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New Territories in Adult Education: Game-based Learning for Adult Learners

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Keywords: Adult learning, game-based learning, transfer-of-learning

Abstract: The purpose of this paper is to address the different approaches to game-based learning by focusing on applied examples and implications for adult education.

Introduction

Digital game-based learning and traditional game-based learning are having a powerful impact on adult education, social and cultural considerations, as well as the future development of learning. This influence of gaming has brought about a new way of life for adult learners through the use of cell phones, iPods, laptops, pdas, game boys, playstations, Xboxes, and handicams (Prensky, 2001). The use of digital game-based learning and traditional game-based learning in adult education could be beneficial for both learners and facilitators (Merriam & Maugle, 1978; Caffarella, 2002). The purpose of this paper is to focus on how adult educators might utilize game-based learning to address the potential impact this type of technology and experience has on adult learners.

Approaching Game-based Learning from an Adult Education Perspective

In order to understand both concepts of gaming and adult education, it is fundamental to define both areas. By game-based learning, we mean games that have an explicit purpose for educational content and applications. These games can be adopted for various learning situations and should foster different learning processes for individual learners in both formal and informal contexts (Dondi & Moretti, 2007). In relation to the field of adult education, the definition from Merriam and Brockett (2007) of adult education is stated as "activities intentionally designed for the purpose of bringing about learning among those whose age, social roles, or self-perception define them as adults" (p.8). In a similar context, Knowles (1973) posited that the heart of education is learning, not teaching.

Mezirow (2000) and Brookfield (1994) have argued for a greater need in adult education to go beyond the normative challenges of helping learners engage in educational learning. One of the ways this could be encouraged is through the incorporation of newer technologies in the classroom. Jarvis (1995) argued that "Adults who have not been familiar with the computer in their youth and who are not scientifically oriented tend to be a little overanxious about using one…As the computer becomes more commonplace, so more learning packages will become available and it will be easier for educators of adults to employ this approach…[Computer-based learning projects] potentiality for responding to the learning needs of students is great" (Jarvis, 1995, p.134-135).

Game-based learning has traditionally been used in college classrooms to help facilitate an idea or to illustrate concepts to learners to test their knowledge, allow for transfer-of-learning, and to keep the class engaged. The topic of game-based learning received significant focus in the early 1970s and tapered off throughout the last thirty years. Recent articles and papers have

investigated the topic from a new standpoint of addressing how digital game-based learning will be changing our educational systems (Squire, 2006). Educators, however, seem more reluctant to embrace this new way of learning than the millennial students (i.e., born between 1982-2000), who have been more exposed to game-based learning throughout their lives (Taylor, 2006).

Part of the reason for the hesitation to integrate technology into teaching is a lack of understanding about the beneficial uses of games in the classroom. Some issues that educators allocate to the ineffectiveness of game-based learning are: fomenting disruptive behavior or distractions to learning; the game may not have consistent learning objectives; the game's features such as color, flickering displays, and/or sounds could trigger cognitive and physiological responses; some digital games contain violence; and there is often a lack of clear assessment or evaluation guidelines for grading. However, with the recent development of many new educational games for learning, some of these concerns are falling by the wayside.

Using the term "games" can invoke problematic connotations for some learners. Another approach could be to use terms such as activity, exercise, task, or learning application. Playing games may also imply having too much "fun" or not enough seriousness in the classroom. Citing current research about the use of games in education beforehand can help ease some of the concerns and remind learners that games are one of the foundational methods for learning. Millennial learners who are entering into graduate school have assimilated digital game-based learning into their education. The millennials respond positively to the interaction, collaboration, and peer-to-peer generated knowledge that are key aspects of gaming (Howe & Strauss, 2007)

What does this trend towards technology mean for educators in the college undergraduate and graduate levels? Game-based learning requires learners to think differently about concepts and ways of knowing than traditional learning has required. Research has shown that games can be more effective than traditional methods of instruction for promoting positive attitudes towards learning and memory skills (Kolb & Lewis, 1986). Computer games and traditional games help connect people together in a learning activity that is guided by the participants and is not lecture-based.

Games can be hands-on activities that require active involvement from the whole class. Games also offer the chance to bring about new ideas, change viewpoints, and explore different outcomes free of risk for the participants. They are able to involve a variety of people from various backgrounds and experiences that contribute to the overall learning experience. Finally, a game encourages increased flexible thinking, which is a key concept of program planning since most programs develop and change constantly due to the numerous factors involved with planning a program (Kiili, 2007).

Applied Game-based Learning

Due to an increase in the use of digital gaming over the last fifteen years, research indicates that millennials now spend more time playing video games than they do watching television, watching movies, or reading books (Prensky, 2001). As a result of using these games, millennial learners have developed a new attitude towards learning. This new attitude can colloquially be expressed as 'why read about it when I can just experience it on my computer?' Educators, however, have been resistant in their acceptance, integration, and use of games and digital games (Beck & Wade, 2004). Many educators fail to see the importance of computer games in the student's learning process.

Game-based learning seems to be a large part of the future of educational learning. What this means for adult educators is that in the next ten years, we will be facilitating a classroom of millennial students who are accustomed to learning from games, either digitally or traditionally.

There is a clear need for educators to start familiarizing themselves with these games in order to begin implementing them into their teaching strategies. For example, MIT developed a game called *Supercharged!* to help students apply electrostatical concepts to the learning environment (Jenkins, Squire, & Tan, 2004). Students who participated in the study outperformed the students who did not participate during hands-on experiments in class, demonstrations, and simulation activities.

These activities actively invest learners with a concern for academic practices that could foster future academic success in adults if educators are aware of the analogies. For example, there exists the possibility of developing a game in adult education to help learners understand the concept of program planning in a virtual world where players could interact online during the semester. Potential also exists for a game to help learners understand what the teaching process is like for a new educator. The premise of the game could have a classroom full of students, each programmed with different abilities and needs that the teacher must assess and react to, including environmental elements and school policies.

The use of games in classrooms has shown that as a learner's self-efficacy increases, pattern recognition and response time becomes better, decision-making skills improve, and the learner's overall positive emotions for learning increase (Squire, 2006). In other fields, like science or engineering, digital games could offer learners a chance to perform an autopsy or reconstruct an accident and interface with statistical programs as well as other discussion groups. School counselors and therapists have been using digital games to help students with successful treatment of their phobias (Knight, 2003). Additionally, the military has been one of the strongest supporters of using games for instructional and educational purposes for the last ten years (Kearney & Pivec, 2007).

One specific example of game-based learning involved an Engineering Fundamentals course at the University of Tennessee where the students were required to build a virtual truss bridge online dealing with engineering mechanics. The students used principles of engineering mechanics to determine the angles and spans of the bridge segments. The resulting virtual bridges were then analyzed and graded based on the bridge's maximum loads divided by the cost of the virtual materials used to build the bridge.

Similarly, in a course that dealt with hands-on laboratory exercises, the students were required to design and build devices that would accrue points based on accomplishing certain tasks. One task mandated that a one-story swinging pendulum-type device released a paintball at a certain point in its arc. The paintball had to hit a target on the floor a significant distance away. Points were awarded based on the accuracy of the released paintball relative to the bullseye on the target.

In each of the game-based learning situations, students responded positively to the challenges presented to them. The analytical aspects of the educational material were assimilated more successfully than in the conventional classroom setting heavily focused on lectures and the textbook. The positive response was reflected in the increased retention and higher grade point averages of the Engineering Fundamentals students as they progressed into the remaining three years of their undergraduate curriculum (Pionke, 2001).

Games allow for an active transfer-of-learning opportunity to apply theoretical knowledge to practical experiences and activities. Learners are able to make mistakes and take risks in a safe protected environment surrounded by others who support them and can offer assistance. Educators are able to supply students with direct, immediate feedback to learners as the game proceeds and everyone can reflect on the learning that occurred during the process.

The New Territory

It has been suggested that researchers begin studying digital games as a medium for learning in adult education. Psychologists have referred to this research as digital mediated learning. In this type of research, digital games are more than outlets for fun or escape because they offer the chance to be actively engaged with other players online simultaneously across entire continents. This type of social learning allows players to interact with thousands of people online at the same time while constructing new knowledge (Squire, 2006; Habgood, Ainsworth, & Benford, 2005).

Persistent games allow users to enter into a new type of social realm that has shown to hold as much importance to players as reality holds. The games are complimented with discussion boards, models of game systems, maps, and narratives. This kind of interaction requires learners to read, write, research, analyze, and implement many of their ideas for others to see and helps create self-awareness, reflection, and a concern for accuracy (Black, 2005).

Digital game-based learning could also offer adult learners the chance for collaborative learning that takes place throughout the semester in addition to lecture-based classes. There are more hands-on and practical application-based approaches to using games in education that could allow for more personalization of learning, self-directedness, and team or group learning (Beck & Wade, 2004; Freitas & Oliver, 2006). Educators could think 'outside of the box' about games and their functions. Specifically, this could include conceptualizing domains and rethinking the exposure and content of games to a more intelligently designed practical experience for learners. This approach would allow future learners to bring their skills with them into the adult education classroom. It could also allow learners to feel more competent, independent, and empowered to reconnect their childhood form of learning with their adult learning. Many games involve strategic planning, group cooperation and divergent thinking skills to help promote creativity in the classroom. Simulation games in particular offer students a chance to engage in real-life situations, apply and develop their own problem-solving skills and increase levels of awareness of potential problems, interactions, and conflicts.

We believe that computers, the internet, and social learning have only just started to influence learning perspectives in adult education. The research presented in this paper supports the idea that digital game-based learning is changing the way traditional education is being structured. Squire et al. (2005) state that "Games 'teach' concepts by immersing players in experiences by providing spaces where knowledge is useful-modeling expert problem solving, calling attention to key features of the problem through cues and structuring problems so that the player builds on previous understandings, all of which are features of our most powerful learning environments" (p.34). As the future of adult education unfolds, game-based learning may prove to be a positive and essential aspect to our social and educational learning environments.

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