Chapter 25
Developing Teacher Knowledge about Gamification as an Instructional Strategy

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ABSTRACT

There is a need for teachers and higher education faculty to develop knowledge about instructional strategies that engage digital learners and accommodate digital learning preferences in order to deliver instruction that digital learners perceive as relevant. This chapter discusses how gamification can be used in higher education as an instructional strategy to meet the needs of the digital learner. Findings from a design-based research study of how gamification was used in a Teacher Education technology methods course, to engage pre-service teachers in activities that develop Technological Pedagogical Content Knowledge (TPACK) (knowledge about teaching with technology) (Mishra & Koehler, 2006), are discussed. The findings provide guidance for teachers and technology educators on how to design courses incorporating gamification as an instructional strategy appropriate for meeting the needs of digital learners. Issues concerning design and implementation as it influenced student engagement and learning are highlighted, and recommendations are made for course development.

INTRODUCTION

In 2013, Project Tomorrow reported, based on data collected from 364,240 K-12 students, that the current generation of students exhibited a preference for self-directed and personalized learning experiences using laptops, classroom chat rooms, games, online textbooks, digital media creation tools, text messaging, mobile applications, and personal mobile devices. This shift in how learners perceive the learning environment calls for a shift in teaching pedagogy to meet the learning needs of these students. Many of the Grade 12 students participating in Project Tomorrow (2013) are now undergraduate students at our universities, further emphasizing the need for higher education fac-

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ulty to reassess the relevance of the instructional strategies they use.

In this chapter, we discuss how gamification can be leveraged in higher education settings to engage and motivate digital learners. The chapter reviews the characteristics of games, the motivational elements of gameplay, discusses how game features are applied to non-game environments (gamification), and presents a case of an empirical investigation of a *gamification* instructional strategy implemented in a teacher education technology methods course. Gamification was specifically used to engage pre-service teachers in activities that develop Technological Pedagogical Content Knowledge (TPACK) (knowledge about teaching with technology) (Mishra & Koehler, 2006). The study findings provide insights into important issues related to course design that influence student engagement and learning. Such insights can provide guidance for teachers and higher education faculty on how to design courses incorporating gamification for teaching in the digital age. It also highlights how gamification specifically supports the development of TPACK knowledge.

LEARNING IN THE DIGITAL AGE

The current generation of students are digital learners – learners who have experienced a consistent exposure to digital technologies in their daily lives (Tapscott, 2008) and use those digital technologies for learning purposes. Project Tomorrow (2013) states that these "digital tools and resources are enabling, engaging and empowering students to become self-directed learners" with a " . . .seemingly insatiable appetite for using technology more effectively within their learning lives" (p. 1). For example, in order to "connect, collaborate and create content in ways that are especially meaningful" (Project Tomorrow, 2013, p. 5), digital learners are using a wide variety of social media tools (texting with classmates about assignments, Twitter to ask for support and communicate learning needs to others, Facebook to collaborate on school assignments, and watching videos online to help with homework). Mobile devices such as smartphones and tablets are becoming the most prominent way for students in K-12 to access the Internet, and this explosion of accessibility to digital tools is influencing how digital learners access information and use these tools for learning purposes:

> *65 percent of students in grades 6-8 and 80 percent of students in grades 9-12 are smartphone users. Students' access to digital readers has followed a similar pattern of growth. In just one year, the number of middle school students with a personally acquired, not school provided digital reader more than doubled from 17 percent in 2011 to 39 percent in 2012. (Project Tomorrow, 2013, p. 4)*

Having information literally 'at your fingertips' and the accessibility of digital tools presented through interactive environments has led to today's digital learners demonstrating an increasing preference for *connected learning*, or the process of learning through accessing digital technologies and multiple online resources in creative and evolving ways to reach a learning goal (Connected Learning, n.d.). Digital learners connect their interests, peer networks, and school accomplishments to build knowledge (Ito et al., 2013), and connected learning has been defined as "the act of 'connecting' one's self to people, content, systems, networks, etc. during the learning process itself … and it may occur through several mediums" (Pontefract, 2011a, para 4).

This perspective of learning encapsulates the many possibilities when learning is no longer the purview of the classroom, but instead is "part formal, part informal, and part social, with each part equally important" (Pontefract, 2011b, para 11). Pontefract (2011a) defines these learning modalities as: