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A Composite Adult Learning Model for Virtual World Residents with Disabilities: *A Case Study of the Virtual Ability Second Life® Island*

By Marjorie A. Zielke, Thomas C. Roome, University of Texas at Dallas;
Alice B. Krueger, Virtual Ability, Inc

Abstract

Many benefits are available to people with disabilities who wish to participate in a virtual world. These include self-efficacy and the ability to share in virtual world community support. Further, many disabled residents of virtual worlds can vicariously experience physical activities through their avatar such as dancing, walking, and running – actions sometimes not possible in real life. However, learning the technology in a virtual world can be daunting for many new residents. Virtual Ability Island in Second Life® offers a platform for adults with disabilities to learn the functionality necessary to enter a virtual world. This article lays out a learning model based on the andragogy theory of Malcolm Knowles, often called the father of adult learning, and complemented by other recent research on e-empowerment and virtual designs for those with disabilities. A composite construct is then created as a framework to study the development of Virtual Ability Island as a destination where new residents to Second Life® with disabilities can learn basic functionality and *enjoy social and physical e-empowerment.*

Keywords: virtual worlds; pedagogy; disabilities.

A Composite Adult Learning Model for Virtual World Residents with Disabilities: *A Case Study of the Virtual Ability Second Life® Island*

By Marjorie A. Zielke, Thomas C. Roome, University of Texas at Dallas;
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"Why do those of us with disabilities want to be in Second Life®? Why do we struggle to overcome access barriers to participate? That's the key. In Second Life® we can do things more like everyone else than we could in real life. It's to be part of a community. I think those of us with disabilities find it hard to be part of a social community or network in real life so we look to Second Life® to fulfill that need."
–Alice Krueger, Virtual Ability, Inc.

Virtual Worlds such as Second Life® (SL) can be a safe environment for adults with disabilities to explore heretofore impossible activities, such as running, dancing, or talking, and achieve camaraderie among peers with similar challenges. However, SL presents a steep learning curve to anyone wishing to enter and participate. For example, in 2007, Linden Lab CEO Philip Rosedale stated that the estimated time to learn to use SL was 4 hours (Reuters, 2007). In 2008, Linden Lab estimated a retention rate of those entering SL of about 10% (Wagner, 2008). Further, a 2007 study of user acceptance of SL showed that only 56% of regular users perceived SL as easy to use (Fetscherin & Lattemann, 2007).

This technology challenge can be even more daunting for those with physical impairments. Virtual Ability Island teaches new SL residents with disabilities how to master virtual world technology. The developers of Virtual Ability Island have centered their design largely on Malcolm Knowles, known as the father of andragogy or adult learning. This article lays out a learning model based on the andragogy concepts of Malcolm Knowles, complemented by other recent research on e-empowerment and optimal virtual designs for those with disabilities. A composite construct is then created as a framework to study the development of Virtual Ability Island as a destination where new residents of SL with disabilities can learn basic functionality and enjoy social and physical e-empowerment.

Virtual Ability Island

People with disabilities, especially those with sensory, communicative, cognitive, or motor issues, may already be using assistive technology to interface with 2-D websites. However, as supported by the statistics presented above, entering and functioning in a 3-D virtual world can be quite daunting. Nevertheless, there are compelling reasons why people with disabilities would want to participate in a virtual world. For example, SL offers residents with disabilities the opportunity to participate in fantasy play, learn a new skill, socialize, and make new friends. People with disabilities can do things in SL like everyone else can in real life and do not have to be socially isolated – readily finding peer support and information important to understanding their situations. In short, they can be part of a functional community.

Virtual Ability Island is managed by Virtual Ability, Inc., a non-profit 501(c)3 corporation based in Colorado. Its mission is to enable people with a wide range of disabilities to enter into virtual worlds like SL and provide them with a supportive environment once there. The group and its support community offers members information, encouragement, training, companionship, referrals to other online resources and groups, ways to contribute back to the community, and entertainment. Based largely on the tenets of adult-learning pioneer Malcolm Knowles, Virtual Ability Island offers specific functionality and design strategies so that adults with disabilities can learn both technical and social skills, feel comfortable and safe, and overall enjoy their entry into virtual world life.

The Target User Population

A clear understanding of target users is a key component for developing optimal design for the Island. For example, Goh and colleagues identify several target user population characteristics to take into account when designing effective psychotherapeutic gaming interventions for children and adolescents (Goh et al., 2008). These characteristics include gender, culture, socioeconomic status, and genre of the game (Goh et al., 2008). In the case of Virtual Ability Island, it is assumed that the residents are male or female adults of varied socioeconomic status with either mental, emotional, or physical disabilities. Visitors to the island are not asked to reveal their disability status. In fact, approximately half of the Virtual Ability group in Second-Life® is made up of people without disabilities. The environment is the Second-Life® virtual world.

The Benefit of E-Empowerment, Support Groups and Community for Adults with Disabilities

Substantial benefits appear available to people with disabilities who are empowered to participate in virtual technology. For example, Yalon-Chamovitz and Weiss (2008) examine the potential of using virtual reality (VR) game environments to provide leisure activities for young adults with considerable physical and intellectual disabilities. The authors observe that taking part in VR allows participants to experience control over their environment and success in activities that are usually inaccessible to them. The authors conclude that as a result of participation in a virtual environment, VR game participants with severe intellectual and physical disabilities could be attracted to more active and physically demanding leisure activities in real life.

Amichai-Hamburger, McKenna, and Tal (2008), suggest that for beneficial empowering processes to unfold, barriers must be broken, and posit that the Internet is a powerful avenue to achieve this goal, terming the ability of the Web to empower, “e-empowerment.”

According to the authors, e-empowerment comprises reframing identity, increasing self-efficacy and skills, social compensation, and high self-disclosure. Other benefits of online empowerment include stereotype use reduction, finding similar others, and group reinforcement (Amichai-Hamburger et al., 2008).

Finally, Barak and colleagues summarize that support groups in general base themselves on the simple premise that people who share similar difficulties, misery, pain disease, condition, or distress may both understand one another better than those who do not and offer mutual emotional and pragmatic support (Barak, Boniel-Nissim, & Suler, 2008). The authors list the psychological impact of writing, expression of and connecting to emotions, the impact of emotion and knowledge, effects of interpersonal relationships and social processes, and influence on decision-making and resulting action as other reasons for the success of online support groups (Barak et al.) .

Using Malcolm Knowles Theory of Andragogy as a Way to Facilitate the Entry of Adults with Disabilities into a Virtual World

"One of Knowles' assumptions is that adults need to know why they are learning…. In K-12 we tell kids to learn this because it is in the curriculum or because they will need to know it at some unspecified later time. Adults won't usually stand for that."

–Alice Krueger, Virtual Ability, Inc.

Malcolm Knowles was one of the first educators to recognize that adults have different learning styles and motivations than children. His tenet is that adults are more self-directed, seek relevance, leverage their experience, have an orientation toward current problems, and are internally motivated (Smith, 2002).

However, in 1995 when Knowles wrote one of his final missives, *Designs for Adult Learning: Practical Resources, Exercises and Course Outlines from the Father of Adult Learning*, he likely did not envision the new canvas of e-empowerment the Web would offer to his theories. At that time, the network-enabled distance education environment that would connect students and professors globally was just beginning. Yet his basic precepts of self-directed adult education are the essence of collaborative virtual education.

Likely further yet from Knowles imagination at that time would be the emerging 3-D Web and the way this environment brings new possibilities to his basic concepts of self-motivated adult learning. A comparison of how Knowles' theory of adult education supports inherent features of virtual worlds offers some interesting parallels. Table 1 lists Knowles basic precepts of adult education with a conceptual perspective of how Virtual World Technology can help fulfill the theory.

Table 1
Knowles' Essential Concepts of Andragogy Compared with Features of Virtual Worlds

Concept	Virtual World Feature
Self-concept: As a person matures, he moves from looking to others for instructional guidance toward **self-directed learning** (Smith, 2002).	• Being able to learn independently of an instructor or mentor. • Setting own pace for learning. •Availability of asynchronous technology •Real-time feedback
Experience: As a person matures, she accumulates **life experiences** to use as a learning resource (Smith, 2002).	• Comparing novel topics to be learned with "common knowledge." • Environment that allows sharing acquired knowledge with others.
Readiness to learn: As a person matures, he is **ready to learn relevant skills and knowledge** oriented toward the developmental tasks of his social roles (Smith, 2002).	• Seeing the use of learning a skill in its immediate application. •Motivation for increased skill level for use in work or hobby. • Choosing what to add to virtual-world inventory.
Orientation to learning. As a person matures, she becomes less interested in acquiring knowledge for future use, and is more likely to **learn in order to solve problems** (Smith, 2002).	• Viewing practice opportunities as problem solving. • Immediate application of material to be learned.
Motivation to learn: As a person matures, he operates more from a sense of **internal motivation** rather than for external rewards (Smith, 2002).	• Entering voluntarily into a virtual world. • Determining start/stop points. • Checking own progress, and re-learning if needed.

Clearly virtual worlds offer specific enabling technology that facilitates the implementation of Knowles' concepts.

Interactive Design Considerations to Facilitate the Andragogical Learning Model for Virtual World Residents with Disabilities

As outlined above, e-empowerment constructs and the Knowles model suggest specific elements that could be useful in designing a platform to teach technical skills to adult virtual world residents with disabilities. Further, Goh and colleagues, in their review of psychotherapeutic gaming interventions for children and adolescents, offer several interactive design suggestions which could also facilitate an adult learning model for teaching virtual world technology to those with disabilities. The authors' suggestions include:

- Considering mental and emotional states as well as cognitive and socioemotional development,
- Utilizing the senses, i.e., vision, hearing, and touch,
- Incorporating fine motor control and coordination,
- Incorporating a sense of control,
- Allowing opportunity for strategy development and the discovery of information,
- Encouraging repetition of an activity until it has been mastered,
- Designing for multiple levels or sub-goals allowing opportunity to achieve a sub-goal even when the ultimate goal is beyond the reach of a player,
- Offering a degree of realism, and
- Providing animated conversational agents or avatars for human touch, real-time feedback, and acknowledgment of actions (Goh et al., 2008).

These elements and other specific design strategies for constructing a space to teach people with disabilities how to use virtual world technology will be discussed further below.

Essential Elements of a Composite Adult Learning Model for Virtual World Residents with Disabilities

The above analysis provides a framework for exploring Virtual Ability Island based on the factors of e-empowerment, adherence to Knowles' model of andragogy, and interactive design characteristics for psychotherapeutic gaming interventions as per Goh et al. (2008). These parameters as they manifest in Virtual Ability Island design are discussed below.

Design of Virtual Ability Island

Virtual Ability Island leverages the motivation of its inhabitants, the Knowles model, and specific design strategies to optimize the user experience on Virtual Ability Island for adults with disabilities. These design elements are discussed below.

Overarching Design Metaphor – The Tropical Island

"Speaking of metaphors … we tried several different design metaphors for the whole island. We chose a tropical island because it allowed folks to practice all the skills we wanted to teach, but in a fun setting – dancing on the beach, catching dragonflies … that kind of thing."
–Alice Krueger, Virtual Ability, Inc.

In their review of psychotherapeutic gaming interventions, Goh and colleagues (2008) offer some guidelines for visualization that include utilizing the senses, i.e., vision, hearing, and touch, and offering a degree of realism. While Virtual Ability Island does offers some degree of fantasy, the overall design metaphor is set in a tropical island, a place the target audience may have visited on vacation, seen in a movie, or dreamed of going to someday. Figure 1 is a snapshot of a mountain and waterfall on Virtual Ability Island. It is a "real" setting in a virtual world.

Figure 1. The tropical natural setting of Virtual Ability Island in Second Life offers trainees a somewhat realistic experience in a digital environment as per the Goh and colleagues (2008) construct.

This tropical island visual metaphor provides an environment where new residents can learn all the necessary skills for success within a stress free and supportive setting. These basic virtual world skills include moving, communicating, obtaining and managing an inventory of belongings, navigating throughout the island and the world, and creating a personal identity. Within Virtual Ability Island, these basic skills metaphorically translate into activities such as dancing under paper lanterns, catching dragonflies, picnicking, wearing tourist clothes, chatting with Bob the intelligent monkey, and taking photographs.

Usability for the Target Audience

"One bit of our training concerns a danger inherent in Mouselook. A quadriplegic isn't going to be able to crawl under the desk and turn off the computer and turn it back on to reset the darn thing. So in our training we put up a warning about it. That's something we've never seen elsewhere. We gave a tour to employees of Linden Lab, and they were surprised. They did not know about this issue. No one had pointed it out to them."

–Alice Krueger, Virtual Ability, Inc.

A variety of heuristics guide the overall usability for the target audience. For example, signs throughout Virtual Ability Island are slightly tilted and have a beige textured background in contrast to many other signs in SL that are flat vertical with white backgrounds or other colors. The Virtual Ability Island sign approach was tested with visually impaired users to discover optimal design constructs. Figure 2 shows these carefully tested signs.

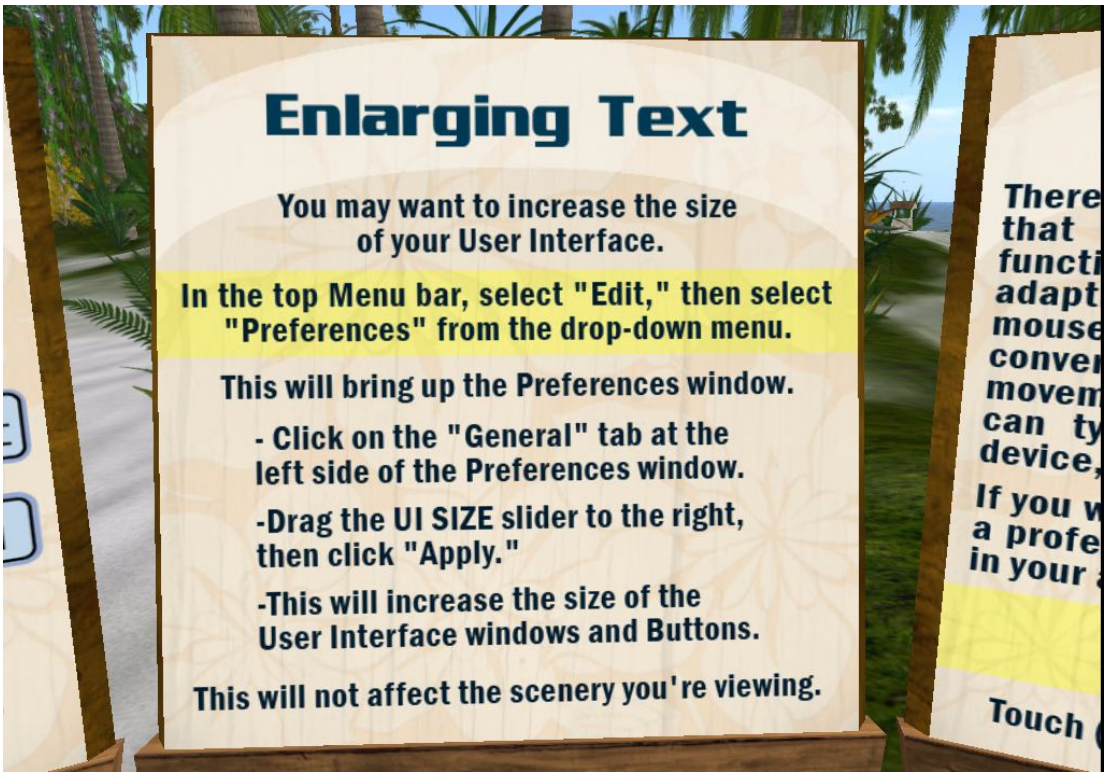

Figure 2. Background color and angle of the instructional signs throughout Virtual Ability Island were tested and designed with the target users in mind.

Further, the New Resident Orientation Course on Virtual Ability Island teaches these skills linearly in approximately 1 hour, which is the fatigue limit for many in the target population. All of the functionality on Virtual Ability Island leverages the initial avatar default settings that a new user has when entering SL with the idea that users don't yet understand how to change them, or why they should be changed.

One of Knowles' tenets is **internal motivation**, which includes accepting responsibility for planning and evaluating one's own learning experience. While the newcomer course is linear, builds on critical basic skills, and is intended to be completed in a single hour-long session, some people go through it one skill at a time, signing off between sessions. The course is designed modularly, with each acquired skill being practiced and reinforced in the next activity area. In this way, trainees can pace themselves according to how much content they can retain in one session and their own physical stamina. For example, some new residents in the target audience cannot sit upright at a computer for an entire hour.

Further, many of the new residents with disabilities who enter SL use adaptive inputs on their computers, and it is difficult for them to easily reboot their machines to get out of a setting. Therefore, there is training in the Virtual Ability skills session that teaches users how to avoid such problems. For example, Mouselook is the first person shooter viewpoint familiar to many gamers, where the screen perspective is as if it were coming from the user's eyes and not through an avatar. Through common keyboarding errors, Mouselook mode can be entered unintentionally, whereupon the onscreen keyboard vanishes and therefore the user cannot hit escape (ESC). The Virtual Ability Island training session teaches new users to avoid this danger. Although entering Mouselook – or the avoidance thereof – is an advanced skill, the designers of the Island leverage Knowles' precept that adults learn when they see a real benefit to their lives and introduce this concept early in the beginning training session. Figure 3 shows the Mouselook warning sign. Overall, the focus of Virtual Ability Island focuses not only on which skills need to be taught, but also how, and when, they are taught.

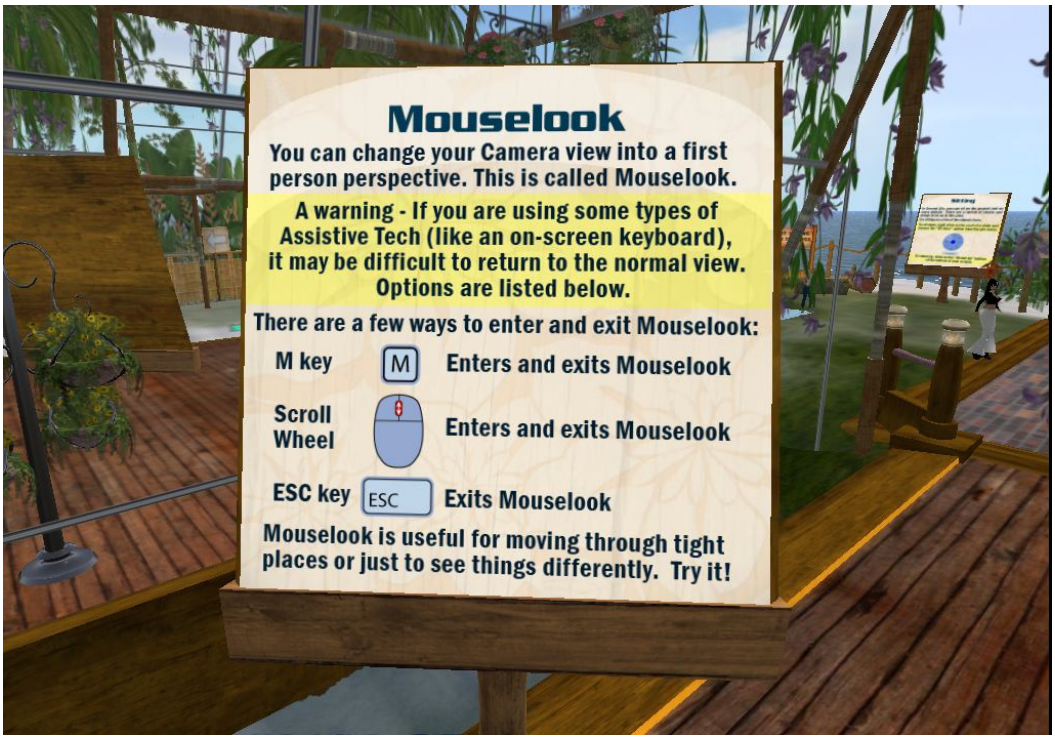

Figure 3. Some advanced skills such as Mouselook are introduced early in the training, assuming a motivation by the user to avoid major issues.

Andragogical Theories in the Design Strategy

"For adults, more than for kids, motivation lies in their real lives. They learn for their job or their hobby or for self-improvement according to their own perceptions. Adults don't usually learn to please the teacher per se."
–Alice Krueger, Virtual Ability, Inc.

Knowles felt that **self-directed learning** is evidenced by adults being proactive learners, entering into learning situations purposefully and with greater motivation than a child trudging into a classroom. Knowles saw self-direction in learning as a step-wise process, involving diagnosis of learning needs; identification of learning resources; choosing and implementing appropriate learning strategies; and evaluating learning outcomes. This process is evident in the design of Virtual Ability Island.

The Virtual Ability Island design team spent months determining learning needs by observing and participating in newcomer training and touring other orientation facilities. They identified experts to help with particular elements of the design, including an assistive technology practitioner, a Mac (Apple computer) trainer, SL wheelchair users, and people with various kinds of visual impairments.

Andragogical theories are evident throughout the design of the overall Virtual Ability Island learning experience. For example, the order of the skills to be learned, the instructional strategies, and the opportunities to practice independently are designed for the adult learner. Observers and helpers along the orientation trail can quickly evaluate a newcomer's progress. Are they wearing a logo T-shirt? Sporting a tourist hat? These identify visually the skill sets acquired by the learner.

E-empowerment and Motivation

"I think folks come to Second Life® for many different reasons … some to do fantasy play, some to learn a new skill, some to socialize and make friends, and I think that people with disabilities have all those motivations. But the additional motivation is that we can actually DO those things in Second Life®, whereas many of us can't in real life. In real life I can't stand unaided, but in Second Life® I go dancing as often as I am invited."

–Alice Krueger, Virtual Ability, Inc.

Unlike real life, appearing to have a disability is a choice in SL. As discussed earlier, one of the key motivators for people with disabilities who choose to learn how to use the SL technology is the ability to virtually experience physical activities such as dancing, running, walking, and even flying. Accordingly, some SL residents with real-life disabilities create avatars that do not display these same physical characteristics and thereby explore the fantasy of not being bound to their real-life bodies, which might require wheelchairs, canes or other mobility aids.

Other residents come simply for the community or other personal reasons and equate their avatar to their real-life body image incorporating their mobility or other aids into their virtual persona. For example, many chair users consider the apparatus to be a part of them. These residents can acquire a free wheelchair or modify their avatar body in other ways to match their real-life selves. Figure 2 shows an avatar seated in a wheelchair. According to one Virtual Island Ability developer, one theory explaining this choice is that more people who have been with their disability from birth identify with the apparatus of their disability more than do those who acquired the impairment later in life.

Figure 4. Some new members choose to use wheelchairs and some do not.

Examples of Teaching Some Skills through the Composite Construct: Learning to Move, Communicate, and Navigate

Skill Number One: Learning to Move and Catching Butterflies and Dragonflies

As illustrated below by Figure 5, newly created avatars who enter SL through Virtual Ability Island arrive standing on a boardwalk. Clearly visible, directly under their feet, is a large graphic of four arrow keys, labeled to indicate that they are used to make the avatar walk. Although using these keys is intuitive to experienced gamers, not all newcomers to SL have any virtual world experience at all, so the initial instruction is very basic.

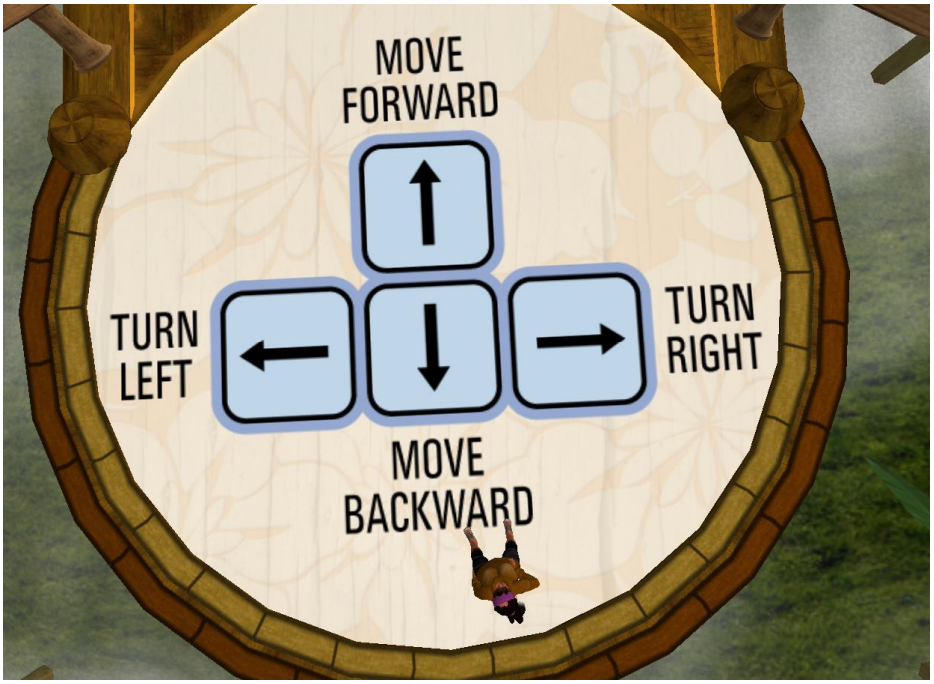

Figure 5. Newcomers land on an arrow keys graphic. Walking is one of the first skills taught on Virtual Ability Island. © 2009 Virtual Ability, Inc.

The first few instructional posters are clearly visible from the initial landing position. New avatars arrive with a preset point-of-view, or camera position, and these posters are readily visible in newcomer default visual mode. However, the posters are spaced farther apart than in many SL newcomer training courses to encourage the use of the first skill, learning to walk. Learning to walk is immediately employed to move from poster-to-poster down the first straight walkway on the training course. In educational terms, this is embedded practice.

Several suggested elements from Goh and colleagues' (2008) design construct are included in this first skill encounter. Emotionally, successful navigation of this starting point is very important for the new SL resident in that it will likely dictate whether or not the resident will continue their skill attainment. Certainly the senses are utilized in that there is a very clear visualization to the arrows, the direction of the pathways, and the posters. Further, this first skill session clearly incorporates fine motor control and coordination. Given that the user can go in any direction they wish at this point and linger as long as they choose over any instructional poster, there is clearly an opportunity for strategy development and the discovery of information. Further, the entry point to Virtual Ability Island is reminiscent of a path or entryway, which would be a realistic starting point.

From an andragogical perspective, many of Knowles' tenets are employed as well. Colorful geographic maps are used all along the orientation path to show learners their progress and what they will encounter next. Following Knowles, these progress charts are one of the many built-in consistent elements that link the novel experience of SL to the learner's already existing personal knowledge.

Self direction and readiness to learn is implied by the initial entry into Virtual Ability Island. Overall, the challenge is up to the new resident to either learn the basic SL functionality and achieve the larger goals of e-empowerment and community – or give up. The new resident may hear about the Island through word of mouth, but ultimately the individual needs to take the initiative to enter SL and arrive at the Island. The entire learning experience on the Island is self-directed – the new SL resident navigates the various learning modules at will and only calls for a live mentor when they feel it is necessary. The initial entry into the training also well illustrates Knowles' concept of learning in order to solve problems.

The Island's designers employ the activity of catching flying insects over a pond to practice another movement skill, positioning the viewpoint camera. This module teaches users to learn camera controls and access menu-driven commands to interact with objects and other avatars. Catching butterflies hovering in one spot over a pond provides a simple level of practice. When new SL residents master that functionality, they move on to dragonflies – a harder challenge because they are smaller and flit quickly. In attempting to view the insects, new residents must not only use the viewpoint camera correctly, but may need to change the position their avatar is facing or walk to another position to get a better perspective.

This strategy, of course, follows the Goh and colleagues' (2008) criteria to design for multiple levels or sub-goals –allowing frequent opportunity to achieve a sub-goal. Further, by equating this learning experience to something someone might do in real life – attempting to capture butterflies or dragonflies – the designers employ the Knowles concept of using a life experience as a learning resource. The adult student could begin to realize that other functionality within SL might have similar parallels.

Figure 6. Catching butterflies teaches visitors camera and menu skills. © 2009 Virtual Ability, Inc.

Skill Number Two: Communication with Bob the Talking Monkey and Secondability Mentors

The array of communication tools training taught on Virtual Ability Island also supports the constructs of Goh et al. (2008) and Knowles. Because the learning environment is asynchronous and self-driven, the designers could not assure that other avatars would be around if trainees wanted to chat. Therefore, following the tropical theme, Bob the talking monkey was added to instruct newcomers how to chat using typed text. People learn to chat as Bob asks and answers questions. Bob, a chatbot, records what he hears and learns. Bob answers anything asked of him, can do math, can tell how many bananas he has eaten, and can even tell what his favorite book is (answer = Curious George). Bob also greets people and makes jokes. Visitors often tell Bob he is funny and he seems to enjoy hearing that. A sample of Bob's chat with a visitor is presented below and Figure 7 shows a new avatar having a conversation with Bob.

[22:49] Human: hi bob
[22:49] Bob the Monkey: Hi there!
[22:49] Human: how are you?
[22:49] Bob the Monkey: Good, thanks!
[22:50] Human: how do you work?
[22:50] Bob the Monkey: Some people call my technology "Case-Based Reasoning" or CBR.
[22:52] Human: what is case base reasoning?
[22:52] Bob the Monkey: Searching ... Searching ... Please stand by.
[22:57] Human: who made you?
[22:57] Bob the Monkey: I was created by Virtual Ability.
[22:59] Human: What is CBR ?
[22:59] Bob the Monkey: Cased-Based Reasoning is another name for "nearest-neighbor" classification. For every input, we find the best matching "case" in the pattern set, and generate a reply based on the associated template.
[23:02] Human: Do you learn from questions?
[23:02] Bob the Monkey: Yes, that is basically how I work.
[23:04] Human: How do you like the island?
[23:04] Bob the Monkey: I'm not sure if I like it. I like my creator.
[23:05] Human: Who is your creator ?
[23:05] Bob the Monkey: I was created by Virtual Ability.

Figure 7. A new avatar chatting with Bob, the Monkey (a chatbot). Bob allows trainees the opportunity to practice the chat functionality at their own discretion. Copyright © 2009 Virtual Ability, Inc.

The use of a Chatbot on Virtual Ability Island is a strategic functionality addition, which facilitates a self-directed learning environment and certainly fits the Goh et al. (2008) criteria for allowing trainees to develop their own strategy development and discover information. Bob follows the Knowles construct by allowing the user to see the chat functionality immediately and put it into action. Bob is also a perfect example of providing animated conversational agents or avatars for human touch, real-time feedback, and acknowledgment of actions.

SecondAbility Mentors – The Human Factor

Virtual Ability Island also offers users a choice of learning modes. For example, at the end of the course, there is a way for the newcomer to "call" a real person to come talk to them. Those people are called SecondAbility Mentors, and they have special training in working with people with disabilities and access to a database of SL resources that might be particularly applicable.

Although the instruction on the orientation course is intended to be accomplished independently, there are two reasons for newcomers to meet other avatars. One is that, unlike some online games, every character in SL represents a real person. No computer-generated bots exist to outwit. Interacting with real people in a social environment, even if it is virtual, involves real feelings and emotions. This is important for new residents to realize from the beginning.

Equally important, new residents must understand that in a social setting, such as the communities of SL, most learning comes through interaction with other people. Therefore, there

are places on Virtual Ability Island where a newcomer can call a real person to come and converse with them. Figure 8 shows the bell a learner can ring to summon a live assistant. SecondAbility Mentors have specific training in working with newcomers who have disabilities, and can access a database of SL resources appropriate for this population, including numerous peer support groups. SecondAbility Mentors also reinforce SL communication skills with a human-driven avatar.

Figure 8. If they choose to do so, trainees on Virtual Ability Island can use a bell to summon a SecondAbility Mentor for help. SecondAbility Mentors also teach communication skills with a human-driven avatar. Copyright © 2009 Virtual Ability, Inc.

Skill Number Three: Learning to Navigate throughout the Virtual World by Flying

"Before we had this course, we taught people individually and out in the open on our property. When we told them how to fly, they would fly away without adequate controls, and then be lost and not know how to get back. And we couldn't find them to help them. We thought at first we should teach them to fly in a cage … but that just plain felt wrong…. Too many of us with disabilities have been in cages of some sort … casts … MRI machines … not experiences we appreciate."
–Alice Krueger, Virtual Ability, Inc.

An ongoing theme of the Knowles concept seems to echo the dignity of the adult. Adults learn when they recognize they have an educational need. This suggests the development of an environment where adults can feel free to experiment and try new things that are needed to succeed, but might be difficult or even daunting. This design characteristic might be even more important when one adds in consideration for people with disabilities to risk learning a new

technical skill that does not equate directly to their real lives. Clearly, learning to fly can be traumatic for new learners, who lack adequate controls over the process. They often fly away, get lost, and do not know how to get back – causing fear and frustration.

Flight training on Virtual Ability Island takes place inside a butterfly pavilion. This is a safe area enclosed by glass and hanging vines. The learner can practice flying up, down, forward, and backward without any danger of becoming lost. Figure 9 shows an avatar flying inside the butterfly pavilion. Although the environment is controlled, the design metaphor uses a butterfly pavilion theme to maintain a sense of safety and dignity for new trainees, while still maintaining control of their learning.

Figure 9. Flight training design allows the adult user with disabilities to practice in a safe environment and avoid flying away and getting lost. Although the environment is controlled, the design metaphor uses a butterfly pavilion theme that maintains a sense of safety and dignity for the new trainee, while still maintaining control. Copyright © 2009 Virtual Ability, Inc.

Teaching Accessibility to People without Disabilities

Another aspect to the andragogical element of Second Ability Island is that it provides an example of accessible design criteria. For example, the Island features two types of training facilities – two cabanas that seat about 20 and a large auditorium that seats over 70 – both fully accessible to virtual wheelchair users. Also to accommodate wheelchair users, ramps of an appropriate angle and width are provided. The foot space in front of the seats in the virtual facilities is also wide enough so that a chair can pass in front of people who are already seated without crushing their toes. No need exists to segregate wheelchair users in the back of the

meeting space as sometimes occurs in real-life facilities. Other builders in SL sometimes come by and ask how to retrofit their existing builds to make them more accessible.

Further, both facilities have large AV screens to help the visually impaired see training slides. All training presentations are transcribed and are simultaneously available in audio (for blind, dyslexic, or similarly challenged users) and text (for deaf and hearing impaired users).

Opportunities for Further Research

Several additional interesting opportunities for research are suggested by this exploration of an adult learning model for virtual world residents with disabilities. These include:

- What is the retention rate of SL residents after completing Virtual Ability Island training?
- How do the types of disabilities represented within SL compare with the incidence rates in the general population? If it is different, how might that be explained?
- What technologies allow people with disabilities to access virtual worlds? How can access be made simpler, more reliable, and more effective?
- What activities within SL do people with disabilities participate in? How does this compare with the participation of people without disabilities? If different, how might that be explained?
- How does virtual world technology, per se, improve e-empowerment and self-efficacy through community beyond 2-D support websites?

Summary

Virtual Ability Island in SL offers a chance for adults with disabilities to learn the functionality necessary to enter a virtual world. Benefits to successful trainees include self-efficacy and the opportunity to experience the community and e-empowerment available through virtual world participation. By exploring motivation, andragogical precepts of Malcolm Knowles and the design construct suggestions of Goh and colleagues (2008), a composite adult learning model for virtual world residents with disabilities has been presented in this paper. The design of Virtual Ability Island also metaphorically teaches accessibility to designers of other virtual and real life places.

Finally, those of us without disabilities currently are sometimes referred to as the not yet disabled (NYD) under the assumption that many people will eventually develop some type of disability. As the population ages, more people will be faced with impairments, and virtual world functionality such as that found on Virtual Ability Island will likely have an even more profound impact in the future.

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