

Chapter 22

Assessment through Achievement Systems: A Framework for Educational Game Design

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ABSTRACT

Educational games have great potential as tools for motivating and engaging students, in addition to teaching learning content and objectives, but have had difficulty proving their potential through traditional means. This article proposes that recent advances in the achievement systems of entertainment games can be used to measure motivation and engagement in educational games, and can serve as a self-assessing tool for both students and teachers. Achievements may also be utilized as a way to measure things that have been traditionally difficult to measure, such as creativity, curiosity, and the nuances of problem-solving ability. This article proposes a structure for categorizing achievements in relation to assessment, and discusses future research directions for achievements as measures of assessment for educational games. The article covers both traditional and non-traditional measures of assessment as they relate to gaming achievement systems, as well as the psychological aspects of achievements and player behavior, good design principles for learning assessment achievements, and potential for achievements as an additional measure of motivational engagement by students.

INTRODUCTION

For educational and entertainment games alike, player engagement is key. Educational games have been shown to have a great potential as tools for learning both inside and outside the classroom and at various levels of education. In his book *What Video Games Have to Teach Us About Learning and Literacy* (2003), James Paul Gee notes that children and adults are willing to commit immense time and effort towards the mastery of a computer game, which players often prefer to be longer, more varied, and more challenging experiences. “Wouldn’t it be great,” he asks, “if kids were willing to put in this much time on task on such challenging material in school and enjoy it?” (2003, p. 5) The motivational aspects of games and play have been studied by Malone and others (1981; Malone & Lepper, 1987; Garris et al., 2002), particularly as ways to further engage students in learning content, and as a primary concern for educators at all levels (Halverson, 2005; Barab et al., 2009).

In practice, for games to be accepted as educational tools, they must accurately assess whether players are in fact reaching desired learning outcomes. This is particularly true for games intended for classroom use. As game developers, one of our core concerns is that many of the current ways learning is assessed – standardized tests, for example – are insufficient or inappropriate measures of the kinds of learning that occur in game spaces. Jesse Schell, author of *The Art of Game Design: A Book of Lenses* (2008), describes games as particularly suited for certain types of educational content, in particular those that center on problem solving, defining facts, exploring systems of relationships, exploring insights, and promoting curiosity. An educational game centered on facts might be well served by standardized testing, but games that inspire curiosity and insights require more sophisticated and nuanced systems of assessment. Additionally, as

interactive systems, games are intended to foster particular kinds of user experiences, and learning that occurs in an experiential way requires a more focused and appropriate system of assessment.

In this paper, we propose that current measures of assessment for traditional classroom learning and for current educational games may not always be successful in capturing the kinds of learning that take place in games. We suggest that new, more game-like measures of assessment may be adapted from current systems in entertainment games, in particular the increasingly popular systems of achievement that occur both within individual games, such as *World of Warcraft*, and across systems, such as those for XBOX Live and the Playstation Network. Additionally, we suggest that achievement-based assessments may help to measure learning outcomes that have been previously difficult to track, such as curiosity, creativity, and engagement itself.

EDUCATIONAL ASSESSMENT THROUGH GAMES

There is a large body of research dedicated to educational assessment, some of which has been applied to play, games, and other forms of interactive learning. For our purposes, we are most concerned with authentic assessment, or the direct examination of students’ performance on worthy intellectual tasks (Wiggins, 1990). The difference between authentic learning experiences, such as an education-focused visit by elementary school children to a zoo or aquarium, and more traditional classroom experiences such as lectures, quizzes, and tests, is of great importance for experience-focused educational games. Games as a medium have excellent potential for presenting authentic learning experiences, which are traditionally more difficult to assess. This being said, computer or digital games also present great potential for assessment of these authentic learning experiences,

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