# Chapter IV
# An Investigation of Current Online Educational Games

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## ABSTRACT

*Electronic games are becoming an important part of many American children's life today. Electronic educational gaming, as a new instructional technique and media, holds great potential for the new millennium of learners. To reflect the preferences and meet the needs of this generation of learners, many various online games for educational purposes are made available the sheer number of existing educational games is overwhelming. The purpose of this chapter is to investigate the current state of educational games on the Internet, targeting K-12 learners in the United States. Major game providers and salient design features are identified, and future directions of game development for educational purposes are discussed.*

## INTRODUCTION

Digital games have emerged as one of the largest forms of entertainment in pop culture, and playing video and computer games is an important part of many children's leisure life in the United States (Entertainment Software Association, 2007). Gaming is ranked among the top applications of the Internet (Pew Internet and American Life, 2005); kids between 2 and 18 years of age spend 20-33 minutes a day playing digital games (Kaiser Family Foundation, 2002). As a multi-billion-dollar industry rivaling with Hollywood's cultural influence, playing digital games is a dominant play culture and is increasingly affecting the way kids grow and their informal learning outside school.

Digital games' popularity and influence have aroused an intense interest in exploring their educational uses and benefits. Prensky (2001), Gee (2003), Aldrich (2005), and Squire (2005a) are among the early pioneers who have attempted to understand the inherent lure of games, as well as to uncover the power of digital game-based learn-

ing. Meanwhile, a number of research centers and initiatives dedicated to game study have emerged, including the Media Lab at Massachusetts Institute of Technology and its Games-to-Teach Project, the Games and Professional Practice Simulations (GAPPS) Group at the University of Wisconsin-Madison, the Virtual Human Interaction Lab at Stanford University, the Entertainment Technology Center at Carnegie Mellon University, and the Digital Games Research Center at North Carolina State University. Digital game-based learning is said to be the next generation's educational media that holds great potential for meeting the needs and learning styles of the millennial generation of learners (Aldrich, 2005; Gee, 2003; Oblinger, 2004; Prensky, 2001).

To reflect and cater to the needs and preferences of the millennials, myriad educational games are constantly being developed and made available on the Internet. A Google search of "online educational games" returned about 14.5 millions hits. Companies, organizations, or services targeting children compete to offer free online games intended to help children learn while playing. Some educational organizations and agencies have categorized or recognized top educational game Web sites monthly or annually. For example, EduHound (affiliated with T.H.E. Journal) identifies and updates its listing of "Fun & Games" Web sites for kids (http://www.eduhound.com/cat.cfm?subj=Kid%20Sites); Exploratorium, on the other hand, recommends "Ten Cool Sites" featuring fun games monthly (http://apps.exploratorium.edu/10cool/index.php).

Undoubtedly, the sheer number of existing online games designed for educational purposes can be overwhelming for educators who want to incorporate gaming into their curriculum. In fact, one of the major obstacles for teachers is that it is difficult to identify quickly the accuracy and appropriateness of the content within a particular game and how the game is relevant to some components of the statutory curriculum (Kirriemuir & McFarlane, 2004; Rice, 2007). Moreover, research on the use of electronic gaming in education is relatively new (DiPietro, Ferdig, Boyer, & Black, 2007). While a number of studies have emerged to investigate video games (Squire, 2005b), as well as 3D massively multiplayer online games (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005b; Dede, 2003), there appears to be a lack of studies looking into the huge collection of various online games that may hold great potential in supporting learning in the K-12 classroom. The purpose of this chapter is to examine the current state of online educational games. Specific research questions include:

1. Who are the major providers of existing online educational games?
2. What are the major types of existing online educational games?
3. What are the salient design features among existing online educational games?
4. What are the implications of the current state of online educational games for future development?

## LITERATURE REVIEW

Online educational games refer to a hybrid type of game genre that is played on the Internet through a Web browser, utilizes game formats (e.g., arcade, adventure, puzzle, massively multiplayer online game, etc.), and incorporates some type of learning objectives, the goal of which is to promote student learning in a fun, engaging, and interactive way (Okan, 2003). Different from mainstream games whose design focus is purely entertainment, online educational games target students, teachers, and parents, and as such their design focuses on subject matter and cognition (Gros, 2003).

To identify the major types of existing online educational games, a brief overview of existing game taxonomies is in order. In addition, what the literature has suggested about core elements