Using a Ludic Simulation to Make Learning of Middle School Space Science Fun

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ABSTRACT

In this paper, the authors describe a ludic simulation designed for middle school space science and examine its use to support students’ learning and motivation. The participants were 383 sixth graders and 447 seventh graders. The findings of this study showed that sixth- and seventh-graders perceived the simulation as having substantial ludic characteristics and educational value. The results indicated that having a playful experience is important for this age group and that participating in a ludic simulation can help motivate students to learn school subjects. Results also indicated that incorporating ludus into the learning experience can improve students’ attitudes toward the subject matter. Implications of policy, research, and practice with regard to using ludic simulations to support classroom-based learning were discussed.

Keywords: Attitude, Learning, Ludic Simulation, Middle School Science, Motivation

INTRODUCTION

The use of digital simulations and games to support learning has garnered significant interest in recent years. Simulations are routinely applied in a variety of fields to address diverse learning objectives, but increasing interest in games within popular culture has led many to consider the effects that playful or ludic simulations can have on learning. For instance, about 60% of children and adolescents reported playing digital games daily during 2009, an increase from 52% in 2004 and 38% in 1999 (Rideout, Foehr, & Roberts, 2010). With such an explosion of interest in the ludic value of digital media, we echo the question that the editors of this special issue posed: “What does it mean to have a simulation that could be called ludic?”

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The purpose of this paper is to describe a ludic simulation designed for middle school space science and to highlight previous and emergent research findings that can help us better understand the value of ludic simulations in education. To this end, we will proceed by first presenting a brief overview of previous research studies conducted on the simulation and then explore some intricacies of students’ ludic experiences within it. In so doing, we will directly address issues relevant for this special issue and hope to provide valuable insights to educators interested in the topic.

THEORETICAL FRAMEWORK

Considerations of the pedagogical value of ludus, or play, feature prominently within constructivist metatheory, having been of interest to both cognitive constructivists (Piaget, 1951) and social constructivists (Vygotsky, 1978), and the topic has seen renewed attention in recent years (cf. Singer, Golinkoff, & Hirsh-Pasek, 2006). At early stages of development, children engage with the world and people around them through playful interactions that allow them to learn by imitation, symbolic interaction, and cognitive representation, thereby constructing experiential knowledge about the world (Piaget, 1951). As a result, play for children is “an engaging and deliberate activity to which they devote great effort and commitment” (Rieber, 1996, p. 44), and out of such play, children can develop deep and important understandings. Current research in a variety of fields suggests that “play is an important mediator for learning and socialization throughout life” (Rieber, 1996, p. 44; see also Csikszentmihalyi & Bennett, 1971).

With the introduction of digital technologies, researchers were empowered to think about play in new and innovative ways, and digital games as a method of play have become commonplace amongst consumers on computers, game consoles, and mobile devices. In 2009, for instance, it was reported that 42 percent of U.S. homes had a game console (Ivan, 2009), and the emergence of Internet-based social networking technologies and new content distribution platforms such as Valve Corporation’s Steam (2003) and Apple’s App Store (2008) have enabled the growth of new popular methods of digital gaming like massively multiplayer online games (MMOG’s), casual games, mobile games, and social gaming.

This rapid growth and the prevalence of digital games in our culture have led many to consider the questions we might answer and the problems we might solve through play. McGonigal (2011), for instance, argues that games in today’s society “are fulfilling genuine human needs that the real world is currently unable to satisfy” and that games, if properly harnessed, have the potential to address real-world problems. Current gamification or ludification movements agree with this stance and hold that a “new ludic system” is arising in conjunction with a variety of ludic social phenomena (e.g., the video game industry, theme parks, etc.). Ortoleva (2012) explains that this “new ludic system would not exist without thinking machines, to which we owe a great variety of playful practices, from video games to casual games, to those peculiar games that are social networking websites,” and in the words of Fuchs (2012), “we have a society with a ‘high lusory attitude’ … in using these ludic interfaces [e.g., digital games], we increasingly turn work, war, sport and health into gamified processes.” Focusing on specific problems in education, Squire (2003) has argued that digital games can “elicit powerful emotional reactions in their players, such as fear, power, aggression, wonder, or joy” (p. 2) and that designers of educational products have much to learn from game developers with regard to designing “interface, aesthetic, and interactivity” (p. 11) to support learning, and Gee (2003) has further argued that good commercial games incorporate “learning principles that … are all strongly supported by contemporary research in cognitive science” (p. 1). Regarding the educational value of games, Gee even goes so...
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