# Chapter 2.13
# Motivation, Learning, and Game Design

**Mahboubeh Asgari**
*Simon Fraser University, Canada*

**David Kaufman**
*Simon Fraser University, Canada*

## ABSTRACT

While there are thousands of educational computer and video games in the market today, few are as engaging and compelling as entertainment games. Some entertainment games have also been used in classrooms and have proven to produce incidental learning (e.g., Civilization III, SimCity). This has demonstrated that learning can occur through playing computer and video games, although it does not address the question of how to design engaging games for learning that incorporate specific learning objectives. As educators, we generally design instruction by specifying our learning objectives and then developing our learning materials to address these objectives. The authors of this chapter argue that there are a number of elements used in entertainment games that motivate players, and using these elements in the design process for educational games based on learning objectives would create motivational and engaging educational games. This chapter outlines the elements needed to develop such games.

## INTRODUCTION

During the past 40 years, computer games have been played with a variety of technologies and on a variety of devices: from a floppy disk; CD-ROM; through the use of e-mail; on the Internet; with handheld machines such as the Game Boy, mobile phones, and game consoles such as the Sony PlayStation 2 or Nintendo's GameCube.

These powerful tools have the potential to create environments that increase motivation, engage learners, and support learning (Cordova, 1993; Dempsey, Haynes, Lucassen, & Casey, 2002; Gee, 2003, 2004; Lepper & Malone, 1987; Rieber, 1996; Rosas, Nussbaum, Cumsille, Marianov, Correa, et al., 2003; Shaffer, Squire, Halverson, & Gee, 2005; Squire, 2004, 2006; Stewart, 1997). They have a great appeal to teachers and for learners, making it important to examine the characteristics that help with the design of educational games that are motivating and engaging.

While there are thousands of educational computer and video games in the market today, there are very few as engaging and compelling as entertainment games; the best known examples are *Where in the World is Carmen San Diego?* (Broderbund Software, 1985) and *The Oregon Trail* (Minnesota Educational Computing Consortium, mid-1980s). Meanwhile, there are some entertainment games that have been used in classrooms as an add-on to the regular curriculum materials and instruction, such as *Civilization III*, and SimCity, and proven to produce incidental learning though they were not initially designed and intended for education. This demonstrates that learning can occur through playing computer and video games, although it does not address the question of how to design games for learning that incorporate specific learning objectives while providing engagement.

As educators, we generally design instruction by specifying our learning objectives and then developing our learning materials to support learners in meeting these objectives. The authors of this chapter argue that there are a number of elements used in entertainment games that motivate players, and if these elements were used in the design process for educational games based on prescribed learning objectives, then we could create motivational and engaging educational games. This chapter outlines the elements needed to develop such games.

The authors first address the importance of motivation in engaging students and increasing their learning. Knowing that computer and video games are motivating and engaging, the authors discuss the need for integrating these games in education and examine the positive affect of games on learning. *Civilization III* and *SimCity* are then explained as entertainment games that have been used in regular classrooms and have produced incidental learning. Finally, the elements incorporated in the design of such engaging entertainment games are outlined so they can be applied to the design of educational games that are based on prescribed learning objectives.

## MOTIVATION AND LEARNING

To design games for learning, one fundamental factor needed is to incorporate features that increase motivation. Motivation plays an important role in engaging students doing activities and increases their learning. Learner's motivation in learning is an important evidence-based psychological principle reported by American Psychological Association (APA, 1997). What is learned, and how much is learned, are both influenced by the learner's motivation. According to the APA, learner's positive emotions such as curiosity can increase motivation and facilitate learning; however, negative emotions and related thoughts such as anxiety, worrying about competence, or failure can decrease motivation and interfere with learning. In addition, tasks that are personally relevant, meaningful, interesting, appropriate in complexity and difficulty to the level of learners' abilities and skills, provide personal choice and control, and tasks that learners believe they can succeed, can stimulate learner's intrinsic motivation. Furthermore, providing an opportunity for learners to interact and collaborate with others can enhance motivation and learning.

Learning may be enhanced when the learner's current level of arousal increases, increased intrinsic motivation may heighten the learner's attention toward the instruction, enhanced motivation may change learner's "depth of processing" or active

## Related Content

FOMOphobia: The Psychological Drivers of OTT Media Consumption Through Social Comparison, Self-Esteem, and Anxiety

Sridevi Gopakumarand Madhava Priya Dananjayan (2024). *The Rise of Over-the-Top (OTT) Media and Implications for Media Consumption and Production (pp. 161-184).*

www.irma-international.org/chapter/fomophobia/337672

A New Neural Networks-Based Integrated Model for Aspect Extraction and Sentiment Classification

Rim Chiha, Mounir Ben Ayedand Célia da Costa Pereira (2021). *International Journal of Multimedia Data Engineering and Management (pp. 52-71).*

www.irma-international.org/article/a-new-neural-networks-based-integrated-model-for-aspect-extraction-and-sentiment-classification/301457

Context-Based Interpretation and Indexing of Video Data

A. Mittal, Cheong Loong Fah, Ashraf Kassimand Krishnan V. Pagalthivarthi (2008). *Multimedia Technologies: Concepts, Methodologies, Tools, and Applications  (pp. 527-546).*

www.irma-international.org/chapter/context-based-interpretation-indexing-video/27105

A Real-Time 3D Visualization Framework for Multimedia Data Management, Simulation, and Prediction: Case Study in Geospatial-Temporal Biomedical Disease Surveillance Networks

Nathaniel Rossol, Irene Cheng, Iqbal Jamal, John Berezowskiand Anup Basu (2011). *International Journal of Multimedia Data Engineering and Management (pp. 1-18).*

www.irma-international.org/article/real-time-visualization-framework-multimedia/54459

A Biologically Inspired Saliency Priority Extraction Using Bayesian Framework

Jila Hosseinkhaniand Chris Joslin (2019). *International Journal of Multimedia Data Engineering and Management (pp. 1-20).*

www.irma-international.org/article/a-biologically-inspired-saliency-priority-extraction-using-bayesian-framework/233861