Chapter 1
Inside, Outside, and Off–Site: Social Constructivism in Mobile Games

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ABSTRACT
Well-designed mobile games that require player agency and meaning making are excellent examples of constructivist learning. Mobile games can generate a myriad of different learning experiences such as discovery learning and contextually based learning. One of the most powerful affordances of games is promoting social learning, or social constructivism; collaborative games provide plenty of opportunities for peer scaffolding and collaborative discourse. This chapter details three mobile augmented reality games designed to afford constructivist learning through collaborative interactions: one inside a school, one on and around school grounds, while the last one is located at a working farm. We hope to demonstrate that collaborative mobile games represent a flexible approach that can promote meaningful learning across subjects, ages, and even environments. Game-based learning (GBL) can, does, and should continue to occur in class; however, GBL can also be effectively implemented outside and even far away from the classroom, off-site.

INTRODUCTION
Today’s young students learn differently—they want active, exploratory learning. Don Tapscott (2009), an expert on the transformative power of the digital age, believes that young students who are growing up digitally connected actually learn differently; because their brains have developed differently through their media interactions, their brains process information differently. This different style of learning is largely why students are often disengaged at school (Goyal, 2012). Curricula struggle to support

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Inside, Outside, and Off-Site

Tech-savvy students because a tension exists between traditional, didactic teaching approaches and the distributed, decentralized nature of today’s media (Roschelle & Pea, 2002). To get students engaged at school, content mastery needs to be replaced by learning mastery (Richardson, 2012).

We believe that mobile augmented reality (AR) games represent a unique opportunity to create active, exploratory learning environments that engage students and offer more meaningful learning experiences. Today’s students have the opportunity to learn in different ways, largely because of the technologies that surround them outside of school (Ito, 2010). One medium that dominates a young student’s out-of-school time is gaming and it starts from an early age. In fact, “gaming represents the central form of early computer experience for kids” (Ito, 2010, p. 196). By middle school, students are high-frequency users of video games and web-based games (Spires, Lee, Turner, & Johnson, 2008). More importantly, students value the use of games for learning (Goyal, 2012; Project Tomorrow, 2010). Nikal Goyal (2012), who published his student perspective on the state of education, stated “I have learned so much more about math by playing games…than by hearing lectures and doing textbook problems” (loc. 5400); he goes on to clearly state that he wants to see games used in the classroom. He is not the only student voicing this opinion. Students in the Speak Up study—approximately 300,000 students—also advocated for games in the classroom because games can get them more engaged with the subject matter, help them to work in teams, and provide an easier way to understand difficult concepts (Project Tomorrow, 2010).

If games are worthy of exploration from an educational perspective, then what is the best way to deliver game-based learning? We believe that the digital medium that warrants the most potential at this moment is mobile technology, because we are at a tipping point. For over a decade, mobile phones have been a vital part of teenagers’ social lives (Katz, 2006); young people live in a mobile world and their devices connect them to it. Mobile technology has had time to incubate outside the K-12 system; now, it is ready to be a “disruptive innovation” (Christensen, Horn, & Johnson, 2008). More and more schools are inviting students to bring your own device (Norris & Soloway, 2011) and many schools have invested heavily in providing both students and teachers with devices such as iPads, Chrome Books, and other 1:1 technology. We need to create and enact curriculum activities that ensure students will garner important skills and benefit from the unique affordances of mobile technology—no more business-as-usual. We believe that mobile AR games can serve as an effective solution. In this chapter, we will present three mobile AR games that we designed and developed. We intend to demonstrate that well-designed mobile games represent a flexible, constructivist approach that can promote meaningful learning across subjects, ages, and even environments.

BACKGROUND

The games discussed in this chapter draw on a vast body of literature from foundational educational theorists such as Piaget and Vygotsky to today’s top thinkers in the games and learning field such as Kurt Squire and Eric Klopfer. Since all of the games discussed in this chapter are collaborative, we start off with some background literature on social constructivism. Then, we will bring you up to speed on some of the literature pertaining to games and learning. Lastly, we include some of the foundational research on collaborative mobile games that helped us to set up our game designs.