provides a digital link to additional textbook content that provides more information, study helps, external videos and content maps. Students can access this extra content by scanning a QR-code placed in the physical textbook indicating the presence of external digital content. These QR-codes are scanned using a free smartphone application that opens a web browser on their smartphone and takes the student directly to the relevant content. Another study indicated that in addition to providing access to additional textbook content, QR-codes could be used to access mini-assessments of the student's understanding of content read thus far (Chen, Wei, Huang, & Kinshuk, 2013). This study indicated that this immediate, personalized, constructive feedback significantly increased learning performance. However, not all researchers indicate positive outcomes when using e-textbooks (e.g., Brown, 2012; McCarthy, 2011). McCarthy (2011) found that although students like to read e-books for pleasure, this preference did not translate into a desire to use e-textbooks. A year later, Brown (2012) found a similar result. In both studies, it appears that e-textbooks had not yet reached a format the students enjoyed using, or would choose over a physical textbook.