CHAPTER 5
Solo Learning Activities in Content- or Context-Rich MUVEs

The MUVE as a Learning Crucible

This chapter includes a general description of content- and context-rich MUVE learning, with examples of specific health care regions in Second Life®. Strengths and limitations of this type of learning are discussed.

This chapter is for you if:

1. You are interested in exploring characteristics of content- or context-rich MUVEs.
2. You are planning a content- or context-rich MUVE learning activity.

Pedagogical Advantages Offered by Content-/Context-Rich MUVE Regions

One of the most important characteristics of MUVEs is multidimensional sensory richness. Visually and acoustically stimulating, they engender rich imaginal experiences. This chapter will focus on two characteristics of these types of learning environments: content richness and context richness. Learning activity design begins with a strategic use of these two characteristics to support optimum learning. (Note: The Second Life® sites referenced in this chapter were available as of 2015.)

Content-Rich MUVEs

Content-rich MUVE regions provide topical information to region visitors. Such information can be presented in a huge range of ways, from graphic representations such as a huge DNA molecule with which a MUVE user can interact to video and other media. Some content-rich MUVE sites engage participants very actively, others less so. This is well illustrated by two regions in Second Life® that are content rich. Both are dedicated to posttraumatic stress disorder (PTSD) education. At one site, visitors simply walk around reading and listening to information about PTSD. There are posters, family dynamics
presentations, and a self-evaluation survey. The site displays excellent information about PTSD in an attractive location that is engaging to explore, but learning there is relatively passive. In another site also dedicated to PTSD, sights and sounds are intended to simulate the experience of having PTSD. In this content-rich site, the role of the learner is more active.

There are many examples of content-rich regions in Second Life®. One such region is dedicated to avian flu prevention. Visitors can wander through a village whose inhabitants are at high risk of avian flu. The purpose of this site is to provide information about the disease, risk factors associated with it, and prevention strategies for village inhabitants. Another is Second Life®’s Cystic Fibrosis University, dedicated to disseminating information about cystic fibrosis. This region offers information for people with the disease as well as interested health care practitioners. A different type of content-rich environment, POP-CENT, is a Second Life® region that displays information for scientists working on emerging neurotechnology research. Researchers use the site to share information, approaches, topical announcements, and resources.

On a site dedicated to reproductive health, Ovary and Testis Tours takes visitors on a recreation park–like ride in a tour of the structures of the male testis and female ovaries. During the tour, visitors listen to the tour guide’s explanations of the anatomical structure and physiological function of the testis and ovaries, which are observed as the ride progresses. Numerous Second Life® regions provide health information of interest to both health care professionals and the general community. Good examples are Health Info Island, which is sponsored by the Mayo Clinic, and its neighbor island, Ability Island, which provides information about several different kinds of disability.

The various MUVE sites described so far illustrate MUVEs that are content rich. The advantages of learning in these regions arise from their ability to effectively communicate content material about a specific topic (such as cystic fibrosis), a specific phenomenon (hallucinations), or processes (neurological research). Others target specific learners (caregivers and family members of people with schizophrenia) who are focused on a specific topic.

**Context-Rich MUVEs**

A different type of MUVE focuses not on content but on the rich environment within which learning takes place. These sites provide rich crucibles for learning and are valuable not for their content richness but rather for the richness of the context they offer. Context-rich sites are different from those whose purpose focuses on topical content. Context-rich sites do not necessarily convey topical information. The goal of a context-rich MUVE is to provide an environment
that particularly supports effective learning. A context-rich MUVE offers instructors an opportunity to match a learning activity with an environment that most effectively supports learning there. These types of sites situate learning within a context that makes the learning richer. For example, a health care profession student who is learning to interview clients can do a learning activity in an environment similar to places where interviewing usually takes place (a clinic or emergency room). Such context-rich sites simulate the environment within which learned behavior will be used in the future. Its richness comes not from the content it offers but rather its similarity to the environment in which learning will be applied. The MUVE is valuable in this case as the crucible for learning it offers and the bridge it creates to future application, fostering translation of learning into practice.

Some of the earliest private MUVEs were context-rich environments. These environments were created as a place to learn a particular subject. Harvard University created a private MUVE that consisted of a nineteenth-century village called River City. This MUVE was designed as “a multi-user virtual environment for learning scientific inquiry and 21st century skills” (River City Project, header). The inhabitants of River City were afflicted with a particular disease. River City visitors investigated the disease by exploring the city environment, the physical surroundings, city records, and historical documents such as photographs and journals. Visitors could interview River City citizens to investigate the source and progress of the illness under study. Working as individuals or teams, students were able to explore both human and environmental issues such as risk factors, infection vectors, and disease spread. River City is an example of a MUVE created to be a learning crucible for a particular set of learning activities focused on a specific goal. River City itself did not teach about the disease or its spread. It provided no information signs, posters, speeches, or presentations by experts on the disease. The River City environment was, rather, a place where students could explore issues related to disease transmission and spread. They could also demonstrate scientific reasoning skills as they investigated the disease plaguing River City. This context richness supported engaged, multilevel, dense learning.

This type of MUVE shares some characteristics with multi-user role-playing games. Students in River City worked toward specific goals and objectives. River City as an environment provided only a context for goal achievement. Context-rich learning MUVEs differ from games because in the River City MUVE, for example, there is more than one solution to problems being explored. The focus is on learning both science concepts and individual inquiry. There is no one correct answer, no game to win (Ketelhut 2007).

Another early context-rich private MUVE is Quest Atlantis. In this MUVE, nine- to twelve-year-old students experience learning through a series of
learning quests. These quests took place in Atlantis, a community facing a crisis that arose from poor leadership. Quests included a wide range of activities such as study of the environment, comparison with other cultures, interviewing members of the community, exploration of issues related to social commitment, and formation of plans to deal with the crisis. Similar to the River City MUVE, the primary role of Quest Atlantis was not to provide information about leadership or social responsibility but rather to provide a context within which students could explore these issues. Learning in this MUVE was designed to be very active and included opportunities for both individual and group learning within a context-rich environment that supported learning (Barab et al. 2005).

Critical Life was another early private MUVE created for nursing students. This context-rich site used a specific learning environment, a simulated acute care hospital facility, where nursing students were able to practice crisis intervention skills. When presented with a patient who was in a physiological crisis, students selected the best course of action for treatment of the patient. Their actions triggered specific physiological consequences for the patient. This illustrated the consequences of students’ interventional choices. Students could participate either solo or in groups, practicing collaboration skills, learning from each other, and learning performance evaluation (Rogers 2010). This simulation exercise for critical reasoning and problem-solving skills took place in an environment similar to clinical environments in which students expect to practice after graduation. The learning activities involved clinical problems, care goals, and a variety of positive and negative outcome possibilities. When done as a small group, Critical Life learning activities also involved collaboration. This MUVE was primarily a context-rich environment but offered content instruction as well. Patients in Critical Life were programmed to respond to selected interventions in specific ways. When a student performed an intervention, a specific patient symptom was elicited (improved or worsened blood pressure, for example). The students’ role was very active, and students received immediate feedback on their chosen interventions. This added content richness to the context richness of the MUVE.

These context-rich MUVEs were created for specific learners and targeted specific objectives. Other MUVEs are context rich but not created for specific topical instruction. Second Life®’s Second Health Hospital, created by the Imperial College of London, depicts a futuristic health care center that provides health for acute and chronic conditions as well as both rehabilitation and preventive health care. Second Health is a state-of-the-art hospital facility that includes an emergency department, endoscopy unit, wellness center, rehabilitation and counseling centers, and a variety of other clinical units. This region in Second Life® is
not inhabited. No residents can be found there on a regular basis. There is a welcome sign that introduces visitors to the hospital and a health survey that can be completed. Other than that, there is little content related to health or illness portrayed in the setting.

Second Health Hospital is an excellent example of a context-rich environment. A visitor there hears the paging system overhead just as would be expected in a First World hospital. In each area of the hospital, there is furniture and the basic equipment one would expect to see in a hospital facility (heart monitors, stretchers for patients to sit on, intravenous poles). There are generally no educational displays and no presentations on diseases or disease prevention. Second Health Hospital is simply a place.

This site can be used for a wide range of purposes. Health practitioners use Second Health as a place to practice a range of professional skills. Architects visit the site to get ideas about the design of health care facilities. A patient experiencing anxiety about an upcoming hospital admission can visit Second Health Hospital to practice being in a hospital without anxiety. Public health specialists use Second Health Hospital as a way to explore issues related to infection control. There is no specific content to be learned by visiting Second Health Hospital. It is, however, an excellent location to do clinical nursing learning activities. The clinical rounds activity, referred to previously and described in a later chapter, can easily take place in Second Health Hospital, in an emergency department, a wellness center, or an intensive care unit, depending on the goals of the learning activity.
Sites That Combine Content and Context Richness

Some MUVEs combine elements of both context- and content-specific learning. One acute care hospital region in Second Life® provides patient charts for learning activities that take place there. At this facility, no one can enter any patient area until they first approach a sink and wash their hands. This location provides rich context for learning but also includes some content elements as well.

Another Second Life® region, called the Reality Check Café, similarly combines content and context richness. This MUVE is designed to illustrate the relationship between food choices and exercise. Arriving at the Reality Check Café, visitors are invited to take a seat at the café and to select items from a menu on the table. After indicating their choices, visitors are given a calorie summary of their order. Next, the visitors are invited across the street to a fitness center, where a wide range of exercise machines are available. Once the visitors select one for use and begin to exercise (on a treadmill, exercise bicycle, or other piece of exercise equipment), they are informed about the length of time they will need to exercise to metabolize all the calories generated by their café menu choices. This MUVE uses the context of a café and a fitness center to teach about healthy food and exercise choices. In addition to situating learning in an environment specific to the learning goal (restaurant and fitness center), the specific caloric consequences of food and exercise choices contribute a content focus to this MUVE. This site is a good example of a MUVE that is both context rich and content rich.
The University of Kansas also sponsors a Second Life® MUVE site for medical professionals that combines content and context richness, called the Medical Examiner’s Office. This MUVE illustrates a medical examiner’s office where visitors can observe autopsies, attend lectures, and interact with equipment and protective clothing typical of such an office. Because this site is also a place for medical professionals to perform learning activities, it also combines content richness with context richness.

Some MUVEs combine context richness and content richness through the use of robot teachers that are programmed to inhabit the MUVE. These robot avatars are not associated with a live user but rather are preprogrammed parts of the MUVE environment. They are designed to interact with site participants, who click on the robot to activate it. An example of this is a Second Life® intensive care unit where visitors interact with preprogrammed robot patients. Visitors observe physiological data provided by the robot patient and make adjustments in medications and other medical treatments. The robot avatar patient is preprogrammed to respond in specific ways to these interventions. Students learn both by observing the patient in situ and by observing patient responses to medical interventions. In other MUVEs, preprogrammed avatar robots are used as avatar coaches who give site visitors feedback about their learning activity performance. What all these examples have in common is the way they combine content and context richness to support learning.

**Pedagogical Benefits of Context- and Content-Rich MUVEs**

Learning MUVEs that are content or context rich offer several pedagogical benefits. Participants have freedom to explore, to problem solve, and to experience both learning content and process directly. Students engage with information that pertains to their interests. Learning is thus student driven. This experiential focus enables participants to create and develop meaning constructs that help them to expand and deepen their understanding.

For example, participants in River City arrive in the city with no idea of how to look for a disease. They might begin by exploring the physical surroundings, perhaps observing environmental contaminants. Later they might interview River City residents (“Everyone is too afraid to go to the doctor”). Students construct ideas about investigating disease outbreaks and factors specific to new disease transmission. They explore factors that make this search difficult (fear and lack of information). At the Second Life® Virtual Hallucinations region, participants might have experiences that assist them in understanding patients who have auditory or visual hallucinations (“I realized I had no reliable frame of reference. I had no way of knowing what was real and what was not.”).
Limitations of Environment as Pedagogy

A significant disadvantage of a content/context-rich type of MUVE learning is that such regions are time, energy, and resource intensive to build. If an instructor decides to create a content- or context-rich MUVE, a high degree of technological expertise or expert assistance is needed. Most instructors do not have these resources and choose to focus on designing and implementing learning activities.

Most topic-specific MUVE learning environments, even the most complex and detailed ones, present highly focused learning of a relatively small body of knowledge. The hallucinations MUVE is very effective, but it only engages a very small segment of a very large topic. For some purposes, this is not a serious limitation. One of the early uses of the University of Hawai‘i (UH) Second Life® campus was for automobile drivers’ education. The earliest UH Second Life® campus had a track around it, which was used to practice safe driving skills. As psychomotor skills go, driving skills are fairly limited in number and complexity, but for most topics, that is not the case.

Another weakness of teaching in content/context-rich MUVEs is that, like all experiential learning, MUVE learning offers students an opportunity to create their own meaning constructs. This type of learning is sometimes criticized for having vague or poorly defined learning outcomes. Specific goals and performance outcomes may be more difficult to achieve using learning activities that focus on a student’s own creation of meaning systems. Designers of learning activities for content- and context-rich MUVEs must understand this challenge and incorporate learning specificity into the instructional design.

Reader’s Roadmap: Where Are We?

In this chapter, general characteristics, pedagogical advantages, and disadvantages of content- and context-rich MUVE learning have been discussed. In Chapter 6, two specific examples of these types of learning activities will be presented.

CHAPTER REFERENCES
