ANDRAGOGICAL CHARACTERISTICS AND EXPECTATIONS
OF UNIVERSITY OF HAWAIʻI ADULT LEARNERS
IN A 3D MULTI-USER VIRTUAL ENVIRONMENT

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ABSTRACT

The purpose of this study was to discover which andragogical characteristics and expectations of adult learners manifested themselves in the three-dimensional, multi-user virtual environment known as Second Life. This digital ethnographic study focused specifically on adult students within the University of Hawai‘i Second Life group and their learning characteristics and expectations within Second Life. Methods used for data collection included participant observation of four University of Hawai‘i classes, faculty interviews, and student focus groups. All data collection occurred within the Second Life environment. Fifty-five students were involved in the observation portion of the study, six students were involved in the focus groups, and three instructors participated in the interviews.

Andragogical characteristics and expectations were observed to be manifested by the adult learners. The faculty interviews and student focus groups confirmed these characteristics. Pedagogical characteristics and expectations were observed and confirmed in the focus groups and interviews as well. Constant comparative method was used to categorize and analyze the data. The analysis of the data revealed a relationship between the andragogical and pedagogical characteristics. Results indicate that the use of pedagogical instruction by instructors may result in the manifestation of andragogical characteristics by adult learners within the Second Life environment. However, more research is needed to confirm the relationship between the two.
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CHAPTER 1. INTRODUCTION

Andragogical characteristics and expectations are learning traits exhibited by adult learners, popularized by the American adult educator, Malcolm Knowles (Adams, 2006, sec. Characteristics of Adult Learners). Knowles suggested that adult learners differ in learning than their younger counterparts and have unique learning characteristics and expectations. For example, according to Andragogy, adult learners are often self-directed and typically not dependent on others for direction, where young learners are often dependent on other adults for direction (“Characteristics of Adult Learners,” 2012, p. Characteristics).

Andragogy is the opposite of pedagogy, in which a course is more instructor-directed rather than student-directed. Currently, in academia, pedagogy can refer to teaching in general, rather than referring specifically to a teacher-directed or student-directed style of instruction. Yet, it can also refer to an instructor-centered approach, which is associated with teaching younger learners. In higher education instructors have used both pedagogy and andragogy to teach adult learners. In other words, higher education classes are either instructor-centered, student-centered, or a combination of both. In this study, the older definitions of andragogy and pedagogy are used, andragogy meaning student-directed teaching and pedagogy meaning instructor-directed teaching.

Over the past two decades, adult learners, who have experienced both pedagogical and andragogical instruction, have transitioned from learning in physical classrooms to online classrooms. Moreover, instructors are now teaching a few of these online courses within 3D virtual worlds online. Since the theory of andragogy was created when adult
education took place in a face-to-face classroom setting, the question is whether this theory is it still applicable to learning within 3D virtual environments?

This ethnographic study focused specifically on adult students within the University of Hawai‘i Second Life group and their learning characteristics and expectations within a 3D virtual environment. The study followed an examination of the available literature on online andragogy and two pilot tests investigating adult learners in these environments.

The study of the characteristics and expectations of Second Life students who learn on a virtual campus is of importance in order to understand how to better design instruction for adult students who are learning in this particular environment which has become increasingly popular as an instructional setting. The findings from this research will help instructors and instructional designers who are developing curriculum and instruction for this particular audience. The ability to understand the similarities between learners’ characteristics as well as their expectations within 3D virtual environments can provide instructors who teach in this environment with knowledge of their students’ characteristics and expectations that can aid in planning their curriculum.

**Statement of the Research Problem**

Interestingly, researchers suggest that online instructors highly structure their courses in order to ensure student success (Ragan, 2008).

In a traditional classroom, structure is at least implicitly understood whereas in the online environment, it is much less clear due to the newness of the medium and the multiple ways in which it can be accomplished. In the online environment, one of the more important design aspects is to set and communicate clear expectations to help students keep track of their learning (Sandoe, 2005, p. 21).
Within these suggestions, mentions of student input and independent learning are not found. Also, since the rise of 3D virtual environments is relatively recent, little research exists on adult learners within these online environments (Wang & Lockee, 2010), including whether or not structure or student input is needed for courses taught in these online environments.

Some research to date suggests that learners in this environment have a need for structure (Gaimster, 2008) as well as the need for interaction (Atkinson, 2009), similar to their needs in any online classes. Researchers also suggest that virtual world learners are in need of rules and conventions in order to feel comfortable while learning (Gaimster, 2008). However, little to no research has looked into the specific characteristics and expectations of learners in 3D virtual environments. It is recommended that instructors take into consideration the characteristics and expectations of their adult students when teaching in online 3D virtual worlds (Adams, 2006).

Researchers of teaching within 3D virtual environments suggest that instructors need to adapt their instruction to the needs of the learners they are teaching. “In terms of instruction, teachers need to know how to help students maximize their experiences that address specific curricular needs. In short, it is recommended for instructional designers and teachers to help students move from the role of virtual resident to virtual learner” (Atkinson, 2009, p. 31). When teaching in 3D multi-user virtual environments (MUVEs), it is proposed that instructors keep in mind the specific curricular needs of their students. In other words, it is suggested that they understand that the learning process engages through exploration and reflection, learning is embedded in a 3D environment where learners interact through roleplay, learning is
proactive and collaborative where learners test and compare multiple perspectives, and learning simulates real life authentic context through real world activities, behaviors, actions, and events (Atkinson, 2009).

Instructional Design (ID) has potential to assist with issues of improving learning in such an environment. Yet, one of the current criticisms of instructional design is the fact that ID models fail to take into account the particular characteristics and background of the specific audience for which a design is intended. “Instructional design cannot and does not exist outside of a consideration of culture” (Henderson, 1996, p. 86). While it is recommended that those educators designing curriculum take into account who they are designing for, they also need to take into account that those learning in MUVEs most likely have their own learning characteristics and expectations in that environment as well.

**Research Purpose**

The purpose of this study was to discover similarities among the andragogical characteristics and expectations of adult learners in the three-dimensional (3D) MUVE known as Second Life (SL), and understand how these characteristics and expectations impact their learning. The students of the University of Hawai‘i have their own unique backgrounds and learning experiences. Therefore, the participants in this study consist of University of Hawai‘i adult learners who use Second Life. Currently, the University of Hawai‘i has five dedicated virtual islands, also known as “sims,” for use within Second Life that are used by instructors to teach adult learners. These sims are also used by several faculty and staff for networking and professional development purposes.
The University of Hawai‘i currently offers a number of online classes. Ten of these classes are taught within Second Life. These classes include courses from several disciplines including psychology, library and information sciences, education, and second language studies. Instructors from other colleges in the university have indicated that they wish to teach a class in the Second Life in the near future as well. This case study intends to study the types of learners that are participating in these virtual world classes and their common learning characteristics and expectations.

**Questions Under Investigation**

This study investigated the following research questions.

1. What andragogical characteristics and expectations are manifested by University of Hawai‘i adult learners within the Second Life virtual environment?

2. Do relationships exist among the different characteristics and expectations, and if so what are they?

**Significance of the Study**

Enrollment in online classes is increasing every year as more and more people are returning to college due to the current economic downturn (Parry, 2010). Colleges are offering online classes in several delivery formats, including the use of learning management systems and online conferencing software. Instructors are using MUVEs for online instruction as well (Calongne, 2008; Omale, Hung, Luetkehans, & Cooke-Plagwitz, 2009; “Virtual World Conference - McCombs School of Business - UT Austin,” 2009). These MUVEs include Second Life, Active Worlds, and Blue Mars.
While methodologies for instruction may differ among instructors who teach in 3D MUVEs, the premise for this study is that similarities exist regarding the characteristics and expectations of adult learners taking classes within these environments. Since andragogy proposes that adult learners have similar learning characteristics and expectations when learning in a face-to-face environment, this is possibly the case in 3D virtual environments since these environments often mimic physical learning environments. Other current researchers have proposed that adult learners in regular 2D online courses have similar learning characteristics and expectations as well (Perret, 2008). The questions are whether these online characteristics and expectations manifest themselves in adult students who are learning in 3D MUVEs and if a relationship exists among these characteristics and expectations.

Another argument is that instructors have the added challenge of not only designing curriculum that is publishable within the 3D architecture of the virtual world, and designing curriculum for adult learners that choose to take a class within this environment. How educators choose to design their curriculum for adult learners within this environment is a major concern since this type of medium for communication and instruction is fairly new within the academic community (Calongne, 2008; Gaimster, 2008).

**Conceptual Framework**

The framework for this study is andragogy since its focus is on the characteristics and expectations of adult learners. The theory of andragogy provides a clear outline of how instructors need to adjust their teaching based on the learning characteristics and expectations of adult learners (Burge, 1988; Cercone, 2008), and has been used in
previous research of online learning by adults (Gastfriend, 2001; Lawrence, 2007; Nelson, 2010). Andragogy can be defined as “a theory that guides the scope of both research and practice on how adults learn, how they need to be taught, and elements to be considered when adults learn in various situations and contexts” (Cooper & Henschke, 2001, p. 2). Shown in Table 1 are some commonly included characteristics and expectations of adult learners, according to andragogy.
Table 1

Comparing Andragogy Characteristics and Adult Learner Expectations

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults have many experiences and are knowledgeable. Their backgrounds provide a rich resource for learning.</td>
<td>They expect learning that immediately applies to their job or personal life.</td>
</tr>
<tr>
<td>Adults have various values, beliefs, and opinions.</td>
<td>They often question new information and change.</td>
</tr>
<tr>
<td>They are responsible for their own learning.</td>
<td>They expect to be treated like adults.</td>
</tr>
<tr>
<td>Adults’ self-concept is self-direction.</td>
<td>They are usually not dependent on others for direction.</td>
</tr>
<tr>
<td>They often approach learning as problem-centered rather than content-oriented.</td>
<td>They expect to be involved in the planning and evaluation of the course curriculum.</td>
</tr>
<tr>
<td>Adults gravitate more toward survey type, straightforward courses.</td>
<td>They have specific results in mind for their education and will leave if their education does not lead to those results.</td>
</tr>
</tbody>
</table>


The theory of andragogy specifically emphasizes the need for instructors to take into consideration the characteristics of the adult learners who they are teaching, including those in an online environment. The theory of andragogy parallels several key principles of teaching in 3D MUVEs identified in earlier studies: *immersion, interaction, identity, and integration* (Atkinson, 2009). Also, since andragogy focuses on the learner
rather than the 3D environment itself, it serves as a guide in this research to identification of characteristics of the learners studied, and to structure the research instruments.

In other words, the focus is only on the characteristics and expectation mentioned within the model, rather than its effectiveness in part because of concerns raised about the model by its critics (see Chapter 2). “While a practical ideal type is not a roadmap to perfection, [andragogy] does serve as a good frame of reference” (Roberts, 2007, p. 34). Whether or not the model is an effective application for creating curriculum and facilitating learning is beyond the questions addressed in this study.

**Overview of Study Design**

In this digital ethnographic study, the types of characteristics these learners have and their expectations for their learning in 3D virtual environments was investigated. Methods used to study this particular group of people included participant observation, interview, and focus groups. The three focus groups involved adult students who had taken a class within any one of the four University of Hawai‘i Second Life virtual campuses in the past three years. The interviews included three active University of Hawai‘i instructors in Second Life, and the observational field notes involving four classes conducted in Second Life. This study parallels methods used in other studies on adult learning including those by Paula Flaherty (2007), James William Hynes (2005), and Paul Wilmarth (2011).

For over five years, I have used Second Life for academic purposes, both in terms of instruction and as an area of research. I originally started exploring Second Life as a graduate assistant at the Technology Distance Programs in the College of Education at UH. Then, in 2009, I was Project Manager for the development of the College of
Education island in Second Life. In the meantime, I also was a teaching assistant for one of the Educational Technology classes taught in Second Life and was co-instructor for another. In addition, I conducted qualitative research within Second Life on one of the Educational Technology classes held on the University of Hawai‘i island in Second Life.

However, in this study the researcher’s role was as an outside participant observer. Coming from the outside of a group and studying them has its benefits. “It is important to emphasize that, as with all interpretivist research, ethnography is flexible in terms of research design with researchers seeking ‘to be totally open to the setting and subjects of their study’” (Williamson, 2006, p. 87). As suggested by Tinker and Armstrong (2008, p. 53), “acknowledging one’s outsider status can help the researcher to gain detailed and comprehensive accounts from his or her interviewees.” Although I am very knowledgeable about learning in 3D virtual environments, the students and faculty still belong to a unique class culture of their own within Second Life. My lack of experience with the four classes within this study has proven beneficial since the students and faculty members were more inclined to inform me about their individual experiences with learning in Second Life.

Educators need to take their audience into consideration when designing curriculum, including their audiences’ characteristics. People’s characteristics are often defined by themselves, their community, and their culture. Their community and culture also aid them with defining their expectations. The environment people are learning in also allows them to create expectations within it and enables a connection between other characteristics they choose to identify with.
Online expectations are no different. Even though many view the World Wide Web as a tool, it can also serve as a medium in which a person can better define their characteristics and expectations among others in different online communities. Since a lot of people are starting to participate in formal and informal learning within MUVEs, I recognize that this is a topic that needs closer study since characteristics are more fluid in this environment than others. Further, this study is influenced by constructivist theory which is a big influence on perceptions and thoughts about learning online. Within constructivist theory, “researchers investigate constructions or meanings about broad concepts such as cultural values, or more specific issues or ideas” (Williamson, 2006, p. 85).

**Study Limitations and Delimitations**

Some limitations exist when researching adult learners online. First of all, when researching online, researchers are unable to see the many social cues and the context that exist in a face-to-face classroom. As proposed in media richness theory, computer-mediated communication “is not a rich medium for communication since it has a narrower bandwidth and has reduced social cues” (Anstey, 1999, sec. 2). Although the participants’ avatars have some range of facial expressions, they are still restricted to the animations Second Life provides for them in terms of avatar movement. Therefore, lacking physical cues and not knowing the context in which the participant is speaking may lead to some misinterpretations of the data when researching adult learners or teaching them online.

Another concern is that researchers may have a false sense of anonymity and neutrality when studying their participants on the Internet since their physical appearance
is often hidden and communication is mainly text-based. However, many academics agree that the Internet is not neutral since everyone’s biases and beliefs manifest themselves in one form or another either through text or voice communication. “For the ethnographer, …the Internet should never read as a ‘neutral’ observation space as it is always remains a fieldwork setting, and as such, a researcher’s data selection and analyses are always biased by agendas, personal histories, and social norms” (Murthy, 2008, p. 840). Online researchers need to exercise caution whenever they start to view their actions as neutral on the Internet. During this study, caution was exercised by reviewing the data with a critical lens as well as asking other peer reviewers to make note of any bias they observed in the research data.

A further limitation may be the result of the selected research methodology. One of the weaknesses of digital ethnographies is that researchers have to integrate themselves into a group of people who they have little to no relationship with. “Conversely, many online environments are extremely status conscious and can prove punishing to ‘outsiders’” (Somekh & Lewin, 2005, p. 39). This can hinder the study since the participants within the group may choose to exclude researchers from certain pieces of information or from communication altogether.

Also, researchers have conducted few studies using digital ethnography as their frame. “Data elicited from ethnographic online discussions with participants show how the characteristics of graphical environments pose unique issues for participant observation that are distinct from those posed by text-only and traditional offline settings” (Williams, 2007, p. 9). Therefore, one cannot conclusively say whether or not it
is an effective framework for researching this particular group of adult learners until more studies, such as this one, are conducted and published.

Another disadvantage of ethnographies in general is that sample sizes are often small, which critics of ethnography believe are unreliable. They believe that “generalizations beyond the sample are inadvisable without strong evidence from other studies” (Williamson, 2006, p. 98). However, an aggregation of these smaller studies can lead to greater discoveries, and one small study can act as a starting point for future research on a particular group of people or a specific community.

Furthermore, critics argue that data from small samples within a qualitative study, cannot “fit neatly into easily managed categories” like they would within quantitative studies (Williamson, 2006, p. 98). Yet, one could also argue that in quantitative studies “people’s views will not fit neatly into the little boxes representing categories chosen by the researcher” (Williamson, 2006, p. 98).

Additional issues that may have impacted the study involve the role of the researcher, and the researcher’s particular role in Second Life classes. I know two of the instructors within the study personally through connections at the University of Hawaii and participation in University of Hawaii events in Second Life. Two of the three classes I observed were led by these instructors. Also, I helped a few of their students who are participating in the study with their projects and assignments in Second Life.

There are also issues related to power differential. Of the instructors who I know personally, all of them view me as a colleague. The students also view me as one of them since I am also still a student. This situation placed me at an advantage since I could relate to both groups that I interviewed and observed. In addition, I built up a rapport
with the students and faculty I interviewed in order for them to feel safe to share their insights with me about their learning experiences and their background in real life and Second Life. I assured them that the information they shared with me during the study was confidential. In all cases, I carefully assessed these conditions and structured the study to eliminate bias. Still, the potential remains for these as possible limiting factors in the results.

**Definitions**

*Andragogy*: “A set of assumptions about how adults learn” (Fidishun, 2000, sec. What is Andragogy?).


*Instructional design*: “The process by which instruction is improved through the analysis of learning needs and systematic development of learning materials. Instructional designers often use technology and multimedia as tools to enhance instruction” (Culatta, 2011, sec. Instructional Design).

*Multi-user Virtual Environments (MUVE)*: Applications that “incorporate computer graphics, sound simulation, and networks to simulate the experience of real-time interaction between multiple users in a shared three-dimensional virtual world” (Funkhouser, 2012, sec. Overview). They are also known as 3D virtual environments.

*Pedagogy*: “Systemized instruction or principles that promote student learning,” (Kelly, 2008, sec. Problem Definition – Basel Pedagogy) often refers to teaching younger learners when compared with Andragogy.
Second Life (SL): “A special internet browser that offers a multi-user virtual environment in 3-D. This seemingly endless virtual world has been built by its residents from all around the globe” (“Second Life,” 2010, sec. What is Second Life?).


Summary

The following chapter covered the purpose of this study, the questions under investigation, the significance of the study, its conceptual framework, and its design. It also provides a list of definitions to explain the common terminology mentioned within the study. The next chapter will discuss the history and issues of andragogy. It will also provide a more in depth description of MUVEs and cover studies that have investigated learning in MUVEs.
CHAPTER 2. REVIEW OF LITERATURE

Although 3D virtual environments are relatively new as a tool within education, the study of adult learners is not. Even before the rise of distance education, researchers extensively studied the characteristics of adult learners in face-to-face settings. Then, after distance education grew in popularity among higher education institutions, researchers suggested that, although adult learners had the same characteristics as they did before, they had additional expectations about their learning in distance education. More recently, research is appearing in journals about adult learners in 3D MUVEs. In this section, the history and principles of andragogy, the issues associated with adult learning online, and some recent research on adult learners in 3D MUVEs is reviewed.

History and Principles of Adult Learning

The growth and development of andragogy as an alternative model of instruction has helped to… improve the teaching of adults. But this change did not occur overnight. (Hiemstra & Sisco, 1990, para. 5)

Adult learning has had an interesting and expansive history. Starting out as the broader theory of pedagogy throughout most of modern education, andragogy developed and grew in popularity in the 20th century due to Malcolm Knowles’ influence (Bates, n.d.; Carlson, 1989). Since then its principles have evolved at the hands of other theorists and through empirical evidence from research studies focused on adult learning. Although it has many proponents, andragogy has had its many critics as well.
From Pedagogy to Andragogy

Until an explicit theory of andragogy was proposed around the 19th-20th century, the theory of pedagogy was used as the primary method of instruction for both adult and children. Pedagogy was originally developed by the monastic schools in Europe during the Middle Ages to teach children in the monasteries about developing into “obedient, faithful, and efficient servants of the church” (Hiemstra & Sisco, 1990, para. 2). The model of pedagogy then spread throughout Europe and America, and was used to guide teaching practice and strategies for both adults and children until very recently.

Pedagogy is known for its “teacher-centered or directive learning” (Ronkowitz, 2008, para. 5). Its five core principles acknowledge that teachers

- “are committed to students and their learning,”
- “know the subjects they teach and have the necessary pedagogical knowledge,”
- “are responsible for managing and monitoring student learning,”
- “think systematically about their practice and learn from experience,” and

In other words, learning is dependent on instructors and their own backgrounds.

However, what pedagogy does not take into consideration is that as learners mature they increase in their independence and responsibility for their own actions (Hiemstra & Sisco, 1990). In addition, mature learners are motivated by immediate issues and problems in their lives, and are self-directing. “In many ways the pedagogical model does not account for such developmental changes on the part of adults, and thus
produces tension, resentment, and resistance in individuals” (Hiemstra & Sisco, 1990, para. 4). Thus, pedagogy does not take into account the needs of adult learners. Table 2 compares pedagogy and andragogy in regards to their views of the learner.
<table>
<thead>
<tr>
<th>Regarding:</th>
<th>Pedagogy</th>
<th>Andragogy</th>
</tr>
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<tbody>
<tr>
<td>Concept of the Learner</td>
<td>“The teacher is expected by society to take full responsibility for determining what is to be learned, when it is to be learned, how it is to be learned, and if it has been learned.”</td>
<td>“Adults have a deep psychological need to be generally self-directing, although they may be dependent in particular temporary situations.”</td>
</tr>
<tr>
<td>Role of the learners’ experience</td>
<td>“The experience learners bring to a learning situation is of little worth. It may be used as a starting point, but the experience from which learners will gain the most is that of the teacher, the textbook writer, the audiovisual aid producer, and other experts.”</td>
<td>“As people grow and develop, they accumulate an increasing reservoir of experience that becomes an increasingly rich resource for learning – for themselves and for others.”</td>
</tr>
<tr>
<td>Readiness to learn</td>
<td>“People are ready to learn whatever society (especially the school) says they ought to learn, provided the pressures on them (like fear of failure) are great enough.”</td>
<td>“People become ready to learn something when they experience a need to learn it in order to cope more satisfyingly with real-life tasks or problems.”</td>
</tr>
<tr>
<td>Orientation to learning</td>
<td>“Learners see education as a process of acquiring subject-matter content, most of which they understand will be useful only at a later time in life.”</td>
<td>“Learners see education as a process of developing increased competence to achieve their full potential in life.”</td>
</tr>
</tbody>
</table>

*Note.* From Knowles, 1988.

A few writers, such as Kapp and Lindeman, briefly talked about educating adults within their publications at the beginning of the 20th century (Henschke, 2010; Paraskevas & Wickens, 2003). It was not until the 1960s that Malcolm Knowles...
popularized the model of andragogy. A professor of adult education at Boston University, Knowles contributed to the spread of andragogy through multiple publications for the next three decades until his death in 1997 (Hiemstra & Sisco, 1990). Malcolm Knowles, in particular, theorized that adult learners have different needs than youth learners.

In a recent discussion on Knowles’ contribution, Conlan, Grabowski and Smith (2012, sec. Andragogy) noted that Knowles argued that instructors needed to include adult learners “in the planning and evaluation of instruction,” account for their individual experiences and backgrounds, focus on how the subject taught has relevance to adult learners’ current jobs or personal life situations, and make sure the “learning is problem-centered rather than content-oriented.” In comparison, educators saw youth learners as preferring more subject-oriented courses that focus on current mandatory activities or their future as an adult. The figure below explains Andragogy’s core adult learning principles. Notice how is the principles are different from the way youth learners learn.
The six basic expectations of adult learners within andragogy include their

1. self-concept of independency or self-directedness.
2. reservoir of experiences that build learning.
3. readiness to learn in conjunction with their adoption of social roles
4. appreciation of the immediacy of application and performance-centeredness of a course.
motivation by internal factors rather than external factors.

6. need to know the reason behind what they are learning.

In other words, adult learners start off dependent on the instructor, but eventually control their own learning. They want to build their learning around past experiences, they are social in their learning, and they like to see the relevancy in their learning and enjoy “hands-on” experiences (Calvin, 2008; Hiemstra & Sisco, 1990).

**Recent Research on Andragogy**

The model of andragogy has many positives as a learning theory (Ferozali, 2011; Fidishun, 2000; Gibbons & Wentworth, 2001). In the academic community, it is admired for “its flexibility, broad applicability, the ability to take into account the perspective of the learner, and cohesiveness with other learning theories” (Roberts, 2007, p. 20). A number of studies have been done over the past decade comparing the use of pedagogy and andragogy in course design and delivery. (Egsegian, 2002; Mencl, 2010; Strawbridge, 1999). Within these studies, researchers found that andragogy was as effective as pedagogy when teaching adult learners. They noticed that when they started their course with a pedagogical approach and then switched to an andragogical approach, effective learning took place among the adult students. They also noted that, if applied to an online course environment, andragogy might have an edge over pedagogy in regards to providing confidence to the learner (Egsegian, 2002).

In one study, an instructor teaching a philosophy course used pedagogical instruction with one of her course sections and andragogical methodology with another section (Strawbridge, 1999). He found that no statistically significant difference existed in regards to the grades and success of the students in both sections. In addition, no
statistically significant difference existed between the students in regards to their attitudes toward the method of instruction. Although one methodology did not reveal itself as more effective than the other, the study results demonstrated that andragogical methodology is as effective as pedagogical instructional methodology.

Another study examined students in a fire management course who were taught using both pedagogical and andragogical approaches. Results of the study revealed that students showed an improvement in grades when their instruction was switched from a pedagogical approach to an andragogical approach. In other words, using the andragogical model was “very effective in educating fire officers” (Egsegian, 2002, p. 24).

Finally, a study on an undergraduate Human Resource Management (HRM) course compared two sections of the course taught by the same instructor with the same content, but using different types of activities. One class had pedagogically-oriented activities, where the other class had andragogically-oriented activities. The instructor conducted a needs assessment with the students to determine which skills the students wanted to practice during the activities throughout the courses. The students singled out five particular HRM skills they wanted to practice. The instructor then designed the activities around these particular skills. Yet, the approach with which the instructor facilitated the skill-based activities was based on the models of pedagogy for one class and andragogy for the other. Findings of the study... showed that self-efficacy increased significantly over time for the five targeted skills in [the andragogically oriented class], indicating that confidence increased as these skills were practiced. However, no significant increase in
confidence to use the five targeted skills was found for [the pedagogical-oriented class]” (Mencl, 2010, p. 24).

In other words, although achievement was the same between both classes, confidence in the skills the students learned was higher in the andragogy-based class.

**Criticisms of Andragogy**

While some see andragogy as an improvement over its predecessor pedagogy, it still has its critics. Opponents often argue that andragogy is not an actual theory, that adult learners are still somewhat dependent on their instructor in classes and not self-directed, and that some of the characteristics of these learners are not as Knowles described in his theory (G. M. Boulton-Lewis, Wilss, & Mutch, 1996; Carlson, 1989; Roberts, 2007; Sutherland, 1998).

For example, when andragogy gained in popularity in the 1970s, the president of Boston University, John Silber, vocalized his opinion, stating that andragogy was far too democratic and that the adult students learned more from each other rather than from the instructors themselves (“Malcolm Knowles: Apostle of andragogy,” 2005). Roberts (2007) noted that critics often question whether or not andragogy is an actual theory and whether researchers have tested it empirically.

Sutherland (1998) described andragogy as “incompatible” since the adult learner has some dependence on the instructor even though the instructor is training learners to direct their own learning. He also argued that andragogy is not truly self-directed since “the learner controls the content, [yet] the instructor controls the process.” In other words, the instructor needs to have some control of the learning in order to evaluate whether or not the students “succeed” in the course.
Boulton-Lewis et al. (1996, p. 90) stated that “adults, particularly in formal learning situations, often do not appear to possess the characteristics that Knowles attributes to them.” The authors also cited as evidence another study where . . . the majority of students [in the study] believe that learning is a matter of how much information is retained by rehearsal for recall, and [that it] depends on the lecturers’ presentation and success in arousing their interest. (G. Boulton-Lewis, 1994, p. 400)

Another criticism is that “andragogy does not address programmatic goals; it only addresses characteristics of adult learners” (Roberts, 2007, p. 23). However, many of andragogy’s critics admit that although it focuses on the characteristics of the adult learners and “provides a starting point for instructors of adults,” it offers “a good chance of productively facilitating learning among students” (Roberts, 2007, p. 23). As this suggests, some critics admit that, despite its weaknesses as a teaching model, andragogy minimally provides guidelines for instructors to analyze their students’ characteristics.

**Evolution of Andragogy**

Despite its critics, Knowles’ theory has evolved over the years. Other adult learning theorists have argued for the need of experiential learning and focus on social context within adult education (Mason, 2006). They claim that adult learners have a variety of thinking and learning styles as well. For example, adult learners are often classified as reflective thinkers, creative thinkers, practical thinkers, or conceptual thinkers. They may learn visually, through auditory means, kinesthetically, or environmentally (“Characteristics of Adult Learners,” 2012, sec. Learning Styles).
Cross extended the model of andragogy into her own model aptly called “Characteristics of Adult Learning” (CAL) (Galicia-Castillo, 2004) shown in Figure 2.

The two main components of the CAL model are personal and situational characteristics. Personal characteristics include the factors of aging as well as life phases and developmental stages. The aspect of aging includes the examination of the learners’ sensory motor abilities such as eyesight, hearing, and reaction time, as well as their intelligence abilities such as decision-making skills, reasoning, and vocabulary. Life phases and developmental stages include the factors of marriage, job changes, and retirement; factors that are not necessarily related to aging.
Situational characteristics look at the types of learning the learners are engaging in. The first type of learning featured in the CAL model is part-time versus full-time learning, which is often affected by how the instructor is facilitating the students’ learning. This includes such factors as schedules, location, and procedures. The second type is voluntary versus compulsory learning, which “pertains to the self-directed, problem-centered nature of most adult learning” (Kearsley, 2003, p. 2). Thus, the CAL model tends to focus mainly on the unique characteristics of adult learners that instructors need to consider rather than the generalized needs of adult learners.

**Issues in Adult Learning Online**

With the expansion of online learning in formal and informal settings, the research community took into consideration additional factors that differed from issues in face-to-face learning (Hara & Kling, 2003). For example, researchers have revealed that adult learners expect online support for their classes not only from the instructor, but from their educational institution as well (Deggs, Grover, & Kacirek, 2010). Also, researchers have proposed additions to the theory of andragogy for adult online learners (Perret, 2008).

**Change in Expectations**

As online learning grew in popularity at the turn of the century, researchers continued analyzing adult learners in online environments. They revealed that, in online environments, emotions and affective learning often play into whether or not an adult learner is motivated to learn, especially where emotions affect the adult learners’ sense of community within the online course (Hara & Kling, 2003). Researchers also have found
that online adult learners face similar challenges to those face-to-face adult learners encounter when taking classes, such as “managing work, family, and study obligations” (Zembylas, 2008, p. 73).

Adult students also expect to have learning experiences in online courses that are “both engaging and relevant” and “allow for personal growth and improvement” (Deggs et al., 2010, sec. Expectations about Learning Outcomes). Other expectations include having instructors who communicate effectively and provide feedback online in an appropriate time frame, such as having online office hours to ensure accessibility, and having support systems offered by their college or university such as library resources and technical support when using the online course management system (Deggs et al., 2010).

**Online Andragogy**

Many researchers have discussed the application of andragogy’s six main expectations to online learning for adult learners (Blondy, 2007; Cercone, 2008). Researchers have suggested that instructors need to adapt their andragogical approach to teaching in an online environment (Perret, 2008). Table 3 offers some suggestions to adapting andragogy to an online teaching environment.
Table 3.

*Adaptations to Andragogy Online*

<table>
<thead>
<tr>
<th>Andragogy Expectations</th>
<th>Online Adaptations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults want to know the importance of learning something before investing time in learning it.</td>
<td>Online adult learners have the ability to solicit feedback in multiple ways about the learning they are participating in.</td>
</tr>
<tr>
<td>Adults know they are responsible for their own decisions.</td>
<td>Web-based learning for adults is now nonlinear. Adults can pursue different avenues of learning to reach their desired goal.</td>
</tr>
<tr>
<td>Adults have more variety of educational experiences than youths.</td>
<td>Online adult learners have the ability to investigate case studies or reflective activities by assuming different identities through group projects and role playing. Allows them to reconsider their expectations on their learning habits or previous knowledge.</td>
</tr>
<tr>
<td>Adults are more apt to learn when it applies directly to their real-life situations.</td>
<td>Similar to face-to-face learning. Students have the ability to share their real-life experiences and input in variety of ways through online mediums, while learning from other adult learners who have the ability to share their real-life experiences online as well.</td>
</tr>
<tr>
<td>Adults are task-centered or problem-centered in their learning.</td>
<td>With online learning tools, students are able to share input in the design of lessons or assignments. Collaboration tools online, such as Google docs, now allow students to collaborate on projects that involve completing a particular task or project.</td>
</tr>
<tr>
<td>Adults are more motivated by internal goals rather than external goals.</td>
<td>Online learners now have the ability to share the various parts of their lives.</td>
</tr>
</tbody>
</table>
through online media. Activities that allow students to share their final projects, work products, or real-life experiences can provide a boost in self-esteem.

Note: From Perret, 2008.

First of all, Perret (2008) stated that instructors now have the ability to solicit student reflection about their ongoing learning processes in a variety of ways online. Examples of this include the use of discussion boards, blogs, and community groups for students to write about and share with one another what they are learning. Use of these tools helps the students reflect on what they expected to learn and how they can use what they learn in the future, and can aid in soliciting feedback about the relevance of the ongoing learning process.

The second assumption regarding adult learners’ responsibility for their own learning has changed. Now, “non-linear web based learning allows [adults] to follow the path that reflects their need to learn” (Perret, 2008, p. 6). Therefore, instructors need to design their course in a way that will allow students to take several different paths to the goals they have created for themselves within the course. Yet, it is also recommended that instructors provide some structure for students who are not yet self-directed in order to guide them into developing into independent learners.

The third assumption is that adults’ experiences with education are different than those of young learners. Perret (2008, p. 7) suggest that instructors “provide opportunities for learners to use their knowledge and experiences.” One way he suggested to accomplish this in an online environment is to engage adult students in group activities where each of their individual expertise is needed. Another example is to
have students examine case studies and assign students roles as different characters in the case studies in order to analyze and reflect upon the case.

The fourth assumption is that adults are “more eager to learn things they must know and apply in order to cope effectively with their real life situations” (Perret, 2008, p. 8). Thus, adults need to know why they are learning and why what they are learning is important. Perret recommends that instructors apply students’ needs and future goals to their curriculum.

For the fifth assumption, which says “adults are life-centered… in their orientation to learning,” Perret (2008, p. 9) suggested that instructors use situations and examples that would exist in the students’ real life. This applies to online learning in that online environments enable students to share their real-life situations with other classmates. They are also flexible, allowing students to use their real-life experiences to contribute to the design of a lesson or assignment.

Finally, the sixth assumption states that adults, although responsive to external pressures, are more inspired by internal motivators. Examples of external pressures include the need for a better job, higher salary, or promotion, whereas internal motivators are possibly increased job satisfaction, self-esteem, and quality of life. Online environments currently allow flexibility for instructors and students in that students are now able to contribute to the creation of lessons and share accomplishments online via discussion boards, picture uploads, or video sharing. This in turn allows students to build self-esteem in an online environment (Perret, 2008).

Although online learning is relatively new, many adult students who are in online academic programs will have had experienced learning in an online course. They will
bring these experiences from previous courses with them. With these adaptations of andragogy to an online environment, researchers suggest that online instructors need to consider the expectations their adult students have of their classes.

**Criticisms of Andragogy and Online Education**

Of those who are critical of applying andragogy to online instruction, most point out that although andragogy advocates individualized learning, distance education is often a group venture where instructors design materials for groups of students rather than individuals (Peters, 1989). However, this argument is applicable to face-to-face courses as well. Additionally, computer technology has changed within the past few decades allowing for students to pursue more individualized learning whether in a face-to-face or distance learning course.

**Adult Learners in Multi-User Virtual Environments**

In addition to online learning, adult learners are adapting to learning in 3D multi-user virtual environments. The definition of MUVEs is ever expanding and they are branching out into all fields of higher education. In turn, researchers are starting to explore how adult students learn within the MUVEs.

**What is a Multi-user Virtual Environment?**

Basically, MUVEs are “worlds for social interaction, worlds in which you can present yourself as a character, in which you can be anonymous, in which you can play a role or roles as close or as far away from your real self as you choose” (Turkle, 1994, p. 159). In the late 1970s, the concept of MUVEs in cyberspace started with the advent of what were popularly known as MUDs (multi-user dungeons [and dragons]) and MUSHs
(Multi-user shared hallucinations). With MUDs, users were able to choose an identity from a list of various identities and navigate their way through text-based descriptions of exotic locales created by programmers, such as dungeons, space, or other types of fantasy landscapes, as well as chat with other players who were logged on the MUD at the same time.

MUSHs, on the other hand, were user created environments that, like MUDs, were text-based descriptions. In MUSHs, “players would pay more attention to their home (which they were constructing) and the city (which they were also building, with many others)” (Au, 2008, p. 6). During the late seventies and early eighties, these environments usually existed on university mainframes, and were created by a few select people (Au, 2008). For example, the popular online gaming environment theWorld of Warcraft (WOW) is a modern-day MUD, whereas Second Life is more equivalent to a modern-day MUSH, although these newer equivalents are more graphic than their predecessors. In today’s 3D virtual worlds, individuals are provided similar affordances to virtual worlds of the past, which were mainly text-based. Three-dimensional MUVE users have the ability to log on at the same time, communicate, move around, collaborate, play, learn, and engage in commerce. Modern users are represented by avatars. In other words, the users are represented on screen as a character. Another way to define the word “avatar” is “the embodied manifestation of the [user’s] engagement with the [virtual space]; it is the player incarnated” (Klevjer, 2006, p. 10). Avatars today are three-dimensional rather than text-based.

Today’s MUVE users have the ability to create an avatar of themselves in which their appearance is of their own choosing. They are also provided the chance to assign
their avatar a nickname as well as to assign it different characteristics. The only difference is instead of text-based descriptions, individuals are now provided with 3D renderings of their identity as well as spaces to post their profiles to provide further depth to their online identity. The user is often allowed to place floating text above their avatar’s name, which is often located above the avatar’s head, to identify themselves as part of a particular group or as having a particular characteristic or characteristics. For example, one person may place floating text above their avatar’s head that says “University of Hawaii” to show other users that they are from the University of Hawai‘i.

Users of MUVEs can also communicate with other participants in their online worlds through instant messaging, local Internet Relay Chat (IRC), and voice. The avatar has various actions and gestures that the user activates using the mouse and computer keyboard. These actions can include running, jumping, waving, and laughing, depending on the exact 3D virtual environment in which they are participating. Users also have the ability to interact with other avatars through text-only chat or through voice-to-voice communication (Bailey & Moar, 2001).

Users are allowed to “construct” objects and create communities or landscapes. In other words, they are provided the ability to construct 3D interactive objects in their environment to create their own unique living situation. That being said, the addition of the visual element to such environments, along with greater access to such environments on a global scale encourages the need for more investigation into such environments. In MUVEs, “individuals and organizations can create public or private spaces where digital avatars” take the place of the real-life participants within the virtual world (“For ‘digital natives,’ educational games stimulate thinking, interests.,” 2008, p. 55). Avatars have the
ability to interact with objects within the virtual environment as well as with other avatars in the area (Bailey & Moar, 2001). In addition, everything is user-created including the buildings, scenery, and objects within the environment (Greenberg, Nepkie, & Pence, 2009).

Second Life as an Example of a MUVE

Second Life is an example of a MUVE. “As of early 2008, Second Life supported almost 12 million unique avatar accounts. . . . This growth is due in part to the engaging, 3D environments that provide users with stunning visuals, animations, role playing opportunities, and social communities” (Mennecke et al., 2008, p. 323). Users can create an avatar by visiting http://www.secondlife.com. After creating an avatar, the website asks users to download a special browser that then places the users’ avatars into the virtual world. Users then can move their avatar around, start communicating with other users’ avatars and visit different places within the Second Life virtual world by “teleporting.”
Eventually, users may want to work at these virtual places and earn virtual currency known as “lindens.” Some places are family friendly, such as dance clubs or shopping malls, while other places are considered “adult,” such as virtual strip clubs. Some users start businesses of their own. Examples of businesses in Second Life include buying and selling virtual land, designing clothes, or offering services, such as counseling.

Users may also participate in nonbusiness activities. Many places in Second Life hold classes where instructors teach about different subjects or skills used in Second Life. Also, groups may meet up intermittently to discuss a particular topic, interest, or issue. Other places are virtual recreations of real life places or experiences that users can visit. Examples include the recreation of the Sistine Chapel at Vassar College’s virtual campus.
or the University of Plymouth’s sexual health sim that features several interactive activities, including a 3D virtual tour of the human testes.

![Figure 4](image_url)

*Figure 4. An avatar visiting the recreation of the Sistine Chapel at the Vassar College sim in Second Life.*

Although many educational opportunities exist in Second Life, the designers of Second Life did not specifically design for education in mind (Barile-Spears, 2011). Many adult themed places exist in Second Life that students may find offensive. Also, instructors are often unable to initially block users who may virtually harass their students.
Another challenge that instructors may encounter is the fact that collaboration is difficult at first. “Second Life is still far from reaching the point at which it will serve as an effective e-collaboration tool for organizations” (Kock, 2008, p. 6). Often students have to rely on sites outside of Second Life to collaborate on assignments, such as their institution’s learning management system or Google docs. Additionally, sims, or virtual land, can only support a few avatars at a time (Mennecke et al., 2008). Still, despite these challenges, instructors choose to teach in Second Life due to its immersive and interactive environment (Barile-Spears, 2011).

**MUVEs in Higher Education**

The types of virtual environments currently in use by higher education institutions include *OpenSim, Croquet Consortium, Project Wonderland, Olive, Twinity,* and *Second*
Life. Of all the virtual environments that exist currently online, Second Life “represents the most mature of the social virtual world platforms, and the high usage figures compared with other competing platforms reflects this dominance within the educational world” (Warburton, 2009, p. 416). Second Life was created by Linden Labs in San Francisco, CA.

Currently, several colleges and universities are using Second Life for distance education (“Second Life Education Directory - Second Life Wiki,” 2009). These higher education institutions include Princeton University, Boise State, Brown College, University of Texas, Bowling Green State, University of Kansas, University of Illinois, Harvard University, University of Bedfordshire, Bournemouth University, University of Hamburg, Hong Kong Polytechnic University, Edinburgh University, European School of Visual Art, and Griffith University, among many others.

A variety of higher education classes are held in MUVEs. These include classes in education, nursing, art, music, and English, among others. In general distance education classes, instructors set up a variety of activities and interactive materials for students to use in MUVEs. Along with basic lecture and discussion, these include self-paced tutorials, digital storytelling, role-playing, and community engagement (Sanchez, 2009).

Nursing classes use other activities to engage their students in learning. Such activities include using simulated tools and talking with simulated patients in a virtual health facility, role-playing between faculty and students in different situations that may occur in these facilities, and engaging in simulated disaster scenarios. Three colleges that use Second Life to teach their students nursing include Tacoma Community College,
University of Kansas School of Nursing, and University of Wisconsin Oshkosk College of Nursing (Skiba, 2009).

In addition, art and design, music, writing, and English classes use several types of activities within these virtual environments to facilitate learning. These include exploring and creating simulated environments. These simulated environments include historical recreations and re-enactments, recreations of living and immersive archaeology, re-creations of current real-life environments, and recreations of fictional environments from literature and media. Examples of these recreations include Vassar College’s recreation of the Sistine Chapel by the college’s director of academic computing services, Steve Taylor; performances of Shakespeare’s plays at the Round Theatre by the Second Life’s Shakespeare Company; recreation of the Amun-Temple of Luxor; creation of the Inferno from The Divine Comedy by English instructor of Lehigh Carbon Community College, Beth L. Ritter-Guth; and a virtual recreation of the Massachusetts Institute of Technology by Phillip D. Long, associate director of the Office of Educational Innovation and Technology (Foster, 2008a).

Other types of activities include attending live in-world music concerts (Greenberg et al., 2009), visiting virtual job fairs (“For ‘digital natives,’ educational games stimulate thinking, interests.,” 2008), holding student recruitment events and virtual campus tours (Foster, 2008b), creating displays and exhibits (Warburton, 2009), facilitating teacher collaborations (Greenberg et al., 2009), setting up meetings (Gaimster, 2008), and creating movies and music videos (Warburton, 2009). An example of a student-teacher collaboration project created within Second Life is the SUNY (State University of New York) Oneonta Second Life Music Project. For this project, faculty
from three different departments within the college “joined forces to create an
opportunity for Oneonta music students to organize concerts” in Second Life (Greenberg
et al., 2009, p. 252). The instructors assigned the students a concert team where each
group member was responsible for testing the technical requirements for the
performances, working on the publicity for the concerts, or acting as the general manager
who was liaison to the performer and master of ceremonies for the performance.

Recent Research on MUVEs in Education

Since the rise of 3D MUVEs is relatively recent, little research exists on education
within 3D MUVEs (Kramer, 2010; Wang & Lockee, 2010). A few studies on 3D
MUVEs and education indicate that the effectiveness of instruction within these
environments is similar to face-to-face and online classes (Bailey & Moar, 2001; Derby,
2008; Diehl & Prins, 2008). Even though “much of the literature argues that computer-
mediated communication (CMC) is not as rich as face-to-face communication . . . it also
can be more liberating” (Gaimster, 2008, p. 191). One study reported that students’
perceptions of instructor immediacy within a 3D virtual class was the same as their
perception of instructor immediacy in a face-to-face or online class (Lawless-Reljic,
2010). Therefore, 3D environments can be as effective as online classes, yet they inject
the feeling of immersion and immediacy in a particular environment that is often absent
from online classes. Another study found that

the SL teaching and learning did not differ dramatically from the teacher-
centered, physical world classroom. In sessions involving active learning
tasks, however, the students’ level of participation and use of cognitive
messages increased” as well as their participation in discussion. (Stoerger, 2010, p. v).

A study with undergraduate students determined that

Learning in Second Life is authentic and transferable to the nonvirtual world, as well as being collaborative, motivating, immersive, playful, and challenging, in an environment that is safe and realistic for exploring real-world issues. [Yet], drawbacks include a steep learning curve and technical problems. (Kramer, 2010, sec. Abstract).

In other words, students’ experiences with instruction within 3D virtual environments are similar to experiences with learning in face-to-face environments. However, the environment allows for more interaction and participation that is often lacking in tradition face-to-face classrooms.

Lastly, a study with ESL pre-service teachers discussed the . . . positive potential of using Second Life and Skype to enable self-regulation and pedagogic transformations to occur among the participants with appropriate considerations acknowledged for the teaching audience, developmental goals, and venue of instruction (Blankenship, 2010, p. xiii).

In other words, along with learning online, Second Life enables learners to develop learning skills, such as self-regulation. In summary, most studies reported that using Second Life as a means for delivery of instruction is as effective as teaching in a face-to-face class with some challenges in overcoming the steep learning curve to begin using SL.
Recent Research on Adult Learners in MUVEs

Even fewer in number are studies on the characteristics of adult learners within MUVEs. Of these studies, most involved educators or pre-service teachers, while others focused on adult learners in businesses (Inman, 2010; Tomcsik, 2010). These studies mainly centered on the themes of gender, socio-economic status, career path, learning styles, and behaviors of the adult learners.

One study investigated gender and collaborative learning within 3D virtual environments. The author reported that the participants’ real-life and virtual genders had little impact on collaborative learning in virtual corporate communities online (Tomcsik, 2010). In another study, the authors observed that socioeconomic status did not affect their participants’ actual use of the application. The study focused on educators in rural communities; the author determined that rural teachers faced the same challenges while learning in Second Life as those that were not living in a rural environment (Derby, 2008). Based on these findings, socio-economic status and gender, whether in real life or online, do not seem to affect educators’ use of MUVEs.

A recent study that looked specifically at the “millennial generation” asked whether the "learning styles of [these] students …had also evolved to a Web 2.0 standard” (Lee, 2010, sec. Abstract). This study used Facebook, YouTube, and Second Life as the means by which students submitted their data. Results of the study revealed the “millennial generation students’ preferences for a blended combination of visual, musical, kinesthetic, logical, linguistic and personal intelligences for their course assignments” and that educators need to “reduce their reliance on linguistic readings and lectures and move towards a delivery model that is more inclusive of nonlinguistic
activities to match the learning styles of the millennial generation student” (Lee, 2010, sec. Abstract). In essence, the author concluded that adult learners in 3D MUVEs prefer activities that appeal to a variety of learning styles.

However, although adult learners like variety, many are hesitant about using MUVEs. One study, involving adult learners in general, revealed that adult learners were consistently engaged with each other throughout collaborating within Second Life, although many of them had reservations about the difficulty of using the application (Carter, 2008). In another study, the author reported that “pre-service teachers as digital natives are not necessarily comfortable or confident in using newer Web 2.0 technologies” and “although [the participants of the study] were prepared to use Second Life operationally, they were not confident in their ability to use Second Life/virtual worlds with future students” (Inman, 2010, p. iii). Another study with pre-service teachers revealed that educators felt that the virtual world of Second Life should have a more restricted environment (Teoh, 2008). The educators described themselves as not ones to take risks. They also stated that they were not “self-directed.” Researchers from these studies inferred that adult learners need structure at the beginning of using 3D MUVEs for learning, since by nature most are not risk-takers.

Lastly, researchers found that educators using Second Life “with intrinsic personal reasons for participation are more likely to be successful, over those with purely professional, work-related motivation” (Jamison, 2008, sec. Abstract). In other words, those who are internally motivated to use MUVEs are more likely to achieve success in their classes taught within 3D MUVEs than those who are only taking the course for class-related purposes.
Summary

In conclusion, adult learning has adapted to the various changes in teaching over the past few years. From starting out in classroom environments where adult learners were primarily taught using face-to-face modalities, to current situations where adult learners are learning in 3D MUVEs, the characteristics of adult learners have not changed in the past few decades. However, researchers have yet to determine if andragogy is an effective model to use when teaching adults in 3D virtual environments.
CHAPTER 3. METHODOLOGY

This chapter outlines the methodology used for this study of characteristics in University of Hawai‘i adult learners in Second Life and how their characteristics and expectations affect their learning within the context of a multi-user virtual environment. This chapter first presents an overview of the reasons for using digital ethnography as an approach to the study. Following that, I provide a description of the participants in this study and the location online where the research took place. Next, I discuss the theoretical framework for this study and the plan for analysis of the collected data. Finally, I describe the methods used for this study, and present concluding thoughts.

Research Design

Digital ethnography has been defined as “the process and methodology of doing ethnographic research in a digital space” (Newman, 2012, para. 1). It typically deals with studying the culture and characteristics of groups of people. One argument for applying this approach to the research design is that published studies of adult learners as well as other types of ethnographies have shown meaningful results through using a qualitative approach to investigating adult learning (Coral, 2011; Ferozali, 2011; Jamison, 2008). Within these studies, the researchers have described collecting rich data that has led to new discoveries about adult learners.

The use of digital ethnography for a research methodology has many benefits (Beaulieu, 2004). In particular, “ethnography is about telling social stories” (Murthy, 2008, p. 838). The types of practices used by digital ethnographers reflected the type of
methods used in this study to let the participants tell their stories about their backgrounds.

In other words, digital ethnographies provide a lens to explore the characteristics and expectations of the participants without the restrictions of a quantitative framework that would impede them from describing themselves to their fullest.

Also, “data elicited from ethnographic online discussions with participants show how the characteristics of graphical environments pose unique issues for participant observation that are distinct from those posed by text-only and traditional offline settings” (Williams, 2007, p. 9). Since ethnographers have conducted studies mostly on asynchronous online learning experiences, but not synchronous, visual learning online, using an ethnographic approach can only prove beneficial since it explores whether or not this approach is effective when researching within this environment. “What is certain is that new technologies, such as the Internet and more recently the grid [virtual worlds], have the potential to alter the ways in which ethnographers collect, analyze, and represent data” (Williams, 2007, p. 6).

A criticism of ethnography is that it “. . . assumes no prior framework that orders the data, that contributes to the coherence and generalizability of the descriptive account. This leads to a lack of cumulative research results” (Nardi, 1995, p. 5). Some researchers have countered this criticism by proposing that using other theories as a framework helps with structuring the data collected from ethnographic studies involving the study of adult learning. Therefore, this study is framed using andragogy, including its basis for beliefs held about the characteristics of adult learners.

The term “characteristic” is often a definition of self and gathering qualitative data through digital ethnographic methods is therefore the best approach for gathering
data about someone who learns online. While andragogy provided a framework for exploring characteristics of the participants, the ethnographic approach to collecting data and a constant comparative method for analysis allowed for new understandings to emerge from the study.

**Participants and Context**

**Participants**

Within this ethnographic case study, participant selection occurred through purposive sampling. Selection of the participants in this study included students and faculty who are members of the University of Hawai‘i Second Life group.

**Sampling and recruitment.**

Purposive sampling was used to select the target population for this study. “A purposive sample is a non-representative subset of some larger population, and is constructed to serve a very specific need or purpose” (Sommer, 2006, sec. Nonprobability Samples). Criterion sampling, a form of purposive sampling, is where the researcher picks participants based on “some criterion, such as all children abused in a treatment facility, [for] quality assurance” (Dell Siegle, n.d., sec. Purposive Sampling). Attributes of the participants in this study included: 1) member of the University of Hawai‘i system group, 2) active in Second Life some time within the past three years, and 3) has taught or taken a class in Second Life. Sampling did not include those within the group who are not faculty or students since the study was specifically meant to observe those who have engaged in higher education learning within the environment. Further, some members of the group are affiliates of the university and reside in other locations besides Hawai‘i and these individuals were also not included. The reason for
choosing the particular makeup of interviewees was to have consistent demographic
variables among the participants, such as cultural makeup and geographic location, so the
data could focus more on andragogical expectations and characteristics of the adult
learners rather than other variables that are not clearly addressed by andragogy. The pilot
studies also revealed that this was an appropriate population for the research. In addition,
all of the target population were adults and easily accessible.

In order to find people who fit these particular criteria, contact with faculty
members from the University of Hawai‘i Second Life group was made via email or
instant message. The emails or instant messages asked for recommendations of other
University of Hawai‘i instructors and students who are using Second Life. In addition,
the emails or instant messages asked the instructors for permission to observe their class
sessions taking place in Second Life. Finally, the emails or instant messages asked the
instructors if they could ask their students if they were willing to participate in focus
group sessions for the study.

Two instructors who were teaching in Second Life from the University of Hawai‘i
volunteered for the study. One teaching assistant, who taught in Second Life, also
volunteered to participate in the study; the study refers to the teaching assistant as an
instructor.

**Descriptions of Participants.**

The University of Hawai‘i system group has a total of 442 members as of April
2012. The group is comprised of faculty, students, and affiliates. From that group, three
instructors participated in the faculty interview portion of the study, six students
participated in the focus group portion of the study, and at least 55 students participated in the observation portion of the study.

The 55 students in the observation portion of the study were from four different classes taught within Second Life. One of the classes was made up of undergraduate students while the other three classes consisted of graduate students. In addition, one of the classes was online and mainly used Second Life for instruction while the other courses used Second Life intermittently and primarily met in person.

Class 1. The first class was a graduate Educational Technology class. The majority of the class took place in Second Life. The instructor conducted his lecturing and teaching within the Second Life environment and students constructed their projects within the Second Life environment as well. However, the students utilized online resources outside of Second Life to complete and submit their assignments. These included the university’s learning management system to download resource materials as well as outside websites to download course readings. The course also required students to use online conferencing software and blogs. All activity took place online. No activities were conducted in a physical classroom.

Class 2. The second class was a psychology class made up of undergraduate students. This class met in person, and conducted their Second Life activities in a computer lab during class time. Their Second Life activities were intermittent, and the students used other online tools such as Google groups and Facebook. Their final class project was created and presented in Second Life.

Classes 3 and 4. The third and fourth classes in the study were two Library and Information Science courses made up of graduate students. These classes were
conducted in a physical classroom and used a computer lab during classtime to enable all
the students to log into the Second Life environment. Students completed certain
assignments for the course in Second Life. They also utilized other online tools such as
Jing and Google groups within their course.

Focus group participants. The six students within the focus groups were from two
of the courses within the research study. All of the students were graduate level students
from either the Educational Technology or Library Studies classes. None of the
undergraduate students agreed to participate in the study. Regarding the interview
portion of the study, the participants included one instructor who taught the Educational
Technology course, another who taught the Psychology course, and the last instructor
taught both Library and Information Sciences courses.

Sampling Exclusions and Possible Limitations.

Several limitations of this study need to be addressed. Currently, demographic
data on those within the University of Hawai‘i Second Life group does not exist. Since
andragogy does not take into account the economic status, ethnic background, gender, or
age of the adult learner, the focus groups and interviews did not investigate these
demographic characteristics of the participants. Many in the academic community view
these as factors that affect adult learning (Burgstahler, 2012). Examining these factors at
a later time and date could be done as part of another study. The observation portion of
this study confined its inquiry to the participants’ learner characteristics and expectations
within the theory of andragogy.

However, demographic data of students and faculty at the University of Hawai‘i
in real life exists on the University of Hawai‘i website. The sample population for this
study only represents about 0.53% of the 60,090 students attending the University of Hawai‘i in 2011 ("Overview of the 10-campus University of Hawaii System,” 2011). Therefore, the makeup of the sample will not accurately represent all University of Hawai‘i students. However, the sample of approximately 55 students and 3 faculty members represents around 13.1% of the members of the UH Second Life group.

Given the University profile, most likely participants in the study have Asian, Caucasian, Hawaiian, or mixed ethnic backgrounds since the majority of UH students and faculty are of that particular ethnic background. However, more female participants than male participants were in the study compared to the student makeup at the university of 58% female and 42% male ("Overview of the 10-campus University of Hawaii System,” 2011). Also, the majority of the participants most likely came from upper middle-class to middle class backgrounds since people from these types of socio-economic backgrounds are likely to have a computer and attend or work at a higher education institution.

**Study Setting**

Collection of the data took place online in Second Life within the University of Hawai‘i’s College of Education campus, the University of Hawai‘i’s Aquaculture sim, and University of Hawai‘i system campus. The participants in the study mainly met on the College of Education’s online SL campus for the interview and focus group portions of the study. However, one interview took place on the University of Hawai‘i system SL campus. The observation portions of the study took place on all three SL campuses.
Figure 6. University of Hawai‘i College of Education Virtual Campus in Second Life

The University of Hawai‘i College of Education virtual campus is a recreation of two of the college’s main buildings with additional surrounding structures inspired by the culture and principles of the College of Education.

Figure 7. University of Hawai‘i system virtual campus in Second Life.
The University of Hawai‘i system virtual campus is a recreation of one-quarter of the actual University of Hawai‘i campus. It contains the recreation of four buildings on the Mānoa campus, which are Sakamaki Hall, the Hawai‘i Institute of Geophysics, the Pacific Ocean Science and Technology building, and Holmes Hall. It now serves as the virtual home of faculty and students who participate in class activities online.

![University of Hawai‘i Aquaculture virtual campus in Second Life.](image)

*Figure 8. University of Hawai‘i Aquaculture virtual campus in Second Life.*

The University of Hawai‘i’s Aquaculture sim contains several recreations of aquaculture systems found throughout the world. Faculty have taught approximately ten types of classes on these campuses that range across a variety of subjects including Library and Information Sciences, Educational Technology, Psychology, Nursing, and Second Language Studies.

The students, staff, and faculty on the campuses are part of the University of Hawai‘i system in real life, yet they come from different departments and in some cases different locations other than Hawai‘i. The types of activities that group members engage
in on the campus include taking classes, having get-togethers, participating in virtual field trips, engaging in group work, or building learning objects within the environment.

**Instrumentation**

As stated previously, the students in the study participated in the focus groups, the instructors participated in the interviews, and both participated in the observation portion of this study. In this section, a more in depth description of the instrumentation is provided. The instruments were developed specifically for this particular study. The questions used with the interview and focus group parts of the study were developed and validated by other researchers. Questions for the study are located in the appendices. Additional validity for the instruments was examined through previous pilot testing. Table 4 provides a list of methods used to collect data, the objective of each method used, and how each method applies to the theoretical framework used for the study.
### Table 4

**Goals for Data Collection Instrumentation**

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Objective</th>
<th>Theoretical Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus Groups</td>
<td>Allows participants to openly describe their characteristics and expectations. Participants can comfortably and collaboratively build upon each others’ viewpoints and experiences as adult learners during the interviews when listening to other participants (Blank, 2002).</td>
<td>Questions focused on learning characteristics and expectations as outlined by andragogy, and did not cover race, ethnicity, gender, or social class. (Sandlin, 2005)</td>
</tr>
<tr>
<td>Interviews</td>
<td>Allows instructors to share their observations on characteristics and expectations of adult learners (Driscoll &amp; Brizee, 2010).</td>
<td>Questions focused on learning characteristics and expectations as outlined by andragogy, and did not cover race, ethnicity, gender, or social class (Sandlin, 2005).</td>
</tr>
<tr>
<td>Observations</td>
<td>Observations allow students to not feel pressured into providing information about their expectations. Observations allow the researcher to passively gather data about adult learner expectations (Kraut et al., 2004).</td>
<td>Researcher will mainly look at questions adult learners ask in the class in order to gather data about their learning expectations (Driscoll &amp; Brizee, 2010).</td>
</tr>
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**Pilot Studies and Instrument Development**

Three pilot studies occurred before this study regarding identity and characteristics of faculty and students in Second Life where interviewing was the main method of choice. In the Fall of 2008, the first study involved a practice interview as part
of a class assignment with Dr. Barbara McLain from the UHM Music Department about her activities in Second Life as an educator. The interview questions focused on her activities and her motivations for participating in these activities. Many of her responses dealt with her identity within the virtual environment on all levels: physical, emotional, and social.

In the summer of 2009, another pilot study surveyed Dr. Peter Leong’s ETEC 648 class, Virtual Reality. Findings from the study revealed a connection between the students’ real life identities and the activities they participated in inworld. These activities included attending classes and creating learning objects. After analysis of results, the interview questions were changed based on the results received from the survey in order to clarify those that may have confused the students or questions that needed more information about the students’ identity and learning in particular. In addition, the findings were presented at the AECT 2010 conference in Anaheim, CA to gain more feedback about how the questions needed revisions (Meeder & Leong, 2010).

After that, another study took place where three students from the Dr. Leong’s fall 2010 ETEC 648 class answered interview questions and the rest of the students completed another series of open-ended survey questions. This time the questions focused on students’ learning characteristics rather than their identity. Analysis of the interview transcripts revealed four basic themes. These themes included (a) the feeling of immersion matching up with specific learning styles, (b) the need for socialization while learning in the online environment, (c) the variety of learning within the environment, and (d) real life situations affecting motivation to learn within the environment (Meeder & Leong, 2011).
Overall, these studies, using interviews and participant observation, gathered rich data. Although the last two studies used surveys as one of their data collection methods, surveys were not used for the current study since the methods of interviewing and focus groups seemed to reveal more useful data than the surveys. The purpose for using online focus groups was to allow the participants to define their own characteristics as well as feel comfortable sharing their ideas and experiences in a group a setting. The students seemed to feel more comfortable sharing in a group rather than sharing in an online, one-on-one interview.

Focus Group Questions

For the current study, the focus group questions (see Appendix B) were based on the questionnaire and survey from a study called “Unintended Outcomes in Second Life: Intercultural Literacy and Cultural Identity in a Virtual World” (Diehl & Prins, 2008, p. 109). The authors examined general Second Life (SL) residents and their views of identity within SL through the “activity system” they participated in. The authors suggested that SL residents are often exposed to a plethora of cultural identities. They also found that the majority of users could speak more than one language, were friends with other residents from other cultures, and had learned about other cultures from Second Life.

For this study, the questions were altered to focus more on aspects of adult learning rather cultural learning. For example, in the Diehl and Prins (2008) survey, the participants were asked “What are your goals in participating in Second Life?” In this study, the focus group questions asked the students, “How much input did you have on the design of the lessons or assignments of the class, if any? What kinds of input did
your instructor encourage from you and other participants about the class?” This relates to the conceptual framework by focusing only on those characteristics featured in the andragogical model, and not other characteristics featured in many liberal arts studies, such as race, gender, age, and social class.

**Faculty Interview Questions**

The faculty interview questions were based on the Diehl and Prins (2008) questionnaire. However, instead of asking the instructors about their learning experiences in Second Life, the interviews inquired about their observations of adult learners in their classes. For example, one of the Diehl and Prins interview questions asked “What are some of your thoughts about culture and interaction of people of different cultures in Second Life?” I asked the instructors in the current study, “How do you encourage collaboration among your students on projects/assignments in Second Life? How do your students collaborate in class? In other words, what methods do they use?” This also relates to the conceptual framework by focusing only on those characteristics featured in the andragogical model, and not other characteristics featured in many liberal arts studies, such as race, gender, age, and social class.

Overall, the purpose for this methodology was to allow students and instructors to speak privately and feel comfortable in sharing their experiences and observations of adult learners. This allowed the focus groups to delve further into the questions of “What are the characteristics and expectations of adult learners?” and “Are these characteristics and expectations applicable to andragogy in 3D virtual environments?” Also, using the interview method allowed the instructors to expound on their
observations of adult learning rather than limit themselves to categories within a survey or questionnaire.

**Participant Observation Protocol**

Finally, the participant observations looked mainly at the behaviors the students’ avatars exhibited during class, such as their dependency on the instructor for their learning or how much of their real life experiences they disclosed to their classmates. This helped focus on the particular characteristics of the students, and gained more insights on their expectations. This relates back to the research question of “What are the expectations of the students?” Also, the observations recorded their expectations and needs within the course through the dialogue they had with their instructor. This also relates to the conceptual framework by again focusing on the part of andragogy that analyzes the expectations of adult learners. Overall, the purpose for this methodology was to identify any additional andragogical behaviors the students might have in addition to the insights they provided in the focus groups.

**Data Collection**

This study consisted of faculty interviews, student focus groups, and participant observations of three University of Hawai‘i classes held in Second Life. Student focus groups and participant observations revealed the needs of adult learners who belonged to the University of Hawai‘i Second Life group. Interviewing the faculty revealed information about the adult learners from instructors’ perspectives.
Data collection in SL occurred through the avatar, Professor Szwarz, who conducted interviews and field observations. The avatar is female and had existed for approximately three years within the Second Life virtual world. Past work with this avatar include assisting graduate classes online, planning social activities, and conducting workshops within the Second Life environment.

**Observations of SL Classes**

Observations took place during four individual class sessions on the University of Hawai‘i virtual campus that were taught by the instructors interviewed for this study. Observations lasted between one to three hours. Camtasia Studio software recorded the events on a computer, following the procedures used by You (2010) in her study of how users evaluated metadata in digital libraries. This provided systematic field notes that were used to review the observations. “Unlike in offline settings these recording practices are completely inconspicuous, allowing avatars to go about their everyday business uninterrupted and unimpeded” (Williams, 2007, p. 20). In other words, recording video of the participants through the computer was less intrusive than videotaping research
participants in real life. The author of this study was the only person who viewed the Camtasia videos in order to ensure the anonymity of the participants in the study.

**Student Focus Groups**

Data collection was initially through the student focus groups. The instructors in the study helped recruit the students, asking them to volunteer for the study. A total of six students participated in the focus groups; these students were divided into three separate groups.

The three focus groups took place entirely in Second Life between December 2011 and March 2012. The focus group interviews lasted about one hour each and took place entirely in synchronous text chat. After the interview was finished, the text of the conversation was copied and pasted into a Word document, which was then coded as described below in the Data Analysis section.

During the focus groups, the student participants were asked about their online learning characteristics and expectations following the questionnaire protocol described above. First, the questions covered their personal learning characteristics such as their experiences in education, beliefs about learning, approaches to learning, learning styles, and learning needs. However, when asking the students about their formal learning while using Second Life, the questions assumed that the majority of them had engaged in formal learning through the credit classes they were required to take as part of their major at the University of Hawai‘i. Therefore, when asking the students about their formal learning, the focus group interviews were referring to when the students took a class in Second Life. Then, they were asked about their experiences with the Second Life environment in regards to their learning. Also, the student participants were asked if they
encountered any issues or situations while in Second Life that required extensive
communication or problem-solving. According to adult learning theory, instructors need
to apply various strategies in their teaching to take into account the variety of learning
types they will experience in their courses (“Characteristics of Adult Learners,” 2012,
sec. Learning Styles). When inquiring about the educational background of adult learners
in Second Life, any reported similarities among the students could provide information
on what accommodations and changes instructors may have had to make in their
curricula to provide effective learning.

In addition, the interviewer inquired about the expectations the students had of
learning within MUVEs; in other words, their needs when learning in this environment.
They were also asked about their viewpoints on the presentation of new information,
learner responsibility, instructor dependency, and educational goals and outcomes, factors
that affect learning.

**Faculty Interviews**

Interviews involving the three instructors from the University of Hawai‘i System
group were semi-structured. The reason for this decision was that these particular
instructors were still active and using Second Life for teaching and instruction. The
three instructors were from different departments within the University. Therefore, they
all had different backgrounds in regards to their education and experiences. However,
they shared common observations about the adult students that they taught in Second
Life.

The one-on-one interviews included in-depth questions about faculty perceptions
of their students’ characteristics and expectations. This allowed the interviewer to gain
information about the adult learners in the group from expert instructors with extensive experience in classroom dynamics, adding to the data obtained from observing them within the sim or basing the results solely on the answers of the students in the focus group.

The interviews took place between November and December 2011. Each lasted about an hour and took place entirely in text chat. The instructors received some of the guiding questions via email before the interview so they could plan their answers in advance. After each interview was finished, the conversation was copied and pasted into a Word document for analysis.

The faculty interviews followed the Diehl and Prins (2008) questionnaire as modified (see Instrumentation) asking about their students’ personal and situational characteristics. The interviews inquired about the faculty members’ observations of adult learners within the Second Life environment, including their observations of adult learners on the virtual University of Hawai‘i campus and on other virtual campuses.

**Data Analysis**

Data analysis is one of the final steps within a research study. It is described as “a body of methods that help to describe facts, detect patterns, develop explanations, and test hypotheses” (Levine & Roos, 1997, p. 1). I used the constant comparative method to analyze all data collected. In the constant comparative method, researchers combine “inductive category coding with a simultaneous comparison of all social incidents observed” (Goetz & LeCompte, 1981, p. 58). In other words, when using the constant comparative method, researchers first develop categories based on careful and systematic
analysis of data chunks, then narrow down their data from several categories into one main overall theme or theory.

Constant comparative method helps generate theoretical ideas since researchers have to look at each data element one piece at a time and carefully compare the categorization to those developed for data elements already examined (Glaser, 1965). It allows researchers to gradually take a more inductive approach with the data, in each stage narrowing down the information into an overall idea or theory.

**Collecting and Coding Data**

The first field observation conducted was the first set of data coded. Subsequent coding of the rest of the field notes and transcripts from observations, interviews, and focus groups occurred in the order collected. In other words, after the collection of each piece of data, the categories and subcategories changed to better describe the results that were appearing. As a result, further refined categories and sub-categories emerged. For verification purposes, colleagues peer reviewed some of the coding to increase the trustworthiness of the study. The categories and sub-categories that developed are described in the next chapter. After the coding process, the relationship between the categories was explored as part of the broader data analysis.

**Comparing the Two Groups**

The reason the faculty and students portions of the study occurred separately is that both groups offer different perspectives of adult learning in Second Life. Therefore, although the focus groups and interviews asked similar questions regarding student characteristics and expectations, the groups were separated in order to ensure their perspectives were best represented. Comparing the faculty and the students in regards to
their perspectives on adult learning enabled analysis of how designers can accommodate both faculty and student perspectives when designing learning spaces and curriculum in a 3D MUVE. In addition, the data analysis compared the students who had some experiences in Second Life with students who had varied experiences MUVEs and video games.

**Verification**

Along with reliability, a study must demonstrate validity as well. Validity is defined as “the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure” (Howell et al., 2005, para. 1). It is possible to have reliable methods for a study, yet have them not valid. Therefore, to ensure that the study accurately answers the questions posed in the study, researchers need to ensure the validity of the entire study. With qualitative data, this is possible through the use of triangulation (Golafshani, 2003). Using a variety of methods, a variety of participants for the study, and peer review of the final data ensured the validity of the study.

First of all, the methodological triangulation of three different methods increased the variety of the data. “Methodological triangulation involves the use of multiple qualitative and/or quantitative methods to study the program. For example, results from surveys, focus groups, and interviews could be compared to see if similar results are being found. If the conclusions from each of the methods are the same, then validity is established” (Guion, Diehl, & McDonald, 2011, sec. Methodological Triangulation). Using three different methods of data collection and triangulating the findings ensured the validity of the end results since the methods of data collection varied. These methods
included focus groups, interviews, and observations. As noted in the previous paragraphs, similar past studies demonstrated that the methods used in this study are reliable.

Secondly, using a variety of participants for the study helped ensured the validity of the data. “Data triangulation involves using different sources of information in order to increase the validity of a study. . . . These sources are likely to be stakeholders in a program—participants, other researchers, program staff, other community members, and so on” (Guion et al., 2011, sec. Data Triangulation). Both the focus groups and the observation portion of the study used students from four different classes within the University of Hawai‘i Second Life group. The interview portion involved instructors from the University of Hawai‘i Second Life group.

Finally, three peer debriefers reviewed the data. “This is done with a similar status colleague (not with a junior or senior peer) who is outside the context of the study and who has a general understanding of the nature of the study and with who you can review perceptions, insights, analyses” (Del Siegle, n.d., sec. Credibility). In addition, “it is believed that individuals from different disciplines or positions bring different perspectives. Therefore if each evaluator from the different disciplines interprets the information in the same way, then validity is established” (Guion et al., 2011, sec. Theory Triangulation). The peer debriefers for this study were doctoral students from an Educational Technology seminar course taught in Spring 2012. They were all in the same program, but were from a variety of different backgrounds in the field of education.
Summary

In conclusion, the determining of the research design, narrowing down the participants in the study, developing the instruments for data collection, and deciding which strategy for data analysis to use has ensured a valid structure for the study. Also using a variety of participants, instruments, and peer reviewers for the study has ensured the validity of the study as well.
CHAPTER 4. RESULTS

During the first review of the data from the Educational Technology class field notes, I noted any incidents of learning in general and assigned an initial category to each. These initial categories included the concepts of (a) choice, (b) adult identity, (c) navigation, (d) community, (e) using experiences as a learning aid, (f) purpose, (g) variety, (h) multi-sensory learning, (i) appearance, (j) asking questions, (k) guided learning, (l) group learning, and (m) documentation. Out of these categories, three broad initial categories manifested. These were: (a) independent learning, (b) instructor dependent learning, and (c) a broad category I named miscellaneous.

After the categorizing of the field notes, analysis of the first instructor’s interview transcript created additional categories, which turned into subcategories. The subcategories under independent learning were (a) guidance, (b) self-directed exploration, (c) peer reviewed proposals, and (d) real-life experiences and skills. Other subcategories emerged under the category of instructor dependent learning such as (a) use of other media, (b) problem-solving, (c) real-life application, (d) additional guidance, and (d) assigned work. Finally, under the category of miscellaneous, four subcategories appeared. These included (a) group activities, (b) immersion, (c) multiple intelligences, and (d) past virtual world experiences.

Since many of the categories were nonexamples, or opposite, of andragogy, they remained within the collection, but placed aside in a separate chart. Three main categories related to andragogical characteristics and expectations that manifested themselves in the behaviors and interview statements of the students and faculty. These

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are (a) self-directedness; (b) peer learning; and (c) real-life backgrounds and behaviors. Within those, several sub-categories emerged. Categories that did not specifically relate to andragogy were removed from the comparison process. The categories that reflected the main characteristics and expectations described in andragogy remained in the data analysis.

Figure 10 shows the final categories and sub-categories. These emergent categories were then related to andragogical theory in the discussion. In the following section, both andragogical characteristics and pedagogical characteristics are reported as categories that consistently arose from the analysis.
Figure 10. Final categories from data analysis of andragogical characteristics and expectations
Self-directed Learning and Responsibility

One of the main themes of adult learning theory is the adult learners’ sense of independence. Within andragogy, adult learners “accept responsibility for their own learning, if learning is perceived as timely and appropriate” (“Characteristics of Adult Learners,” 2012, sec. Characteristics). Additionally, andragogy describes the adult learner as self-directed (“Characteristics of Adult Learners,” 2012).

Several instances of independent learning appeared during the observational portion of the study. In addition, adult learners and instructors within the study mentioned instances of independent learning within their experiences of learning and teaching in Second Life. From that category three sub-categories appeared: responsibility for learning, learning on their own, and application to real-life occupations. While it was within the expected results to observe these categories within the data, instances of opposite behaviors occurred as well.

Independent Learning

Students within all four classes were working and learning on their own without any prompting from the instructor. In three of the four classes, students were building learning objects within the virtual world during their break time, even though their instructors did not tell them to construct these objects. In one of the beginner classes, a student practiced using the camera function in Second Life without any prompting, even though the instructor had not taught her how to use it yet. In addition, one of her classmates, who was also new to Second Life, explored the benches nearby during the break by right-clicking and sitting on them.
Some students went exploring on their own after working with their groups. As one instructor acknowledged, “Some enjoy exploring different sims not on the class list of LMs (landmarks).” During one of the Second Life field trip activities, one student did not follow the group and stayed at an exhibit while the rest of the class walked off. At another point during the field trip, a different student moved closer to the exhibit to get a closer look, while the others remained with the rest of the group. Another example of self-directed learning occurred during the same field trip when the group tried to use a malfunctioning teleporter to travel to the second floor; one of the students walked out of building and took the stairs to second floor. Instead of remaining with the group, the student explored other options to solve the specific problem that arose. Also, while on the second floor, the students walked around exhibits without any directions from the instructor on which exhibit to look at first. Interestingly, one student remained logged on to look around some more, even after everyone else had logged off.

When interviewing adult learners in Second Life, a few of them mentioned learning on their own. When asked about learning outside of class, one student said, “since leaving [class], [I] go to builder brewery and NCI for classes in everything from blender, gimp to scripting, to particles. After this interview, I am going to build a gingerbread house . . . . [Also], I look for ways to make lindens.” In other words, even though the class was finished, the student chose to continue with her learning within the Second Life virtual environment. The same student had to work by herself at one point during class. “Because I was isolated, I had to learn how to do things. . . . So I learned more skills from the frustration of having to make a lot of things on my own.” Therefore,
within the study there was evidence of independent learning, even while in an instructor-centered course.

Yet, most instructors conveyed that they were uncomfortable letting their students learn independently within the virtual environment. “SL is not a place to send my students without [me] being there at the same time.” The mindset of these instructors interviewed was that students were not ready for independent, self-directed learning.

**Responsibility for Learning**

Even though some students demonstrated that they learned independently outside of instruction, the research notes revealed that they were responsible enough to learn on their own within the context of assigned work and tasks. In two of the four classes, the instructors told the students to work on their own in groups, even allowing them to choose the dates for their presentations. Within one of the classes, the students asked the instructor for clarification on assignment directions during one of the group activities. They also took initiative and asked the instructor about additional resources for scripts during the group time.

One instructors stated, “On their own they need to figure out detailed instructions about complex activities.” In other words, even though the students received guidance through directions provided by the instructor, it was their responsibility to complete the tasks assigned to them. One instructor said:

At first I tried to give them lessons in how to do this or that in SL, but now I found that they teach each other and find out on their own. So I don't do formal lessons in SL, only detailed lists of activities and skills they are expected to learn on their own. They have problems, but they solve them
one way or another. Especially if they do things as a team, they help each other.

He believed the students were capable of learning by themselves with limited instruction. This instructor also stated that he facilitated the creation of groups and tasks. Yet, he let the students take responsibility for completing the task, noting:

The online class is run so that sub-groups of students go online into SL at the same time (by prior arrangement) and perform weekly tasks collaboratively as a Team in SL. They follow the detailed weekly instructions that I have prepared for them. . . . Some of the exercises have them explore other SL areas, including libraries, meeting places, and shopping areas.

Another instructor revealed that:

For several field trips people could go to different destinations at their own discretion, under a certain time limit. So sometimes the time limit dictated how many locales could be visited. . . . My opinion is that this class would be just fine at finding educational sims on their own. However, criterions or some form of guidance can focus their search.

In other words, although the instructor provided some guidelines for the activity, he believed the students could complete or initiate the activity on their own. Furthermore, during the student interviews, one of the students confirmed this, “For one of the courses I took in the summer, I got to design [a] whole exhibit on my own.” Therefore, many examples appeared that supported the “Responsibility for Learning” sub-category.
Guidance.

On the other hand, contradictory categories manifested themselves during the comparison of data for this particular category. The sub-categories of guidance, feedback, and resources appeared. For example, one of the instructors kept inspecting (right clicking) her student’s learning object while they were in the process of creating it. Another instructor stated that with his class, he walked “the classroom back and forth when possible to give feedback during the building activities. I can easily see who is keeping up with the tutorial and who isn't, and can help those who aren't get back on track through private messages.” Therefore, instructors were still providing real time feedback to their students instead of letting them learn on their own.

Another instructor also said,

For some SL activities I give brief workshops to teach VW (virtual world) skills they will need to accomplish assignments such as building booths, using textures, creating posters, creating givers with links and NCs (note cards), creating media prims, etc. I also have them use a [guide] prepared by a former student that provides much information on how to use SL.

Some of the instructors believed that adult learners needed guidance from their instructors within the Second Life environment. “When I first entered SL, an educator I met recommended letting students find their own way. In my case that did not work and participation was lower than when I schedule orientation events held during class to build community.” In other words, some instructors have observed less work and participation from their students when they are left alone to complete their work without any guidance.
Students within the study also confirmed this observation. “My instructor(s) were excellent at providing resources and pointing / introducing the students to the right people in SL . . . encouraging the students to participate and engage in different activities.”

Another student confirmed that she needed guidance as well. “I asked for advice on how to build certain objects, but other than that I would say I didn't ask for TOO much help.”

A different student observed that some students in her class needed more guidance than others. “I do feel some are a bit more adverse to such a new way of learning. They were given more time and the TA was great to assist with more guidance.” Another student confirmed that student’s observation. “We all seemed to move forward OK. Maybe some were going to [the instructor and teaching assistant] a lot.” Therefore, some students needed little to no guidance while others needed constant guidance in real time.

**Feedback.**

Instructors in the study also noted that they provided feedback to help their students. One professor stated that for his class, “Every student submits an online report of their weekly activities in SL. They can see each other’s reports and they are required to reply with comments on each other. I also read and comment on some of them.”

Therefore, not only are the instructors providing guidance in real time, but they are also providing feedback after their students complete their work. “All grading is done by the instructor, but I provided in depth feedback for the mini-build assignment (one where students build their own learning object) and the Unit Proposals.” Another instructor stated, “I, as [the] instructor give written feedback when assignments are turned in. For some SL activities inworld [experts in the field] who attend student-produced
events and exhibits give feedback or play a mentoring role.” Interviews with some of the adult learners confirmed this as well stating that they receive feedback from various content experts via Chat or in person.

Resources.

Another sub-category created that contradicted the “Responsibility for Learning” category was the category of “Instructor-provided Resources.” One instructor stated, “This semester … I have one face-to-face graduate course in a computer lab with SL.” While another professor said, “This semester I have … two face-to-face classes meeting in a computer lab that makes SL available to students.” The other course within the study had students use their own computer. However, the students whose computer specifications were weaker than others needed more guidance from the instructor. “I've worked personally and extensively with at least two students now and their need for extended guidance is due to their poor computer specifications which causes them lag and so many other problems they can’t help but fall behind.” Although andragogy claims that adult learners are independent learners, it does not take into account that some adult learners have fewer resources and tools than other adult learners. Therefore, assistance is needed, especially in a virtual environment where computer specifications are different among adult learners.

Application to Real-life Occupations

Adult learners also “seek educational solutions to where they are compared to where they want to be in life” (“Characteristics of Adult Learners,” 2012, sec. Characteristics). The majority of the students stated that the skills they learned helped or will help them with their current or future occupation. The instructor confirmed that
they designed the class activities to facilitate this type of learning. The students also stated that the skills they learned indirectly helped them as well.

As stated before, quite a few of the students from the first class commented that they used what they learned from the class for their occupations in real life. One student remarked how she learned the skills needed to eventually teach a class in Second Life. “How to control an avatar (LOL), how to create learning objects with SL tools such as slide presentations, audio, books, quizzes, surveys, multimedia, etc. . . . implementing an instructional module, after the ID (instructional design) process in SL.” She added that the class she completed was “very useful, in addition to providing skills for designing a virtual world learning environment, it added valuable experience to the overall process of designing instruction.” Another student mentioned the same.

So, definitely useful for being in SL because now I have enough confidence to consider actually teaching training / courses in SL. Outside of SL, some of the skills I learned (for instance Scratch) I can apply to create animations for other projects that I might do . . . and of course, I can take these skills and use them in other classes I am taking now.

The students were also able to use what they learned and created in the class for research and presentations at conferences. “I had several opportunities to show my project to an audience at like a conference or some kind of event.” Therefore, not only did the skills they learn help them directly with their work, but were also used for professional development purposes.

Two students mentioned that learning in Second Life indirectly helped them with their real life. “I have improved my socializing skills in that I don't always have to win or
be right. [I] think a bit more about how the other person might look at things.” Another student mentioned, “I don't separate or divide the two worlds (RL & SL). I think I just gained a lot of confidence by practicing what people call ‘real life’ skills. But I believe there is no such thing as RL or SL.” Therefore learning in Second Life can result in unexpected or informal learning as well, which potentially could help with student’s occupations.

For one of the psychology classes taught in Second Life, the instructor stated that the students were learning similar skills that they would use in their future real-life occupations. “For the Psychology skills, they practice oral role-play of situations that relate to the topics we are studying. e.g., cyberbullying, cybercounseling, photo sharing, and the like.” He continued, “They are in preparation for the workplace so whatever new online skills they will need, they get to practice in these classes.” The instructor covered both real life and online skills that the students will eventually need when they enter the workforce.

Another instructor who taught Library Science courses in Second Life notices that her students sought out activities that pertained to their future occupation. “Some enjoy going online together to ... engage in SL activities related to their field or just for fun with another person.” She added that “students read literature about and hear from inworld librarians on the professional roles of librarians in SL.” The instructor also assigned students assignments that pertained to their future occupation. “Students have a field assignment to observe at the Community Virtual Library Reference Desk in SL on Info Island.” Interestingly, she also noticed that some students logged in to Second Life well after the semester was over. “Yes a few still login [after class has finished] and have
become even more involved by doing professional work in SL.” It appears that some students still use Second Life for professional development.

Through all the interviews, focus groups, and field observations, only one student admitted that what they learned in Second Life did not necessarily pertain to their occupation.

I guess it depends on where I go with it. I did a presentation for a group of physicians [at my workplace] and their eyes started rolling around in their head, and they were pretty much overwhelmed! So, if I'm to take it to prime time, I need to figure out a way to get folks on board quicker than I did.

For the most part, the skills that the students learned directly or indirectly from their Second Life courses helped them with their current or future occupation.

**Peer Learning**

Although andragogy is characterized by self-directedness and independent responsibility for their work, the theory does leave room for peer learning or collaboration among students. “Online adult learners have the ability to investigate case studies or reflective activities by assuming different identities through group projects and role playing” (Perret, 2008, p. 7). Along with the manifestation of the peer-learning category, the creation of two other sub-categories occurred during the constant comparative process. These categories include problem-centered, project-based activities; and exploration and socialization.
Problem-centered, Project-based Activities

Adult learners often take on a problem-centered or task-centered approach to learning (“Characteristics of Adult Learners,” 2012; Perret, 2008). This is evident in the interview and focus group responses. All of the instructors had their students participate in some type of role-playing or presentation activities that required students to engage in problem-solving.

The first instructor interviewed stated that he had his class engaged in “field trips (this includes resource gathering, role-play, and observation) . . . scavenger hunts, [and] building lessons.” He continued, “The skills that they learned were problem solving, modeling, observation and deduction, . . . social skills or adaptation to the social norms present in the virtual world.” Many of these activities were project-based and were completed collaboratively.

The instructor’s students also confirmed that they engaged in several field trips and role play. “Role play at Tombstone, particle place ...building, and script modifying.” The students within the class often had to use problem-solving to collaborate. “[We use] Google docs for the pedagogical content [for collaboration]. . . . A lot of things we originally wanted to do were not possible with our skills so we tried to make workarounds.” Another student mentioned, “I used a lot of resources to help me during class. Like the annotated list we put together in the first assignment. I referred to that a lot.” In other words, the students collaborated with organizing resources and helped each other by engaging in several problem-solving activities. “I think we had a lot of helping each other going on too . . . because in SL you can see what everybody else is doing, . . . LOL.” Another student chimed in during the focus group interview, “Especially on the
group projects.” Even though the students had to use different tools and strategies to collaborate on assignments than they would in a real-life classroom, they were still able to complete the project.

The second instructor interviewed required “that all activities be done collaboratively; online classes use Google Calendar features to arrange for sub-groups (three to six students) to meet online at the same time.” He stated that, “The main thing I believe is for them to be engaged and to practice collaborative tasks with each other … [and] to work in groups.” Again, group work was one of the main parts of the classes in Second Life.

Within this particular class, the instructor had his students participate in role play for their final class presentation, pretending they were either customers who were considering buying a vehicle or salespeople selling a vehicle. The purpose of this activity was to explore the psychology behind the marketing of cars and how the marketing of the cars influenced consumers’ attitudes and behaviors about driver aggression. The “role-play engaging activities [were] restricted to assigned topic and method of approach requiring research and preparation.” Overall, “as teams and sub-groups, they need[ed] to produce a plan for a specific problem or issue.” In the end, even though the students were engaged within a role-play activity, it was their responsibility to create the environment in which they role-played. In other words, they had to create the cars that they were selling, along with the marketing material, and then switch roles and pretend that they were the customers buying the car.

The last professor interviewed also used group work within her class. “I require SL (Second Life) activities to be done collaboratively to enable students to study the
collaborative process in using the SL interface. They will gather data on collaboration in the VW (virtual world). They also produce public SL events and exhibits in teams.” She continued, “Other assignments have them work in teams in SL and then they begin to do things they choose. These assignments build on the orientation events at the beginning.” The instructor used orientation activities at the beginning of the course to guide students with familiarizing themselves with the Second Life interface and then allowed the students to work in groups.

In the interview, the instructor also noticed that “some [students] enjoy going online together to …collaborate on assignments.” She also observed that the “students report SL (Second Life) can feel empty and lonely but when they are with another classmate SL is experienced as engaging.” During observations of her class, when the conference chat disconnected one of the students, the instructor decided to switch to nearby chat, and other student decides to switch to nearby chat as well. This is also evidence of problem-solving and collaboration within the Second Life environment.

Although the sub-categories of problem-solving and project-based activities manifested themselves within the category of peer learning, evidence of lack of problem solving also emerged. In one of the classes, even though the students were working on their own in groups, they still used virtual note cards provided by instructor for guidance regarding their group activity. Therefore, the students were engaged in guided learning from the instructor, even though they were working on their own in groups.

Within the final presentations of another class, the teaching assistant made sure the students stayed within the time limit and facilitated the pace of the presentations, rather than only the students managing the pace of the presentations. The teaching
assistant also reminded the students about the presentation guidelines during the final presentations.

In one of the last classes observed, the instructor led the class the entire time and the students followed the instructor. She stated that in later classes she allowed students to work in teams on their own. However, she provided guidance while they conducted their work. “In teams they create a plan for a specific inworld activity they will produce that takes several weeks. Class time is given in the form of Research Workshops to make progress on their planning and producing activities. I circulate and we discuss their questions.” Although the instructor allowed some independence, she still provided immediate feedback and guidance for their work.

**Exploration and Socialization**

From the Peer Learning category, the sub-category of Exploration and Socialization came about. In Perret’s (2008, p. 5) online adaptations to andragogy, he stated that online adult learners have the ability to solicit feedback in multiple ways about the “relevance of the ongoing learning process” they are participating in. This includes feedback from other group members. The students were also social and liked to explore. They received feedback not only through their instructors, but through socialization with their peers and through interacting with the environment itself, through exploration.

In one of the classes observed, the instructor asked his students to explore different builds from a Second Life class from Sweden and provide feedback to the Swedish students about their builds as an assignment. While participating in this activity, the students tended to follow each other in groups, take off on their own, and then return back to a common area to complete the assignment with their group members. Also
during that time, when one of the students accidentally logged off, the other members of her group waited for her to log back in.

The later focus group interviews inquired about their experiences with learning with one another. One student reported:

Yes, one of the first comments shared between myself and 2 other classmates was how we noticed an emotional aspect of our experiences. . . . For example, at the amusement park that we visited together; we had fun on the rides etc. It really "felt" like we had gone on a trip together and we felt emotionally attached to the experience. In other words, a "real-life" experience. We felt it carried throughout SL in general.

Another student from the class chimed in, “Also, I was pleasantly surprised to learn how intimate it felt. We were all at our desks [at home], but it felt like we really were together.” The feedback that the students received from this socialization made the students feel emotionally closer.

For another activity, the instructor asked the students to provide feedback to one another on their own projects. “Yes, students peer reviewed each other’s Unit Proposals as well as several Forum Discussion topics.” He also remarked that for “the most part I see that they enjoy working together, and they could not possibly build what they have built so far by themselves. That's true [of] a lot of the group work I've seen so far. [It] can't be done by just one person.” For this particular class, the socialization aspect of peers reviewing each other’s work was prevalent in their learning as well.

In another class, one of the instructors noted that, “some [of the students] enjoy looking around and exploring SL. Some enjoy going online at the same time and doing
some collaborative work or just socializing.” Then, in a later interview, an instructor from another class added, “Some like meeting people from other countries and regions, and using translator functions to chat. Some enjoy going online together to explore.” It seems that students were interested in socializing and exploring while learning. In another class, the students were very social, talking to one another and adding me to their friends list in Second Life. They also walked around on their own but stayed close to the class.

However, some of the students within the focus groups mentioned that they wished they could have completed some of exploration activities in smaller groups rather than with the entire class.

There were a lot of places to visit and I think all of them were good places but I wish we had more time at most of them but in keeping with time limits on the class most times we had to leave before I really was able to gain something substantial from the field trip. So maybe if we had less of those as a class and had to do it as a group.

It seemed that taking time to explore and interact with one another during the assignments and activities was important to them. She continued,

Plus as a class there was so many of us that it took a little time to ‘travel’ with everyone, but field trips as a group/team of 2-3 on our own time would be good, but unless its assigned, most peeps won't do it :) and SL is much more fun when exploring it with someone.
Another student chimed in, “Yes, some of those trips reminded me of scuba diving. We were all looking at things but sort of isolated and not really interacting with each other. It got more intimate when we were working in groups of 3 or 4.” Therefore, the students preferred socializing and exploring on a limited scale rather than with the entire class at once.

Real-life Background and Behaviors

Another category that appeared during the constant comparison of the data was the students’ use of their real life background and acquired behaviors to navigate and learn in the Second Life environment. Sub-categories from this category include (a) technical and educational skills and experiences, (b) prior beliefs, and (c) skepticism of new information. Contradictory categories appeared as well. These include (a) lack of experience or skills, (b) nonadult beliefs and behaviors, and (c) acceptance of the content and structure of the course.

Technical and Educational Skills and Experiences

“Adults have years of experience and a wealth of knowledge” (“Characteristics of Adult Learners,” 2012, sec. Characteristics). Several of the students brought previous skills and experiences that helped them with their learning in class. From the observations and interviews it appeared that their technical and educational backgrounds helped them with completing their coursework.

More than a few instances of students using their previous skills to complete assignments revealed themselves in the data. In the first class observed, the students used Babelfish, a translation website, to translate the Norwegian text in the builds to English.
They also used Google docs to complete assignments. The instructor confirmed that his students used other technology that they had learned about previously. “Skype and Google docs. . . . I think they have learned it prior to class, or if they just learned it, it was through other [department] courses.” The students seemed very familiar with collaborative technology before enrolling in class.

He also conveyed that they “knew how to blog before class.” Several of the students were already familiar with various types of technologies, even before they started taking the class in Second Life. The instructor related, “A few I spoke with were online MMO players which surprised me. So, they have some experience with role playing or video gaming, but very few.” A few of the students were also experienced with virtual worlds and video games in general.

The students also used their nontechnical skills in their Second Life classes. “Mainly social skills [we incorporated into Second Life class].” Another student added, “We had a very diverse group and everyone brought something different to the table. Made it fun!” He continued, “Also, it was helpful to have people skills, more so than in a 2D online course (not sure why), way more social than Blackboard Collaborate.” The adult students seemed to have effective communication skills.

One student expounded on her research skills,

As for skills. . . well the only skill that I think really helped me was my research skills. Because I had to research a lot for our project . . . not only for the content but also for how to build what we needed for the project, so I was able to locate the information I needed to help me with my build in SL - from how to build objects to how to write scripts etc. . . . Ditto . . . on the
computer skills :) - for instance, being a fast typist is very beneficial . . .

haha.

In addition, the students used their real life experiences to complete assignments in class. One instructor noted:

There weren't many instances of class discussion, but when there were, students often kept referring to the real world. For instance, one question asked if SL is a valuable tool for learning and most respondents said yes, and juxtaposed reasons to real life examples, like say a classroom. My best estimation is that maybe 75% of responses contain some reference to the real world.

The instructor continued, “I read their blogs . . . and in their blogs I see a lot of the references to RL . . . Many of our students are educators though. I think it helps their frameworks and learning strategies to become more solid.”

The students in the class confirmed what the instructor conveyed.

[Class in Second Life is] very similar to real life activities in comparison to online/distance learning environments which I have had much experience with. In fact, SL adds another element to the learning experience with movement and a way to express yourself via an avatar.

It seemed that since the students had experience as educators, they were able to adapt to the new style of learning they were experiencing within the Second Life environment.

In another class students used their experiences to help out for the final presentation that involved role play. The instructor explained,
In one of the face to face classes, the topic is driving psychology, so we specifically discuss the relationship between real life driving and virtual driving in SL, and especially the issue of whether virtual driving can have a positive effect on some of our real life driving habits that are dangerous.

During the final presentation, where the students played the roles of car salespeople and consumers, the students made references to Japan. They also inquired about several topics regarding the purchase of a car including child safety, fuel economy, cost, interior accessories, speed, tire tread widths, transmission, under the hood inspection, upgrades, and maintenance.

Although students brought a lot of experience to the Second Life class, some of the students demonstrated that they lacked some of the skills to effectively learn in the virtual environment. During one of the observations of a class, one of the students struggled with the navigating the Second Life interface, even when the class was almost finished towards end of the semester. The instructor of the course also stated during the interview,

I think it would improve things greatly if [the students who struggled] had up-to-date computers, but they exhibit certain characteristics that suggest that they would need more help anyways or at the very least, they need to spend more of their free time than their peers to catch up.

One of the students confirmed this point. “The students who had less experience with technology [class struggled or were more dependent on the instructor]. Most of the students had the necessary skill level I believe.”
Those students who had computer skills, but not necessarily virtual world experience, gradually caught up with those already experienced with virtual worlds. “Since I am not a computer gamer I was never good at using all the keys of the keyboard, but after SL I have become pretty proficient at using the keyboard and mouse, being fast at doing stuff, multi-tasking.” Another student stated that learning in Second Life was “challenging at first because I had little experience in virtual world environments, however, it proved to be an effective learning environment . . . very little [gaming experience].” It seems that not all adult students have skills in gaming or virtual worlds.

A different student repeated what the previous student said, “I had only spent a little bit of time in SL so I had a steep learning curve.” He continued, “I watch my son go crazy with his X-box, I never have time to get good enough to have any fun.” The other student in the focus group iterated the same idea. “Video games for me, not really. I've played them but I'm not an avid video game player. My VRW (virtual world) experience was limited to trying SL a few years ago (very briefly) and then doing a SL assignment for a class in my course . . . last Spring, 2011.” The presumption that adult learners who take classes in Second Life are young adults with video game experience seems more of a stereotype rather than actual fact, at least for this particular group.

The Library Sciences professor in the study confirmed that her students had very little experience with virtual worlds. “My graduate students are completely unfamiliar with the immersive avatar worlds and SL in particular. Some have been gamers but none had tried VWs before the classes.” She also confirmed that they had little experience in the subject area she was teaching as well. “Very few have worked in libraries. None have a bachelor's degree in library and information science because librarians need a subject
degree and a MLISc. A few have worked before in libraries as student help of paraprofessionals, but most have no prior experience in the LIS field.” Therefore the characteristic within andragogy stating that adults have years of experiences may ring true in other fields and learning environments, but for the Second Life environment technology and virtual world skills, some adult learners lack skills.

**Prior Beliefs**

“Adults have established values, beliefs, and opinions” (“Characteristics of Adult Learners,” 2012, sec. Characteristics). Adults have their own set of perspectives when taking a class online. Many of their different viewpoints are based on their backgrounds, experiences, and stages in life. During the focus groups, interviews, and observations, some of the main beliefs that were mentioned or appeared included professional behavior, appearance, and coursework.

In the first class observed, two of the students changed the names floating above their avatar’s heads to their real life names, in conjunction with their avatar’s names, at the beginning of the class. One of the students also edited his avatar’s appearance. It seems that physical appearance and professionalism is important to students, even though their avatars are only a digital representation of them.

On another topic, the focus group interview questions asked the students whether or not they felt Second Life was too cartoonish and whether the course belonged in higher education. One student remarked, “I still feel it’s definitely university level education.” Another added, “Definitely adult.” In another focus group interview, one student mentioned, “Regarding social learning . . . I believe the interdependence is what promotes social production, an important aspect.” She continued, “The course content
was higher level for sure, especially since we were required to apply what we had learned and have our work evaluated.” Another student said, “Definitely not something you'd find in high school – IMO (in my opinion).” The students’ perspective that they were participating in a higher education course, even in a cartoon-like digital environment, is an interesting find.

An instructor confirmed. “Students have a general consensus, whether formed from the workings of this class or preconceived notions that learning is most effective when engaging and multi-faceted.” He continued, “From the blogs I am reading to what I am hearing personally from students, a majority believes that learning should be immersive and engaging and accessible; this class fits all of these criterions, and so I believe this class fits their established values, opinions, and beliefs about learning.” In other words, the students felt as if they were learning in a real life higher education course.

However, some of the students did exhibit behaviors not related to adulthood or higher academia. During final presentations in the Psychology class, the undergraduate students made references to sex, Little Wayne, stealing cars, drifting, and Pokemon during the role play assignment. Usually these references are not associated with adult behaviors in Western culture, although adults of all ages are interested in these topics in real life.

The Library Sciences instructor noticed that, “They all come as something different these days, the avatar choices are awesome; lots of robots and aliens.” She continued, “Most enjoy editing their appearance, changing avatars to non-human forms and imaginary forms.” This type of behavior is not usually associated with adult-like
behavior in Western culture, although many adults engage in this type of behaviors in virtual environments.

In regards to whether Second Life is an adult-only learning environment, some of the students believed that the course they enrolled in could apply to high school students with some changes. “SL, itself could be in high school. I like to think that we took our builds to a higher level than a highschooler could, but that was the content. You certainly could have designed a course with content aimed at highschoolers.” Another student agreed, “If you are speaking about the skill building SL objects than those could definitely be accomplished by students in H.S. now (well those with an interest in technology, graphics, video games, and similar subjects).” The previous student added, “Right SL is the vehicle. The content could be adjusted to any audience, once they learn how to drive.” In other words, the students believed that even young adults were capable of using the Second Life environment to learn. However, they did believe that the specific course they took in Second Life matched their expectations for higher education and that they were treated like adults.

**Questioning of Medium and Content**

Adult learners are “often skeptical about new information; prefer to try it out before accepting it” (“Characteristics of Adult Learners,” 2012, sec. Characteristics). Many of the students questioned what they were learning while taking courses in Second Life. In one of the education courses in Second Life, while critiquing another class’s work, the students asked what the purpose of the build was. They talked about the design and mentioned that it was not user-friendly. They also discussed the meaning behind the
build. In the end, they concluded that the build’s instructions were not clear and had no meaning. They also stated that it was sterile and had no ambiance.

Another student was also not entirely trusting of the Second Life environment around her. “I experienced a lot of ‘feelings’ which I so didn't expect. I was frustrated, even felt spooked sometimes (when I would log in and end up in strange worlds).” Questioning both the content of the courses in Second Life as well as the Second Life environment itself was a minor theme within the focus group interviews and observations.

The instructors also stated that the students questioned the use of Second Life as a teaching environment.

Several years ago there was a feeling of disconnect between a serious college credit course and the immersive avatar worlds of games or SL. Students reported having to defend the idea to their friends who thought it was a joke. Some students in class themselves felt that disconnect with serious academic study, as they discussed the topic on their weekly Discussions Group. However this only lasted two or three weeks, and then they wrote about accepting the idea and finding out that it was much bigger than they had at first anticipated.

He also mentioned, “Some pick it up fast, some slowly, some with enthusiasm, some with complaints.” It seems that some students question and disagree with the medium and content at certain points of the course. This however is expected, according to the theory of andragogy (“Characteristics of Adult Learners,” 2012). Students may also feel more apt to question the instructors and their choice of content and medium due
to the feeling of anonymity in an online environment. “You have the safety of online anonymity, thus making it more comfortable for the person to participate in events,” one instructor shared. Even though the instructors in these courses may know who the students are, the basic notion of anonymity may still exist among the students.

However, some students fully embraced the use of Second Life for the course without questioning it. One student mentioned, “[Taking a class in Second Life] reinforced my belief that it takes more than the traditional textbook to reach learners, that immersion and flow theory are key points of emphasis in the education of both child and adult learners.” Another student in the focus group agreed, “Yes, because there is so much hands on even with the computer as the interface, it reinforces my belief that people learn by doing.” None of the students had negative comments about using the Second Life environment for their course.

A student from the library class stated,

I understand when the students struggle with the software (tech issues, i.e. downloading and installing) and the students and/or the teachers struggle with learning the basic movements to explore the 3D environment. I would recommend that both the instructors and the students need to be patient and have the positive attitude towards the 3D virtual space.

This student emphasized patience with the medium rather than questioning or critiquing it.

An instructor within the Library Sciences course believed that her students’ interests and dispositions caused them to not question the medium. “Librarians are typically future oriented as a profession and accepting of new technologies as long as
they are considered useful and not mere distractions. . . . Students who choose the SL-enabled courses I teach are favorable to the technology in theory.” Overall, both types of the adult learners existed: those who did not question the medium used or the content of the course and those who did.
CHAPTER 5. DISCUSSION

The research questions addressed in this study were “What andragogical characteristics and expectations are manifested by University of Hawai‘i adult learners within the Second Life virtual environment?” and “Do relationships exist among the different characteristics and expectations, and if so what are they?” For the most part, andragogical characteristics and expectations manifested themselves among University of Hawai‘i adult learners. However, the results showed that pedagogical characteristics and expectations manifested themselves as well.

In this chapter, the first section further explains which characteristics and expectations appeared, the prevalence of andragogical characteristics and expectations as well as the pedagogical characteristics that manifested themselves in the data, and which characteristics and expectations did not emerge. The second section talks about the implications from these findings, or, in other words, the relationships between the findings. The third section talks about the generalizations we can glean from these findings and interpretations. Finally, the fourth section discusses the limitations of the study and suggests directions for future research.

Interpretation of Results

Several instances of andragogical characteristics and expectations appeared in the Second Life environment during the observations. Also, the students and faculty mentioned them within interviews and focus groups. These characteristics and expectations included instances of self-directed learning, peer learning, and background
and behaviors. Table 5 summarizes the characteristics, expectations, online adaptations, and relating categories that were developed from the constant comparative analysis of the data.
Table 5

*Comparison of Andragogical Characteristics and Expectations with Categories from Data Analysis*

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<tr>
<th>Characteristics</th>
<th>Expectations</th>
<th>Online learning adaptations</th>
<th>Categories from Data Analysis</th>
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<tr>
<td>Adults have many experiences and are knowledgeable. Their backgrounds provide a rich resource for learning.</td>
<td>They expect learning that immediately applies to their job or personal life.</td>
<td>Online learners now have the ability to share the various parts of their lives through online media. Activities that allow students to share their final projects, work products, or real-life experiences can provide a boost in self-esteem.</td>
<td>Real-life occupation, background and behaviors, and technical and educational skills and experiences</td>
</tr>
<tr>
<td>Adults have various values, beliefs, and opinions.</td>
<td>They often question new information and change.</td>
<td>Online adult learners have the ability to investigate case studies or reflective activities by assuming different identities through group projects and role playing. Allows them to reconsider their assumptions on previously learned information or patterns.</td>
<td>Peer learning, prior beliefs, and questioning</td>
</tr>
<tr>
<td>They are responsible for their own learning.</td>
<td>They expect to be treated like adults.</td>
<td>(Same as f-2-f)</td>
<td>Independent Learning, responsibility</td>
</tr>
<tr>
<td>Adults’ self-concept is self-direction.</td>
<td>They are usually not dependent on others for direction.</td>
<td>Web-based learning for adults is now nonlinear. Adults can pursue different avenues of learning to reach their desired goal.</td>
<td>Self-directedness</td>
</tr>
<tr>
<td>They often approach learning as problem-centered rather than content-oriented.</td>
<td>They expect to be involved in the planning and evaluation of the course curriculum.</td>
<td>With online learning tools, students are able to share input in the design of lessons or assignments. Collaboration tools online now allow students to collaborate on projects that involve completing a particular task or</td>
<td>Problem-centered, problem-based activities</td>
</tr>
</tbody>
</table>


Adults gravitate more toward survey type, straightforward courses. They have specific results in mind for their education and will leave if their education does not lead to those results. Online adult learners have the ability to solicit feedback in a variety ways about the importance of the learning they are participating in.

**Exploration and socialization**

*Note.* From Perret, 2008.

**Self-directed Learning**

One of the characteristics observed and confirmed by this study was the characteristic of self-directedness. Andragogy claims that adult learners need to feel self-directed and that they are usually not dependent on others for direction (“Characteristics of Adult Learners,” 2012). This was revealed in three different sub-categories: independent learning, responsibility for learning, and seeking learning that pertains to their real life occupation.

Adult students within the study revealed examples of independent learning where they were not dependent on other people for instruction. As seen in Chapter 4, examples of adult students learning without prompting from the instructor did exist. However, only a few of the students exhibited this trait. Many of the other students from the focus groups did not indicate that they pursued other types of learning outside of class in Second Life. To answer the main question for this study, the characteristic of independent learning does exist among Second Life adult learners. Yet, it was not evident among all of the learners observed and interviewed.
On the other hand, most learners took responsibility for their own learning. During the observation portion of the study, many students worked independently or in groups with direction from the instructors. Only a few instances occurred where the students needed direct guidance from the instructor. This was also confirmed by students during the focus group interviews who observed that only a few of their classmates were unable to work on their own without constant guidance from the instructor. One of the instructors stated that a few of his students needed constant guidance. Another instructor provided constant guidance for her students at the beginning of her courses, but said that they were able to manage learning without constant guidance after the first few weeks.

The last sub-category from this section was the characteristic of adult learners seeking out “education that relates or applies directly to their perceived needs, that is timely and appropriate for their current lives” (“Characteristics of Adult Learners,” 2012, sec. Characteristics). For the most part, students said that they were able to use what they learned in class for their current or future occupations. All the instructors stated that the curriculum the students were learning was directed toward what they would need for their current or future occupation. Conducting a follow up interview with the students after the study would provide more evidence that what they learned from the class was used for professional development purposes.

**Peer Learning**

The second category from this study is peer learning. This matched with the online adaptation to andragogy that says online adult learners have the ability to investigate case studies or reflective activities by assuming different identities through group projects and role playing. This allows them to reconsider their assumptions about
“already learned information or patterns” (Perret, 2008, p. 7). From this category, two other sub-categories emerged: problem-centered, project-based activities; and exploration and socialization.

All of the classes observed contained some form of group projects and role playing. Although the category of peer learning is not necessarily a characteristic from the original theory of andragogy, it does accentuate the original characteristic that “adults often have a problem-centered approach to learning” (Perret, 2008, p. 9). In other words, when students are assigned projects or role play activities, the activity often contains a problem that they have to solve. Overall, the instructors believed this type of learning worked well in this environment.

The exploration and socialization category matches Perret’s (2008) online adaptations to andragogy where adult learners have the ability to solicit feedback in multiple ways about the “relevance of the ongoing learning process” they are participating in. Mixed results emerged regarding whether or not the adult students wanted to explore and socialize. Some of the students exhibited characteristics of self-directed exploration where others stayed with their class and did not venture off to other places within the virtual environment. Some of the students preferred exploring with their classmates, but stated that they wanted to explore and socialize in smaller groups, and not with the entire class.

**Background and Behaviors**

The final category is the background and behaviors of the students within 3D virtual environments. This category matches with the characteristics of adults having “years of experience and a wealth of knowledge” and “established values, beliefs, and
opinions” (“Characteristics of Adult Learners,” 2012, sec. Characteristics). From this category, three sub-categories emerged that included (a) technical and educational skills and experiences, (b) prior beliefs, and (c) questioning of the class content and medium.

The students in the courses observed had effective communication and research skills. This was confirmed by the instructor and student comments. Also, during the observations, the students were able to effectively communicate with one another and research to the extent that they were able to complete their group projects.

The students were also skilled with using online collaboration software such as Google docs and Skype. With online learning tools, students are able to share input in the design of lessons or assignments (Perret, 2008). Such collaborative software enabled students to add their input to the design of the projects they were working on.

However, the students who were undergraduates were not necessarily experienced with working in the occupation they hoped to eventually pursue. In addition, many of the adult learners in the study were not experienced with using virtual worlds or playing video games. Although andragogy states that adult learners have years of skills and experience, the popularity of virtual worlds seems so new that many adults probably have not had the chance to gain much experience using them. This was confirmed by faculty comments that stated that the adult students in these courses did not have much experience with virtual worlds. In the end, it looked like the adult learners had a lot of useful real life skills and experiences, in addition to using software for collaboration, but most of the undergraduate and graduate students had little to no skills with virtual world technology.
The sub-category of “prior beliefs” also revealed several examples and nonexamples of adult-like behavior and beliefs. Andragogy states that adults have established values, beliefs and opinions ("Characteristics of Adult Learners,” 2012). The majority of the graduate students exhibited adult-like behavior within their courses. Examples of this included professional behavior and dress via their avatar. Also, when questioned about the content of the course they were taking as well as the medium, the students stated that they felt as if they were in an adult-like environment and that the course content was curriculum meant for a higher education course, despite the cartoon-like environment. One student mentioned, “Well people berate what they don't know, I think, people think of SL (Second Life) as a video game, which is not, and they don’t have the correct conception of what a video game is to begin with.” Although Second Life looks like a video game to those who do not frequently use it and is seen as an environment that would require a more pedagogical approach to learn in, the students believed that learners could learn andragogically.

Only a few nonexamples existed. Primarily the undergraduates exhibited nonadult behavior when completing the role-play activity. Also, one of the instructors mentioned that her undergraduates dressed as cartoon or mythological characters during class. Based on the data from the study, it seemed as if the graduates exhibited adult behaviors where the undergraduates exhibited behaviors more associated with children or young adults. However, both undergraduates and graduates believed that the curriculum they were learning was meant for higher education.

Andragogy states that adult learners are “often skeptical about new information” and “prefer to try it out before accepting it” (“Characteristics of Adult Learners,” 2012,
Two instructors mentioned that their students questioned the content of the class and the environment at one time or another. Also, some students questioned or were unsure of the Second Life environment around them. During a focus group session, one of the students questioned the medium they were learning in as well.

However, the rest of the students stated that learning in Second Life reinforced their beliefs about learning in virtual environments and that learning through this medium is an effective way to learn. Therefore, questioning of the content and medium exists among adult learners. Yet, some students fully accepted the curriculum and environment.

**Missing Categories**

Some andragogical characteristics or expectations did not manifest themselves within the study. One of the online adaptations of andragogy did not manifest itself. This adaptation was the statement that web-based learning for adults is now nonlinear and that adults can pursue different avenues of learning to reach their desired goal (Perret, 2008). The Second Life classes in the study did not necessarily allow students to pursue different avenues of learning and were mostly led by the instructor.

An original characteristic from andragogy stating “Adults tend to be less interested in survey types of courses and more interested in straightforward how-to” (“Characteristics of Adult Learners,” 2012, sec. Characteristics) was not investigated because this research focused more on how the class related to the students’ real-life occupations or future occupations.

**Summary**

As stated previously, this study examined whether andragogical characteristics and expectations are manifested by University of Hawai’i adult learners within the
Second Life virtual environment, and the relationships among the different characteristics and expectations. Findings suggested that andragogical characteristics and expectations existed among these students. These characteristics and expectations included the students’ self-directedness, questioning of the course content, variety of background skills and experiences, responsibility for their own learning, and problem-solving approaches to learning.

Overall, andragogical characteristics did not consistently appear among the students, since the instructors structured the courses pedagogically for the most part. Statements from students and faculty confirmed this, demonstrating that the students exhibited these characteristics and expectations. Furthermore, the appearance of these characteristics and expectations within the data demonstrates that these groups of adult learners are capable of self-directed and independent learning, as characterized by the theory of andragogy.

No relationships appeared among the andragogical categories within the data. Yet, a relationship emerged between the pedagogical and andragogical categories. The next section explains the relationship between the two.

**Discussion**

Students exhibited both pedagogical and andragogical characteristics and expectations. Andragogical behaviors did not necessarily outnumber the pedagogical characteristics or vice versa. Some characteristics and expectations appeared more than others within the different categories, but the data were too varied to determine whether the adult learners adopted a more pedagogical as compared to an andragogical approach
to learning. However, the evidence suggested that andragogical characteristics manifested in this learning environment, answered the main questions within the study.

What was most interesting was that some of the pedagogical and andragogical characteristics and expectations seemed to have a symbiotic relationship among one another. In other words, in order to trigger the andragogical behavior, a pedagogical action or expectation must occur, usually by the instructor. For example, one of the students talked about eventually learning how to use the advanced build options in Second Life outside of class. However, she did not learn how to build objects until she first learned the skill in class, which is what started her interest in building.

A few of the students confirmed this during the focus group interviews. “In the beginning [the instructor] would stay after class and help me finish my objects, but by the end I was using other classmates to help me when I needed it.” Therefore, the student needed instructor guidance at the beginning of the course, but then eventually took on responsibility for her own learning, requiring only the help from her classmates when she needed it.

<table>
<thead>
<tr>
<th>PEDAGOGICAL EVENTS</th>
<th>ANDRAGOGICAL RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor control</td>
<td>Learner responsibility</td>
</tr>
<tr>
<td>Guidance &amp; feedback</td>
<td>Engagement &amp; socialization</td>
</tr>
</tbody>
</table>
This was confirmed by some of the instructor participants. “At first students certainly needed more guidance as they learned the ins and outs of Second Life (both the virtual environment and the user interface) but as they matured and learned more, they seemed to need less guidance.” This is another example where guidance from the instructor at the beginning goads the students into more andragogical behaviors and attitudes. The instructor continued, “I encouraged collaboration by recognizing the class as a whole and as exceptional individuals. I think by recognizing the efforts of students, they are motivated to work; add that to recognizing the need to work together and I feel they are encouraged to work as teams.” In this way, instructors aided in developing andragogical characteristics within the adult learners.

Another professor stated, “In lab together they laugh and have fun with their first avatar experiences at UHS (the main University of Hawai‘i virtual campus), together as avatars and as themselves. It helps to increase engagement.” She continued, “Gradually I have realized that I must establish more structure to build a relationship between students and SL.” In order for the students to engage with each and socialize more, the instructor had to organize the class and environment to build in where and when opportunities for socialization would occur. Although more research is needed, the discovery of this relationship between pedagogical and andragogical characteristics in Second Life is a starting point.

**Implications**

This study adds additional insights to previous studies of Andragogy and adult learning in 3D virtual environments. The first section covers the difference between studies of andragogy in the face-to-face classroom and andragogy within Second Life.
The second section covers the difference between this study and previous studies of Andragogy in 3D virtual environments.

**Face-to-Face Andragogy and Andragogy in 3D Virtual Environments**

In Chapter 2, one of the studies compared two sections of one course. The first section was structured pedagogically while the second section was taught andragogically. Results from the study indicated that the students’ grades, success, and attitudes towards learning were the same in both sections (Strawbridge, 1999). These results relate to the finding for this study. In this study, although all students participated in instructor-led activities in the 3D virtual environment and some of the students exhibited andragogical type behaviors, none of the students indicated that the pedagogical activities were better than the andragogical activities in regards to their learning, and that they benefitted from both types of activities.

Another study about a face-to-face fire management course used instructor-led activities at the beginning of the course and then switched to a more independent learning approach. The study indicated that switching from a pedagogical approach to an andragogical approach was effective for the students’ learning. Similarly, results from this dissertation revealed a relationship between the pedagogical actions of the instructors and andragogical behaviors of the students learning in the 3D virtual environment.

Another study looked at a human resource management class when one section was taught pedagogically and the other andragogically. Students in the both classes achieved the same grades. However, the students in the andragogical class had more confidence in their learned skills than the students in the pedagogical class. In this study, confidence levels were not measured, but observations of the adult students in the 3D
virtual environment demonstrated that allowing them to learn independently encouraged them to cultivate this confidence.

Overall, the stereotype of online learning establishes that instructors should have detailed, highly-structured courses when teaching (Hamel & Ryan-Jones, 2002) since they are not able to immediately provide feedback to their students as they would in a face-to-face course. However, this study demonstrated that adult learners have the ability to learn within a 3D virtual environment without immediate instructor guidance or a highly structured course. In other words, the ability for adult learners to learn on their own with little guidance from the instructor, and the ability of the instructor to immediately provide feedback in a 3D virtual environment simulates learning in a face-to-face environment. Therefore, this study challenges the notion that structured courses are needed when teaching online, especially if the students and instructors are using a 3D virtual environment to facilitate teaching and learning.

**Andragogy in 3D Virtual Environments and Andragogy in this Study**

Earlier studies on MUVEs and learning have led to mixed results regarding whether or not learners are self-directed within a 3D virtual environment. Some of these studies’ results match up with the results of this study, while others contradict it. These studies touch upon the topics of learning styles, independent learning, and course structure.

First of all, this particular study indicated a mixture of learning styles exists among adult learners within Second Life. This links back to the study mentioned in Chapter 2 which suggested that those in the millennial generation who are participating in MUVEs prefer activities that appeal to a variety of learning styles (Lee, 2010). Similarly
in this study, the University of Hawai‘i students within Second Life exhibited both andragogical and pedagogical characteristics and expectations. What instructors can learn from this study is the fact that students have a variety of learning styles, personalities, and needs, even in 3D virtual environments. Instructors who teach in a 3D virtual environment, such as Second Life, have the ability to provide multiple avenues or choices of learning for the students to choose from within their curriculum.

Secondly, adult learners are capable of independent learning online. Although previous studies indicate that adult learners often believe they are not confident or comfortable with their skills when learning in a 3D MUVE (Carter, 2008; Inman, 2010; Teoh, 2008), this study revealed that exceptions are possible. In other words, the study provided evidence that it is possible to assign activities and projects that allow students to learn independently. Even though some adult students within a course may not have the learning style or skills that enable them to pursue independent learning, other students are capable of self-directedness. In other words, it is possible to provide adult learners a choice in regards to choosing assignments or activities, and still expect effective learning outcomes.

In addition, the relationship between pedagogy and andragogy in this study reveal a potential for dependent learners to develop independent learning characteristics. This relates back to the study that suggested that pre-service teachers wanted a more restricted virtual environment to learn in (Teoh, 2008). Therefore, it is recommended that instructors experiment with instructor-directed types of actions at the beginning of the course, such as setting up activities and situations where the instructor decides on the type of instruction and location and time of the class meeting, and then gradually allows
the students to transition the class into a more student-directed environment where the
students can explore and learn on their own or in their own chosen groups.

**Recommendations for Future Studies**

Although a lot of data were gathered for the study to try to answer the research
questions posed, the final results indicated that additional study of this topic are needed.
This study excluded adult learners in the group who were not formally enrolled in a
course. In addition, the study did not take into account the number of people who were
active in the group. It also did not take into consideration the culture of those
interviewed for the study.

The only participants interviewed and observed for the study were those learners
in the UH System Second Life group who were officially enrolled in a class or instructors
who had taught a class in Second Life. However, the group also contained adult
members who never officially enrolled in a class in Second Life. It is possible that they
developed andragogical characteristics and expectations without any pedagogical actions
taken by instructors. Interviewing those learners and comparing those data with the data
from this study would provide insights into whether adult learners in general manifest
andragogical characteristics and expectations.

Also, it is difficult to confirm who was active in the university’s Second Life
group and who was not. Although group members have the ability to see who logged on
recently, the login date recorded by Second Life does not confirm the amount of time
they were logged on or whether they were actively engaging in any specific activity. The
group represents a total of participants who joined the group over the years and not the
current active members. In addition, a few of the group members were not from the
university and were mainly affiliates from other states within the United States who were interested in activities sponsored by the group. Therefore, it is hard to say whether or not the sample used in this particular study is representative of the active members within the group. A similar study that interviews the active members in the group who are not officially students or instructors can fill this gap.

Lastly, another aspect about the participants that was not taken into consideration was the culture of the participants. Since andragogy did not necessarily take into consideration the ethnicity of adult learner, the participants were not asked about their culture and its influence on their learning. However, many students from the university are from Asian and Pacific Islander cultures. In the Japanese culture, it is often taboo to question authority (Lonner, Dinnel, Hayes, & Sattler, 2006). Therefore, the part of the study where some of the participants said that they accepted the curriculum and virtual environment might have stemmed from the students’ reluctance to disobey authority and mention any of their true feelings about these particular topics. Repeating this study on a smaller scale, but inquiring about the participants’ ethnicities may help with filling this particular gap.

However, limiting the sample population to a specific group of learners so that observations could take place in real time ensured that these learners were active participants in the group. Furthermore, questioning the learners’ instructors about their students’ skills and experiences provided a general idea regarding the amount of past experience students had with the Second Life environment. Also, limiting the sample population from the group made certain that these learners were from Hawai‘i and could generalize their similar ethnic and culture backgrounds.
From a personal viewpoint, MUVEs have the potential to take online learning to the next level, but, more research is needed on teaching adult learners within this environment. On the technology side, various improvements are needed in order for educators and students to fully adopt MUVEs as a potential tool for their courses. Improvements include streamlining the interface, creating a more structured environment for educational sims, and lowering the graphics requirements. These improvements can possibly lead to a more full adoption of this technology.

**Recommendations for Instructors and Instructional Designers**

In summary, based on this study, it is recommended that instructors design their courses for students with a variety of learning styles. In other words, although some students have a learning style that depends more on the instructor for guidance, it is probable that courses will also have students who are capable of self-directed, independent learning in a 3D virtual environment. Therefore, it is suggested that instructors include activities in their courses that are less structured in order to accommodate those who prefer or are capable of independent learning. Another suggestion is to allow students to investigate the environment in groups since students within this study demonstrated the need to socialize with others and explore.

For instructional designers, at least for those designing instruction for University of Hawai‘i adult learners, recommendations based on this study include keeping in mind the background of the learners when designing learning objects for courses within this environment. Not only can instructional designers take into account the learning preferences of the adult learners and their capabilities of learning independently, but they should also take into account their lack of prior experiences with using virtual worlds.
On the other hand, instructional designers can also take into account that these adult learners’ have higher education level research skills.

Designing education for 3D virtual environments can expand learning in ways that were once not possible through simulations, role-play and other immersive activities. Instructors can continue to follow pedagogical practices since some adult learners within their courses will need step-by-step guidance, and designers can take into account the skills these learners already have regarding their experiences with technology and higher education research. Both instructional designers and instructors have the ability allow room for activities to accommodate andragogical-minded learners as well in such an environment.

**Summary**

Overall, the research questions in the study were answered and additional discoveries within the data may possibly lead to other future studies on MUVEs and adult education. Results from this study can enable instructors to better facilitate their courses within MUVEs and thereby enable adult learners in their courses to fully take advantage of the potential learning possibilities MUVEs have to offer. As one student in the study stated, “I took [this course] because I was interested to see where virtual worlds are in terms of being used to deliver educational courses. I really think this is where the future of universities lie.”
APPENDICES

Appendix A: SL Online Consent Form

Instructor Interview Consent Form

Andragogical Characteristics and Expectations of University of Hawaii Adult Learners in 3D Virtual Environments

RESEARCH INFORMATION AND CONSENT FORM

This research project is being conducted by Rebecca Meeder for her doctoral degree in Educational Technology. The purpose of the project is to discover if characteristics and expectations of adult students in online 3D Multi-user virtual environments, such as Second Life, apply to the instructional model of Andragogy. You are being asked to participate because you are an instructor teaching a class in Second Life.

Participation in the project will consist of participating in an interview and possibly allowing to the investigator to observe your class, if you are teaching at the time of the study. Interview questions will focus on your observations of adult student learning characteristics and expectations in Second Life. Data from the interview will be summarized into generalized categories. Completion of the interview should take no more than an hour. Interviews will be recorded via local chat within the Second Life environment for the purpose of transcription.

The investigator may also use screen capturing software to record your online class while it is taking place, if applicable. Video from the screen capture will be stored
on the investigator’s external hard drive. No personal identifying information will be included with the research results.

The investigator believes there is little or no risk to participating in this research project.

Participating in this research may be of no direct benefit to you. It is believed, however, the results from this project will help instructors teaching within MUVEs to better design their instruction.

Research data will be confidential to the extent allowed by law. Agencies with research oversight, such as the UH Committee on Human Studies, have the authority to review research data. All research records will be stored in the primary investigators’ laptop for the duration of the research project. All transcriptions and digital video will be destroyed upon completion of the project.

Participation in this research project is completely voluntary. You are free to withdraw from participation at any time during the duration of the project with no penalty, or loss of benefit to which you would otherwise be entitled.

If you have any questions regarding this research project, please contact the researcher, Rebecca Meeder, at (808) 352-8167.

If you have any questions regarding your rights as a research participant, please contact the UH Committee on Human Studies at (808) 956-5007, or uhirb@hawaii.edu.

Participant Consent:
____ I have read and understand the above information, and agree to participate in this research project.

____ I agree to have my avatar recorded online for this research project.

Student Focus Group Consent Form

Andragogical Characteristics and Expectations of University of Hawaii Adult Learners in 3D Virtual Environments

RESEARCH INFORMATION AND CONSENT FORM

This research project is being conducted by Rebecca Meeder for her doctoral degree in Educational Technology. The purpose of the project is to discover if characteristics and expectations of adult students in online 3D Multi-user virtual environments, such as Second Life, apply to the instructional model of Andragogy. You are being asked to participate because you are a student over the age of 17 taking a class in Second Life.

Participation in the project will consist of participating in a focus group interview. Interview questions will focus on your learning characteristics and expectations in Second Life. Data from the interview will be summarized into generalized categories. Completion of the focus group interview should take no more than an hour. Interviews will be recorded via local chat within the Second Life environment for the purpose of transcription. No personal identifying information will be included with the research results.
The investigator believes there is little or no risk to participating in this research project.

Participating in this research may be of no direct benefit to you. It is believed, however, the results from this project will help instructors teaching within MUVEs to better design their instruction.

Research data will be confidential to the extent allowed by law. Agencies with research oversight, such as the UH Committee on Human Studies, have the authority to review research data. All research records will be stored in the primary investigators’ computer for the duration of the research project. All transcriptions and digital video will be destroyed upon completion of the project.

Participation in this research project is completely voluntary. You are free to withdraw from participation at any time during the duration of the project with no penalty, or loss of benefit to which you would otherwise be entitled.

If you have any questions regarding this research project, please contact the researcher, Rebecca Meeder, at (808) 352-8167.

If you have any questions regarding your rights as a research participant, please contact the UH Committee on Human Studies at (808) 956-5007, or uhirb@hawaii.edu.

Participant Consent:

_____ I have read and understand the above information, and agree to participate in this research project.
I agree to have my avatar recorded online for this research project.

Student Consent Form – Observations

Andragogical Characteristics and Expectations of University of Hawaii Adult Learners in 3D Virtual Environments

RESEARCH INFORMATION AND CONSENT FORM

This research project is being conducted by Rebecca Meeder for her doctoral degree in Educational Technology. The purpose of the project is to discover if characteristics and expectations of adult students in online 3D Multi-user virtual environments, such as Second Life, apply to the instructional model of Andragogy. You are being asked to participate because you are a student over the age of 17 taking a class in Second Life.

Participation in the project consisted of allowing to the investigator to observe the class you are participating in. The investigator used screen capturing software to record the online class while it was taking place. Video from the screen capture is stored on the investigator’s external hard drive. No personal identifying information will be included with the research results.

The investigator believes there is little or no risk to participating in this research project.

Participating in this research may be of no direct benefit to you. It is believed, however, the results from this project will help instructors teaching within MUVEs to better design their instruction.
Research data will be confidential to the extent allowed by law. Agencies with research oversight, such as the UH Committee on Human Studies, have the authority to review research data. All research records will be stored in the primary investigators’ laptop for the duration of the research project. All transcriptions and digital video will be destroyed upon completion of the project.

Participation in this research project is completely voluntary. You are free to withdraw from participation at any time during the duration of the project with no penalty, or loss of benefit to which you would otherwise be entitled.

If you have any questions regarding this research project, please contact the researcher, Rebecca Meeder, at (808) 352-8167.

If you have any questions regarding your rights as a research participant, please contact the UH Committee on Human Studies at (808) 956-5007, or uhirb@hawaii.edu.

Participant Consent:

_____ I have read and understand the above information, and agree to participate in this research project.

_____ I agree to have my avatar recorded online for this research project.
Appendix B: Focus group and Interview Questions

Table 6.

Focus group and interview questions

<table>
<thead>
<tr>
<th>Focus group (student) questions</th>
<th>Interview (instructor) questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you share what you have learned or accomplished in Second Life with others in real life? How does learning in Second Life make you feel? How do you incorporate your real life experiences or skills in your Second Life class?</td>
<td>Can you remember any instances in Second Life where your students shared with other classmates about their real-life experiences? Any other instances you can think of? How often does this happen?</td>
</tr>
<tr>
<td>How does the Second Life class you are taking fit your established values opinions, and beliefs about learning?</td>
<td>How does the Second Life class you are teaching fit your student’s established values opinions, and beliefs about learning?</td>
</tr>
<tr>
<td>How would you describe the class that you are taking now? Would you change anything about your class? Why or why not?</td>
<td>How would you describe the class that you are teaching now in Second Life? Do you find that students need more or less guidance in this class than in a real life class? How so?</td>
</tr>
<tr>
<td>How much input do you have on the design of the lessons or assignments of the class, if any? What kinds of input does your instructor encourage from you and other participants about the class?</td>
<td>How much input do the students have on the lessons or assignments in class? What are some examples of students contributing to the design of the lesson or assignment?</td>
</tr>
<tr>
<td>How does your instructor involve you in problem solving in your class? In what arenas are these problems posed?</td>
<td>In class, how do you involve your students in problem solving? In what arenas are these problems posed?</td>
</tr>
<tr>
<td>How do you collaborate with others on projects/assignments in Second Life?</td>
<td>How do you encourage collaboration among your students on projects/assignments in Second Life? How do your students collaborate in class? In other words, what methods do they use?</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>In Second Life, what type of activities have you participated in?</td>
<td>In Second Life, what are the types of activities do your students enjoy participating in?</td>
</tr>
<tr>
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<td>What did you learn from them?</td>
</tr>
<tr>
<td></td>
<td>How were these activities different from real life learning activities?</td>
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<td></td>
<td>How useful are these skills now?</td>
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<tr>
<td>Who provides feedback for your work in Second Life?</td>
<td>Who mainly provides feedback for your students’ work in Second Life?</td>
</tr>
<tr>
<td></td>
<td>How do you receive feedback from these people?</td>
</tr>
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