

# Mobile Games and Learning

**Boaventura DaCosta**

*Solers Research Group, USA*

**Soonhwa Seok**

*Korea University, South Korea*

**Carolyn Kinsell**

*Solers Research Group, USA*

## INTRODUCTION

The unparalleled popularity of mobile devices, in part, has helped pave the way for a variety of research interests, to include how mobile games can be effectively used in today's digital age to support not only social development, but intellectual activities (Spikol & Milrad, 2008) and general learning (Facer et al., 2004; Rogers & Price, 2006). This should not come as a surprise. Experts have long endeavored to understand the draw of video games on youth and how this entertainment medium can be used in the context of learning within an educational setting, such as a classroom, to the extent that game-based learning has become a major vein of study (Pivec & Pivec, 2008) among researchers and educators alike.

The anytime, anywhere, and on any device nature of mobile technology appears to offer new opportunities for researchers and educators interested in leveraging the potential benefits of game-based learning. These are mobile devices that not long ago were esoteric (Cohen & Lemish, 2003), but are now at the forefront of technology. Moreover, these devices are now an important part of culture, altering the way people communicate and collaborate (Spikol & Milrad, 2008). The potential instructive benefits of mobile devices go beyond their attractiveness, widespread ownership, and everyday use, warranting serious study as to their role in education.

In this chapter, we offer a review of the literature on the benefits of video games in an educational context focusing on mobile games and their educational contribution. In doing so, we summarize what is currently known about the use of mobile games in learning, providing examples of mobile games explicitly called out in the literature that have been experimented with and/or used to explore game-based learning both in and out of the classroom. Overall, the purpose behind this chapter is not to debate the practice of introducing video games into the classroom, but instead spark interest in future research, driving forward the study of mobile games as a learning medium, regardless of the environment in which it is used.

To ensure scholarly rigor, the research presented in this chapter was compiled in a staged approach very similar to that found in primary research (Cooper, 1998). First, this chapter compiles the great majority of its content from substantive literature including books, academic journals and databases, and online journals. Next, considerable effort was made to ensure peer reviewed materials were foremost whilst researching and gathering content for this chapter. Finally, other resources were used as well, including online articles as supplemental information befitting their academic stature and to provide context regarding "practicing real world examples or an in-the-trenches view" (Kinsell, DaCosta, & Nasah, 2014, p. 161).

In addition, a multitude of experts in video game research were cited in this chapter. From early pioneers, such as James Gee and Kurt Squire, who are both involved in the Games, Learning, and Society group at the University of Wisconsin-Madison, and who have made a significant contribution to the field of game-based learning in regard to their publications as well as research projects. To other leading scholars, such as Mark Griffiths, a professor of Gambling Studies at Nottingham Trent University, and director of the International Gaming Research Unit, who has conducted extensive research on the psychosocial implications of video games, most notably, his work on video game addiction. This is particularly important because, as we will soon discuss, research on video games is far from conclusive (Huizenga, Admiraal, Akkerman, & ten Dam, 2009). Thus, this chapter attempts to present the perspectives and findings of numerous scholars, practitioners, and experts, to provide a rounded view of video game research in general, and mobile game-based learning, specifically.

For clarifying purposes, unless otherwise noted, throughout the remainder of this chapter, the term “video game” refers to traditional games played on a PC, game console (e.g., Xbox®, PlayStation®, Wii®), or handheld game device (e.g., 3DS®, Vita®); whereas the term “mobile game” refers to a classification of video game, played exclusively on a mobile device (e.g., cell phone, personal digital assistant [PDA], smartphone, tablet).

## **CURRENT SCIENTIFIC KNOWLEDGE IN MOBILE GAMES AND LEARNING**

Video game research has been historically wrought with disagreement. While researchers have investigated video games in numerous contexts, the preponderance of the literature has led to stanch arguments debating their psychosocial implications versus educational benefits (DaCosta, Nasah, Kinsell, & Seok, 2011).

## **The Psychosocial Implications of Video Games**



A good deal of emphasis to this day continues to focus on the discouraging aspects of violent video games as an entertainment medium (DaCosta et al., 2011). Video games have long been viewed as a social concern in the U.S. and other countries (Kirsh, 2002; Schneider, Lang, Shin, & Bradley, 2004) sparking considerable research found within the field of psychology (Federman, Carbone, Chen, & Munn, 1996) focused on violence and aggression in adolescents (Barlett, Anderson, & Swing, 2009).

Numerous studies can be found, for example, reporting on the relationships between video games and aggression (e.g., Anderson & Bushman, 2001), as manifested in violent thoughts or feelings (e.g., Anderson & Ford, 1986; Anderson & Morrow, 1995; Ballard & Wiest, 1996; Barlett, Harris, & Baldassaro, 2007; Barlett, Harris, & Bruey, 2008; Calvert & Tan, 1994; Carnagey & Anderson, 2005; Eastin, 2006; Eastin & Griffiths, 2006; Farrar, Krcmar, & Nowak, 2006; Graybill, Kirsch, & Esselman, 1985; Ivory & Kalyanaraman, 2007) and violent play (e.g., Schutte, Malouff, Post-Gorden, & Rodasta, 1988; Silvern & Williamson, 1987); as well as the possible negative influence of gaming on other factors, such as physiological arousal (e.g., Ballard & Wiest, 1996; Barlett, Harris, & Bruey, 2008; Ivory & Kalyanaraman, 2007; Kirsh, 2002) and addiction (Choo, Gentile, Sim, Khoo, & Liau, 2010; Gentile, 2009; Hussain & Griffiths, 2009; Porter, Starcevic, Berle, & Fenech, 2010; Seok & DaCosta, 2012).

## **The Educational Benefits of Video Games**

Research exclusively addressing the educational benefits of video games has shown similar discouraging findings. There is research, for instance, suggesting that video games can be a negative activity resulting in poor academic performance (e.g., Anderson & Dill, 2000; Harris & Williams,

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