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Leveling up: Are non-gamers and women disadvantaged in a virtual world classroom?

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ABSTRACT

Today's young gamers are tomorrow's students who expect more immersion from their online learning experiences. Teachers and administrators, however, must ask are some students at a disadvantage in such a class and does gender play a role? We examine the degree to which gaming experience and gender influence sense of presence in a virtual world learning classroom. Feelings of presence are key to involvement in virtual worlds. Participants, 348 undergraduates, interacted within a custom designed virtual world classroom focusing business negotiation skills. Results reveal that while gaming experience gives a slight advantage, lack of previous software ownership and gender do not put learners at a disadvantage. This finding shows that non-gamers and females can equally participate in a virtual world classroom, relieving concerns of adoption.

I would like to know how many female students enjoy playing Minecraft, compared to the male students? Will students who already have a grasp of the specific game being used… fair better… then students who have never played that particular game?

Forum question in response to a post on using Minecraft in the classroom http://www.edutopia.org/blog/minecraft-in-classroom-andrew-miller.

1. Introduction

This study explores the possible downside experienced by learners when introduced to a virtual world learning space. Specifically, we consider the lack of gaming experience and effects of gender and ask if groups of students will be left behind when a teacher adopts a virtual world instruction method.

Studies of the prevalence of video game playing indicate that, while it is highly extensive among the young, there is still a significant minority of about one in five university students who are not active gamers (Gentile, 2009; Thomas & Martin, 2010). The Entertainment Software Association recently reported women over 18 are gaming at a higher rate than boys under 18 (33% compared to 15%), showcasing how video games are now mainstream (Entertainment Software Association, 2014). That same report shows 26% of game players are under 18 and the average gamer age is 35. Assuming college students are comfortable and experienced with virtual worlds may be dangerous. Less than half of Americans report three or more hours of computer game play a week. This means there is clearly a population of young people engaging in hobbies other than computer gaming with little to no opportunity for, or interest in, PC gaming or console use.

PC Gaming is leading a revolution in interface design, pioneering first-person perspectives and self-efficacy, allowing players to wander in virtual worlds, control their own avatar's appearance, and even form social networks with other players. Sandbox games (a reference to the free-form play of a child's sandbox) allow players to construct everything within the game (e.g., *Minecraft*; Mojang and Microsoft Studios) and worlds that provide components to users that, erector set-like, they can construct their preferred possessions (e.g., *The Sims*; Electronic Arts). Users actively seek these fully immersive environments, feeling a freedom to explore sans linear narrative, while moving between virtual environment and peer social interaction (Lim, 2011, pp. 271–287). In a very short number of years, virtual worlds have come to dominate gaming because of the freedom players experience in creating their own

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storylines. The Sims, for example, dominate video game sales, accounting for one third of the top 20 PC game unit sales (Entertainment Software Association, 2014).

Students with gaming experience are familiar with the conventions of self-constructed virtual world narratives. Students lacking video gaming experience may be disadvantaged in the increasingly rich milieu of online educational delivery as augmented reality and virtual reality grow in adoption. A further consideration is the objectification of and violence against women in video games that has been an alienating issue within the industry since the 1980s (Kent, 2010). Rather than declining, the Internet has amplified this problem, as seen in recent public debates; such as, gamergate (Parkin, 2014) and Penny-Arcade (Salter & Blodgett, 2012). Disturbingly, these cases include threats of violence against women that Salter and Blodget attribute to a perception, by the male-dominated hard-core gaming market, of a threat from the increasing participation of women in casual gaming.

2. Literature review

While keeping the attention of students is one aim of the gamification of education, the ultimate goal is to encourage self-efficacy, leading to a constructed learning space with students creating and following their own learning directions. Gamification focuses on a transformation of the classroom in ways that extend far beyond simple badges of achievement (Kapp, 2012). Today's students commonly interact with their educational institutions through virtual links. In fact, according to the Sloan Consortium study conducted in 2010, nearly 30% of college students participate in online courses (Allen & Seaman, 2010). While the Babson Survey Research Group 2011 study reports approximately 31% of college students are taking at least one online course (Allen & Seaman, 2011). If educational institutions are to thrive in such an environment, they need to understand predictors of student engagement and motivation (Friedman & Friedman, 2014) in order to construct successful online delivery systems that assure no students are disadvantaged. The foundation of that understanding is the source of virtual world environments, namely video games, which we examine next.

2.1. Video gaming

The market for video games topped US$15 billion in sales for 2014 (Entertainment Software Association, 2014), including a vast diversity of game platforms, prices, and genres. Arsenault (2009) points out the difficulty in classifying gaming as game genre labels describe a feeling of play more than defining any clear demarcating taxonomy. A first person shooter (FPS) emphasizes experiencing gameplay through the eyes of the protagonist who moves within a three dimensional space. This game genre was pioneered by id Software, in 1992–93, with *Wolfenstein 3D* and *Doom*. Recent examples include *Far Cry* (Ubisoft), *Half-Life* (Sierra Entertainment and Valve Corporation), and *Call of Duty* (Activision). The popularity of the FPS genre now attracts development budgets larger than Hollywood movies. Simulation games (SIM) copy real life activities that often lack specific goals (a sandbox game), such as *The Sims* (Electronic Arts), or include clear goals, like *Madden NFL* (EA Tiburon). Role playing games (RPG) focus on developing a character, choosing appearance, and building skills. Gameplay in RPGs emphasizes tasks relating to logical thinking and problem solving while individually, or in groups, on a quest. The quest generally follows a linear story, such as in *Mass Effect* (Microsoft Game Studios and Electronic Arts) and *Skyrim* (Bethesda Softworks). Beginning with local area networks, later migrating to the Internet, RPG gamers seek social interaction and cooperation through massively multiplayer online role playing games (MMORPG), such as *World of Warcraft* (Blizzard Entertainment).

The appeal of a constructed space was recognized as early as 1986 by LucasFilm's with the virtual world of *Habitat*—the first incarnation of an MMORPG. Players of MMORPGs improve their mood states (Hussain & Griffiths, 2009; Youn, Lee, & Doyle, 2003) and derive social support from other players (Longman, O'Connor, & Obst, 2009). It is the opportunities to increase students' participation, involvement, enjoyment, and overall motivation in education that rationalizes over two decades of integration of gaming into the education setting.

2.2. Virtual worlds in collaborative learning

Academics increasingly report the adoption of virtual environments in educational settings (Mikropoulos & Natsis, 2011). References to virtual environments emphasize their capability to encourage students in the co-construction of knowledge (De Lucia, Francese, Passero, & Tortora, 2009; Jamaludin, Chee, & Ho, 2009; Jarmon, Traphagan, Mayrath, & Trivedi, 2009), collaboration (Jarmon et al., 2009), and critical thinking (Herold, 2010). With their fully immersive spaces, Second Life and, more recently, Minecraft are increasingly popular for instruction (Schifter & Cipollone, 2013, pp. 2951–2955). Science educators use virtual environments (De Lucia et al., 2009; Mikropoulos & Natsis, 2011) as do liberal arts teachers (Echeverría et al., 2011).

Learning results in virtual worlds are often directly attributed to increasing engagement (Cheong, 2010; Wrzesien & Alcañiz Raya, 2010), interaction, and critical thinking (Herold, 2010; Jamaludin et al., 2009). It is a lack of these attributes in massive open online courses (MOOCs) that is associated with high dropout rates (Henning et al., 2014). Participants in MOOCS simply feel a lack of social interaction and support. Successful development of MOOCs require some component that increases interaction and learner self-efficacy (Mackness, Mak, & Williams, 2010; Mak, Williams, & Mackness, 2010, pp. 275–285) in order to show better results (Breslow et al., 2013). The asynchronous nature of MOOCs, and the lack of interaction combine to lower feelings of involvement, leading to problems in self-efficacy as learners are left on their own, without role models and with very tenuous connections to the class material, instructor, and, most importantly, other learners. Research into the educational exploitation of massively multiplayer online games (MMORPGs) provides valuable insights on issues of engagement, commitment, learner connectedness, and distributed learning.

2.3. Involvement through feelings of presence

Asynchronous technologies do not allow for immediate feedback between participants, which hinders many parts of communication, such as, dialog, feedback, and context. Virtual immersive software, that is synchronous, can offer these aspects of communication (Grodal, 2000). Increasing levels of synchronous interaction improves degrees of immersion, which leads to higher levels of user involvement. This experience succeeds by evoking a greater psychological sense of presence (Steuer, 1992). Thus, feelings of presence are key to the success of a virtual world, while also instrumental in offering an environment for self-efficacy among learners.

Within a virtual world, players face fluid situations and are presented with continuous choices requiring responses and involvement (Nelson, Keum, & Yaros, 2004). The more open the virtual world (sandboxed) the more learners are free to cooperate and use the space in ways they construct, rather than a linear