

## **Second Life, a Simulation: Barriers, Benefits, and Implications for Teaching**

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**Abstract:** Simulations are a part of our social and cultural environment; some children grow up playing simulated online games and continue the practice throughout college. However, few educators are experimenting with simulations. Simulations might be used in schools and are particularly important for educators teaching subjects in the natural, physical, and sciences. This paper begins by defining what a simulation is, presents barrier that prevents educators from exploring simulations, argues for the potential of learning through simulations, introduce *Second Life* (Linden Lab, 2006) as an online simulation, and concludes by presenting implications for educators.

### **Purpose**

With the availability of Web and computers, many universities are integrating new delivery platform into course curricula, both to enhance conventional classroom-based learning and to enable geographically bound students to overcome barriers of time and distance. The rise of computers also means the increase of programming, blogging, digital cameras, web quests, wikis (online encyclopedia), virtual field trips, and e-portfolios (Polin, 2000).

However, most current on-line instruction typically focuses on a well-defined task; a large number of users who browse a Web site or post messages to course management systems such as the Blackboard or WebCT — and only minimally reflects new notions of technology (Polin, 2000). While these tools are useful for discussions, they provide little, if any, support needed to bring forth the kinds of cognitive, collaborative, and social interactions that are characteristic of successful instructional technology like gaming and simulations (Schaffer & Clinton, 2006). The purpose of the present paper is to explore the use of simulations by addressing each of the following questions: What are simulations? What are the barriers that prevent the successful integration of simulations in the formal school environment? What are the benefits of learning through simulations? Is *Second Life* a simulation? Finally, what are the implications for educators in using simulations for their teaching?

## Simulations

Currently, the host of definitions for simulations ranges from any synthetic creation, the creation of an artificial world that approximates the real one, or a mathematical model that allows for prediction as time unfolds (Prensky, 2001).

Historically, however, simulations have been confined to simple problems, often of a physical nature (Crawford, 2005; Aldrich, 2005). “Perhaps, the most ambitious applications of simulations in the early days were the attempts by the Club of Rome to model the future supply and consumption of natural resources” (Crawford, 2005, p.1). But by the 1970s, these simulations lost credibility and were regarded as complex, ill-defined systems that were subjective and unreliable (Crawford, 2005).

Thus, current attitudes toward simulations remain colored by early experiences. Most people expect simulations to be accurate, and seem to judge simulations by the value of the results as either correct or incorrect (Crawford, 2005). Crookall, Oxford, and Saunders (1987) and Manninen (2002) provided some clarification to the problem of distinguishing between games and simulations. According to Manninen (2002), a simulation is a representation of some real-world systems that are flexible and variable that allows simulations to evolve. By contrast, games do not intend to represent any real world system because they are purely fictional worlds in its own right (Crookall et al., 1987). Simulations are beneficial because they allow users to take risks and to practice in safety. But simulations in themselves can also become boring once the novelty wears off. For instance, a simulation of going through a building might be interesting the first time, perhaps, but not more (Prensky, 2001).

According to Prensky (2001), the difference between games and simulations is the minds of learners. In the same sense that driving a car to work or going through the same route can become boring, Prensky (2001) suggests that designers incorporate two things into simulations: learning and gaming elements, because most users will try things in play that they might not try in life. In actuality, simulations that stress realistic environments while at the same time engage users inhabit the best of both worlds. One of the earlier simulations, known as *Sim City 2000* implemented this concept by letting inhabitants create and control their worlds.

Also, Caillois (1979) noted that in simulations, the rules and constraints of ordinary life are temporarily suspended and replaced by a set of rules that are operative within the fixed space and time of the simulation. In addition, there are different types of frameworks that can be introduced from the game world into simulations (Garris et al., 2002): 1) system rules — operating rules of the world that is embodied in the simulations, 2) procedural rules — actions that can be taken within the world, and 3) imported rules — participant-imported rules from the real world, allowing play to take place in simulations.

“Open ended simulations like *Sim City* fall outside the realm of games because they have no explicit goals (i.e., no explicit values attached to the outcome of the game), but what happens in the simulations is still attached to the player, and therefore, the player invests

efforts in playing *Sim City*” (Juul, 2003, p.10). The important distinction lies in that simulations propose to represent reality and games do not (Fletcher, 2003), although simulations can incorporate elements of games such as scoring or fantasy.

A simulation such as *Second Life (SL)* allows the virtual space to be experiential with enough built-in principles to allow players to form their own experiences (Second Life, 2006). *SL* is a pure simulation in which all concepts of progress, winning and losing, and meaningful action must be structured by its players. In this sense, the learning process for the player is how to form and construct meaning within the constraints of the world (Lindley, 2002). The more basic the general principles of a simulator are, the larger the creative space is for the players of the simulation. Furthermore, simulations within a virtual environment do not have to be limited to mechanistic functions. For instance, Multi-Massive Online Role-Playing Games (MMORPG) are online role-playing games (RPGs) in which a large number of players interact with one another in virtual worlds. As in all RPGs, a player assumes the role of a fictional character usually in the form of an avatar and takes control over most of that character's actions (Lindley, 2002).

### **Barriers of Simulations**

In the early 1990s, video games were barely considered as a topic worthy of inquiry. Marsha Kinder's *Playing With Power In Movies, Television, and Video Games*, and Eugene Provenzo's *Video Kids: Making Sense of Nintendo*, both published in 1991, were two of the earliest works that represented a new form of media literacy worthy of scholarly investigation (Kinder, 1991; Provenzo, 1991). Since then, the struggle has been for simulations to engage the imagination of its users in the same way that commercial gaming has been so successful (Jenson & Castell, 2002). Over the last 25 years, simulations have gained momentum in the form of *Sims Online*, though few of them claimed to be educational.

Two barriers that prevent the successful integration of simulations in the formal school environment are: 1) commercial simulations and games are successful at building problem solving tasks and puzzles that are integrated, whereas schools tend to structure student learning through a series of puzzles or tasks that are disjointed (Jenson & Castell, 2002; Bransford, Brown, & Cocking, 2000) and 2) the fluidity of movement in space within virtual reality allow students to learn at their own pace and time, whereas schools lack the freedom of space, structures, and boundaries to allow students to explore outside a pre-defined structured curriculum (Jenson & Castell, 2002).

Ironically, other issues that hinder the expansion of gaming and simulations are also “not much different from those facing higher education in general: cost, attitudes, and gender gap” (Neas, 2005, p.26). The first factor is the cost to buy, develop, own, and teach the games. The second factor is instructors' inability to recognize games as educational tools that can show depth of analysis, problem-solving, collaboration, and fervor. The third factor seems to be that gaming appeals more to men than women, however, Neas (2005) suggests that the gap is closing considerably based on current research conducted by Sweedyk and Laet (2005).

Another reason for the resistance of gaming and simulations seems to be that “not all educators and parents are convinced that games can be beneficial to students” (Virvou, Katsionis, & Manos, 2005, p.54) and hence, they criticize the quality and violent nature of games. Moreover, at the college level, the implementation of games would require a shared host among many students, thus creating bandwidth problems (that is, how many packets per unit of time may pass a certain path connecting two adjacent routers) (Oliveira, Mortensen, Jordan, Steed, & Slater, 2004).

Although some teachers, researchers, and society are calling for different approaches to learning, the educational system is quite slow to change in its ongoing adjustment due to structures like curriculum, standard requirements, technical equipment, resource allocation, and physical appearance of classrooms (Egenfeldt-Nielsen, 2006).

### **Learning through Simulations**

Squire and Jenkins (2003) illustrate a number of ways that simulations can be used in education. First, they suggest that simulations can function as out-of-classroom assignments, allowing students to work through challenges on their own and at their own pace. Second, simulations can also be a problem-based learning experience, testing students’ abilities to transfer specific tasks previously learned to an online medium (Oblinger, 2004). Third, simulations can serve as a flexible pedagogical medium because students are motivated to mobilize information to solve simulated-based situations; they do not just memorize facts (Squire & Jenkins).

Simulation is more than an exercise for the students because it allows them to share a common experience and to use it as a basis for further discussions (Square & Jenkins, 2003). In the best cases, the confines of simulations make flaws in students’ thinking visible both to the teacher and the students by enabling students to learn from the consequences of their actions (Squire & Jenkins, 2003). Unlike most academic classes where everyone is expected to succeed and learn in the same way, students understand that a simulation is not a win or lose situation (Foreman, 2003; Squire & Jenkins, 2003). It is more about the process of working together, taking ownership, reflecting on the experience, and figuring out what went wrong (Squire & Jenkins, 2003).

In simulations, learning no longer means confronting words and symbols separated from the things they are about in the first place. For instance, the “law of gravity is not something that can be understood solely through equations; students can gain virtual experience by walking on worlds or plan manned flights that require understanding the changing effects of gravitational forces in different parts of the solar system” (Schaffer et al., 2004, p.4). Learners get to experience firsthand the realities that words and symbols describe (Schaffer et al., 2004).

Simulations allow students to explore the solution space and ask, “What if I did this” or “What happens in that event” because online environments enables trial and error learning to take place (Herz, 2002). Hertz suggests that students can push, test, and

explore — a truly interactive system to prepare them for the workforce. In classrooms, students get into small groups — but once the group is scaled up, acquisition of knowledge becomes limited and more difficult. Yet, the author maintains that in online simulations, large groups of people can push against the limits of their knowledge and go beyond. That is when simulations become different and important.

A simulation's greatest potential is that the world is in a box (Gee, 2003). For instance, if a person wants to be a scientist of a certain sort, that person will want to know what it is like to feel, value, and talk that way. Students can do that now through online simulations and be in that world (Gee, 2003). This is what Bransford et al. (2000) calls a deeper form of learning because students can have all sorts of experiences by being in these worlds that they never could have experienced before. Prensky (2003) remarks that things that people just had to imagine in the past they can now simulate — and things people had to read about, they can now live. Essentially, simulations transcend the boundaries of time and space, allowing students to relive and recreate their experiences.

Describing his experience in *What Video Games Have to Teach Us About Learning and Literacy*, Gee (2003) illustrates how simulations allow users to assess and identify skills they need to develop as they progress along. Similarly, in *SL*, more experienced avatars also provide basic skills development within the in-world context to improve retention, integration, and transferability of skills. As Gee (2003) points out, information is given multimodally, and messages are reinforced with prints, sounds, and images. Moreover, information is presented more than once and feedback is immediate; these are all important principles of sound instruction for how people learn (Oblinger, 2004; Bransford et al., 2000). Once beyond the initial stage, users begin to feel comfortable navigating themselves in the environment, eventually building user confidence. Gee (2003) points out another principle of good gaming that can be applied to simulations is: “Good gaming allows players to operate within, but at the outer edge of the competence” (p.54).

According to Gee (2003), simulations are forms of learning that young people are familiar with and that the principle of learning behind it is currently reflected in cognitive science. Current scholars such as Bransford et al. (2000), the author of *How People Learn*, is currently undertaking a massive project in a simulated laboratory known as *Terra Nova* within *SL*. Gee (2003) claims that principles of good learning are embedded in simulations, but are not found in elementary schools, high schools, and colleges.

Furthermore, exploiting simulations as interactive tools meets students' expectations for deep simulated engagement, motivates persistence, customizes to the experience of each individual, promotes long term memory, and promotes the transfer of learning (Foreman, 2003). Dede et al. (2002) predicts that shared graphical environments such as *World of Warcraft (WoW)* and *Asheron* will be the learning environments of the future. Jenkins, the Director of the Massachusetts Institute of Technology (MIT) Simulations to Teach Project, is demonstrating simulations' unleashing potential and how it might enrich the institution at the advance placement high school and college levels. Hinrichs, Group Project manager for Learning Science and Technology at Microsoft Research, is claiming

that simulations will move us away from lectures, tests, and note-taking into immersive and interactive learning environments (Foreman, 2003).

The major difference in simulated technologies is that it provides visualizations and sophistications that can bring students into any environments that can be imagined, allowing them to explore, enter, and create screen-based simulated worlds that are the next best thing to reality (Foreman, 2003). For example, if teachers want students to learn about group dynamics, they could team them up in a structured survival mission in a simulated online jungle (Foreman, 2003). “But then again, some might argue that text-based education of the post-Gutenberg period has done an excellent job without simulations, so why replace it?” (Foreman, 2003, p.15). Prensky (2002) argues that the simulation-playing generations are different from those who have not spent thousands of hours playing simulations. There is no question that hours spent playing games are a critical formative experience for children, because these simulations are engaging, visually dynamic, rapidly paced, and pictorially gratifying, making conventional schoolwork boring by comparison (Foreman, 2003).

### **Second Life a simulated environment**

*Second Life (SL)* grew out of the vision of Metaverse described in Stephenson’s (2003) novel *Snow Crash*. “Stephenson was the first to describe an online environment that was a real place to its users, one where they interacted using the real world as a metaphor and socialized, conducted business and were entertained” (Ondrejka, 2004, p. 81). “The developers of SL, Linden Labs (2006) see their user-constructed world as the first step towards fulfilling this vision. This vision is to create a space where anyone can create and build an avatar body and fantasy-like places that fulfill desires — a world that will function as real, transcending the bounds of flesh and circumstance of the actual, tangible world” (Jones, 2005, p.3).

As a simulated virtual environment, *SL* as of November, 2006 is comprised of 1,500,000 residents from more than 150 countries (Linden Labs, 2006). The growth is due, in part, to a change in policy that allows new users to obtain basic membership for free as well as increased media coverage (Jones, 2005). *SL* grew out of an ancestry of publicly available simulations, combining user creativity and sociability of text-based Multi-User Domains (MUDs) with the graphics richness of Massively Multiplayer Online Role-Playing Game (MMORPGs). MUDs and MMORPGs contributed greatly to what *SL* is today and set *SL* apart from other currently available simulations such as *Sims Online*, *There*, and *Active Worlds* (Jones, 2005).

As such, *SL* differs from stand-alone computer games in that thousands of players use the world simultaneously. While they are online, they can interact with each other, cooperate, fight, or transact. When a player logs off, the world does not stand still, it continues to change under the influence of other players who remain active in the game space (Taylor, 2002). Players begin by selecting avatars — bodies’ people use in these spaces to provide a means to live digitally and to fully inhabit the world or a game character whose movements through the game space the player will control (Taylor, 2002).

Through ownership of lands and objects, SL encourages a sense of place and a sense of self. It is this economic and creative level that adds value to the social meaning of interaction in SL (Jones, 2005). Although SL does not replace real life, “users find meaning and experience in a type of reality that has ramifications for their actual world beyond identity exploration and social interaction” (Jones, 2005, p.22). SL is compelling because there are cultural constructs in the form of an avatar, virtual reality in the form of computer generated screen images, “and society meet to form a hybrid reality that crosses and challenges ontological boundaries of meaning” (Jones, 2005, p.26).

### **Implications for using simulations**

Can simulations such as SL be used to harness educational goals? The answer appears to be in the affirmative. Unlike commercial games that are notorious for violence and story plots, SL allows players considerable scope to build homes, to amass economic resources, and to train avatars in various skills, including a range of productive skills such as mining, building, scripting, designing, producing, and composing. SL is also more manipulatable than the real world; the owners of land can choose which variables to modify while leaving the others constant (Second Life, 2006).

Learning in simulation can be interesting, engrossing, and addictive (Garris, Ahlers, & Driskell, 2002). Dewey (1938) stated that “education is not an affair of telling and being told, but an active experiential process” (p.38). SL provides students with the opportunity to reflect and to link knowledge gained in the real world (Garris et al., 2002). SL can be use as a platform to push students beyond linear mode of thinking to non-linear hypertext immersion, interaction, collaboration, and hands-on learning with other students (Gilster, 1997).

### **Conclusion**

For the younger generation who grows up in an information technology and media rich world, simulations provide a freshness of approach and motivation to their studies (Oblinger, 2004). Although simulations can be a promising tool for education, much effort is still needed to assure educators that simulations can be used effectively to integrate content into the classrooms.

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