

Using Massively Multiplayer Online Role-Playing Games for Online Learning

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This article addresses the use of a massively multiplayer online role-playing game (MMORPG) to foster communication and interaction and to facilitate cooperative learning in an online course. The authors delineate the definition and history of massively multiplayer online games (MMOGs), and describe current uses of MMORPGs in education, including their experiences with constructing and using the MMORPG *Second Life*. In addition, the authors detail with practical examples the process of using MMORPGs to support cooperative learning activities, and explore future uses and research questions for using MMORPGs in education and training.

Introduction

Picture for a moment, a café reminiscent of Starbucks™ in which patrons sit and mingle, while enjoying their favorite coffee beverage. One patron chooses to relax in a brown leather chair, sipping a venti mocha latte. While munching on a chocolate chip cookie, another patron plays checkers with a friend and discusses current technology trends. In yet another part of the café, smiling and laughing patrons debate about the topic of the day, which was posted on the barista's slate menu board. In a somewhat opinionated manner, the barista joins in the conversations, asking questions which make the patrons feel rather uncomfortable.

Does this sound like a typical day at the local café? Yes, it could be. However, in this case, it was a description of a cooperative learning activity in *Second Life*, a massively multiplayer online game (MMOG). In our scenario, the patrons (students in this case) are in a virtual café which looks remarkably like their nearby (or not-so-nearby)

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Starbucks™. The discussions in the café surround a course topic which was posted by the barista (instructor in this case). The instructor circulates through the café guiding the discussions, asking probing questions, and yes—keeping the students on-task.

Online courses are becoming ubiquitous at many universities. The ability to complete entire degrees without actually being present on a college campus is becoming popular with adult students. The ability to attend classes while eliminating long commutes or taking classes at a time more convenient to the student is creating an entirely new genre of student: one neither the instructor nor the other students in the class ever meets in person.

Many online classes use chat rooms, email, or electronic mailing lists (listservs) in an attempt to create interaction between the students in the class and faculty. Far too often, the lack of immediacy with email and listservs may tend to limit the student responses to other students' and instructor's comments. Chat rooms may improve the immediacy of interaction between students, and students are becoming more comfortable with the concept of "talking" by typing to others online. Some students prefer, and thrive in, an online environment (as opposed to a face-to-face class) as it allows them time to more completely formulate their thoughts as they respond to the class discussion. Virtual online worlds provide an additional level of personality that is missing from the typical chat room environment.

In an attempt to address these issues of communication and interaction, the authors constructed a virtual office space in the massively multiplayer online role-playing game (MMORPG), *Second Life*. This article will: (a) define and explain the history of MMOGs, (b) describe current uses of MMORPGs in education, (c) detail the process of using MMORPGs for cooperative learning activities, and (d) explore future uses and research questions for MMORPGs in education and training.

Although only in their infancy, online virtual worlds such as *Second Life* and other MMORPGs have the potential to provide new ways of learning by giving both instructors and learners the opportunity to interact with one another and their learning environment; ways that until now were not possible in an online setting.

MMOGs—Definition, History, and Key Concepts

MMOGs evolved out of multi-user dungeons (MUDs). A MUD is a multiplayer computer game that typically combines text instant message chat rooms and role-playing games. Typically, players read descriptions of their environment, objects, events, and characters in a virtual world. Users interact with other players and their surrounding by typing text commands. Many MUDs involve a fantasy world populated by mythical beings. In order to complete quests or adventures, users must complete tasks, while exploring the virtual world. The increase in computer processing speed, graphic capabilities, and broadband Internet access eventually led to the development of real-time, graphic-intensive MMOGs. According to Steinkuehler (2004, p. 2):

Massively multiplayer online games (MMOGs) are highly graphical 2- or 3-D videogames played online, allowing individuals, through their self-created digital characters or "avatars," to interact not only with the gaming software (the designed environment of the

game and the computer-controlled characters within it) but with other players' avatars as well. These virtual worlds are persistent social and material worlds, loosely structured by open-ended (fantasy) narratives, where players are largely free to do as they please—slay ogres, siege castles, barter goods in town, or shake the fruit out of trees.

With the addition of highly customizable/detailed avatars, objects, and actions, some MMOGs have now evolved into MMORPGs. *Second Life*, the MMORPG used for this project, is one such portal into an online virtual world. *Second Life*, an online virtual world, is a 3D space totally created and evolved by its users. Within this space, and with creation tools, users can construct a virtual, customized, digital representation of themselves (avatars). Users can develop land and even build virtual establishments and businesses, as well as earn microcurrency (Linden dollars) that can be “spent” in the *Second Life* environment (and can also be exchanged on the World Wide Web for US dollars). The real-time simulated environment provides the opportunity for collaboration with other users and interaction with objects in the *Second Life* virtual world.

Second Life and other MMORPGs provide educators with opportunities to develop learning activities which closely replicate real-world learning experiences previously available only through face-to-face interaction. Simulations of practically any real-world scenario, from running a virtual business to maintaining a virtual church, are made possible through the use of MMORPGs. Settings such as these, anchored in highly collaborative real-world experiences, provide learners with many meaningful and enriching learning experiences. In addition, MMORPG virtual environments provide instructors with an opportunity to design highly social cooperative learning activities that can be conducted with relative ease and efficiency.

Campus: Second Life

Second Life provides a special program (i.e., *Campus: Second Life*) for educators to use in their classes (currently higher education only). *Campus: Second Life* gives educators and their students the opportunity to experience the “simulation and creativity tools available within a large, heavily populated digital world” (Linden, 2005a, ¶4). Professors and instructors wishing to use the *Campus: Second Life* program are required to submit a proposal outlining educational goals and plans and how *Second Life* will compliment those plans. Additionally, plans for research leading to publication are requested.

In fall 2005, there were 10 university courses in the *Campus: Second Life* program. Course titles included *Art in Virtual Worlds*, *Digital Collaboration in Architecture*, *Introduction to International Business*, *Foundations of Instructional Technology*, *Urban Planning in the Gaming World*, *Human Computer Interface*, *Designing Digital Communities*, *Introduction to Sociological Perspectives in Education*, *Multiplayer Game Design*, and *Exploring Health Applications in Massive Multiplayer Online Role-Playing Environments (MMORPEs)* (Linden, 2005b, ¶3).

MMORPGs have attracted the attention of other educators and researchers. For example, Aaron Delwiche, assistant professor at Trinity University teaches his

Games for the Web course in *Second Life*'s virtual world. Students are able to use, and experiment with, the many object creation tools made available in *Second Life*. In addition, Delwiche provides opportunities for guest lecturers in the virtual world (Foster, 2005). Yet another interesting application of *Second Life* can be found in the work of Antonacci and Modaress (2005). At the University of Kansas Medical Center, Antonacci and Modaress have created a *Second Life* medical clinic in which medical students can practice patient encounter strategies. During their role-playing, each student assumes the role of a doctor, nurse, patient, or patient's spouse. Students experience patient encounters from their different roles, discuss, and reflect upon their experiences.

Highly collaborative learning opportunities anchored in real-world experiences, such as those described above, provide a foundation for many new and exciting models of teaching and ways of learning. Role-playing scenarios which were once only possible in a face-to-face environment may now be conducted in an online virtual world.

Integrating *Second Life* into an Online Graduate Course

Through the *Campus: Second Life* program, *Second Life* was integrated into an online graduate-level Foundations of Instructional Technology course in a mid-sized Midwestern university. The course is part of an entirely online Master of Science degree program in Instructional Design and Technology. An integral part of the degree is the Foundations of Instructional Technology course, which serves as an introduction to the field, its history, underpinning theories and philosophies, and its trends and issues. Currently, the course uses the Blackboard™ learning management system (LMS) for the delivery of content (primarily online text-based lectures), submission of assignments, and communication between students and the instructor. Although students in the course commonly indicate that they feel a strong sense of belonging and community with the other students and the instructor, it was the instructor's belief that an MMORPG such as *Second Life* would foster an increased sense of community among the students, as well as provide better communication between the instructor and the students.

The principle behind MMORPGs such as *Second Life*, may be demonstrated through an understanding that, at any given time, thousands of participants may be online and interacting at the same time (the massively multiplayer capabilities) and the participants are engaged in a 3D online representation of actual locations (the virtual world). This virtual world has been, and is still presently, in the process of being designed, constructed, and modified by those involved in *Second Life*. Objects in *Second Life* may be very detailed, due both to the design capabilities of the program and the ability to include photorealistic textures on objects. Participants in *Second Life* may choose to interact with many existing objects and also have the capability to create and manipulate their own objects. Participants may also buy/sell/trade/acquire objects, ranging from books to food to houses. Some objects in *Second Life* have physical properties. For example, users may bounce on

a trampoline, watch actual video on a virtual television, or ride a virtual jet-ski on a virtual lake.

The purpose of this project was to engage online students in an environment that would allow them to become more involved with not only the instructor, but each other as well. An online class that uses a chat room as part of the class instruction tends to resemble a group of people sitting around a table in a classroom. The students read and respond to the conversation in real time as it occurs. Other than the occasional use of emoticons such as ;) (wink) or other generally accepted instant messaging abbreviations such as <LOL> (laughing out loud) or <ROFL> (rolling on the floor laughing), there is little, if any visual feedback that alerts the students to the tenor of the discussion. The use of *Second Life* adds a visual feedback element that serves to enhance the interaction between the participants. Students can observe the actions of other students, watch how others interact with the various elements found in the virtual world, and introduce a visual element of proximity which is not available in a typical online classroom (the ability to chat with another person is affected by virtual distance—one can only see the conversation if one is within range of the person talking). Students can effortlessly break into smaller groups, simply by moving away from one another.

Students were pre-registered as *Second Life* users. As users in *Second Life* are generally allowed to choose their own username, this pre-registration allowed the instructors to keep track of the students registered in the class. One feature of *Second Life* is the use of teleportals to quickly move from one location in *Second Life* to another. However, one participant may offer to transport another participant to their *Second Life* location. As new participants enter the *Second Life* environment a long “virtual” distance from the designated office location, it was decided that once the students entered the *Second Life* environment, they would message the instructor to be transported to the office building location.

Once transported, a user can then set a location as a landmark, or, in the case with the students, as a home location (which would allow them to enter the *Second Life* environment at the office location). Once at the office, students were given an orientation to the *Second Life* environment and presented with tasks which emulated skills they would need while in the *Second Life* world (such as moving and creating objects, flying, and interacting with the instructor/other participants). Students were also allowed to explore the three-story office building, which was designed to provide a large number of online experiences (such as accessing Web sites outside of *Second Life*, opening and reading online books, and leaving messages for the instructors).

First Floor

The first floor of the three-story virtual office building included a lounge area, with a couch (on which avatars could sit and converse with each other), a coffee table, and decoration accessories such as a tropical fish aquarium. The first floor deck included a library with both course-related and leisure readings. The entrance of the first floor

contained URL globes that, when touched (mouse-clicked) by the avatar, provided access to relevant Web sites on the user's computer.

Second Floor

The second floor (accessible by stairs, flying, or teleporting) faculty office consisted of a couch, coffee table, faculty desk and chairs, and various decoration accessories. During virtual office hours, students could sit across from the instructor's desk and chat (via text), just as they might chat verbally, in real life. Should the instructor be out of the office, students could leave a text message by simply clicking on a message globe. From the second floor deck, students could watch streaming videos on a 20 ft. × 10 ft. high definition television containing both instructional content and entertainment content such as movie trailers, music videos, and vintage animated cartoons.

Third Floor

The third floor (rooftop) allowed larger groups of students to gather in a more relaxed setting. The open-air rooftop was outfitted with a popcorn machine, Coca-Cola™ vending machine, and a launching chair. Students could converse, enjoy a box of popcorn and a Coke™, and ultimately (for fun) sit in a launching chair which would launch the avatar several hundred feet into the air, releasing the avatar for a freefall (parachutes are available for purchase at several locations in the *Second Life* grid).

Built on a 1-acre snow sim (snow simulation), the office building provides a place for both students and instructors to gather, hold real-time discussions, conduct group meetings, and have one-on-one meetings. From student comments and feedback, it appears that the goal of accomplishing a closer-knit class sense of community among class members was accomplished. The next step for this project will be to integrate more instructional tools and materials into the virtual environment, such as multimedia content, class activities, and cooperative learning experiences. Providing such a highly social and collaborative environment will foster greater opportunities for real-world learning experiences, cooperative learning, and group activities; experiences and activities that have never before been possible in an online environment.

Using MMORPGs for Cooperative Learning

The highly social attributes of MMORPGs make them rich environments for cooperative learning-based activities. Bonk and Reynolds (1997) suggest several critical thinking and cooperative learning techniques for the Web. Bonk and Reynolds' cooperative learning techniques for the Web can be easily extended to MMORPGs. These techniques can be categorized into partner activities and group activities (see Table 1).

To illustrate the adaptation of cooperative learning to MMORPGs, this section of the article will give several examples using partner activities and group activities in

Table 1. Cooperative learning techniques for the Web (and MMORPGs)

Partner activities	Group activities
Think/pair/share	Electronic café
Share/check	Round robin/round table
Work/review/discuss	Jigsaw
Peer review/edit	Discussion group
Partner conference	Structured controversy
Peer interview	Panel discussion
Tell and retell	Debate

Second Life. In the interest of brevity, one example of partner activities and three examples of group activities will be given.

Partner Activities

Think/pair/share. One example of a partner activity, Think/pair/share (Gunter, Estes, & Schwab, 1999) is easily accomplished in a MMORPG environment. The teacher poses a thought-provoking question to the entire class via email, Web site, or LMD. Students are encouraged to individually think about the question, with the goal of reaching a reasonable answer/solution. At a predetermined time, each student meets in-world (real time) with a partner to discuss (keyboard chat) his/her solution and to reach a consensus with the partner. In the final step of the Think/pair/share activity, the students meet in the virtual classroom location to share their answers with the entire class (with a virtual PowerPoint presentation, if needed). Supplemental documents, images, and Web sites are plainly shared to support discussions.

Group Activities

Round robin/round table. Another cooperative learning technique, Round robin/round table, is easily facilitated in a virtual world (Kagan, 1994). In this brainstorming activity, the class is divided into small groups with one student appointed as the recorder. A thought-provoking question is asked, giving students time to think, individually. Each group then assembles in a different room of the virtual building (or any location in the virtual world, for that matter) for sharing of answers and discussion. The recorder copies and pastes the answers of the individual group members into the *Second Life* text tool, for sharing and review at a later time. The recorded responses are housed in the classroom library.

Jigsaw. Through cooperative learning techniques such as group investigation, higher-order thinking skills such as analysis and evaluation can be achieved. After planning, researching, and dividing assignments, group members synthesize and

summarize their findings and share them with the entire class. The jigsaw technique is a common group investigation method. Imagine for a moment how a jigsaw activity on geography might take place. Students are assembled in the virtual classroom, where they are given a geography assignment. The students are assigned to groups of four, with each person in the group being assigned to a different geography topic as location, landforms, bodies of water, and climate. Students with like topics meet together and gain expertise by mouse-clicking on *URL globes*. These globes direct the students' Web browsers to information-packed Web sites, preselected by the instructor. After the topic exploration, students return to their original groups and share their newly gained expertise.

The previous activities illustrate how essentially any face-to-face cooperative learning activity can be adapted to a MMORPG environment. The reader is encouraged to explore other ways in which the remaining partner/group activities (and other activities not listed) can be used in MMORPGs. As they become easier to use and more realistic, MMORPGs may one day become the preferred platform for cooperative learning activities.

The Future of MMORPGs in Online Learning

As computer processing speed, bandwidth, and innovations increase, MMORPGs will most likely continue to become more sophisticated, offering increased interactivity and realism. The use of pedagogical agents, artificial intelligence, and customization will increase ways that MMORPGs can be integrated into education, training, and performance support systems (Bonk & Dennen, 2005). As MMORPGs are integrated, more attention will need to be given to teaching and learning issues such as higher-level thinking skills, problem-solving, identity, and social affiliation. Not only will the use of MMORPGs offer many pedagogical options for educators, but it will also provide exciting opportunities for researchers. Bonk and Dennen (2005) list 15 issues which may require further exploration and research when using MMOGs (and MMORPGs) in education and training (see Table 2).

Conclusion

Improvements in MMORPGs will lead to increased realism and interactivity, blurring the line between the face-to-face learning environment and the online virtual learning environment. Combined with this increased realism and interactivity will also be innovative teaching models and new ways of learning. These innovative models will most likely address critical thinking and problem-solving, and will be based upon real-world, highly social learning experiences. Advances in artificial intelligence may well promote the integration of pedagogical agents (learning agents) into the teaching/learning models; agents that will customize materials for each learner, based upon the learner's own individual needs.

Currently, *Second Life's* educators' electronic mailing list (educators@lists.lindenlab.com) provides an ongoing exchange of new ways that *Second Life* and other

Table 2. Potential research issues for MMOGs (and MMORPGs)

Performance and decision-making style	Bandwidth constraints and differences	Learning from mistakes
Impact of addiction to MMOGs	Role assignment	Learning style and game selection
Sense of community and group longevity or persistence	Cognitive tools and MMOG performance and dialogue	Game-based motivation
The apprenticeship process in MMOGs	Collaboration and virtual teaming	Problem-solving processes and types of knowledge facilitated by MMOGs
Game authenticity and constructivism	Decision-making, leadership, and interpersonal conflict in MMOGs	Social skills and friendship development

virtual environments can support education. Educators regularly share their experiences, successes, failures, and new teaching strategies on the list. With these numerous teaching, learning, and research opportunities at hand, it appears that educators and researchers will have a plethora of directions in which to drive their fields. Use of MMORPGs in education and training is in its formative years. Innovations and improvements in MMORPGs will likely be a catalyst for new ways of learning and new models of teaching. The limits to these exciting teaching/learning advances will ultimately be up to the technology and the creativity of the educators using it.

Notes on Contributors

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