PBL as a Framework for Implementing Video Games in the Classroom

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ABSTRACT

Video games and problem-based learning (PBL) are both significant trends in progressive approaches to education. The literature demonstrates a fit between the two approaches, indicating they may be mutually beneficial. With limited literature on implementing games in the classroom, and a growing body of researchers highlighting the importance of the teacher in mediating game use and maximizing the effectiveness of games for learning, guidance is needed on the role teachers can play in utilizing games in structured environments. PBL has a richer literature base on its effective use, and with its similarities to game-based learning, can inform the effective use of games. In order to assist educators in integrating video games into their curriculum, a video game implementation framework based on PBL principles was developed. The efficacy of utilizing video games for learning in formal and structured learning environments may be improved by integrating PBL guidelines as a framework.

Keywords: Educational Technology, Game-Based Learning, Problem-Based Learning, Teaching Methods, Video Games

INTRODUCTION

A growing body of advocates has called for the use of video games in order to engage learners and promote learning (Aldrich, 2005; Federation of American Scientists, 2006; Prensky, 2006; Quinn, 2005). However, sound empirical research on the outcomes of using games for learning are limited, particularly research on the use of games in classrooms, and results in the literature are mixed (Ke, 2009). Most of the available literature focuses on studies that examine the game as the tutor or instructor rather than as a tool for learning (Amory, 2010). Additionally, more and more researchers are highlighting the lack of research on implementation guidelines to support the effective use of games for learning, including the role instructors and teachers can play (Garris, Ahlers, & Driskell, 2002; Leemkuil, de Jong, de Hoog, & Christopher, 2003; O’Neil, Wainess, & Baker, 2005). Ke (2009) argues that more research is needed on how to effectively implement games.

Despite this call, little exists in the literature to guide teachers in how to actually implement games (Baek, 2011), particularly in a formal...
educational setting. Indeed, video games (hereafter, games) are sometimes promoted as a magical instructional solution where learners cannot help but learn, and the teacher may no longer be necessary. In reality, while further empirical research is necessary and results are mixed, there are studies demonstrating neutral or negative effects on learning from games (Gredler, 1996; Leemkuil et al., 2003; O’Neil et al., 2005), studies that reinforce the call for quality implementation guidelines. In practice, teachers can play a very large and important role in setting goals and promoting reflection by students playing games in formal educational settings (Watson, Mong, & Harris, 2011).

While the inherent challenges of implementing games within the sometimes unyielding confines of a classroom learning environment can offer strong impediments to the successful use of games for learning (Squire, 2003; Back, 2008), the reality is that banishing games to after school programs and home use diminishes the scope of their potential impact and limits the availability of teachers to facilitate learning. It is therefore important to establish an implementation framework to guide the use of games in such structured environments as classrooms.

Problem-based learning (PBL) is a progressive approach to instruction focused on contextualized learning and the promotion of problem-solving skills that is a strong theoretical fit with games and offers a deeper research foundation on effective implementation. This article provides a practical framework for how teachers should implement games for learning in formal settings by integrating PBL implementation guidelines.

**VIDEO GAMES IN THE CLASSROOM**

Video games have been highlighted for their potential for promoting learning and their fit with learning theories such as situated cognition. Situated cognition theorizes that learning best occurs when learners complete authentic tasks in authentic environments (Brown, Collins, & Duguid, 1989). Game proponents have looked at how games provide rich environments as a context for performing authentic tasks and thereby gaining epistemological knowledge through the playing of a specific role (Gee, 2003; Shaffer, 2006). Furthermore, the interactive nature of games promotes engagement, and when used for learning, supports a learner-centered environment for learners (Prensky, 2002; Watson et al., 2011).

However, as previously discussed, it would be overly optimistic to assume that deep learning will occur with games unless the game is implemented using sound instructional practices. Egenfeldt-Nielsen (2008) posits that many educational games are now or need to be what he calls third generation educational games, based on social-cultural, situated learning where the game must effectively fit within existing curriculum and practice. He highlights the teacher as critical for facilitating learning and debriefing. A number of recent articles describe the use of games in classrooms and the role of the instructor in facilitating and promoting learning.

In her case study on implementing math education games in the classroom, Ke (2008) found that students often failed to reflect on what was happening in the games, and some students struggled without the support of their teacher. She stresses the importance of an instructor to facilitate games for learning and calls for additional research to discover how to promote engagement through games while also maximizing learning with the interplay of in-game and external instructional activities.

Amory (2010) conducted a study focusing on the use of a game as a tool for learning within a collaborative learning environment. A group of facilitators worked to guide learning amongst South African orphans playing a puzzle-oriented health education game. The study found that the game should facilitate the learning process as opposed to being the focus of the activity, and Amory argues that games should be part of a socially collaborative learning activity if they are to be implemented in classrooms.

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