

## Chapter 1.12

# Mobility, Games, and Education

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### ABSTRACT

This chapter proposes that the convergence of mobile devices and digital game-based learning may have profound implications for educational transformation. Key issues to be addressed in the chapter are: (1) the pervasiveness of mobile and shared technologies, (2) contemporary accounts of learning theory in terms of mobility, (3) unique qualities of mobile learning and technologies, (4) successful applications for mobile learning, and (5) implications for future research and practice. Commuters play Sudoku on smart phones on the subway. High school freshman swap downloaded music across digital media devices in the parking lot. Elementary students debate strategies and

“cheats” for handheld consoles on the bus ride home. For educational researchers, practitioners, and administrators, it is critical to examine these identified trends in mobile technology and digital game adoption and use to develop creative strategies and applications, and effective policies that lead to innovative instructional and learning environments.

### INTRODUCTION

Currently, mobile learning and digital game-based learning are occupying the minds of educational policymakers, administrators, teachers, and scholars. Mobile learning, which can be categorized as a subset of distance learning or e-learning, is defined as instruction and learning delivered and

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conducted via highly portable (preferably wireless) technologies including laptop computers, tablet PCs, handheld computers, game consoles, and cellular telephones (New Media Consortium, 2007; Sharples, 2006). Digital game-based learning is defined as instruction and learning derived from methodologies and design features of computer and console video games (Alessi & Trollop, 2000; Squire, 2006). Although these trends have recently garnered much attention in the popular and academic press independently, the intersection of the two has been essentially overlooked. In this chapter I present a line of reasoning that argues for the convergence of these trends to induce transformation in formal and informal educational settings. The potential for mobile, digital game-based learning could have unprecedented influence on instruction and learning in the 21st century.

Mobile learning has received much attention of late for several reasons. First, mostly in primary and middle school settings, mobile learning is being used to emphasize “learning by doing” (Brown, Collins, & Duguid, 1989) and “knowledge building” (Scardamalia & Bereiter, 1994) pedagogies, encouraging students to collaborate in settings in and outside the classroom by using mobile devices for data collection, analysis, and distribution. The learning theory and pedagogy invoked draws from a substantial line of literature representing everyday cognition (Lave, 1988) and communities of practice (Lave & Wenger, 1991). One example might have middle school students use GPS-enabled handheld computers to collect audio, video, and positioning records of migratory birds in a natural science course. A second example would have elementary students monitoring a community garden using a Web-enabled smart phone to collect and share text, photographs, and video with an agriculturalist to receive expert guidance and feedback. Second, in corporate, healthcare, and military settings, where a significant number of employees are “in the field,” mobile technologies are used to deliver location- and time-based

information, real-time updates, and job aids. One example in the healthcare field is the use of tablet PCs by nurses on rounds to update patient data and records. In military settings, electronics technicians on ships at sea are receiving updates to technical manuals and conducting real-time chat with shore-side experts via ruggedized pocket PCs. Finally, mobile learning is taking hold in developing countries where access to desktop and laptop computers is severely limited, and electricity is intermittent and necessitates a reliance on mobile phones. Thus, in a country such as Kenya, cell phones are used as an ubiquitous platform for education, research, journalism, and commerce. A project undertaken currently by the author, and science education and human-computer interaction colleagues (the Mobile Malawi Project) involves using smart phones in Malawi, Africa, to connect geographically dispersed community elders, teacher educators, and classroom teachers in a participatory revision of existing curriculum on sustainable agriculture. Overall, mobile learning is infiltrating a broad spectrum of learners in education, training and development, and commerce that has caught the attention of teachers, researchers, administrators, policymakers, and mobile, wireless device manufacturers.

Digital game-based learning (DGBL)—though I maintain development somewhat distinct from mobile learning in the scope of instruction and learning literature—is gaining equally fervent attention from educators and researchers. Perhaps inspired in part by the work of James Paul Gee, particularly *What Video Games Have to Teach Us About Learning and Literacy* (Gee, 2003), educational researchers and practitioners are incorporating off-the-shelf titles, and developing education- and content-specific games, for use in primary and middle schools. In higher education, there is an increasing interest and focus to train students in programs from computer science, human-computer interaction, and instructional design and technology in digital game design and development. DGBL can take the form of

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