Disabilities and Virtual Worlds:

An Exploration into the Experience of Learning about Self and Other

Amber Judge

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Signed by the final examining committee:

Rosa Cerone	Chair
Dr. Saul Carliner	Examiner
Dr. Miranda D'Amico	Examiner
Dr. Ann-Louise Davidson	Supervisor

Approved by: Dr. Richard Schmid
Chair of Department of Educational Technology

Date: July 18, 2013 Dr. Joanne Locke
Dean of Faculty

Abstract

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Research Problem: Virtual worlds like *Second Life* are shared 3D graphical places where people interact with each other and the environment through customizable embodied self-representations called avatars. Due to the recent nature of this research environment, the literature encompassing avatar identity, disability and learning in virtual worlds is limited. Thus, the purpose of this study is to explore experiences of people with physical disabilities learning about self and other in virtual worlds.

Research Questions: 1) How do people with physical disabilities experience learning about self and other in virtual worlds? 2) What do they learn?

Literature Review: Virtual worlds' constructs and historical developments contextualize the research environment. Definitions and typologies of selfhood and virtual identity explore the connection between person and avatar. Medical, social theory and capabilities models of disability are described, and accessibility, issues of virtual embodiment and disability in virtual worlds are explored.

Methodology: Conducted in virtual worlds and involving in-depth interviewing of three residents of *Second Life* who experience physical disabilities, this study follows a qualitative phenomenological approach with descriptive and interpretative analyses within and between participants.

Results and Conclusions: Self-avatar and avatar-avatar interactions lead to participants experiencing learning about themselves, their roles, and coping with disability. Participants expressed that *Second Life* is freedom and that with the right knowledge and tools disabilities can be overcome. Implications include shifts in perceptions of disability in technological contexts and potential uses of virtual worlds for self-exploration. The findings are limited to this study; future research should explore their generalizability.

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Dedication

To the resilient and to my father.

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Introduction

This thesis document is comprised of five chapters. Chapter 1 provides the background and rationale for the current study, including the research problem and its emergence and the main questions to be addressed. Chapter 2 reviews past and current literature on virtual worlds, virtual identity and disability in an attempt to further contextualize and situate this particular study within the larger framework. Key constructs, models and typologies are examined therein. Chapter 3 provides an overview of the methodology and procedures utilized for carrying out this study and the inherent assumptions of the phenomenological paradigm. An explanation of the analysis methodology is provided in detail, and ensuring qualitative rigour and actions taken to reduce ethical complications related to conducting research in a virtual setting are also discussed in this chapter. Chapter 4 offers both a descriptive analysis and interpretative analysis of the data. It first introduces each participant and provides descriptive narrations of their experiences related to the explored phenomenon. Afterward, it provides interpretative analyses of the aforementioned experiences. Chapter 5 discusses the findings and implications of the study, includes a researcher testimonial of the research experience, concludes the study, recommends avenues for future research and suggests better practices for conducting research ethically in virtual worlds.

Chapter 1: Background

The purpose of this chapter is to introduce the proposed study, describe the context of its emergence, describe the intended aim and outcomes of this study and explain why it is important to pursue within the realm of educational technology. This chapter starts with the emergence of the situation, the purpose and research questions, and the significance of the study.

The Emergence of Virtual Worlds as a Resource for People with Physical Disabilities

Virtual reality in a grand sense refers to what is created as real in the human mind (Heim, 1998; Jones, 2006; Stepanova, 2005). Virtual reality (VR) in a technological sense is defined by Philip Brey as "a three dimensional interactive computer-generated environment that incorporates a first-person perspective" (Brey, 1999). VR systems traditionally use head-mounted displays that are devices placed over the users' eyes providing a stereoscopic view of a computer-simulated object or environment that adjusts with the users' head-movements (Gobbetti & Scateni, 1998; Sutherland, 1968) and haptic gloves and bodysuits that sense the users' movements and provide tactile feedback to the users (Gobbetti & Scateni, 1998) therefore allowing the user to interact with and become immersed in the simulated environment (Brey, 1999). The differentiation between what is real or virtual lies mainly in the absence or presence of the electronic interface through which one accesses a reality (Ford, 2001a).

Since accessibility is often limited for people with physical disabilities (Imrie & Kumar, 1998; Imrie & Thomas, 2008; Stendal, Molka-danielsen & Balandin, 2011; WHO, 2011), there has been great interest in how virtual reality can provide access and enable individuals with physical disabilities (Ford, 2001b; Kuhlen & Dohle, 1995; Weiss, Bialik & Kizony, 2003). Specific benefits of virtual reality for people with physical disabilities include that they may aid in the diagnosis and rehabilitation of certain disabilities; the possibility for home health care; an assistive technology for people with physical disabilities (Kuhlen & Dohle, 1995; Gourlay, Lun & Liya, 2000); a source of recreational opportunities; and a potential generator of self-esteem and empowerment (Weiss, Bialik & Kizony, 2003). Virtual reality can help to level the social "playing field" and provide access to more social interaction with similar or different people, afford for a "normalized" body-representation less likely to be discriminated against, and increase a sense of self-efficacy and autonomy (Ford, 2001b). Despite these potential benefits, the inaccessible pricing of traditional VR technology (Ford, 2001b; Gourlay, Lun & Liya, 2000; Rizzo & Kim, 2005) stalled VR from becoming a viable option for home use. The inability to benefit from VR technology is especially unfortunate when one considers the number of people with disabilities worldwide.

In Canada, there is an estimated 14% of the population or 4.4 million people (Statistics Canada, 2009) and in the USA, an estimated 17% of the population or 43 million people (Virtual Ability, 2012), totaling to 47.3 million people in both countries who live with at least one form of disability. Disability is a complex concept with multiple definitions depending on the model used (for an in-depth review see: Masala &

Petretto, 2008). The World Health Organization (WHO) states “Disability is the umbrella term for impairments, activity limitations and participation restrictions, referring to the negative aspects of the interaction between an individual (with a health condition) and that individual’s contextual factors (environmental and personal factors).” (2011). According to the WHO, there are over a billion people globally who have some form of disability (WHO, 2011). A portion of those with disabilities have impaired mobility requiring a wheelchair; the number of wheel-chair users is estimated to be 150,000 in Canada (Conger, 2011; Shields, 2004), 2.3 million in the USA (LaPlante, 2003), and 3.3 million in Europe (Conger, 2011; van der Woude, de Groot & Janssen, 2006).

Since the 1990’s, the increased affordability and efficiency of home computers and access to the World Wide Web allowed for the integration of game-like features and graphics with online social networking capabilities (Messinger, Stroulia, Lyons, Bone, Smirnov & Perelgut, 2009). The result of these changes has been the creation and proliferation of freely accessible online immersive virtual environments such as Virtual Worlds (VWs) and Massively Multi-User Online Role-Playing Games (MMORPGs). This development has renewed interest from researchers and related communities regarding the use of virtual applications for people with physical disabilities (Carr, 2010; Cassidy, 2008; Crichton, 2007; Ford, 2001b; 2001c; Hickey-Moody & Wood, 2010; Judge, 2012; Krueger & Stineman, 2011; Monkey, 2007; Stendal, Molka-danielsen & Balandin, 2011; Zielke, Roome, & Krueger, 2009). Virtual worlds (VWs) are shared persistent user-created three-dimensional graphical social places (Aldrich, 2009; Bartle, 2007; Jones, 2006; Lastowka & Hunter, 2004). Massively Multi-User Online Role-

Playing Games (MMORPGs) are shared persistent three-dimensional graphical goal-oriented social games (Jones, 2006; Lastowka & Hunter, 2004). MMORPGs and virtual worlds have gained such popularity that in 2007 there were millions of users and these numbers were projected to grow exponentially (Papagiannidis, Bourlakis & Li, 2008). In the virtual world of Second Life alone, there are currently about 33,311,700 registered residents (Shepherd, 2013), and over $US 1,400,000 transacted on a 24-hour basis (Shepherd, 2013).

Official statistics on how many people with disabilities use virtual worlds are not available. Many researchers posit that there are a significant number of people with physical disabilities who choose to use virtual worlds in integral ways in their lives (Cassidy, 2008; Hickey-Moody & Wood, 2010; Krueger & Stineman, 2011). The closest related statistics come from a survey conducted in 2008 by Information Solutions Group for PopCap Games, where 20.5% of gamers identified themselves as disabled which is 5% higher than the reported percentage of people with disabilities in the American population (PopCap Games, 2008). These gamers reported playing longer hours and that games provided them stress relief, happier moods, distraction from disability-related issues and a sense of belonging (PopCap Games, 2008). Reporting that they spent a significant amount of time playing also aligns with a survey conducted in 2011 where people with physical disabilities (n=12) reported spending an average of 30.57 hours a week in Second Life (with a range of 5 to 70 hours a week) (Judge, 2012). Currently, there are full simulations and an estimated fifty groups dedicated to people with various types of disabilities in Second Life for providing community, support, mentorship and learning opportunities in-world. The most well known simulations are Virtual Ability, Cape Able, and Health Info Island (Virtual Ability, 2012).

Some academics have hailed virtual worlds as liberating for people with physical disabilities, allowing them to experience things they might not in their real lives like social inclusion and ease of communication with people all over the world without fear of prejudice, community support, anonymity and ability to present themselves online without a trace of disability (Ford, 2001b; Ford 2001c; Judge, 2012; Stendal, Molka-danielsen & Balandin, 2011; Zielke, Roome, & Krueger, 2009). Some also express caution regarding the ethics of virtual embodiment in virtual reality or virtual worlds. One concern is the design of default avatars which are 3D graphical representations that the user controls through which the user can act in these worlds (Bartle, n.d.; Bell, 2008; Kromand, 2007), that differ too greatly from real life or have ageist, racial and cultural biases such as white, young and western (Dietrich, 2013; Williams, Martins, Consalvo & Ivory, 2009) and how that might impact the psychology of a person or society and sense of identity (Ford, 2001a; Taylor, 2003). A second concern is the potential for unethical conduct and violence in virtual worlds given that people can be anonymous and not bear true consequences to their online actions and how this may affect moral judgment in both worlds, as well as real-world consequences for victims of virtual violence (Hartz Søraker, 2010). A third concern is the problem of deception enabled by virtual anonymity, whereupon people can misrepresent themselves and lie about their offline selves, which may have serious repercussions on virtual communities and online communication (Pasquinelli, 2010). Finally, the potential for virtual addiction and escape from so-called reality is another great concern whereby people may neglect and avoid their offline "real" lives causing detrimental effects on daily activities and functioning (Jones, 1996; Stanney, 1995).

Virtual worlds are already part of many people's lives. It is no longer relevant to as if virtual worlds should be used or avoided, but instead one must enquire how best can virtual worlds be designed and used to leverage benefits and minimize harm. Also, given that educational technologists work with these environments and knowing that many people with physical disabilities use virtual worlds and that related communities exist within a virtual world, from an educational perspective, one must ask if and what learning is occurring in these contexts. This brings up the basic questions behind this thesis project: When people with physical disabilities create identities and interact in virtual environments with their virtual selves, what do they experience and what do they learn? Consequently, what can others in the real world learn from these experiences? What can educational technologists learn from these experiences to minimize potential harm and maximize the positive aspects in the design and implementation of these technologies? Thus, this study explores this specific situation thorough phenomenological analysis of in-depth interviews with individuals who have physical disabilities and may be homebound who use the virtual world of Second Life. The next section of this chapter will outline the specific aim and research questions this study will focus on.

Purpose and Research Questions

The primary aim of the study was to explore the subjective experiences of learning about self and other by individuals with physical disabilities, through their interactions in a virtual world context. The research questions for this study are of qualitative phenomenological nature:

1. How do people with physical disabilities experience learning through interacting in immersive virtual environments?
2. What do people with physical disabilities learn about themselves and about each other through interacting in immersive virtual environments?

Though participants were required to state if they experience some form of physical disability to be eligible for this study, the actual real life physical state of the individual as disabled cannot be externally validated. Furthermore, their “official status” as disabled or not is irrelevant to this study as it deals with self-reported and perceived disability and experiences.

It is also important to note that by the term “learning” in this context, I am referring to the phenomenological meaning-making or sense-making that occurs subjectively and inter-subjectively as perceived and expressed by the individuals themselves. There is no attempt made in a phenomenological study to ‘objectively’ measure learning as a change in performance or behavior. Instead what matters is the perceived experience of learning. In order to do this, I will gather subjective information pertaining to the background and context, the present, and meaning-making related to people's experiences with learning about self and other in virtual worlds. It must also be stated that different subjective definitions of learning may naturally emerge from the participants themselves during the study.

Significance of the Study

This study contributes to the present literature by exploring a specific phenomenon in situ that has not yet been extensively researched. It will inform the current literature with a different perspective, a phenomenological one, as well as inform other researchers in the fields of disability research, education research and virtual worlds and virtual identity research. It is hoped that an increased awareness of disability issues will result from giving voice to the participants in this study who are part of the larger community of people with physical disabilities. Furthermore, if it can touch on the informal educational value of virtual worlds through identity construction, self-exploration and virtual interaction, it might bring attention to the fact that virtual worlds are not mere games and should be taken seriously (Lehdonvirta, 2008). The potential for the real world to learn from these experiences make it worth the while; it might change the way we define disability, inform designers of virtual environments, policy makers, educators and educational institutions, even employers who may wish to use virtual worlds, as well as the general populace interested in virtual worlds and physical disabilities.

The next chapter provides an in-depth overview of relevant literature to further situate the study in the current academic context.

Chapter 2: Literature Review

The purpose of this chapter is to describe the context of the study situated in the current literature related to this subject that stands at an intersection between education, psychology, technology, identity and disability research. This chapter starts with virtual worlds, understanding virtual identity, and disability and virtual worlds. Finally, the literature reviewed will be summarized and related back to the research at hand.

Virtual Worlds

Virtuality is not a new concept (for a thorough overview of the history see Jones, 2006; Shields, 2003). What is new since the 1980s however, is virtuality as created and facilitated by modern technology (Shields, 2003; Warburton, 2009). This technology-facilitated virtuality could be said to follow a continuum from physical reality, augmented reality, augmented virtuality and virtual environments, depending on the presence or absence of real/virtual objects, direct/indirect point of views, and real/virtual imaging (Milgram & Kishino, 1994).

Another recent development is the broad commercialization and rapid growth of virtual applications for not only the purposes of entertainment but also for training (Taylor & Chyung, 2008), education (Baker, Wentz & Woods, 2009; Duncan, Miller & Jiang, 2012; Hew & Cheung, 2010; Salmon, Nie, & Edirisingha, 2010; Warburton, 2009), psychological and sociological research (Bailenson, Swinth, Hoyt, Persky, Dimov & Blascovich, 2005; Gorini, Gaggioli, Vigna & Riva, 2008; Young, 2010), business (Arakji & Lang, 2008; Guo & Barnes, 2009; MacInnes, 2006; Papagiannidis, Bourlakis

& Li, 2008), among a plenitude of other purposes. Given the vastness of virtual applications and their uses, this study and review of literature will focus on social 3D graphical virtual worlds.

Virtual worlds are persistent, synchronous and unstructured multi-user immersive web-based 3D graphical places in which networks of people are connected, supported by a technological framework (Bartle, 2007; Bell, 2008; Messinger, Stroulia & Lyons, 2008; Warburton, 2009). Virtual worlds are graphical descendants of textual Multi-User Dungeons and Domains (MUDs), which made their first appearance in 1978 (Bartle, 2007; Kushner, 2004). There are different types of virtual worlds, depending on the particular elements by which one wishes to categorize them. In one typology, virtual worlds were categorized by purpose, place, platform, population type, and profit model (Messinger, Stroulia & Lyons, 2008). Another typology differentiated virtual worlds by purpose, degree of structure given, and types of identities used, which created the following categories: flexible narratives related with online games or MMORPGs, social worlds, simulations and virtual workspaces or computer-supported cooperative work (CSCWs) (McKeown, 2007; Warburton, 2009). This review focuses on social virtual worlds. Social virtual worlds are graphical developments from a specific type of MUD called TinyMuds that focus on social interaction and content creation (Bartle, 2007).

Socially oriented virtual worlds contain both egocentric and object-centric social networks, and do not have pre-determined storylines or character sets (Jones, 2006; Warburton, 2009). They allow its users to create and share content, interact with the environment and communicate with other users via text and voice chat, and a customizable avatar agent under their control (Bell, 2008; Schroeder, 1996; Warburton, 2009). This synchronous interaction leads users to have a strong sensation of "being there" in the virtual environment (Barfield, Sheridan, Zeltzer & Slater, 1995; Jones, 2006; Lee, 2004; Schroeder, 1996; Slater, Usoh & Steed, 1994; Spagnolli, Lombard & Gamberini, 2009; Warburton, 2009). This sense of being there, or presence affects users' emotional states (Freeman, Lessiter, Pugh & Keogh, 2005; Shaw & Warf, 2009; Wolfendale, 2006; Young, 2010), motivation for participating (Yee, 2006) and sense of immersion into the environment (Schroeder, 1996; Warburton, 2009). Though there are literally hundreds of virtual worlds, well-known examples of social 3D web virtual worlds include OpenSim, InWorldz, ReactionGrid, Avination, and the most popular virtual world called Second Life.

A distinguishing affordance of 3D graphical virtual worlds compared to other virtual environments is the ability to create, design and modify a 3D virtual avatar (virtual identity representation) in-world (Jones, 2006). This aspect of virtual identity construction in virtual worlds become an axial node through which to understand all the other phenomena related to virtual worlds. In the next section, conceptions of virtual identity and the avatar will be reviewed.

Understanding Virtual Identity

The experience of constructing, embodying, and interacting through and with virtual identities is a huge component of understanding the phenomenon to be explored in this study. To fully appreciate the complexity of the issue, and to provide a solid context for this research, this section of the literature review will define and explain important terms, concepts and typologies.

Defining self and identity. Self and identity are difficult terms to understand and define and are often redefined to fit particular fields, uses and aims (Childs, 2011; Seigel, 2005). For example, the judicial system is founded on the assumption that the self is a responsible, rational, unitary agent (Adrian, 2008), but other fields related to social justice proclaim that the self is limited to the structure society imposes on it and thus is not fully responsible for its actions or lack thereof (Wright, 1993). The self is depicted as a persistent quality or set of qualities that bring together one's existence and distinguishes a specified person as different from other people, by their actions and attitudes (Adrian, 2008; Seigel, 2005). Social contexts that require flexibility, such as becoming members of virtual communities, may cause a self to emerge or be altered (Ford, 2001a), for multiplicity to arise (Turkle, 1995), or for a particular "version" of the self to emerge (Adrian, 2008).

Identity means oneness (Adrian, 2008; Turkle, 2005). Some say that identity refers to an array of facts about a person that remain the same across contexts and situations (Zimmer, 2000). Others say that identity does not merely refer to a set of facts about a person, but also encompasses the mental model that a person has of himself or herself that is consistent across contexts (Adrian, 2008; Neustaedter & Fedorovskaya, 2009) or that it is perpetually re-created as it dynamically conforms to changes in context (Talamo & Ligorio, 2001). Identity is conveyed through appearances, actions and words while in the presence of others (Adrian, 2008; Neustaedter & Fedorovskaya, 2009). Identities over time form reputations, and increase social responsibility and sense of legitimacy in the person (Adrian, 2008; Taylor, 2003).

According to Childs (2011) and Manders-Huits (2010) the self is more personal and intimate than identity is, because a single individual can assume multiple identities but these identities must be integrated and synthesized into the person's sense of self which is managed and changes over time but remains unitary in nature. Common terms for referring to identity in the literature are "I", "self", "avatar", "real-life identity or person", the "user" or "player" and "virtual identity".

Virtual Identity Construction. In virtual identity construction research, there are those who argue that people create their identities to fit a predetermined personal purpose or need (Ducheneaut, Wen, Yee, & Wadley, 2009; Neustaedter & Fedorovskaya, 2009), and those who argue that identities are instead created via the software design, the social context and situation (Talamo & Ligorio, 2001; Taylor, 2003). Those who argue the latter, say that virtual identity is created through interactions with others and the technological tools and environment provided and is mediated by four main factors: anonymity versus identification, synchronous versus asynchronous communication, visual and textual information and context (Talamo & Ligorio, 2001). In this view, identity is constantly re-created and co-created by the users interaction with others (Talamo & Ligorio, 2001; Turkle, 1994).

In the book *The Coming Age of Second Life*, Boellstorff explains that to fully understand the virtual experience and virtual identity construction and embodiment, the phenomena should be studied in an anthropological manner (Boellstorff, 2008). Studying in an anthropological manner involves the researcher to become immersed into the culture, language, and social atmosphere of a group (Boellstorff, 2008). Methods of data collection include interviews, focus groups and participant-observation (Boellstorff, 2008). The reasoning behind this is that the virtual world has its own legitimate existence that is just as real as the physical world with its own culture and social references and therefore is valid. As a participant observer, the researcher gains access to the subjective experiences of the community to better understand the phenomena in context (Boellstorff, 2008). These basic conceptions discussed above play a huge role in how people tend to conceptualize and typify virtual identity, and how they view the role of the virtual world and software design.

Towards a meta-typology and explanation. There are a number of virtual identity typologies through which to approach in problem of identity in virtual worlds. In the light of the current literature and in an attempt to strategically understand the current conceptions of virtual identity, the researcher made an attempt to construct a preliminary meta-typology after a thorough analysis and comparison of each typology. Analyzing general characteristics with which the typologies were created and then grouping them based on similar or different characteristics allowed for the generation of this tentative meta-typology. Table 1 shows the resulting categories, followed by an explanation of each type:

Table 1

Tentative Meta-typology of Virtual Identity

Typology Category	Typologies Included	Description
Dependent Virtual Identity in relation to the "Real" Self	Bartle (n.d.) Ducheneault, Yee, Wen & Wadley (2009) Neustaedter & Fedorovskaya (2009) Turkle (1994; 1997; 2005) Kromand (2007)	Continuum and category-based typologies that compare virtual identity to real life identity
Identity in terms of Dimensions (Space, time, depth)	Belk (1988) Gottchalk (2010) Zimmerman (2009) Gee (2007) Bartle (n.d.)	Dimension-based typologies that compare virtual identity in terms of its relation to space, time, or depth of connection
Independent Virtual Identity(s)	Taylor (1999)	Conceptions of virtual identity as separate from a real life identity

The first category of typology is “typologies of dependent virtual identity in relation to the “real” self”. These are typologies that try to compare the player or user with the avatar or virtual identity and explain or describe the interrelation between them. The comparison between the user and their virtual identity can be done categorically or as a matter of degree along a continuum. Both Bartle (n.d.) and Kromand’s (2007) typologies are categorical as well as continuum-based, whereas Ducheneault, Yee, Wen and Wadley’s (2009), Neustaedter and Fedorovskaya’s (2009), and Turkle’s (1994, 1997, 2005) typologies are purely categorical in nature.

The second category of typology is “typologies relating to identity in terms of dimensions”. By dimensions, it means to be or exist or define identity virtually in space, time and depth. Bartle’s typology (n.d.) deals with the depth aspect or the depth of the connection with the avatar, as immersion. Belk’s (1988) conception of identity as extended via possessions deals with virtual identity in terms of space that can expand or retract based on what one feels they possess, as well as time by which possessions give a sense of past. Gee’s typology (2007) deals with virtual identity in the time dimension by using the projected identity to imagine a future as that virtual identity. Therefore virtual identity has been and can be looked at in three-dimensions.

The third category of typology is “typologies of independent virtual identity”. It is Taylor (1999) who brings up this interesting conception of virtual identity as able to exist and be understood independently of the person who created it, meaning that the virtual identity can stand on its own and talk for itself without verification or validating it with the creator of it. Taylor (1999) includes multiplicity and plurality into her typology, which coincides well with the conception of virtual identity as independent.

All of the above typologies deal with the virtual identity created and represented on the screen through the avatar. Avatar, pronounced “Av-tar” in the Sanskrit language, is an embodiment, reincarnation or manifestation of a divine being or life into one or many corporeal bodies (Adrian, 2008; Jones, 2006; Talamo & Ligorio, 2001; Vicdan & Ulusoy, 2008). Chip Morningstar first adapted the term avatar in 1985, to refer to embodiment in virtual environments (Adrian, 2008).

Bell (2008) formally defined an avatar as: “An avatar is any digital representation (graphical or textual), beyond a simple label or name, that has agency (an ability to perform actions) and is controlled by a human agent in real time.” Other definitions in the literature include: an avatar is a virtual body, a digital presence with certain characteristics and properties, a representation of identity or a representative of the player in-world, a doll or tool, an online virtual persona, alter ego, a symbolic virtual 3D graphical representation of the self in-world, and an intentional embodiment of one’s identity and a protagonist ‘game unit’ under the user’s control within a virtual space (Bartle, n.d.; Benford, Bowers, Fahln, Greenhalgh & Snowdon, 1997; Ducheneaut, Yee, Wen & Wadley, 2009; Kromand, 2007; Neustaedter & Fedorovskaya, 2009; Taylor, 1999; 2003; Vicdan & Ulusoy 2008; Yee, 2006; Wolfendale, 2006).

The avatar is the user's point of entry into the virtual world, and is the first thing that the user constructs and personalizes to create the desired appearance correlating with the identity they wish to portray in that world, affecting status, confidence, self-disclosure, and socialization in this realm (Kromand, 2007; Neustaedter & Fedorovskaya, 2009; Taylor, 1999). After a while, some avatars may be chosen and used as extensions of self (Ford, 2001a). The intentionality involved in designing and constructing the avatar, allows for the user to engage in self-exploration and awareness at a deeper level (Turkle, 2005). Reflective avatars are those that resemble the user like a mirror image, returning the gaze of the user (Adrian, 2008). Though reflective avatars are rare in virtual world contexts since the avatar usually looks away into the world instead of at the user, Turkle (2005) still argues that the virtual self is much like a reflection, enabling self-knowledge to develop via this interaction of identities. It is through the avatar that the user is able to engage in avatar-centric communication, create and interact with the virtual environment and with other avatars that inhabit it (Kushner, 2004). An avatar may be text-based or graphical; In the realm of 3D web virtual worlds most are graphical representations which may take the form of a humanoid, an animal, a machine, or any other possible object open to the imagination (Kromand, 2007). Figure 1 provides a visual example of a humanoid avatar:

Figure 1. Example of a humanoid avatar in Second Life. As presented, the avatar is a 3D graphical representation of a character or virtual identity that appears on a 2D surface or screen. This particular example is my researcher avatar.

Why virtual identity is an important construct. It has already been established that virtual experiences have real effects of people's emotions and thus have the potential to harm, as much as the potential for good like increasing self-confidence and awareness (Freeman, Lessiter, Pugh & Keogh, 2005; Shaw & Warf, 2009; Wolfendale, 2006; Young, 2010). This becomes especially crucial since virtual and real identities can merge, as in Bartle's explanation of persona (n.d.), and Kromand's categorization of self as avatar in his central and open identity type (2007).

Designers of virtual worlds who decide the parameters of default avatars, and the flexibility of avatar-construction, should be conscious of the effects to their creations on the psychology and self-perceptions of people, to maximize beneficial effects such as self-awareness, compassion, diversity and equality (Ford, 2001a; Jones, 1996; Taylor, 2003) so that virtual worlds are designed and used as places to learn how to be tolerant and work together in collaboration with people all over the world, not to destroy or undermine symviable qualities (Boyd & Zemen, 2007). This is important not only for informing their design, but also for avoiding potential negative effects on people (Ford, 2001a; Jones, 1996; Taylor, 2003).

With regards to disability and virtual enablement, identity construction via avatars becomes crucial to understanding this in-world phenomenon. The next section will review the literature pertaining to disability and virtual worlds.

Disability and Virtual Worlds

This section explores the notion of disability and how it relates to virtual worlds. This section of the literature review briefly overviews models of disability, consequences of disability, disability and virtual worlds, and finally disability, virtual ability and ethics.

Models of disability. The medical model views disability as a purely physical and biological state (WHO, 2011). Because this model attributes disability to the individual as opposed to environmental or social factors (Areheart, 2008; Radermacher, Sonn, Keys & Duckett, 2010; WHO, 2011) the responsibility and blame of disability is placed on the individual (Areheart, 2008). Areheart (2008) claims that the medical model poses people with disabilities as helpless, childlike “objects of pity” or “in need of charity", meaning people with disabilities are viewed as less fortunate, lacking in ability and in need of assistance or a cure. This stigmatization, discrimination known as ableism, and subsequent victimization of people with disabilities result from a view that fails to include the societal barriers and environmental conditions that affect ability (Areheart, 2008; Radermacher, Sonn, Keys & Duckett, 2010).

An alternate view of disability is the social model theory (Tregaskis, 2002; WHO, 2011) that states that the whole construct of what is considered ability and disability is constructed or perceived differently among societies, cultures and environments. According to the latter framework, disability is not merely a fixed physical state though this still remains an important aspect to consider. Instead, it is a variable collection of environmental and societal constraints placed on the individual that hinders and disables them (WHO, 2011).

Another view of disability comes from the capability framework first developed by Sen and Nussbaum and that is referenced in the realm of social justice and understanding issues surrounding freedom, equality and human rights both on the individual and collective level (Clark, 2005; Nussbaum, 2003; Sen, 2005). In Sen's article on human rights and capabilities, he describes capabilities as the "opportunity to achieve valuable combinations of human functionings" (2005). Sen explains how using the capabilities approach does not apply to understanding the *process* aspect of freedom but that it adds significantly to the understanding of the *substantive opportunity* aspect of freedom, meaning that we should ask whether a person is able to do something instead of just whether they have the “means, instruments and/or permissions” to do something (2005). Capabilities’ effect on opportunity informs our understanding and formulation of human rights (Sen, 2005). Nussbaum elucidates this by comparing the capabilities framework to utilitarianism and social contract theory and their underlying assumptions, stating that unlike the capabilities framework they do not take into account the societal barriers that stop someone from being able to be who they want or do what they want (Nussbaum, 2003). Additionally, these frameworks assume that both parties involved are equal, able, and willing participants doing an ‘exchange’ to fulfill each other’s particular needs, but that is simply not the case for people with dependencies such as children, the elderly and people with physical or mental disabilities (Nussbaum, 2003). The foundation of this framework can be found in the works of Aristotle, Marx, and John Rawls, among others (Clark, 2005), and is differentiated from commodity and utility (Clark, 2005; Sen, 2005).

What becomes apparent through this framework is that it does not suffice to only provide more resources to people with disabilities, legislate laws against discrimination and violence, and state that everyone is equal and worthy of human dignity and respect (Nussbaum, 2003; Sen, 2005). This model also asserts the need for affirmative action to ensure that those rights for people with disabilities actually carried out and that people with disabilities are then capable to live their lives in an ideal way (Nussbaum, 2003; Sen, 2005). Affirmative action is defined by Fullinwider in the *Stanford Encyclopedia of Philosophy* as “positive steps taken to increase the representation of women and minorities in areas of employment, education, and business from which they have been historically excluded" and includes public debate and changes in rules and policies (Fullinwider, 2011).

Next, one naturally asks, "What capabilities are we to uphold when it comes to entitlements or rights?" (Nussbaum, 2003; Sen, 2005). Sen (2005) states that what is considered a capability should not be decided by some theorists but be publicly discussed within groups to include as many viewpoints as possible and avoid biases, which John Rawls called "objectivity in ethics". However, stakeholders whose viewpoints must be heard in these discussions are often left without a voice, this in conjunction with adaptive preferences put at risk the objectivity attempted in these discussions when letting groups of people list and order capabilities themselves (Nussbaum, 2003). Nussbaum (2003) states that there are some universal capabilities that should be respected regardless of country, culture or time in history: 1) life; 2) bodily health; 3) bodily integrity; 4) senses, imagination and thought; 5) emotions; 6) practical reason; 7) affiliation; 8) other species; 9) play; and 10) control over one's environment.

Consequences of disability. Physical disabilities affect one's mobility and access to spaces, hinders the social interaction and the formation of friendships due to prejudices and stigmatisation, and also reduces the likelihood of being a visible and heard member of society (Blake, 1976; Boyle, 1997; Cassidy, 2008; Singh, 2005; Specht, Polgar, Willoughby, King & Brown, 2000). Furthermore, Statistics Canada (2009) found that people with disabilities were at a much higher risk for criminal victimization and violence including sexual and non-sexual assault and robbery.

Disability and virtual worlds. Research conducted before Second Life came into full existence in 2003 hypothesized that the ‘future’ of technology and the Internet would break the barriers of time and space, and of disability itself, to allow for individuals with disabilities to gain access to the same things people without disabilities have access to, increase social inclusion or engagement, and through the avatar have profound effects on the disabled person’s sense of self-identity as disabled or enabled (Coombs, 1993; Ford, 2001b). The same sentiments were expressed 5 years later, and were specifically attributed to Second Life (Cassidy, 2008).

When Second Life introduced voice chat, researchers studied how individuals with hearing disabilities used Second Life. These researchers focused the specific aspects of accessibility and the construct of what ability or disability is in comparison to what ‘everyone else’ has access to, and how that affects ones sense of identity, specifically when Second Life introduced voice chat how that affected self-perceptions and social inclusion of individuals who are deaf, within the virtual world (Carr, 2010).

One of the features of Second Life are *islands*. An island is a simulated and customizable plot of land surrounded by water that is not attached to the main continents (or mainland) of *Second Life* (Boellstorff, 2008). The Second Life island “Virtual Ability” which is a center that helps teach people with disabilities how to use Second Life also conducted a study. Researchers prepared a case study of this island. This case study explores themes such as the avatar and how its ability to walk and dance and fly affects one's sense of identity and social inclusion, how the platform of Virtual Ability allows residents to form a community where individuals with real life disabilities interact socially and mutually empower each other, and how they learn to use Second Life can inform how to teach in Second Life (Zielke, Roome, & Krueger, 2009). Zielke, Roome, and Krueger found that Virtual Ability Island helped teach how to use Second Life to people with disabilities which increased their sense of self-efficacy and allowed them to participate in the virtual world and the community (2009). Additionally, the design of the island served as an educational example of accessibility design (Zielke, Roome, & Krueger, 2009).

Judge (2012) explored the experiences of individuals who are homebound or have physical disabilities. The survey portion of the study found that these individuals spent as much as 12.8 hours per day, an average of 30.57 hours a week in Second Life. The grounded theory analysis portion of the study found that virtual worlds empowered these individuals by providing access to lasting social relationships and support, activities and learning opportunities, virtual mobility and space, and renewed self-confidence and friendships which transferred into the "real world" (Judge, 2012).

Accessibility and virtual worlds. These themes are also consistent with other research and advocacy; some activists fight for virtual environments to become and remain accessible and disability-friendly (Krueger & Stineman, 2011). For example, Second Life disability activists studied by Hickey-Moody and Wood (2010) told the researchers that Second Life gives them access to a whole world of possibilities and social interaction. These activists added that these possibilities of Second Life result not only from technology, but also from the inclusive attitudes of the Second Life community (Hickey-Moody & Woods, 2010).

Disability, virtual embodiment and ethics. Although virtual worlds provide some people with a newfound freedom, ethical concerns regarding virtual embodiment and disability must also be considered. In 1996, Jones stated:

> ‟There is potential cruelty in returning physically disabled people from their 'perfect' selves in a VR world to their limitations in the real world. Use of advanced interfaces and prostheses may be more acceptable ways for disabled people to gain worthwhile experience of a wider range of real world activities.″ (p. 152)

This concern might be important to consider, but not all people with physical disabilities wish to embody a "perfect" self or idealist representation (Ducheneault et al. 2009). Some actually prefer to represent themselves as realistically as possible, which aligned with the realist identity type (Ducheneault et al. 2009). As Hickey-Moody and Woods (2010) observed:

> "Denise: You have chosen to project yourself as someone in a wheelchair? What is that?
>
> Simon: Self identity
>
> Denise: So it is important for you to look authentic to your RL (real life)?
>
> Simon: I haven't got time to be someone else' (SKYPE interview with Simon Stevens February 8, 2008)"

Ford (2001a) and Taylor (2003) both bring up important ethical points concerning the design of virtual software and virtual representation. They caution designers to carefully consider the implications of how they conceptualize virtual identity representation as it may have far-reaching effects on users and the real world (Ford, 2001a, Taylor, 2003). Issues such as race, gender, diversity as programed biases, defaults and inflexibilities can potentially harm people and the greater society (Boyd & Zemen, 2007; Ford, 2001a, Taylor, 2003). This is no different for designing virtual world client software with accessibility and disability in mind.

Summary

The above literature review aimed to provide an overview of the various perspectives, ideological components, and findings that represent the current work of researchers thus far. Explored in this study are: how people with physical disabilities experience learning, and what do they learn about themselves and others through interacting through and with their virtual identities and other people in-world. A conceptualization of the problem as informed by the above literature is used to guide the methodology and research questions described in the next chapter.

Chapter 3: Methodology

The purpose of this chapter is to restate the research questions, explain the rationale behind the chosen research approach, describe and explain the scientific methodology used, describe the context and participants, detail the procedure, discuss ethical considerations and their proposed solutions, and delimit the scope of the study. This chapter starts with the research questions, the methodological approach, research environment, participants and purposeful sampling, procedure, ensuring qualitative rigour and trustworthiness of the data, the researcher's role and other ethical considerations, and limitations of the study.

Research Questions

The purpose of this study is to explore meaning-making and perceived learning experiences of individuals with physical disabilities who use and interact in the virtual world of Second Life. Specifically, this study explores this group's subjective experiences of learning about the self and other through interaction in virtual worlds.

The main research questions for this study are the following:

1. How do people with physical disabilities experience learning through interacting in immersive virtual environments?
2. What do people with physical disabilities learn about themselves and each other through interacting in immersive virtual environments?

It is hoped that addressing the main questions through this study may provide a preliminary platform on which to explore the aforementioned issues in-depth. The next section will describe and explain the methodological approach used during this inquiry.

Methodological Approach

This research study follows a qualitative phenomenological approach. Giorgi (1975b, p.83) states that, "Phenomenology is the study of the structure, and the variations of structure, of the consciousness to which any thing, event, or person appears." Phenomenology as research means to look at a specific event, occurrence or object and its meanings as perceived and experienced by human participants (Finlay, 2009; Groenewald, 2004; Seidman, 2006).

Justification behind the methodological choice. There are two main reasons behind choosing to conduct a qualitative phenomenological approach to this study:

1. The methodology follows from the researcher's aim for the study as well as the epistemological and ontological assumptions made by the researcher (Guba & Lincoln, 1994). It fits the subsequent research questions posed in this study better than any other method as it focuses on meaning-making and emphasizes the perceived reality and experiences of the participant (Giorgi, 1979; Groenewald, 2004) which are of actual interest to the researcher.
2. To understand the phenomenon as experienced by participants, their subjective experiences must be thoroughly explored. This is achieved through in-depth qualitative interviewing (Seidman, 2006) and analyses (Giorgi, 1975a; 1975b).

> Engaging in phenomenological interviewing means to conduct in-depth and directed explorations into the lived experiences and meaning-making through dialoguing with one or many participants (Seidman, 2006). An understanding is obtained from the rich narratives, stories and descriptions of participants' experiential accounts of a particular event or object resulting from this research process (Giorgi, 1975a; 1975b; Seidman, 2006).

Adding further support to this methodological choice lies the assumption that a phenomenological approach takes into account the particularities of the virtual context in which the research will be conducted. This is to say that perceptually phenomenology and virtuality have a lot in common; it is the 'virtual' or perceived that is accessible to the researcher through subjective experiences expressed by participants in the virtual environment. It is the perceived experiences and meaning-making that is of interest to the researcher, thus requiring a qualitative phenomenological approach.

Explanation of the chosen methodology. Irving Seidman's approach to data collection consists of in-depth phenomenological interviewing (2006). Because a significant amount of time and energy is required to conduct in-depth explorations, Seidman aims to provide a structured approach that maximizes the quality of the data obtained through interviews (2006). The data collection is divided into three interviews per participant that encompasses and situates the experience(s) for each participant (Seidman, 2006). The first interview explores the individual's personal history while the second interview explores their present experiences and the last interview explores the meaning-making of the experiences from the point of view of the participant (Seidman, 2006). Each of the three interviews per participant are spaced out to allow for reflection on the part of the researcher and participant and for follow-up questions to emerge (Seidman, 2006).

Giorgi's approach was chosen because it does not require the researcher to have personal experience with the phenomenon as in Moustakas' phenomenological approach, which states that the phenomenon under study should have social and personal meaning, and that the researcher's personal experience "brings the core of the problem into focus" and allows for the researcher to be "passionately involved" in the research (1994). Since I do not experience physical disability in the normative sense, Giorgi's approach is more appropriate than Moustakas' approach for this project.

Giorgi's methodology also tends to be more descriptive of participants' experiences than interpretative (Finlay, 2009). Giorgi (1975a) states:

> "From a phenomenological perspective, description or language is access to the world of the describer. (…) The task of the researcher is to let the world of the describer, or more concretely, the situation as it exists for the subject, reveal itself through the description in an unbiased way. Thus it is the meaning of the situation as it exists for the subject that descriptions yield."

Focusing solely on the descriptions as given by participants, in order to present their experiences in as unmodified a manner as possible, is the method of this approach.

It therefore fundamentally differs from the Interpretative Phenomenological Analysis (IPA) methodology of Smith, Flowers and Larkin, which aims to shed light on human experiences though a "double hermeneutical approach" that takes into account both the participant and the researcher's views and how these two interact to create meaning out of an experience (2009). The pitfall of a purely descriptive methodology is the fact that *completely* bracketing one's presuppositions and biases is unrealistic. A layer of interpretation still remains even in descriptive methodologies, and thus must still be accounted for by clearly stating researcher biases (Giorgi, 1975b). Possible pitfalls of an interpretative methodology are the potentiality for misinterpretation, or interpreting through a lens that may not truly describe the participant's lens or experience or take into account the uniqueness of the context for which the researcher may not have experience, especially relating to such a new research domain (Beck, Keddy & Cohen, 1994). Replication of IPA studies in terms of analysis is also questioned as difficult or impossible because of the lack of a systematic and rigorous methodology (Giorgi, 2011).

In an attempt to reap the benefits of both worlds and counter potential drawbacks of each, I use a mixed approach involving descriptive analysis in the initial phase and interpretative analysis in the secondary phase. The initial analysis phase will provide descriptions of people's experiences while bracketing my own presuppositions and biases to the best of my ability (Giorgi, 1975a, 1975b). This allows a more direct access the meaning-making of the phenomenon as the participant(s) intended to convey. The secondary phase will intensify rigour through triangulation by comparing-and-contrasting experiences across participants. Interpretative analysis can add an interesting facet to understanding the phenomenon itself, thus I reserve own my interpretation of the data for a separate section in the analysis and in the discussion section.

Research Environment

This study took place entirely within Second Life. Staying within the virtual environment of Second Life allowed the researcher to recruit and access participants in the same context the researcher wished to study, thus maintaining as much authenticity of the experience as possible during the interviews. Interviews were conducted on a private and secure platform 3740 meters up in the virtual sky on a mature simulation, far from other Second Life residents' perceptual range to ensure confidentiality. The setting I created for conducting interviews included furniture in a circular formation around a tea table and mimicked a natural outdoor space with grass, plants and flowers. Figures 2 and 3 are screenshot images of the research platform in Second Life:

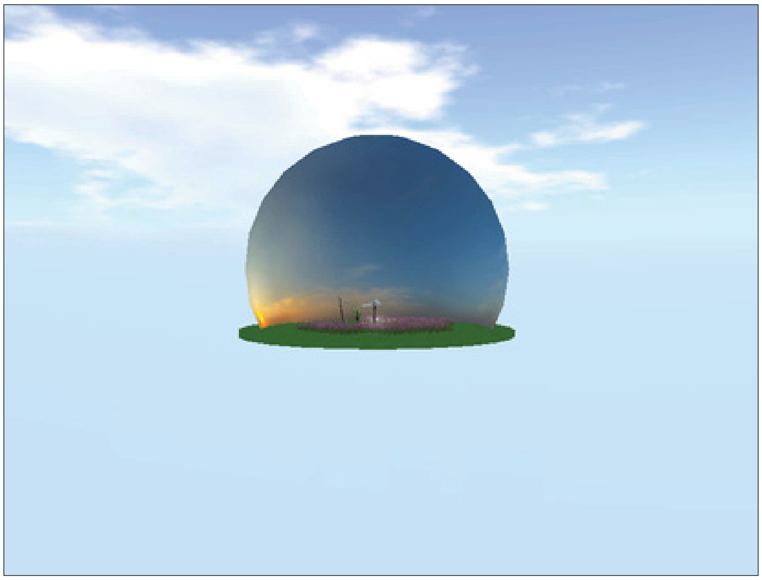

Figure 2. Screenshot of the research platform. This image was taken at a distance and shows the isolated and private research platform 3740 meters up in the virtual sky within Second Life.

Figure 3. Screenshot of the research setting on the platform. This image captures a close view of the casual virtual setting I setup to conduct interviews with participants. The researcher avatar is sitting in a chair with a bot avatar for demonstrative purposes.

The only time the participant stepped out of the virtual world was to read and accept the consent form and provide contact information to the researcher via Fluidsurveys.com which is a secure online survey website. The problem of ensuring the veracity of such information will be discussed in the next section.

Participants and Purposeful Sampling

Heterogeneous purposeful sampling was used to recruit these 3 individuals who participated in this study. There are no clear recommendations regarding the number of participants to have for in-depth phenomenological interviewing. The range of recommended participants can vary between 1 and 25 depending on the type of sample, the research question and the data obtained (Seidman, 2006). I, the researcher, had to judge whether the data obtained is rich enough or whether another participant would be required (Seidman, 2006). Eligibility criteria for recruiting participants included that they must all be over 18 years of age, experience physical disability or reduced mobility, and have a minimum of six months experience in Second Life. Three participants were deemed a sufficient sample size for this study since the chosen participants have different types of physical disabilities and life histories but they all have extensive experience within Second Life.

The verification of participant information to ensure its veracity and participant eligibility is a recurrent problem with online research (Frankel & Siang, 1999; Kraut, Olson, Banaji, Bruckman, Cohen & Couper, 2004), and is particularly difficult when conducting research solely within virtual worlds (Grimes, Fleischmann & Jaeger, 2010). The only fool-proof way to ensure that they are genuinely over 18 years old and actually experiencing limited mobility in real life is by meeting participants face-to-face and seeing real identification information. However, the phenomenological nature of the study rendered this unnecessary, as it is experienced or perceived disability that matters. Maintaining the virtual experience throughout the study was also an important contextual factor, particularly since the study also explored the experience of virtual identity. Furthermore, research has demonstrated that there are minimal differences in findings when comparing face-to-face and virtual interviewing (Knorr, Bronack, Switzer & Medford, 2010).

To respond to the problem explicated above, there are three ways in which I attempted to ensure the eligibility of participants and the veracity of participant information. First, since 2011, Second Life merged the Teen and Adult grids, creating PG, mature and adult simulation ratings instead of two separate worlds (Santo, 2012). This means that anyone over 13 years old can register for Second Life but only 18+-year-old verified users could access mature simulations. Thus, the research interviews were conducted on a mature simulation only accessible to 18+ year olds. Second, no monetary or other tangible rewards were given for participation in the study, thus reducing external motivations and the likelihood for people to fake their eligibility and stories. Last, it was stated that the time commitment for participants of this study is significant; between 60-90 minutes each for three interviews; reducing the likelihood for people to participate without genuine reason. Any participants who did not meet the eligibility requirement would also be dropped from the study.

Three individuals with physical disabilities participated in this study. Participant 1 has been a resident of Second Life for 10 years now and is a middle-aged female with limited mobility due to chronic and debilitating illnesses including Hashimoto's disease and degenerative disk disorder. Participant 2 has been a resident of Second Life for 9 years and is an adult male with limited mobility and balance issues due to Multiple Sclerosis. Participant 3 has been a resident of Second Life for 6 years and is a young adult male requiring a wheelchair and caretakers due to muscular dystrophy.

Procedure

This section describes the procedure for the study in detail to inform the reader on exactly how participants were recruited, the data collected, and the data analyzed in a credible and rigorous manner.

Participant recruitment. This study used a heterogeneous purposeful sampling method. A call for participation letter (see appendix A) was sent to potential participants via related groups in Second Life, such as Virtual Ability and Pixel to Pixel Foundation which were identified as groups catering to people with real-world disabilities through the Second Life group search function. The call for participation letter had an attached notecard or in-world document, with a link to a Fluidsurvey.com page. This page began with a consent form (see appendix B) that the potential participant had to agree to before proceeding to a short information form (see appendix C). The form asked the potential participant to provide their Second Life contact information and other basic information to determine their eligibility for the study. Afterwards, I contacted potential participants in Second Life to setup an interview schedule.

Data collection. The qualitative data for the study was collected through in-depth interviews with consenting participants. The researcher interviewed participants three times for 60 to 90 minutes each as suggested by Irving Seidman to contextualize and inform the experience of the phenomenon (Seidman, 2006). Interviews were scheduled to be 1-2 weeks apart depending on the availabilities of the participants. The initial scheduling had to be extended to 4 weeks between two interviews for one of the participants due unforeseeable real-life constraints. Many of the interviews naturally exceeded the 90 minutes in duration. The first interview dealt with the participant's history and what leads up to their present state (Seidman, 2006). The second dealt with the present circumstance or phenomenon under study and how that is perceived now (Seidman, 2006). The third dealt with the meanings of the experiences explored in the previous two interviews, as expressed by participants (Seidman, 2006). After each interview, questions became increasingly tailored to the participant so I could hone in on their particular experiences (Seidman, 2006). The interviews could be conducted through voice or text chat depending on the preferences of the participant. All three participants for this study preferred to communicate in text chat with me throughout all three interviews. Interview transcripts of the text chat were saved in a document and saved on my password-protected computer. The data collected from this process resulted in 71 single-spaced pages, or 31517 words.

Data analysis. The data analysis portion contains three sequential parts:

1. Descriptive narratives of each participant's experiences as recounted in each interview
2. Synthesized descriptions of each participants experiences and experiences as a group. This section follows a rigorous descriptive phenomenological analysis methodology first developed and formalized by Amedeo Giorgi whose framework is based primarily on the works of Husserl, as well as Merleau-Ponty and Schütz (Giorgi, 1975a; 1979; 2009)
3. An interpretative compare-and-contrast analysis of the data across participants that includes my own perspective on the phenomenon

The analysis portion aims to accomplish four things: analyzing, synthesizing, validating and describing the data (Giorgi, 1979). The researcher analyzes and synthesizes multiple experiences of a phenomenon extracting meanings within a context, over time and of multiple participants, to obtain a distilled form or forms of the experience (Finlay, 2009; Giorgi, 1975b; 1979). This process acts to validate the experiences intersubjectively meaning it is shared among people (Giorgi, 1979), moving from an individual to a broader understanding of the phenomenon experienced by the group (Finlay, 2009; Giorgi, 1979). Finally the researcher describes the experience so that others who have not experienced it themselves, can vicariously understand the subjective experience through the lens of the given group of participants (Giorgi, 1975b; 1979; 2009).

Once the data was collected, I began the analysis phase that consists of two parts. The first part provides rich narrative descriptions and quotes of each participant's experiences. The second part follows the particular phenomenological analysis methodology developed by Amedeo Giorgi (Giorgi, 1975a; 1975b; 1979; 2009). There are three main steps to the analysis portion of the research process as proposed by Giorgi (1975; 1979; 2009).

1. Gain a sense of the whole by reading the entire interview data.
2. Delineate units of meaning by identifying where a change in meaning occurs in the interview data. These units will later be grouped into themes.
3. Synthesize and integrate the participants' experiences into coherent succinct descriptions of the phenomenon.

Throughout the analysis process I attempted to maintain an emic approach to analyzing and reporting the data to ensure that the phenomenological experiences of the participants come through clearly and descriptively (Giorgi, 2009; Groenewald, 2004; Richie & Lewis, 2003). The interpretation followed the analysis and includes my own perspective on the said experiences based on the emergent central themes.

A Detailed Review of the Analysis Methodology

This section first provides an overview of the approach used to organize the data for triangulation and analysis. Secondly, this section describes and explains the two phenomenological descriptive analysis techniques and the interpretative analysis employed to construct an understanding of the phenomenon under study.

Organization of the data and methods of triangulation. The organization of the data followed a three by three matrix approach of the interviews and participants so that triangulation of data could occur between (horizontal) participants and within (vertical) participants over time. Table 2 represents this organization:

Table 2

Organization and triangulation of the data.

	Triangulate each interview per participant (Descriptive - Vertical)		
Triangulate each participant per interview (Interpretative - Horizontal)	Participant One Interview One	Participant Two Interview One	Participant Three Interview One
	Participant One Interview Two	Participant Two Interview Two	Participant Three Interview Two
	Participant One Interview Three	Participant Two Interview Three	Participant Three Interview Three

Triangulation of the data was thus done in multiple ways. The researcher triangulated each interview of each participant vertically and also to triangulate or compare the participants' experiences as described in each interview horizontally. Triangulation between and within participants was done in the descriptive analysis through the process of cross-checking information between interviews for each participant; the synthesis that resulted in the narrative descriptions; the synthesized situated and general descriptions of structure (what) and style (how); and the interpretation by comparing and contrasting between participants for each interview. The next subsections will describe the analysis methodologies used in more detail.

Analysis part one: Narrative descriptions of experiences. The first portion of the analysis is a descriptive narrative of the profiles of each participant that aims to provide an in-depth and contextualized review of their past, present and the meaning they ascribe to their experiences (Seidman, 2006). These concise narrative descriptions of the interviews with participants use the language of the participants in an attempt to faithfully reflect the meaning that the participants intended and to immerse the reader into the conversations as closely as they occurred. Direct quotes from participants were inserted in the narratives to aid in the sense of immersion into the participants' stories. The language of the participant provides access to the lifeworld of the participant as expressed in and represented by their use of language (Giorgi, 1975a).

Analysis part two: Return to the research questions through synthesized descriptions of structure and style of the phenomena. The second portion of the analysis follows a phenomenological approach heavily based on the descriptive analysis methodology developed by Amedeo Giorgi. They include (Giorgi, 1965; 1966; 1970; 1975a; 1975b; 1979; 2009):

1) Read the entire transcript to get a sense of the whole.

2) Re-read the transcript slowly and delineate natural meaning units; where a shift in meaning occurs. The researcher must *bracket* their biases as much as possible during this process.
3) State the central theme of each meaning unit. Eliminate redundancies and synthesize the descriptions based on central themes, keeping in mind the specific language of the participant.
4) Develop descriptions of *situated structure* (the what of the phenomenon under study) and *situated style* (the how of the phenomenon) of the phenomenon:
    a. Return to the data with each research question and express the central themes in terms of what they reveal about the *situated structure* and *situated style* of the phenomenon under investigation.
    b. Synthesize the descriptions of *situated structure* and *situated style* of the phenomenon.
5) Complete the first four steps above for each participant's data. Then take all situated descriptions of structure and style and synthesize and re-word them into descriptions of *general structure* and *general style*. This should arrive at a 'universal' or broader description of the phenomenon for the whole group of participants.

This process addresses the main research questions resulting in four types of synthesized descriptions: 1) situated descriptions of style; 2) situated descriptions of structure; 3) general descriptions of style; and 4) general descriptions of structure. Descriptions of style refer to the 'how' of the experience of learning, and descriptions of structure refer to the ‘what’ of the experience of learning (Giorgi, 1975b). There are situated descriptions of the phenomena for each participant, and general descriptions of the phenomena for the participants as a group.

Analysis Part Three: Interpretative analysis. As an added layer, I also triangulated the data through an interpretative compare-and-contrast analysis of the interviews one, two and three between participants. The aim of this layer was to include my own perspective of what might be occurring with regards to learning about self and other in virtual worlds as emergent from the interviews with the participants. An interpretative analysis was an important element to include as a supplement to the descriptive analysis so that what I gleamed from my interactions with participants could still be taken into account.

This three-part approach added layers of analysis in a sequential and transparent manner to include multiple aspects of the phenomenon under study. The primary phenomenon under study is how people with physical disabilities experience learning about self and other in virtual worlds. This includes how each individual experiences learning specifically and also how the group of participants experience learning in general. Descriptive analysis allows for the exploration of the phenomenon as experienced and recounted by the participants. Naturally, through my questions, synthesis and interpretative analysis, the phenomenon came to include how I, the researcher, perceive the recounted experiences of the participants. Finally, as a reader of this thesis, your perspective and meaning-making also come to form an aspect of the phenomenon as you perceive and experience this text.

Ensuring Trustworthiness of the Data and Qualitative Rigour

Validity in the qualitative sense relates to how the researcher senses that the reported information and experiences are accurate and truthful to the person being interviewed (Seidman, 2006) instead of compared to a population. Ensuring credibility and trustworthiness of the data in this type of study is done by triangulating the data to ensure internal consistency over multiple interviews, throughout interviews, and among participants, (Richie & Lewis, 2003; Seidman, 2006) which is called data sources triangulation over space, time and persons (Thurmond, 2001). Ensuring that the researcher understands participant responses is also another important criteria for ensuring the credibility and trustworthiness of the analysis. This was done in two ways: the researcher ensured that the content the participant provided was understood by the researcher by actively listening and probing throughout each interview, and by asking follow-up questions for clarification in subsequent interviews.

Member checking was not conducted. According to Giorgi (2006), checking the validity of findings with participants is not practical nor theoretically aligned with the phenomenological perspective. First, by the time the analysis is completed the perceived experiences of the participant may have changed, requiring a redo of the analysis and results and given the delicate and time-consuming nature of the phenomenological analysis process it would be impractical to do so (Giorgi, 2006). To address this issue during the data-collection period rather than after the fact, as previously discussed, follow-up questions and probing were used extensively throughout the interviewing process to maximize my comprehension of the described experiences. Furthermore, the transient, temporal and contextual nature of experiences must be taken into account and acknowledged: the analysis and results of this study are a snapshot of the phenomenon at a particular time. Second, with regards to the theoretical aspects of member checking, Giorgi (2006) mentions three main issues:

1) Researchers who require member checks to be conducted misunderstand the goal of the phenomenological study.
2) The assumption that participants can grasp the phenomenological method and the language of the discipline, in this case educational technology, to be able to assess the findings is unfounded.
3) The assumption that the participants are privileged in grasping the meanings of their experiences is unfounded.

First, Giorgi (2006, pg. 358) states, “whether or not the individual participant agrees with the findings is beside the point. There is a confusion here of goals: this is knowledge for the discipline, not for the individual…” Although the results of the research include descriptions of participants’ experiences and the perceived meanings they ascribe to them, there is an additional layer of my own identification and interpretation of meanings in relation to the research questions and my discipline of study. Second, the synthesized descriptions of the meanings of the experiences are written in the language of phenomenology and the researcher’s discipline for it to have relevancy to the discipline (Giorgi, 1975a; 1975b; 2006). One cannot assume that participants understand the language of both spheres, nor have expertise in the phenomenological method to be able to assess the validity of the findings (Giorgi, 2006). Third, Giorgi (2006, pg. 358) states that participants might not have thought about the meaning of their experiences, and that the reflections on the meaning of experiences is done by the researcher during the analysis process, therefore the meanings obtained are not just the participants' perceived meanings but also what the researcher perceives:

> "Participants are surely privileged when it comes to what they *experienced,* but not necessarily concerning the *meaning* of their experience. The findings, if properly obtained, are concerned with meanings of experience. (…) There is no privilege on the part of the experiencer and to use participants as validity checks is not trustworthy." (pg. 358)

Putting aside these issues with member checking in phenomenological research methods, the results of the analysis and conclusion of the study will be debriefed and shared with each participant personally and then with the virtual community. It is appropriate and ethical to debrief participants of the findings given the time and energy they put into participating in the study.

Qualitative rigour in phenomenological research. Qualitative rigour consists of four elements: truth value, applicability, consistency and neutrality (Beck, Keddy & Cohen, 1994; Lincoln & Guba, 1985). In phenomenological research stemming from

Husserl, qualitative rigour must involve bracketing and explicitly stating assumptions and biases (Giorgi, 1975a; Laverty, 2003).

Stating one's assumptions and biases is important because interpretation still lingers despite our best attempts at neutrality (Giorgi, 1975b). Therefore, one must become aware of and clearly state the presuppositions the researcher personally holds. This allows for readers and researchers to "replicate" one's findings by coming to the same conclusions through approaching it with the same lens as the researcher describes themselves to have (Giorgi, 1975a). Giorgi (1975b, pg. 96) states:

> "The control comes from the researcher's context or perspective of the data. Once the context and intention becomes known, the divergence is usually intelligible to all even if not universally agreeable. Thus, the chief point to remember with this type of research is not so much whether another position with respect to the data could be adopted (this point is granted beforehand), but whether a reader, adopting the same viewpoint as articulated by the researcher, can also see what the researcher saw, whether or not he agrees with it. That is the key criterion for qualitative research."

The researcher's assumptions and biases. I came into this study with a series of personal biases and assumptions gained from my own experiences in Second Life, a previous study related to the topic at hand (Judge, 2012), and my own thoughts and reflections on the subject itself culminated throughout the last few years. The emergence of the current exploration and interest with this topic stems from an interaction with a person with a disability, while in-world. The next passage shares an event I experienced:

> I have always been interested in the human condition, and care deeply about social justice, equality and ethics. These interests and concerns arose in me in a new context when in 2009, I discovered Second Life. Within the first hour of exploring the virtual world, I struck a conversation with a stranger who had been using Second Life extensively for several years. After some minutes of friendly introductions this person confided that they were quadriplegic in real life. At first I was surprised because if they hadn't revealed it to me, I would have never known. I wondered if we would have still exchanged such fluid conversation if the circumstances of our meeting were different, if we were more aware of our corporeality. As I tried to imagine this person behind the computer screen, I began to wonder how people with real physical disabilities experience having a virtually able body, no sign of disability, and a whole virtual world to explore on the same playing field as everyone else.

In addition to this experience, I have other biases and assumptions that relate to the type of research at hand. I have a bias towards exploring this subject through a phenomenological lens because at a most fundamental level I assume that concepts and reality are intersubjectively defined between people through meaning-making mediated by social, cultural and historical contexts and that develops from reflecting on sensory experiences and through the use of language. "Objectivity" to me, refers to shared human experiences and meaning. I am biased towards Giorgi's phenomenological methodology based on the Husserlian descriptive phenomenological approach in contrast to the Heideggerian interpretative or hermeneutical approach (Giorgi, 1960; 1975a; 1975b;

2009), because Giorgi's methodology is structured, rigourous and easier to learn, thus it is the methodology I am most familiar with at this point in time.

Furthermore, I think that the way I present participants' experiences should stay as close as possible to the particular language used by the participant so that the subtle nuances relating to tone and choice of words are preserved. In online text chat there are words and ways of communicating that are very particular to the culture of virtual worlds that I want the reader to experience. For example, people in Second Life (SL) refer to the non virtual as "First Life" (FL) or "Real Life" (RL). Terms like these cannot easily be translated into the language of 'another culture' though I do attempt to explain them nonetheless.

The Researcher's Role and Other Ethical Considerations

Considerations regarding my role as the researcher and ethical issues are discussed in this section. Key issues addressed are deception, rigor and trustworthiness of the data, communication with participants and *epoché*, informed consent, *Second Life*'s terms of service, rewards or incentives for participation, and privacy and confidentiality.

First, avoiding deception is a tricky issue when dealing with virtual environments because people can present themselves through their avatar presence as anything. I avoided deceiving participants as much as possible by being authentic in how I present myself in-world and by stating in my public profile that I am conducting research in the domain of educational technology at the masters level.

Second, I cannot ensure that what participants say was true because I cannot verify their information in the real world. However, because this is a phenomenological study dealing with understanding the perceptions, this should not matter. Although I cannot verify the veracity of what participants told me, I could check for consistency of information by triangulating information across interviews with participants. If there were significant reasons to doubt the veracity of their claims, I could omit the participant's data from the study. After triangulating the data, I found that was unnecessary.

Third, I tried to remain conscious of all interactions and communications with participants, including awareness of the language used by participants, pauses in conversations and by emotes and verbal or written expressions such as laughter and sighs. I had to attempt to enter into a state called *Epoché*, whereupon the mind quiets and empties to become receptive to the state of mind of the participant I was interviewing, also called *bracketing* any presuppositions about the phenomenon to prevent these from affecting the inquiry (Giorgi, 2006; 2009; Finlay, 2009; Groenewald, 2004; Moustakas, 1994). Neutrality with the use of the *epoché* mindset was thus attempted while probing and deepening questions, so as to not steer participant responses and explore the phenomenon in-depth during interviews.

Entering the state of *epoché*, requires the suspension of *a priori* conceptions of what "a thing is" or even that it exists at all, so that the individual elements of a sensory experience can be explored as a perceived phenomenon (Giorgi, 2006; 2009). Moran, (2005, pp. 187) states, "*epoché* suspends not just particular beliefs and theories about the world, but the very basis of all 'thetic' (i.e. believing in existence) positing, 'world-belief' (*Weltglaube*) itself." Kockelmans (1994) states that the state of epoché is not the same thing as being a sophist or skeptic that doubts the existence of the world; the world exists but our judgments and pre-conceived notions of the world are set-aside during phenomenological inquiry.

Though I doubt one can enter into an absolute state of *epoché*, I still think it should still be attempted so as to increase rigour (Giorgi, 1975a). This striving for *epoché* is parallel to the natural sciences' that strive for objectivity while studying nature. The difference is that studying experiences of human subjects requires different tools than in the natural sciences because of the unique intangible characteristics of human consciousness (Giorgi, 2005). To make up for the inability to bracket all presuppositions, these should be reported as researcher biases and assumptions so that the scientific community can take these into account while assessing the results of a study (Giorgi, 1975a; 2006).

Fourth, I ensured that participants were fully informed about the study and consented to participate. This study focuses only on individuals with physical disabilities thus understanding the consent form is unlikely to be an issue. The consent form informs participants of what the study entails so that they can make an informed decision about participation. The consent form also informs and reminds participants that they are allowed to discontinue the study at any time without negative consequences. At the beginning of each interview, I reminded participants of the consent form and that they are free to discontinue their participation at any time.

Fifth, respecting *Second Life*'s terms of service was another ethical consideration that applies to research conducted in-world. The terms of service state that one is not permitted to use or share information obtained through private instant messaging chat in *Second Life*. Thus, the text or voice chats with participants can either be done in the local chat or participants explicitly agreed to waive the terms of service for purpose of the study so I could retain the transcript of the private chat conversation.

Last, the decision not to reward participants was a conscious decision made for three reasons: 1) Those who are drawn to participate are more likely to be doing so for intrinsic reasons. 2) Given the anonymity provided by the avatar, this measure aimed to avoid deceitful or unauthentic participation. 3) Because there was no tangible reward given for participation, the participant should not have felt pressured to continue the study.

Confidentiality

Confidentiality of both real and virtual information is important in virtual world research. It is not sufficient to only protect the real identity, because virtual identities and reputations are just as real and vulnerable as out-world ones (Adrian, 2009; Grimes, Fleischmann & Jaeger, 2010). Real names, images or other information were not collected during the study. I was only aware of avatar names. In this report, by replacing avatar names with pseudonyms confidentiality of participants' real and virtual identities are protected. Given that places in Second Life are generally accessible to anyone at anytime, measures were taken to conduct interviews in an isolated and private place in Second Life, far from the ears or eyes of other Second Life residents. A space was rented on a privately owned simulation or virtual land that has a security system installed where only selected avatars have access to the area or they will be removed from the premises. Confidentiality of any personal information obtained through interviews is protected from unauthorized access by saving the data on a computer hard-drive of my computer in password-protected files.

Limitations of the Study

As with any study, the limitations of this study inherently follow from the type of study and its epistemological, ontological and methodological assumptions (Guba & Lincoln, 1994) meaning that it is not suited to operate outside of these parameters. Specifically, a phenomenological study does not aim to describe a mind-independent objective reality but instead to describe the phenomena as experienced by people thus returning to Husserl's idea of returning to "the thing itself" (Giorgi, 2009; Groenewald, 2004; Husserl, trans. 1983). The subjective experiences and extracted meanings are not generalizable outside of the specific group and context under study though it aims to define the phenomenon generally (Giorgi, 2009).

The design and subsequent results of the study were confined by the natural limitations pertaining to the virtual context in which the research was conducted. The researcher did not interview participants face-to-face, and was limited to in-world voice or text chat for interviewing. It is possible that some of the nuances may have been lost in this communication mode, as it excluded genuine body language, and facial expressions. In the case of text chat, vocal fluctuations, sighs and laughter may also be missed. Furthermore, it was impossible to “verify” the information provided by the participant with other sources and observations but this is not a grave issue because it was not deemed crucial to the understanding of the phenomenon *as experienced* and recounted by these individuals.

Chapter 4: Results and Analysis

The purpose of this chapter is to present the results of the descriptive analysis and interpretative analysis of the data. The chapter begins with analysis part one: narrative descriptions of experiences for each participant, analysis part two: return to the research questions through synthesized descriptions of structure and style of the phenomena, and analysis part three: interpretative analysis.

To briefly summarize how the results of each analysis are presented in this chapter, I will provide an overview of each section and refer back to relevant parts of the methodology chapter under section “a detailed review of the analysis methodology”, and then proceed to the data. Part one of the analysis introduces each participant and contains in-depth narrative-style descriptions of each interview for each participant (for more details refer to the subsection entitled “analysis part one: narrative descriptions of experiences for each participant”). Part two of the analysis specifically targets the main research questions by providing synthesized descriptions of the “how” and “what” of the phenomenon for each participant and the group (for more details refer to the subsection entitled “analysis part two: return to the research questions through synthesized descriptions of structure and style of the phenomena”). Part three of the analysis explores similarities and differences among participants’ recounted experiences through a compare-and-contrast interpretative analysis that is organized by theme (for more details refer to the subsection entitled “analysis part three: interpretative analysis”). The results for each research question are summarized at the end of this chapter.

Part One: Narrative Descriptions of Experiences

The descriptions contained in this section provide rich narratives of each participant's experiences as they emerged in the interviews, to recount the story as truthfully as possible so that the reader may understand the meaning of the phenomenon for the participants (Seidman, 2006). Please note that throughout the following narrative descriptions, the abbreviation "SL" refers to Second Life, and "RL" refers to real life.

Participant 1. This participant is a middle-aged woman who suffers from a multiple chronic diseases that debilitate her in real life, including Hashimoto's disease which is an autoimmune disease that attacks the thyroid gland, and degenerative disk disorder. She has been using Second Life for approximately 10 years.

Interview 1: Understanding the context. I teleport the participant's avatar to my research site in the virtual sky in Second Life. There we meet avatar-to-avatar, and the participant presents himself embodied as a male through a role-play emote that says "waits for his vision to clear". The graphics finally load onto our respective screens and the interview begins. I ask whether text or voice would be preferable to him and he replies "Text is fine. I can voice, but I tend to communicate a little better if I type." He also mentions that he is a little nervous but ready to proceed.

He talks at length about the most memorable time in his life; when he joined the military to follow in the footsteps of his father. After testing out from becoming a pilot because of an issue with his hearing, he joined the army reserves and then military police school. His self-confidence grew as he flourished in the training environment, and enjoyed the structure, being pushed and succeeding, and learning new things. He shares "I wanted to take on the world (…) I graduated high school, military police school and started college all in the same summer."

The most challenging aspect of the military was the physical as he says, "I knew almost from the start that something was off though. Building my strength compared to others less in share than I was, was slower going. My joints and muscles our seize when I ran, but I pushed through it." Eventually he saw a doctor who confirmed that it was not normal to seize up or feel as much pain and he ignored the advice of quitting because "I was terrified and pushed through the pain. (…) I wasn't satisfied with giving up, because someone told me I should. I didn't want to be a disappointment to myself or my family (…) I still wanted very badly to succeed and follow through with my commitment."

As we discuss health issues he reveals his physical gender, "Heh… I should probably stop and say now for the sake of the interview, that I'm female in RL (real life)." Her health issues were finally diagnosed 14 years ago. Her husband was relieved they were not fatal, and she was relieved that she wasn't going crazy and imagining things. She lists numerous health issues that she faces: migraines; weight issues; low energy; Hashimoto's disease; hypothyroid due to an autoimmune disorder; fibromyalgia; degenerative disk disorder; sleep apnea; chemical depression. The limitations she faces from these health issues are multiple; "I am not to lift more than 5 lbs. I have very limited about of energy in which to work with each day. I am in chronic pain with frequent flair ups, and despite my best attempts I am 100 lbs over weight.” Due to her disabilities she cannot make long term plans and is forced to live day-to-day.

When I ask about what she has learned from these experiences, she says, “I’m still learning I suppose. I know that I can survive. For a while I was horribly bitter. I liked being physically active and it’s frustrating that I can’t just get up and go, and do all I want in a day. So, I have learned patience. I have recently started learning to work with and not against my limitations. I’m even taking art courses from home.” She adds, “I… don’t really get out. It takes a lot out of me to leave the house and do things. So, most of my life now revolves around what can be done at home, through family, correspondence, internet, SL (Second Life). I do what I can to keep going. I still get frustrated, especially when I have to take breaks and rest. I still burn myself out every few days. I don’t stop, but my body forces me to pause.” she laughs. If life could be ideal, “I’d probably come up with something more than human. I’d settle on having a decent handle of my health for now, some stability.”

As the interview wraps up, I ask her to tell me what disability is. She replies, “In the past I would have said, limitation. I’ve come to understand it differently with time. It’s come to mean, change.” She adds “A change in focus, in how you view yourself and the world around you. A change in how you live your day to day. A complete change in skill sets and interests if need be (…) it is okay to redefine yourself. That doesn’t mean you aren’t still you.” and that “If you are so intently focused on a single thing, and a single way of being, disabled or not, you can still self enforce limitations on yourself" and that "that limits you more than the illness itself."

The interview ends and we warmly schedule our next interview session. He tips his hat and teleports out.

Interview 2: Exploring the present. The participant teleports to my research area in Second Life and the second interview promptly begins. She tells me that she came to Second Life out of pure curiosity while it was in open beta in 2003 because she loved to beta test games. I ask her what kept her in Second Life to which she replied, "I didn't stick around for very long originally, due to real life events, but the idea of shaping the world around you. On an artistic level, that really appealed to me. I don't think things really solidified for me... or in other words. What really glued me here after some time, was the freedom to do what I wanted. That became very important to me as my conditions progressed. (…) I wanted to escape I suppose, to go out and do things without tiring. I wanted to be able to connect with others as well. It developed into so much more after a time. It's truly been a road to self discovery."

She shares the gradual progression of her avatar identity(s) and how it affected her sense of self. She started with an avatar that was a representation of her physical self down to weight, height and gender and that she kept it within constraints "For instance, flying wasn't something I could do in real life, so I didn't here, but I allowed myself to do things that were humanly possible, that I simply couldn't do anymore, or didn't have the resources to do." After this, she found a role-playing community and took her avatar to the extreme, which was in line with her fondness of Dungeon and Dragons and other tabletop role-playing games. She states "Over time I realized I could rebuild myself as whatever I wanted." and "I found that I was more comfortable in a male body for instance. My current avatar is an infusion of fantasy role play, and the person I truly feel I am inside. (…) I feel a connection to this form, a second but equally valid self."

Regarding the exploration of gender through the avatar, she states that her health-condition was all-consuming and she was unable to spend the time and energy into exploring gender until she came to Second Life. Her experience was the following: "I became uneasy with my original form, it didn't "fit" anymore. Too constraining. I experimented with other forms, not as RP this time, but to try and find the skin I was most comfortable in. A few years ago, I did what I had been avoiding for a long time. I tried a male avatar. It was an immediate connection, it felt natural, though it took some time to really admit it to myself." and "My surrogate allowed me to deal with what I had lost in real life, my current form, the male part at least allowed me to deal with what I never had." She adds, "I knew there was something to it, when I became self conscious of my self on the screen. I suddenly cared about what others would think." Over a period of time, she told her closest friends in-world and phased out her female avatar and "mourned her passing" and became male full time in Second Life. She found confirmation through interactions with others, she expresses, "What I found curious and also confirming, is that others assumed my typist was male, no matter which gender I presented myself." She now is aware that she has to deal with her gender in real life but that she “can’t click a few buttons and fix it, you know?” Learning to cope with her disability, she states, also helps her cope with the issue of gender.

I ask her what role Second Life has played in coping with disability. She replies that “The ability to be what you want, to do what you will, to create and interact, it is not exactly limitless, but it often feels that way. Experiencing new things in SL (Second Life) and socializing and talking with others, they've allowed me to reflect on what new things I could try in real life. The surrogate in the beginning allowed me to continue doing the things I couldn't anymore. When I felt down in RL (Real Life) I could log in and do what I was missing, until I didn't need to do it anymore. I could cope with things on my time, a piece of a time, or simply escape for an evening and not think about it. It allowed me to connect with others with similar interests or situations. Talking to others, especially those with similar circumstances, helps me feel less alone and allows me to realize if it's not the end of the world for them it doesn't have to be for me. I have a tight knit network of friends, and we are there for each other to vent to, or to hang out with and goof off, to bounce ideas off one another. It's so much easier to talk with someone who already knows what you are going through. There is less to explain, you can spend more time just being or doing. When we run into an issue, it's possible someone has already learned or developed a coping mechanism, and we can share this information with each other. There is more knowledge to be had in sharing experiences rather than trying to do everything on your own.” She also finds it easier to communicate with people through Second Life because she can type out her thoughts and take her time, and not feel as nervous compared to being in close physical proximity. Through chatting with other people, she says, “My perception constantly changes in regards to others and myself. The more I learn the more I question. (…) I continue to infuse my real life with what I learn here.”

Interview 3: Meaning. This interview explores the explicit meanings the participant ascribes to her experiences. Regarding the meaning of Second Life, she replies “freedom of expression” and “the removal of physical constraints, we can step outside of our body in a way.” She states “It could be argued that there is infinite “can” in SL (Second Life).” and “You can't do physical things in SL, but in regards to simulation it's an amazing platform. It is obvious from the start that the mental and emotional can exists here, sans physical body.”

To her, community in Second Life means “Togetherness with like and or open minded individuals. Groups of people seem to be drawn together here, by common interest. At times, that also means, the ability to work together.” With regards to other people in Second Life, she says, “The people here are the very same people in the real world, regardless of whether or not they behave the same. Everyone who stays on in SL has some sort of relationship with their avatar or avatars as the case may be.”

When it comes to interacting and learning from other people through Second Life, she states, “Yes, certain interactions spark self-awareness. Something as simple as a question can make you reflect on something you may not have thought about on your own time.” Furthermore, that “There is growth and discovery among close friends, and among the community, always sparked by sharing information. People are more open in second life to express themselves.” She provides an example of a friend of hers who is agoraphobic and who is very outgoing in Second Life, and adds that “In both cases (her own and her friend’s) it is our true personalities. If anything I restrict myself in RL (Real Life).”

Regarding the portrayal of disability in Second Life and the meaning she ascribes to it, the participant states, “I've seen folks in SL who choose to portray themselves with their disabilities, a wheelchair for instance, or hearing aid. I guess it depends on whether or not you feel that is a defining characteristic of your person, and how much of yourself or what part of yourself you choose to share in SL. There is a difference between a legal disability you are born with and one that you develop later in life. Someone born blind or deaf will not necessarily see that as a disability. It is simply who they are.”

The meaning of disability also changed for the participant through Second Life, as she says, “It does change how I think about disability and ability. It becomes simply, what you can and can't do, and you don't have to be defined by what you can't. It is more important what you can.” Furthermore, she adds, “Disability is not to be wholly ignored, but it needs to be considered only a part of a persons whole being. Much like our avatars are only a part of our whole being, mentally and physically.”

Elaborating on the meaning of the avatar for the participant she says, “It means that I have a way of expressing a part of myself that I could not so easily express in other means. A tool or extension... a virtual prosthesis that conforms to ones needs.”

Participant 2. This participant is an adult male who was diagnosed with multiple sclerosis four years ago. He has been using Second Life for about 9 years.

Interview 1: Understanding the context. Up in the virtual sky on my research platform, my avatar and the avatar of this participant meet. The graphics load on each of our screens, we take a seat around the tea table and the interview begins. The first things the participant mentions is a place that he created in Second Life to honour past and present friends he has made inside the virtual world, and that he has been a member of Second Life for 9 years. He interacts with the Second Life platform through a speech-to-text program called Dragon when his right hand becomes tired. When I offer to conduct the interview in voice, he says that type is preferable and that he is shy.

He describes the most memorable moments of his life being when he lived in China while he was training a team of people on a system. Since he does not know Mandarin and they did not know English, he said that that situation taught him that words get in the way sometimes. He elaborates and tells me that he once trained a girl with a hearing disability and he said he learned to use facial expressions and gestures more with her and applied that to the training situation in China.

When asked about his strengths and weaknesses, he says, “I am very analytical, to the point I see patterns” and likens himself to a pit-bull that never lets go, saying “tenacity could be a strength, but also a weakness. I’m finding that out with my MS (multiple sclerosis).” Speaking of his disability, which started at the end of 2009, he says “I mainly have issues on the right side and balance issues, I mostly have to use a walker. If I type too much, my right arm gets fatigued.” He says he experiences the fatigue like a rechargeable battery that required rest to recharge, but when it is low his arm “quits” and his leg “drags”. He also mentions that his short-term memory is bad, but this long-term memory is unaffected. He was diagnosed with MS after having a CT scan and MRI to check into balance issues he was having since 2008. He says “literally got my MBA one day and diagnosed the next.” His family’s reaction, as well as his own, was to take it in stride and simply make adjustments to handle it.

To define disability he says “I break the word down: dis = not, ability = can do.” I ask him how he copes or adapts to his disability. He responds that “You have two choices: find a way or quit. Find a way is funner.” He says, “…like I said I am very analytical so I look for technology to help.” but that “Technology is a tool. You must make sure it is not a crutch. Technology can be a crutch if abused, dependent upon too much, or becomes an excuse.” He says he uses technology to balance out his shortcomings only, as expressed in this phrase: “I use it and it does not use me.”

When I ask about his daily life he says, “I wake up, grab some breakfast, watch some TV, then boot my computer to work on some documents or Second Life. Around one o’clock I will do lunch, watch some TV, around 5:30 I will login (to Second Life) and log (out) around 9 o’clock.” He adds that he likes to watch international series best.

He currently lives with his mother and his brother. Regarding his brother he says, “My brother has MS also. He had it before me. He has been a template. For him it is more mental, but for me it is physical. MS might be the same disease, but it affects everyone differently.” I ask him what he has learned from his brother. He says, “I think tenacity. Either it has you, or you have it.”

Regarding what he learns from disability, he says, “hit ctrl shift r (keyboard shortcut for wireframe view) and do it again to get back. That’s how I saw SL (Second Life) when I first started. (…) I use tech to get rid of the dis when I can.”

Interview 2: Exploring the present. This interview begins with the participant introducing me to a place his Second Life partner and himself created that is very significant to him. The virtual building is filled with images of avatars and virtual objects. He says, “We built this to reflect our friends. It’s more of a remembrance of them”, there are images of avatar friends who have passed away in the real world and others who remain. He then points to a specific image and says, “This one is one from ‘there’ (another virtual world called there.com). Its where I met ____ (his partner) 10 years back.” He says that they came to Second Life from There.com because all their friends moved to Second Life and they wanted to get away from drama.

The participant shows me a large screen of changing images that seems to be crowds and crowds of people gathered together and mentions a very dear friend who passed away and who had a huge influence on him and many people in Second Life,

"___ taught me how to do motions (how to build moving objects in Second Life). Come see how many she effected. This is a screen I did at her memorial. In a sec (second) is the avies (avatars) she touched… took three sims hehe." He talks about the simulations that were created where she and other mentors would help new avatars learn how to use Second Life and how to build and create objects in Second Life. As he shows me around his part of the virtual world and all the various objects he created including a star field, he says, "This is what I have done with what ___ taught me."

Speaking of his home, he says, "This is my sanctuary. I come here to meditate, build, listen to my audiobooks. I do tai chi up here too. Balance is my issue, doesn't mean I can't do it here. I find it calms me here, helps with my MS." I ask him what Second Life has added to his life. He responds, "I like the creativity. I like knowing that everything was made by someone else. There is so much you can do here. Here can't is not a word. I like knowing that. The individual is the limitation. You can do stuff here that you cannot do in real life."

With regards to the potential negatives of Second Life he says "It takes away time from my real life. The downfall of Second Life… It is a company. They will always choose what is right for the company. People forget this." He says that Second Life underestimates the importance of the education, non-profit and real estate sectors and that they should focus on these again and that "they should treat it more like an environment" instead of a company.

Returning to the topic of disability, and revealing one's disability in Second Life, he says "Unless somebody tells you about their disability, they would not know. It affects things much life real life. You can choose what people know here. I call it selective information." I ask if there are people he is more likely to tell at which he responds that he is not worried about telling people about his condition and prefer people to take him as he is, and adds, "There is a stigma about people who have disabilities. I am more forthcoming to let them know they are not alone." He also mentions that he used to be a mentor to people in Second Life and that he would like to teach people how to get around that stigma. Given his real world education and work experience he says, "…I am a trainer, so training new people is very gratifying." He adds, "…because of my disability, I lacked focus. I once thought that my MBA was gathering dust. I can use what I know in SL and my expertise here in SL complements that. So now I have a little better focus. I like using my trainer abilities in SL." When new people ask him what the goal of Second Life is, he replies "There is no goal in SL (…) On what there is to do… I say merely exist. (…) to limit it, means not getting the most out of it."

He tells me about his own first experience in Second Life that was 9 years ago. He describes how all the avatars were first female and that one had to change their shape to male manually, that the world was wireframe and there was no way to teleport between places on the grid yet, no islands, just one mainland. He describes his first dwelling in Second Life, "My first house was a hole in the ground with a prim on top. Very different from today." I ask him about how he changed his avatar and he says, "I changed immediately. This is my original shape and hair except from the skin I have not changed much. This is my id and who I am. This is more who I would like to be, taller and thinner. As far as mental characteristics, this is who I am.” We joke about his Elf or Vulcan ears and he says that it came from when he played Everquest (an online virtual game) and was half-elf, and that he kept the appearance and avatar name saying, “We have avatars we’d like to be, so we carry them over.”

When it comes to interacting with other avatars and communities within Second Life, he lists a number of close friends he has known since the beginning and others who came along the way. He says, “Universally they make me a whole. I know I have skills and knowledge they can use… They give me focus to use them. When I first learned I had MS, I knew nothing about it. They shared knowledge with me. Moral support, just having an ear was great.” He also shares that Second Life helps with overcoming initial shyness because it is not as personal as face-to-face contact. Finally, I inquire about what keeps him into Second Life, to which he replies that it is the people and the creativity that keep him here, “I have more connections in SL. It has spilled over into real life by Facebook.” and that though he has never met this virtual partner in real life, they have been together through different virtual worlds for over 10 years. I ask him if they may ever meet, to which he replies, “Time will tell.”

Interview 3: Meaning. This interview begins promptly with the participant stating that Second Life is not a game, and removes limitations. In his own words, he says, “…it isn’t a game hehe for some its their outlet for creativity and a way to socialize. For people who have limitations, it’s good not to have them in SL (Second Life). In many ways.....deaf can hear the chat, homebound people can explore, and people who cant walk can fly."

I inquire about what that change in ability virtual would mean to someone with physical disabilities and he answers, "It all comes down to choice I think. I pride myself on being a shape-shifter but I choose to be who I imagine myself to be. You see some at VAI (Virtual Ability Inc.) in chairs but they can get up and walk around if they choose. It's discovering that identity that makes SL what it is." Regarding 'that identity' to discover, he says, "Who that person wants to be I think. See in SL, all someone sees is the pixels, not the brace, chair, shaking someone has. You choose what you want to be in SL. (…) Some say this is who I am, others show who they want to be. It comes down to choice."

The theme of people impacting others in Second Life emerges next in the interview. He mentions those people who had a huge impact on him and contributed to his success in learning in Second life, saying "I came into SL because of the creativity. Those people had a big impact on me, and I believe to pass it forward. Much like anything worth learning, I went from being a newbie to being a mentor." He says he learned how to build items in Second Life and basic scripting from other people who taught him how among other things.

On the topic of having an impact, the participant explains how he is using his MBA and years of training experience to help train "newbies" or people who are new to

Second Life on how to use the virtual world, and also by giving presentations at Virtual Ability. He says, “I made an impact on others by sharing the info.” Regarding the meaning of these exchanges, he says, “…usually the people are grateful on the training. I get a feeling of accomplishment. I am a firm believer that can't is not a word. When somebody finds out that they can do it, it makes me happy.” When talking of ability in Second Life, he says that Second Life is like its own country with its own language and customs. He says, “…all it takes is knowledge. That is why I say can’t is not a word.”

With regards to how he sees other people in Second Life, he says, “When people first start out in SL, they fall back on what they know. Some people learn new skills, but most people use what they know. (A friend) DJs, I train, and others do what they know. It comes down to comfort zones. People do what they are most comfortable doing from there they can push new limits, try new things.” Though he describes himself as introverted and shy in both worlds, the use of technologies such as Dragon and Second life makes it easier to talk with others. He says, “With my disease talking face-to-face is hard. I have to take a medication (…) so here in SL, I can do face-to-face without actually being face-to-face and talk about my disease. The emotional imbalance is easier to control (and) the medication is more effective.” To describe how Second Life helps, he replies “SL does offer a disconnection with people much like talking on the phone. There is a portion of the safety factor in SL.”

The interview now turns to the meaning of Second Life itself. The participant says “SL could be seen as a giant chat room, there is so much more to it than that but that is why they call this Second Life… back to what I was saying last week about merely existing." When asked to explain his personal idea of what "Second Life" means he replies "SL is like a reboot. You can start over without all the complexities."

Starting over inevitably brings up the topic of "alts" or alternative avatars that people create to have multiple identities in the same virtual world. The participant says that a lot of people have regrets and therefore they start over with a new avatar or alt. He avoids alts saying, "In my eyes creating an alt IS an easy way to run away (…) It's too easy to reboot." and that it is best to face fears instead of running away. He then lists appropriate situations that have valid reasons for creating alts: business applications; sim (simulation) control; professional versus personal avatars; and teacher avatars.

Before wrapping up the interview, I return to the question on how Second Life may have changed the participant's idea of disability, at which he says, "My outlook on being disabled has changed. It used to be the end of the world, now it's just the end of a chapter hehe." When I ask if disability still exists in Second Life, he replies, "It will always exist. Dis = not ability = can do. The trick is to find a way to remove the (dis). I did that by finding tech that evens the playing field." He also became more involved with the Virtual Ability community after he was diagnosed with MS, and helps to share his knowledge about using technology with others who have disabilities.

The interview ends on the topic of the participant's view of disability after his experiences in Second Life. The participant shares the following thought: "It's just another hurdle to be overcome. The thing I like about SL, it makes you look past the pixels. In a way that's what disability is, another layer of pixels."

Participant 3. This participant is a relatively young adult male who was born with muscular dystrophy, requiring caretakers and the use of a wheelchair on a daily basis. He has been in Second Life for 6 years.

Interview 1: Understanding the context. We briefly introduce ourselves in instant messaging and confirm that each is ready to commence the interview process. I teleport the participant to my research platform in the virtual sky and our avatars meet and sit around a virtual tea table. The interview begins by exploring important life moments. The participant shares that the most memorable times in his life were his major accomplishments: graduations; killing his first deer with the help of his father who held the gun which he felt was exciting but sad; learning to play chess; and his first romantic relationship which related to Second Life and 'real life'. When speaking of these events he says, "I guess I see them as marking the ends of different stages in my life. Like rights of passage."

On the topic of disability, he says he was born with muscular dystrophy. Muscular dystrophy affects him in many ways, he says, "I'm basically a quadriplegic, but I can feel everything. I can also speak, but people often can't understand me when I voice online. (…) I've always had to depend on people to help me do everything. Basically all activities of daily living: bathing, dressing, eating, etc…" I ask him how he feels about it and he replies that it doesn't really affect him because as he says, "It's all I've ever known."

When exploring his good qualities, he explains that his intellect is his primary quality. Additionally, he says he is also a good listener, dependable, honest, supportive and very patient. The only aspect he would change about himself is his tendency to procrastinate; he laughs and says he does it, "Probably because I'm smart enough to get away with it". He says he's changed over the years, "I'm becoming more responsible as I age for sure. I don't go out and party like I did in college and grad school (…) but I'm an old person now."

I ask him how he experiences interacting with people in the physical world. He responds, "Initially it was difficult, but once people got to know me it was relatively easy." He adds, "It usually takes time for people to get over the initial shock of interacting with someone who has a disability. It's not something most people are use to. (I) just let them react within reason (…) I just let them experience the situation and interact with me. Everyone reacts differently (…) some people will treat me like a kid, or talk to me like I'm deaf." I ask him if their reactions bother him to which he replies, "Not really, I'm pretty accustomed to it." He adds that once people get over the initial reaction, "People get to know the real me, and eventually stop identifying me as "the handicapped dude"". The people he interacts with the most varies, he says "I see my close friends often. I'm closest to my nurses, an ex-coworker, and some people from college." Regarding what disability has taught him in terms of interaction, he says, "It's taught me that no matter who you are, the biggest obstacle to human interaction is relating your point of view to someone else. Once you figure that part out, everything else is cake."

For employment, he says, "I am a Vocational Rehabilitation Counselor. I was employed fulltime at a training center for the blind, but they laid me off because of downsizing. Right now I'm doing contract work for workers' compensation and for the state, but work is kind of slow right now." He says that although he enjoys his work, there are certain setbacks, he says, "I must say I'm getting tired of discrimination that still exists today." Despite those difficulties he says he finds it very satisfying to solve challenges and see people overcome obstacles because of his work.

To wrap up the interview, I ask him to define disability in his own words. He replies, "I actually think it's just a label that humans feel the need to create. If you really think about it, there are certain things some people can or can't do. Could you compete in the Olympics? Does that make you disabled because you can't do something another human can do? I think not." He continues saying, "I think people have an innate need to label everything. Disabled is a label. It's up to everyone as individuals to decide how we react to labels. Will they define you, or will you work towards showing how pointless labels really are?"

Interview 2: Exploring the present. The interview begins by exploring how the participant became involved in Second Life and the technology that allows him access to the virtual world. He recounts that he had read an article about Second Life over 6 years ago. What brought him to try Second Life, he says was, “Curiosity mostly...and being bored at home. I had just gotten out of the hospital and was on bed rest. (…) I was hospitalized for almost a month. I had really bad ulcers due to a bacterial infection in my stomach. It took a few days to figure out how to get around using my AT (assistive technology), but luckily I'm pretty tech savvy. I can see how many would get frustrated and give up on the experience. After I figured everything out, I loved it.” I ask him which kind of assistive technology he employs and he relays that he uses Eyetech, “It's eye tracking software/hardware. Wherever I look is where the mouse goes. I blink to click. I also type using an onscreen keyboard.” This technology allows him to use the computer and also to access and navigate in the virtual world of Second Life.

Regarding his avatar, he says, “I was eager to learn how to personalize my appearance. I started with just editing my appearance, and finding freebie clothes and hair. I attempted to mirror my RL (Real Life) facial features, but that was the only similarity. Back then griefers (people who cause grief; analogous to trolls or bullies in online 3D virtual worlds) were everywhere. I found that making myself tall and imposing made me less likely to experience griefing.” His avatar differs from his real body in the following ways, he says, “I can walk here. That's probably the most obvious difference. My avi (avatar) is also tall and muscular. I'm neither.” He explains that it felt important to have a sense of security in-world that came with his avatar appearance, because as he says, “I'm never really alone in RL (Real Life) so I've never really needed to feel secure in RL. In SL (Second Life) I'm kinda on my own, or at least I was initially.”

Interacting with other Second Life residents emerges next during the interview. He says, “I've acquired quite a few friends here. Most from different role playing groups. My current closest network of friends comes from VAI (Virtual Ability Inc.), and Lonsdale Boxing Gym.” In terms of how avatar interactions compare with face to face interactions, he says, “I think that depends on at least two factors. An avatar's age and sense of anonymity. Newbies are generally apprehensive and everything, and people without anonymity are less open about themselves.” In terms of anonymity through the avatar, he says, “Some here don't talk about RL (Real Life). and treat SL (Second Life) as an escape. These people rarely mention anything about RL. This gives them anonymity, and a sense of freedom to do/say whatever they like in SL.” Aside from those two factors, he feels that interactions are very similar to real life interactions.

I bring up the topic of disclosing one’s disability to people in Second Life or keeping that information private. The participant says, “I do eventually disclose my physical condition to everyone. I just usually wait till I'm pretty sure that A) it's someone I want to be friends with, and B) I don't think they'll treat me differently because of my physical condition. I know that probably sounds deceptive, but it a luxury that SL provides me. I'm not ashamed to take advantage of it.” What determines whether he will disclose his disability to someone in Second Life, he says is, “…whenever I have a sense of unconditional acceptance, (…) it's kind of a gut feeling. You know it's not always correct, but you still go with it. Everyone reacts differently, (…) Well, if my instincts are right my physical condition won't matter, but if they're wrong I'll experience pity. Pity is something I can really do without.” Otherwise, he says he is very open in Second Life and “real life”.

Most of his time in Second Life is spent volunteering at Virtual Ability Island, or coaching people at an in-world boxing gym. He recounts how he got involved with coaching, “I have pretty decent skills, so the gym owner asked me to coach. I enjoy helping people there. Accessibility is really important to the owner of the gym. He designed his boxing system so that people with various levels of motor control can compete on an even level.” As for his involvement with Virtual Ability, he says it’s the reason why he didn’t quit Second Life after his misadventures with drama in Second Life role-playing groups. Virtual ability, he says, “gave me a new perspectives on the power SL has to do truly great things. Finding VAI was literally a breath of fresh air for me.”

Interview 3: Meaning. The participant and I meet on the research platform as per our usual interview routine and commence into the exploration of meaning. The first question to be addressed is “What does Second Life mean to you?” to which he responds, “Hmm, first word that comes to mind is freedom. Freedom to interact with anyone. Also the freedom to help anyone.” He says that freedom is given in Second Life through the following means; “Well the most obvious way, at least to me, is the removal of almost all physical barriers present in RL. I'm not really just referencing barriers experienced by "people with disabilities". I know now we have things like Skype to communicate with people around the world, but I believe that virtual worlds provide a level of interaction that VoIP will never reach. I'm mostly referring to the ability to manipulate a shared environment with someone."

The participant explains that people can also collaborate on projects to a higher degree in this environment and allows people to gauge someone's ability to do something in real time. He provides an example of when he gave some advice to the boxing gym owner on how to make his gym more accessible, and that within a day the system had been updated and distributed based on his recommendations. He says, "People can accomplish things very quickly here." As it relates to inclusion and standing up for accessibility, he shares a story of how someone at the gym complained to the owner saying that the manner in which the participant was accessing the gym gave him an "unfair advantage". Instead of appeasing the paying customer the owner, "stood before the whole gym and explained away this person's concerns." He says, "This made me realize the difference one person can make in someone else's life. If fellowship in virtual boxing can give someone that "warm fuzzy feeling" we all like, imagine what other methods of inclusion here could accomplish."

Given his educational background and experience as a vocational rehabilitation counselor, he has been thinking about how to expand his services into the virtual world. Helping people brings him satisfaction and allows him to use his training for a purpose in-world. He says, "Unfortunately, I've only recently started to fully utilize the functionality of SL. That being said, I've had the opportunity to help people who would generally have not talked with anyone in RL about their problems. Most in my field don't feel that counseling should be done online, and I haven't be any means perfected counseling in SL. Nevertheless, I know people in SL who provide counseling services here. I believe that having more people available here to provide these services will increase the accessibility of counseling services. I haven't started counseling in SL yet. I just utilize my skills to help people I meet here whenever possible." The realization that counseling was a possibility in Second Life changed his view of his role in the virtual world, as a helper.

While we explore the meaning of communities in Second Life, he says, "I see SL as many separate communities, and people have can choose to be a part of a large and varied number of communities here." I ask how communities enrich his experience in Second life, to which he responds, "They don't really enrich my experience. They are my experience here." He defines communities as the following; "Community is really just a buzzword to describe something people have always done. That's sharing like points of view and/or working together towards a common goal."

Given all interactions in Second Life are through the avatar, the personal meaning is explored. His avatar does not portray disability, he says, "I didn't really have a wheelchair option back in 2007, and I would personally feel odd using one in a realm where I'm able to walk." The meaning he attaches to his avatar is, he says, "Right now it's just another means of helping others and maintaining friendships, but I'm hoping to someday I hope to have a professional presence here too."

In terms of what Second Life adds to his life, he says, “For me, SL allows experiences of mobility and independence I generally can't experience in RL. These experiences are quite liberating for someone like myself, but I'm sure others in SL experience the same liberation in SL for different reasons.” While exploring whether Second Life has changed his idea of disability, he replies, “I don't feel SL has changed my feelings, but it has strengthened my belief that individuals can accomplish anything when given the right tools and circumstances (…) That people are more than just the results of their mental and/or physical abilities.” I ask if disability still exists in Second Life in his view. He answers, “I think that depends on the person and the technology available to them. However, I believe that "disabilities" will be less relevant here as technology becomes better and more affordable.” The only concern for inclusion he raises during the interview is that voice chat in Second Life may affect the social inclusion of some people who prefer to type for communication.

Finally, I ask him if or how his virtual experience affects his self-concept. In response he says, “It doesn't change my view of myself. It's only an alternative method of interaction. Just like my condition, I don't allow SL to define me.”

Part Two: Addressing the Research Questions Through Synthesized Descriptions of Structure and Style

This section is an attempt to address the two main research questions: How to people with physical disabilities experience learning about self and other in virtual worlds? What do they learn? To address these questions, I apply Giorgi's descriptive phenomenological analysis methodology (1975a; 1975b), as described in the section A Detailed Review of the Analysis Methodology, in Chapter 3. This section contains the resulting descriptions of situated structure and style for each participant, the general descriptions of structure and style for all participants as a group, and the resulting conclusions for the main research questions.

Situated descriptions. Situated descriptions are syntheses of the phenomenon as recounted by one individual, that include the specific, concrete details of each instance (Giorgi, 1975b). These descriptions aim to define the structure (elements or what) and the style (interactions or how) that form the phenomenon under study for each particular individual separately (Giorgi, 1975a; 1975b). The following subsections contain tightly synthesized descriptions of what each participant learns and how each learns about themselves and others in virtual worlds. Essentially, each column answers the main research questions (What do they experience learning about self and other in virtual worlds, and how do they experience learning about self and other in virtual worlds) on an individual level, as gleamed from the ensemble of experiential descriptions the participant provided during the interview process. Please note that throughout the descriptions, the abbreviation "SL" refers to Second Life.

Situated descriptions for participant 1. Table 3 presents synthesized descriptions of what is learned and how learning about self and other in virtual worlds is experienced for the first participant.

Table 3

Situated descriptions of structure and style for participant 1

Situated Structure (What)	*Situated Style (How)*
She learns that her disability is not the end of the world and does not define her. She shifts focus to what she can do. She learns to cope with her disability through SL by interacting with people with similar conditions and sharing information, and coping strategies. Coping with disability through SL allows her to focus on other aspects of herself she did not have time for previously. New experiences in SL allow her to reflect on things she can try in real life. The participant learns that people are themselves in SL and everyone has a connection with their avatar. She learns that in SL she could shape the world around her and rebuild herself as whatever she wants. She experiments with other forms by creating fantasy role-playing characters and partakes in a role-playing community that she finds. She doesn't feel the same connection with her role-playing character, and also learns that her surrogate avatar that is a virtual representation of her physical self fulfills her in certain ways but is too constraining. She tries a male avatar, feels an immediate connection and realizes that she is more comfortable in a male body. She becomes conscious of herself on the screen and suddenly cares about what other people think, or whether she may get harassed or not taken seriously. She knows it is serious given that she cannot venture out on the same day and takes a few weeks to find the courage to venture out in SL as a male. She knows she has to deal with her gender identity in real life when her female avatar fades away and she and her SL friends mourn her passing. When her female avatar fades away she experiences it as sad but	By connecting with other people with similar circumstances through SL, sharing information and coping strategies others learned or developed, bouncing ideas off others, venting, hanging out and goofing off, she learns to cope with her disability. Communication is facilitated through text-chat, which makes her less nervous. People are more open in SL, and talking with people who understand requires less explaining. Coping with disability allows her to focus on other aspects of herself. SL allows the participant the ability to build and shape the world around her, which appeals to her on an artistic level. She can be mentally and emotionally there in SL 'sans physical body' removing physical restraints which gives her the freedom to do what she wants which is very important to her as her condition progresses. This allows her to escape, to do things without tiring, to connect with others and to self-discover. Self-discovery through self-interactions with her avatar is made possible by the ability to change appearance and gender with the click of a few buttons. When her female surrogate avatar no longer fits or feels comfortable, she experiments and tries other forms to find which skin fits. She faces what she had been avoiding, and realizes she is more comfortable in a male body when she experiences an immediate connection with her male avatar and becomes conscious of herself on the screen. She suddenly starts caring what other people may think, whether she may get harassed or not taken seriously. Her male gender identity is confirmed to her through interactions with other people in SL who

liberating to not have to rely on that form. She becomes male full-time in SL and gradually becomes more comfortable talking with her spouse about her gender identity outside of SL.	assume her typist is male no matter which gender her avatar presents as.

Both structure and style descriptions provided above are situated, meaning they pertain to this particular individual's experiences and contain as much of the exact language of the participant and the concrete details of the events as possible in a synthesis. The first column of this table, labeled as "situated structure", provides a tightly condensed synthesis of any relevant information participant 1 provided about what she experienced learning about herself and others in Second Life. To summarize the key points contained in the situated structure description, what she reported learning was that she is not alone in dealing with disability and it's not the end of the world anymore; she can share and learn coping strategies with other people in-world; and she can redefine herself virtually as anyone she wants to be and that she is most comfortable in a male body.

The second column of this table, labeled as "situated style", provides a tightly condensed synthesis of any information the participant shared regarding how she experienced learning in Second Life. To summarize the key points contained in the situated style description, how she reported learning what she learned was that through text chatting with other people with similar conditions she was able to learn and adapt coping strategies they employed to her situation; through dialoguing and interacting with others and her avatar she was able to confirm her perceived gender-identity by the way people assumed she was male in real life; and through exploring the level of connection she felt with her avatar she was able to explore and learn more about herself.

In short, participant 1 experiences learning about disability, self and other through self-exploration with the malleability of the avatar identity and her connection to it, and interacting, sharing information and chatting with other people in-world. The descriptions provided in table 3 define the specific instances of the "what" and the "how" she experiences learning in a virtual world. The next subsection will concisely provide the situated "what" and the "how" of learning for participant 2.

Situated descriptions for participant 2. Table 4 presents synthesized descriptions of what is learned and how learning about self and other in virtual worlds is experienced for the second participant.

Table 4

Situated descriptions of structure and style for participant 2

Situated Structure (What)	*Situated Style (How)*
He learns that virtual worlds like Second Life are tools to use to overcome his disability and even the playing field. He learns that SL provides choice to discover and be any identity or have any ability one wishes to have; lifts physical limitations; allows people to mask disabilities through the avatar; and to simply exist. He realizes that he is not alone and that disability is not the end of the world when he becomes involved in Virtual Ability, a community of people in SL who also have disabilities. He learns more about the disease from others in-world and about possible treatments. SL expands his view of what he	By using his analytical skills to address his disability, he finds that there are two choices: find a way or quit. He opts get rid of the "dis" in dis-ability and enable himself through technological tools including Dragon and Second Life. SL allows him the choice to be who he wants to be, to "merely exist", and to keep the same avatar name and appearance as he had in Everquest allowing him to express his identity as his id, and who he wants to be. SL also provides the tools to mask disability through the anonymity the avatar provides; overcome physical limitations; build and create anything he can imagine which provides a

could do with his education after he loses focus due to his disability by realizing that he has knowledge and skills others can use in SL. He decides to help other people, which he finds to be very gratifying. This gives him focus to use his MBA and skills as a trainer in SL. He becomes more forthcoming about his disability at Virtual Ability, which lets other people know they are not alone and helps teach them ways to reduce the stigma attached to disability. He gives presentations and shares what he learns with others, regarding technological tools to overcome disability. He knows SL provides an outlet for creativity and socializing. He finds it easier to communicate in SL and his social circle grows and spills into real life via Facebook. He realizes that SL is like a country on its own that has its own language and culture that requires patience to learn. He learns how to build objects in SL and how to animate objects from a friend he met in-world. The person who taught him how to animate objects has a huge impact on him and he wishes to pay it forward through teaching others. Everything he builds in SL stems from what he has learned from her, including a sanctuary he built in SL, which calms him in real life and helps with his MS.	creative outlet for him; talk and communicate with friends and community; try new things and push limits; and use his real life skills and knowledge to help other people. Since SL is not face-to-face and there is a disconnection parallel to talking on the telephone, socializing comes easier to him. A voice-to-text software called Dragon allows him to continue communicating in text when his arm fatigues, and allows him to avoid voice-chat with other people, alleviating shyness. With the ease of communication he makes more friends in SL, which spills into real life through Facebook. Through interactions with other people he shares mutual support, learns about the potential of SL and his own potential to focus and use his education and skills to help people in Second Life. He has an impact by teaching, mentoring, training and helping people, providing him happiness and satisfaction. Teaching others also strengthens his long-term memory affected by his MS. The sanctuary he built from what he learned from others, calms him and helps with his MS by providing a peaceful place where he can meditate, build, listen to audiobooks, and do Tai Chi, an activity he is unable to do in real life due to balance issues related to MS.

The situated structure and style descriptions pertain only to this participant's experiences and contain as much of the language of the participant and the specific details of recounted events as possible. The first column of this table, labeled as "situated structure", provides a tightly condensed synthesis of any relevant information participant 2 provided about what he experienced as learning about himself and others in virtual worlds. To summarize the key points contained in the situated structure description, what he reported learning was that using the right technological tools allowed him to get rid of the dis in disability and cope better; he is not limited physically and can be anything he wants to be in virtual worlds; he is not alone dealing with disabilities and can learn about his disability from similar people in-world; and about his role as a helper and mentor since he has something to offer to others in Second Life in terms of his real-world knowledge and skills even after being unable to work in real life.

The second column of this table, labeled as "situated style", provides a tightly condensed synthesis of any information the participant shared regarding how he experienced learning in virtual worlds. To summarize the key points contained in the situated style description, how he reported learning what he learned was that through the use of technological tools and Second Life and the sharing of information and community support in-world he was able to lessen the limitations and cope with the disability he experiences in the real world; and that through dialoging with and helping others in myriad ways he could also be a contributing member of the community.

In short, participant 2 expresses learning about his role, disability and others in virtual environments by interacting with technological tools, text-chatting with others and applying his knowledge and skills to help others in-world. The next subsection will provide the situated descriptions for the third and final participant.

Situated descriptions for participant 3. Table 5 presents synthesized descriptions of what is learned and how learning about self and other in virtual worlds is experienced for the third participant.

Table 5

Situated descriptions of structure and style for participant 3

Situated Structure (What)	*Situated Style (How)*
He finds out about SL and figures out how to use and navigate around in SL with his assistive technology called Eyetech. He finds that SL is freedom and liberation for everyone for different reasons and that it provides him mobility and independence he cannot have in real life and allows him to interact with anyone differently than other social technologies due to the ability to manipulate a shared environment with other people. At first he does not know how to edit his initial avatar appearance but learns how to personalize his avatar over time. He learns that he is less likely to experience griefing if his avatar is tall and imposing. This gives him a sense of security he never needed until SL because in real life he is constantly with other people who take care of him. Though he eventually discloses his disability, he learns to take his time and be selective over who he discloses his real life disability to because he wants to be accepted but does not like to be pitied. He learns that interactions with people in SL are the same as in real life aside from two factors: age and anonymity of the avatar. Specifically, he learns that newbies are apprehensive, and anonymous folk don't talk about their real lives, see SL as an escape and it gives them freedom to do or say anything. He makes many friends in SL, and is involved in a number of activities including building virtual objects, volunteering, hosting events, coaching at an SL boxing gym, and role-playing. He learns to use his imagination through collaborative impromptu role-play but found that role-playing in SL was irritating and required a lot of energy due to drama. He learns that there are opportunities to help people in SL with his real life skills as a counselor which he does whenever possible and provides him great satisfaction. SL changes the idea of his role in SL and that people are more than the results of their mental or physical disabilities and can accomplish anything given the right tools and circumstances.	Through an article written 6 years ago, he learns of SL's existence and out of boredom he tries it out. He accesses SL and in a few days, learns to navigate it using his assistive hardware / software called Eyetech that tracks his eye movements, allows him to click with a blink of an eye, and type on an onscreen keyboard. Through the removal of physical constraints present in real life, and through the manipulation of a shared space, SL provides him mobility and independence as well as the ability to interact with and help anyone. He edits his appearance with the editing menu and keeps his facial features similar to his real face, but changes his body to tall and muscular, which is different than in real life but provides him a sense of security in-world. Given that SL provides the luxury of masking disability through the avatar and anonymity, he waits until he senses that a person unconditionally accepts him before disclosing his real life disability. He experiences this sense as an instinct or a gut feeling. Through talking with various people in SL over the course of 6 years, he learns that interacting with people virtually is the same as in real life aside from the factors of avatar age and anonymity. His involvement in many different communities and activities as well as his open nature facilitates him making friendships in SL. Though he experiences some difficulties with drama in role-playing groups he does not quit SL due to the new perspective that SL has power to do great things as demonstrated to him by Virtual Ability and people in that community which make him realize that he also can help people with his counseling skills. Knowing other people provide counseling services in SL strengthens his desire to build a professional presence and increase accessibility of counseling in SL one day. With the affordability of SL and with the prospect of technology improving over time, he believes that disability will become less relevant and allow people to accomplish things they couldn't before.

As with the previous two tables (table 3 and 4), column 1 of this table, labeled as "situated structure", provides a tightly condensed synthesis of any and all relevant information the participant provided about what he experienced as learning about himself and others in Second Life. To summarize the key points contained in the situated structure description, what he reported learning was that Second Life freed him from physical limitations and gave him an independence he never experienced previously due to this disability he experiences in the real world; his avatar shape and appearance affected whether he was likely to be griefed by other residents; and he learns to be imaginative through role-play; and that he is a skilled boxer and can coach others and can use his knowledge and skills about counseling to help others in Second Life.

The second column of this table, labeled as "situated style", provides a tightly condensed synthesis of any information the participant shared regarding how he experienced learning in Second Life. To summarize the key points contained in the situated style description, how he reported learning what he learned was that through editing his avatar appearance and interacting with other people he was less likely to be griefed; that through interacting and chatting with other people in-world that he could help them in different ways; and that through being part of the community of Virtual Ability great things can be accomplished in a virtual environment and that he could be a part of it. The structure and style texts are situated, containing as much of the precise language of this participant and the details of the events as possible within the condensed descriptions.

To conclude, participant 3 experienced learning about the effects of Second Life on his perceived sense of independence and ability, his avatar appearance on interactions with other people through editing his avatar and being around other people in-world, and the potential benefits of being involved in online virtual communities. The next section will provide non-situated descriptions of participants' experiences as a group.

General descriptions. General descriptions are syntheses of the phenomenon under study sans particular details that emerge "trans-situationally" from the experiential accounts of all the participants as a whole (Giorgi, 1975b). These descriptions aim to define the structure (elements or what) and the style (interactions or how) that form the phenomenon under study for the group of participants (Giorgi, 1975a; 1975b). Table 6 presents tightly synthesized general descriptions of what the participants as a whole are learning and how they are learning about themselves and others in virtual worlds. In a phenomenological perspective, these descriptions intersubjectively define the essential elements of the phenomenon of learning and how those elements interact. The general descriptions transpose the language of the participant into the technical language of the research field (Giorgi, 1975b).

Table 6

General descriptions of structure and style for the group of participants

General Structure (What)	*General Style (How)*
The learning that was experienced by this group of participants in virtual worlds includes aspects of technology; virtual worlds	Learning about self and other in virtual worlds, for this group of participants is experienced as occurring through multiple interactions that

themselves; self-identity and about other people as presented in-world; what they can do through using virtual worlds and; what it means for disability. Regarding aspects of technology, they learn that given the right technological tools they can lessen their disabilities or shortcomings. Regarding aspects of virtual worlds, they learn how to navigate and interact in the virtual space, how to edit and personalize their avatars, how to create and shape the world around them, and how to partake in virtual communities and interact and communicate with other people in-world. Regarding self-identity and other people, they learn that they have a connection with their avatars, be it physical resemblance or ideal projection or how their avatar makes them feel. They learn that they can choose to be whoever they wish to be, mask their disabilities and divulge whatever information they wish to share or not with others. Regarding disability, they learn that they are more than their disabilities and they are not alone and can learn from others experiences through sharing information and coping strategies. They also learn how to use the virtual environment to calm themselves and cope with their disabilities and for just existing.	allow for the sharing of information, resources, support, construction and reconstruction of self-identity and conceptualizations of disability. These interactions include interactions between themselves and 1) the technology they use to interact with SL; 2) the virtual environment of SL; 3) the participant and their avatar(s) and; 4) between people in the form of situated encounters, friendships and communities in SL. Interactions with the technologies they use to interface teaches them that tools can lessen disability and shortcomings. Interactions with the virtual environment teach them how to exist in a completely new way in a new space without physical barriers. Interactions with their avatars allow them to explore identity and 'feel' what self-representation connects with them and what it might mean to them. Interactions with people through friendships and communities provide support and sharing of information, which spark self-awareness and reflections that can lead to growth and discovery about their self and their roles, and about other people.

The general descriptions result from the "trans-situational" extraction and synthesis of the experienced what and how of learning from the particular instances as reviewed in the situated descriptions of each participant. Since the situatedness is removed from these descriptions are for the purposes at arriving at a broader definition of the phenomenon for the participants, the language used does not wholly contain that of the participants.

The first column of the table presented (see table 6) provides a tightly synthesized description of the general structure or the "what"of learning about self and other in virtual worlds as extracted from the situated experiences of the three participants in this study.

The structure of the phenomenon, or what makes up the substance of the learning experiences as a whole, thus includes aspects of technology and virtual worlds, avatar identity and roles of self and other in relationship and in community, what virtual worlds allow in terms of ability, and the changing meaning of disability between the physical and virtual world.

The second column of the table (see table 6) provides a synthesis of the general style or the "how" of learning about self and other in virtual worlds as extracted from all the participants of the study as a group. The style of the phenomenon, or what makes up the action or agency of the learning experiences as a whole, thus includes multiple interactions between themselves and the technology they use to interact with Second Life, the virtual world itself, self-avatar and avatar-avatar interaction, that allow for the sharing of information, resources, support, and the redefining of self-identity and of disability.

Together, the structure and style descriptions define the phenomenon generally for the three participants. Thus, to conclude this analysis, the phenomenon of learning about self and other, roles, disability and ability in virtual worlds for the participants of this study occurs through multiple interactions or dialog between themselves and the technology and self-avatar and avatar-avatar interactions, which allow for the sharing of information, resources, social support, and reflective conversation.

Part Three: Interpretative Analysis

Although Giorgi’s (1975a; 1975b) analysis methodology answers the main questions, there is still more to be understood about the details of the phenomenon. Specifically of interest are the similarities and differences among participant’s experiences as this may provide important hints into factors that may affect perceived learning experiences that could be researched in the future. To obtain an understanding of these similarities and differences, a compare-and-contrast interpretative analysis between participants is required.

This section provides such an analysis, adding the researcher’s perspective to the analysis of the data through a horizontal between-participants interpretive analysis of each of the three interviews: understanding the context, exploring the present, and meaning. The section begins with the interpretive analysis of interview one: understanding the context, interview two: exploring the present, and interview three: meaning.

Analysis of the first interviews (Understanding the context). To understand the context of this interpretative analysis, one must comprehend the similarities and differences between the participants and what they live on a daily basis in terms of their experiences with disability. The participants of this study all have some form of physical limitations in common. Each person’s disability affects their lives in profound ways from what they can physically do; intervals between leaving their domicile; their level of independence; ability to sustain employment; to how other people react to and interact with them. Another characteristic common to all participants is their high level of education. All participants have a college-level education, one has military training and two have graduate degrees.

The first and second participants have chronic progressive disorders that worsen with time. These participants have an additional layer of aspects to deal with regarding the emergence of their disabilities, reacting to and dealing with diagnoses, learning to cope with the loss of ability, and diminished energy and activity levels compared to previously experienced levels. Participant one expresses relief upon being diagnosed, and the second participant expresses more of a pragmatic reaction to his diagnoses. The first and second participants express the same tenacity and desire to "not give up" and to find ways and take measures to do the best they can with the ability they have and to use technologies as a tool for enablement.

In contrast, the third participant has experienced disability since birth. The third participant seems to have always used technology, be it his wheel chair or eye-tracking software, to help him achieve things. Due to his experience with technology, he expresses himself as being a tech savvy and patient individual.

Communication medium is another similarity among all three participants for different reasons. They all prefer to communicate online and through text chat instead of voice chat. The first two participants comment that the distance afforded by text chat makes it easier to communicate with others than face-to-face interaction because text chat lessens shyness and nervousness. The third participant can use voice chat, but finds that people understand him better when he uses text chat to communicate with them.

Related to communication, are the social interactions they have in the physical world. All participants commented that most of their social interactions involve immediate family and close friends, and the third participant added caretakers to list. A limitation in social interactions is mostly expressed by the first two participants as related to the difficulties in leaving their dwellings due to fatigue and other physical limitations. The third participant expresses that he sees family, caretakers, a few close friends and people he knew from college but does not mention any difficulties related the physical limitations in leaving his home.

The last characteristic shared by the participants is their initial definition of disability. During the first interview, the first participant defined disability as change; a shift in focus from what one can't do to what one can do, a change in how one views themself and the world around them and how one lives their daily life. In that interview, the second participant defined disability very clearly as "dis = not, ability = can do" but says that he dis can be removed with the right knowledge, tools and technologies. The third participant defined disability as simply a label people use to mark someone, but that if someone cannot do something someone else can, it doesn't mean they have a disability. Each of these definitions assumes that disability is a term indicating 'less or no ability' but that it is not a pre-determined standard; indeed, the level of ability can be mediated by tools and technologies.

Analysis of the second interviews (Exploring the present). The participants found out about Second Life through different means; reading an article about it and escaping boredom, testing out the beta version, or being brought over by friends from a different virtual world. Despite different initial reasons for coming into Second Life, they all stay mainly because of the social connections they have built in-world.

All the participants comment that Second Life allows them to virtually be "there" emotionally and mentally without the need of a physical body. It allows them to step out of their physical body and experience freedom and mobility without fatigue. This sans-physical body experience made possible through the virtual avatar and space allows them to escape their physical disabilities while in-world, as well as make the choice to portray disability or not through their appearances. Though participant 1 commented that she thought that those born with a disability might be more likely to portray their disability in-world if they see it as part of their identity, none of the participants did so. All three participants of this study, regardless of type of disability, choose not to portray their disabilities because it was not needed in a world where one can walk and even fly.

Second Life also provides participants with the freedom to express themselves through personalizing their avatars with the appearance editing tools and creating and shaping the world around them by using Second Life's in-world building tools. All participants mention how the creativity Second Life allows them to have is among the main reasons for their continued involvement and enjoyment of Second Life. Participants

2 and 3 both commented that they were amply involved in building virtual objects. Role-play was also mentioned as a way to involve the imagination, collaborate with others, and self-discover despite problems with drama between role-play community members.

All the participants also spoke about their connections with their avatars, though these expressed themselves in different ways. The first participant felt a connection with the avatar that mirrored her real life body but only to a certain extent. She then felt a greater freedom when she realized she could rebuild her virtual identity to be anything she liked and used this to experiment with her identity through role-playing characters. She felt an instant connection with her male avatar, which made her self-conscious of herself on the screen. This is the moment she learned that she was more comfortable in a male body and that it was more than just an avatar gender identity. The connection with her avatar is related to how she felt it fits her. The second participant had a connection with his avatar that related to how he used the same name and avatar appearances to experience a continuation of his previous avatar in another world that he wanted to be like. The third participant experienced another type of connection with his avatar that related to how the avatar made him feel; his tall and imposing avatar made him feel secure in Second Life and the mobility provided him a sense of independence that he never experienced in real life.

Thus, different types of connections between people and avatars arose: feeling like it fits or matches them, continuation and being what one wishes they could be, and providing a feeling of security and independence. Furthermore, participants 1 and 3 both had avatars that mirrored their real bodies in some respect. Participant 1 had a surrogate avatar that was realistic in portraying her physical characteristics before changing forms, and participant 3 mirrored his facial features onto his avatar but changed his physique to feel safe in-world. In all cases, they edited their avatar appearances in reaction to how they themselves felt about their avatars through interacting with their avatars and or with other people in-world. Transferability of what one learned from exploring their avatar identity happened in one case, participant 1, who confirmed their gender identity through trying a male avatar and got confirmation from other people who assumed she was a male in real life regardless of the gender of her avatar.

Social interactions in-world allowed them to share information and resources that helped them through their disabilities, provided mutual support and understanding, to connect with people in similar situations so that they did not feel alone and know that if other people dealt with their disabilities, so can they. They also learned through discussions with friends and in community, and through simple questions that sparked reflection on things they might not have thought about on their own. Not only did they learn things that could affect how they coped in the real world, but they also socially learned the culture and language of Second life, how to use Second Life, and how to build and create in Second Life. Essentially they learned how to exist in this virtual world with the help of others and among others.

In two cases, participants learned that people in Second Life could benefit from their vocational training, education, knowledge and skills that they have from the real world. Participants report that this makes them feel validated and helpful in Second Life, which fulfills them, making them happy and satisfied. In both cases, this insight came from their exposure to Virtual Ability and changed their view of their role in Second Life. Participant 2 simply wishes to apply his knowledge and skills to help others, while participant 3 wishes to apply his knowledge and skills to help others through building a professional presence in-world with the hopes of working in Second Life.

Another important aspect to Second Life, as expressed by the participants is how they use Second Life as a tool to cope with their disabilities. Participant 1 explains how she uses Second Life to escape the real world, not think about disability for an evening, have fun and goof off with friends, receive and give support and learn coping strategies from friends with similar conditions, and to simply be. Participant 2 explains how he gets mutual support with friends and the Virtual Ability community, and uses the sanctuary that he built in Second Life to help with his MS by engaging in calming activities such as meditation, tai chi, listening to audiobooks and building virtual objects in-world. Participant 3 expresses how Second Life allows him to escape boredom. Though the methods are different, they have all found ways to use Second Life that work for their needs.

Interview Three: Meaning. The meaning of their experiences expresses itself in different ways throughout all the interviews and all interactions, however in the third interview the participants describe their conscious understandings of the meanings they grasp behind their experiences more directly. The meaning behind Second Life, community in Second Life, avatars and alts, self-identity, and disability are examined.

All participants unanimously conveyed their meaning of Second Life as "freedom" through the removal of physical restraints and limitations experienced in real life. Added to this meaning of Second Life are: the freedom of expression; an outlet for creativity and socializing; the freedom to interact with anyone and help anyone; the freedom to "reboot" and start a new life without any complications; infinite "can" and the freedom to "merely exist". In various ways, all participants state that Second Life provides freedom and removes barriers for all people for different reasons, not only for people with physical disabilities. Freedom of choice in how one presents themselves, and what they choose to do in Second Life or with their Second Life, anonymity, as well as the ability to manipulate a shared environment act as crucial elements in their experiencing the removal of real life limitations.

According to participants, community in Second Life means togetherness with likeminded individuals who have a group affiliation and express common interest(s), which leads to growth and discovery catalyzed by the sharing of information. For participant 1, interactions with others spark a self-awareness that makes the person reflect. For participant 2, it allows for mutual helping, sharing of information and paying it forward. For participant 3, people have the choice to be a part of multiple separate communities present in Second Life, which then become their experience.

Avatars mean different things to the participants. For participant 1, her avatar means that she can express a part of herself that she cannot otherwise do and acts as a tool for extension, a prosthesis that conforms to her needs in the virtual realm. For participant 2, his avatar means choice to be a shapeshifter or anything he so wishes to be and to discover that freedom to choose but that alts make it too easy for people to run away from issues and start over. For participant 3, his avatar is a means of helping others and maintaining friendships in-world. The link between self-identity and the avatar also varies in meaning for each participant, as the first participant expresses great self-discovery through exploration with her avatar and others express that their idea of themselves did not change due to their avatar or Second Life but that their idea of what they can accomplish given the right tools changed.

Finally, the meaning of disability appears to have shifted for all the participants due to their involvement in Second Life. Participants 1 and 2 state that their disability is "no longer the end of the world" and that it is more important what they can do. Participants 2 and 3 state that disability can be removed or lessened by learning the right knowledge or skill and with the use of the right technological tools.

This chapter has provided three different analyses to exploring the phenomenon of learning about self and other in virtual worlds by people with physical disabilities. The first and second approach used an emic perspective. The first approach contextualized and informed the reader of the phenomenon in detail using the words of the participants. The second approach synthesized the participants' experiences and captured a general picture of the phenomenon. The third approach shifted into an etic perspective by my comparing and contrasting experiences of the participants. It is important to note that the emic and etic approaches used in the above analyses resulted in congruent findings. The next chapter will conclude and discuss the findings of the study and provide suggestions for future research.

Chapter 5: Discussion and Conclusion

The purpose of this chapter is to address the primary research questions, discuss the emergent findings of this study and their implications in relation to the literature, provide a researcher's testimonial of the research experience and better practices for the ethical conductibility of research in virtual worlds, conclude this research report by recapitulating the findings of this study in a concise manner and suggest avenues for future research related to this realm of inquiry. This chapter begins with the significance of the analysis for the primary research questions, findings and their implications, the researcher's testimonial, the conclusion of this study, and ends with suggestions for future research.

Significance of the Analysis for the Main Research Questions

This section will first list out each of the research questions and systematically review and synthesize the resulting responses to the main research questions put forth for this study. For a review of additional research questions and their results, please refer to Appendix E. Clearly and concisely addressing these questions based on the findings of this inquiry shall set the foundation for discussing their implications in the next section.

The main research questions addressed are listed below:

1. How do people with physical disabilities experience learning through interacting in immersive virtual environments?
2. What do people with physical disabilities learn about themselves and about each other through interacting in immersive virtual environments?

The first main question addresses how people with physical disabilities experience learning through interacting in virtual worlds. Through the analyses and results presented in the previous chapter, what makes up the substance of the learning experiences as a whole includes learning aspects of technology and virtual worlds and how to interact with them, avatar identity and roles of self and other in relationship with others and in community, what virtual worlds allow in terms of ability and how to exploit it, and the changing meaning of disability between the physical and virtual world gained through experiences in-world.

The second main question addresses what people with physical disabilities report having learned about themselves and others through interacting in virtual worlds. Through the analyses and results presented in the previous chapter, what makes up the action or agency of the learning experiences as a whole includes multiple interactions between the participants and the technology they use to interact with Second Life, using the virtual world platform itself, and self-avatar and avatar-avatar interactions, which together allow for the sharing of information, resources, social support, and the redefining of self-identity, role and of disability through experiences in-world.

Additional research would be required to assess the generalizability of the findings for other people with or without physical disabilities who use virtual worlds. The next section will discuss the findings and implications of the study in more detail.

Findings and their Implications

This section summarizes the findings of the study and relates them to the current literature for the meaning of disability, learning in virtual worlds, and the use of virtual worlds for people with physical disabilities for personal, professional, therapeutic and educational purposes.

Findings from the experiences of the three participants of this study point to a shift in the meaning of disability in virtual worlds. What one could previously not do in the real world becomes possible in the virtual world, which means the removal of physical limitations and the ability to let oneself imagine and create who they wish to be and do what they wish to do. Technological tools and knowledge on how to use these tools become enabling factors that remove the “dis” from “disability”. They can still be present mentally and emotionally and interact with and contribute to in-world communities without fatiguing as quickly. This has implications for how we perceive disability in an age where technological tools and virtual environments that enable people become increasingly accessible.

The most prominent models of disability would be affected by virtual worlds depending on whether one accounts for the avatar alone or for the physical person and their avatar(s) together. The medical model of disability (WHO, 2011) would not apply in a virtual world alone because the avatar is sans physical body. The social model theory of disability (Tregaskis, 2002; WHO, 2011) would apply to virtual worlds but not only must take into account the specific culture(s) of online social virtual worlds, but also the technological environment(s) and multiple interfaces (assistive technologies, the computer, client software, virtual world itself, virtual tools in-world), that also affect one's level of ability. These social and environmental aspects created and mediated by technology would add another layer onto how we understand disability with the social theory model. The capabilities approach to disability (Nussbaum, 2003; Sen, 2005) in relation to virtual worlds, would also strongly apply as virtual worlds expand the opportunity aspect of freedom and levels the playing field. Furthermore, virtual worlds include many of the universal capabilities listed by Nussbaum (2003), with life and health of the avatar, imagination and thought, emotions, reason, affiliations with virtual communities, play, and control over one's environment through ever shaping, designing and creating the virtual world and avatar. After reviewing these implications, it would seem appropriate to redefine disability and what it would mean in virtual contexts if anything at all.

Learning in virtual worlds emerged from the experiences of the participants. Learning is perceived to be occurring through interactions with their avatars, other people and the environment in-world. This type of learning would be categorized as informal learning, inline with Livingstone's definition (2001) of informal learning as "any activity involving the pursuit of understanding, knowledge or skill which occurs without the presence of externally imposed curricular criteria." Since the expressed experiences of learning in this context did not happen within the confines of externally directed curricula, the learning occurred informally. The process of interviewing participants and learning from them as a researcher was also a form of informal learning which allowed this study to take place. Recognizing informal learning experiences in virtual worlds could open up further possibilities for their use for self-directed learning and self-discovery.

Learning as self-discovery was experienced in these cases of virtual interactions, through constructing and exploring avatar identities and grasping other people's reactions to those identities as well as dialoging with virtual friends, resulting in self-reflections and changing conceptualizations of self-identity. This aligns with Sherry Turkle's view that engaging with the avatar allows for self-exploration and awareness (Turkle, 2005).

Given that these interactions with one's avatar and other people's avatars had the effect of confirmation of gender identity for one participant, it would seem possible that virtual worlds could be used as a tool for self-learning, exploration and discovery in psychological settings for people with real life gender identity issues, or any host of possible identity and body-perception issues one may confront. Additionally, because virtual worlds can be accessed easily through any home computer, they can be used at a distance for people who do not have easy access to therapy in their locality, and in the case of physical disabilities, or psychological disorders including agoraphobia and social anxiety. This implication has been explored in the literature by a number of virtual reality researchers but still requires more research within the realm of virtual worlds (Gourlay, Lun & Liya, 2000; Rizzo & Kim, 2005).

Learning about how to “live” in the virtual world from other avatars is another branch of the learning experienced by the participants. They learned how to build and create objects in-world, how to interact with the virtual world and how to communicate with others and become members of communities. They learned how to cope with their disabilities through talking with other people who deal with the same issues and exchanging solutions and information. It is possible then that virtual worlds could host educational institutions or organizations that provide a platform for sharing pertinent information and strategies for health and coping, and in fact Virtual Ability and Health Info Island (Virtual Ability, 2012) do just that. They also learned that by existing and doing in the virtual world they were able to “escape” or forget their disability for a while which elevated their mood and helped them deal with their disabilities. All of this, they learned through interacting with the virtual environment and by sharing with other people. This might not seem different than learning outside of the virtual world, but what Second Life does is that it makes people more accessible and the sharing of information easier. It makes them feel less isolated which also elevates their mood and makes it easier to cope with their disabilities. These experiences may have a positive impact on people’s lives over many years and even affect their overall health, which is a possibility that should be looked at seriously and carefully by researchers.

Another important finding that emerged from this research is that though some did not experience a change in learning about themselves in terms of identity, they did experience a change in their perceived role within community in Second Life. This change in role is related to their realization that their real life skills and knowledge that they had put aside in real life due to disability and fatigue or reduced employment, were needed by other people in Second Life and that they could put them to use and share with other people through presenting, mentoring, offering help and even seeking professional presence in the virtual world. At times this lead to collaborative projects (i.e. updating the accessibility of a Second Life gym), and planned community events (i.e. presenting in front of groups of avatars and discussing). These experiences provided a sense of satisfaction as well as a focus and purpose in-world. Due to the fact that people with physical disabilities don't physically fatigue as quickly working in a virtual world environment, it could be an important opportunity for teleworking and collaborating with other people all over the world.

The question of transfer of learning between the virtual and the real world as such was beyond the scope of this study. However from the data obtained, I would safely say that not all of what they learned transfers over into the real world because that learning is not applicable to the real world (i.e. how to build virtual objects and operate within the virtual environment, or how to change avatar appearances, to name a few). What transfers over into the real world are the affective and attitudinal changes brought on by their virtual interactions as well as their changing perceptions of themselves. Future studies would have to explore this realm in more depth.

Researcher's Testimonial

This section provides my testimonial of the research experience itself and my own thoughts as a result of this research process. The aim of this section is to inform the reader of my own subjective conclusions regarding researching in virtual worlds, what I learned about disability and virtual worlds and about myself through interacting with participants and the virtual world during this project.

The mere fact that I could conduct this research in Second Life showed me that we can and do learn about others and ourselves in virtual worlds. Through Second Life, I was able to access and recruit people from anywhere around the world who often do not leave their homes because of their physical disabilities and low energy levels. The ability to communicate with others either in text or voice, synchronously or asynchronously, in shared or different spaces provided ample flexibility to contact participants, and accommodate any potential physical disabilities that participants could have. I was able to converse with these individuals comfortably and openly and learn about their experiences, all within the same virtual context under study. Most importantly, they were comfortable conversing with me and often went over the allotted interview time by choice and desire to share.

Throughout the process, I learned about the potential of Second Life, which made me think about how it could be used to enable and help people. My thoughts were constantly being sparked, challenged and refined by interactions and exchanges I had with participants and other people in-world. In fact, I concur with participant 1 who during an interview, grinned and said, “My perception constantly changes in regards to others and myself. The more I learn the more I question. Heh, much like you are doing with the interview.”

To summarize the bulk of what I learned from the experience of conducting research in Second Life, it made me think that virtual worlds are important research spaces because they are valid places that provide different modes of interaction through the technological interface and avatar self-representation. If living in these worlds can change a person's perception of their own disability, researching these spaces has the potential to completely redefine how we perceive disability as a society and as designers of technological tools for teaching, learning, working, and enabling people.

Conclusion of this Study

Participants to varying degrees experienced learning about self and other in virtual worlds. Learning about "self" ranged from intense self-discovery by exploring and connecting with the avatar to a shift in perceived role from learning that skills and knowledge they possessed could be beneficial for others in Second Life. Learning about others ranged from realizing that there are many other people struggling and coping with similar disabilities who lead active full lives in Second Life and who significantly contribute to community life in-world, to learning that people can and do stand up for equality and accessibility even in a virtual world. They learned that together they can support one another, share information and coping strategies, and enjoy themselves doing activities together which helps them relax.

Participants' experiences of Second Life were unanimously expressed as freedom. Second Life virtually removed physical limitations allowing the participants with debilitative health issues to regain lost ability and the participant experiencing limited mobility since birth to gain an independence they never experienced before. Access to people and communities in Second Life in conjunction with the ability to comfortably communicate through text chat allowed them to develop friendships that spilled into real life and be a part of multiple virtual communities.

To conclude, though the findings of this study can only speak for the participants of this study, potential opportunities in virtual worlds for experiencing self-discovery, learning, social engagement and community, and empowerment of people with physical disabilities are highly noteworthy. More research would be required to ascertain the extent of Second Life's potential. Virtual worlds may change how we perceive disability and provide an environment that allows people with physical disabilities to learn, work and interact with others from home by lessening or eliminating the fatigue and social and physical limitations experienced with physical disabilities.

Limitations of the Findings

The qualitative nature of this study means that the findings cannot be generalized to the greater population. The participants of this study cannot fully represent all of people with physical disabilities who have ever used virtual worlds. Though there may be overarching similarities in experiences, these cannot be generalized beyond this group of participants. The results of this study also cannot be understood outside of the specific context in which they emerged; one must take into account the research environment, the phenomenological nature of the study, and the background and particular cases of the individuals who partook in this study.

Suggestions for Future Research

This section will list suggested areas for future research in this domain and provide a list of better practices for conducting research in virtual worlds. Due to the limited scope of this study and the additional research is required to delve deeper into how virtual worlds affect concepts and phenomena such as the self and disability, and the experience of learning about self and other through interacting with embodied agents.

Suggested areas for future research. Suggestions for future research include but are not limited to the following:

1. Examining potential differences in experience between people with long term debilitative illnesses and people who have reduced mobility since birth
2. Exploring the experiences of people with physical disabilities who once experienced worlds like Second Life and chose to leave virtual worlds
3. Examining the role and design of assistive technologies and accessibility features of the virtual world client software or virtual environment in enabling people with physical disabilities
4. Examining the relevance and potential transferability of learning between the real world and virtual worlds
5. Exploring the potentiality of learning and working at a distance in virtual worlds for people with physical disabilities

6. Inquiring into the shift of meaning of “disability” in virtual worlds for the larger community of people with physical disabilities who use virtual worlds to gain a more universal understanding of the phenomenon in question

The above suggestions for future research in this domain would have the potential to greatly deepen our understanding of disability, embodiment and learning in virtual context. The next sub-section will provide guidelines for ethical research practices in virtual worlds based on my experiences conducting research in Second Life.

Better practices for ethically conducting research in virtual worlds. As a result of this research process and a past study (Judge, 2012) both of which were conducted exclusively in virtual worlds, I have been plagued with a number of ethical questions that have affected my choice of methodologies and procedures. These ethical questions are pertinent to qualitative research involving interviewing and include:

- How do I represent myself as a researcher in-world and avoid deception?
- How do I ascertain that the participant is over 18, has understood the consent form and consents without real world identity verification?
- How do I avoid false data from participants and duplication of participants without real world identity verification?
- How do I ensure privacy and confidentiality of real and virtual information in an online social world?

- How can I be made aware of and accommodate the special needs of people with physical disabilities throughout the research process without being able to see or hear them?

At the heart of these questions lie two important "assumptions": 1) that there are real people behind the avatars that think and feel; and that 2) the virtual environment and avatar can psychological and emotionally affect the people who create and interact with them (Freeman, Lessiter, Pugh & Keogh, 2005; Grimes, Fleischman, & Jaeger, 2009; Shaw & Warf, 2009; Wolfendale, 2006; Young, 2010). Additionally, attention to ethical issues is required for conducting research in virtual worlds because 1) methodologies and procedures for conducting research exclusively and ethically in virtual worlds are still new and in development (Grimes, Fleischman, & Jaeger, 2009; McKee & Porter, 2009); and 2) virtual worlds create particular psychosociological, environmental and technological contexts that differ from other research contexts and the implications of which are still not fully understood (Grimes, Fleischman, & Jaeger, 2009).

Below are 10 suggested better practices for future research in virtual worlds involving qualitative interviewing based on my reflections and experiences as a researcher in Second Life. The aim of these better practices for research are to lessen potential harm and ethical complications brought on by the virtual environment, communication medium and avatar representation:

1. Represent yourself as a researcher in your avatar profile by stating it directly in the avatar description and appear as professional as possible in-world through your avatar appearance.
2. Be aware of the possibility of deceptive information and self-representation from participants, but avoid breaking the tacit cultural norm of anonymity in-world. Instead, choose a research design, methodology and procedure that take these issues into account.
3. Assuming participants remain anonymous, checking the veracity of the data can be difficult. Use triangulation methods over time and between people (Thurmond, 2001) and your judgment to ascertain if the data is trustworthy.
4. Ensure that they have read the informed consent form by providing multiple ways the participant can access the form. Send an in-world copy of the form and verify that they consent to participating through dialoging with the potential participant, before beginning the interviewing process.
5. Be sensitive to textual, verbal, visual and temporal cues that may point towards them not wanting to participate, or not understanding what they seemingly consented to. Drop them from the study if there is reason to doubt a potential participant's readiness and consent to participate.
6. Use Second Life's age verification process to your advantage. Conduct your interviews on an age-verified (mature) simulation to ensure they are over 18 years in age in the real world.
7. Do not reward participants in Linden Dollars or other in-world currencies to reduce the risk of obtaining false data from alts or bots. Focus on intrinsic rewards

for participation when recruiting, and recruit from groups already related to your target population if possible.

8. Ensure privacy in-world by conducting interviews in a private and secure place far from the eyes and ears of other people. Private sky platforms work well to this effect.
9. Keep avatar names and pictures private, unless your participant explicitly consented to it. Confidentiality issues apply to both worlds as avatars also hold reputations within virtual worlds (Adrian, 2009), and be recognized by others who have seen them before (Benford, Bowers, Fahln, Greenhalgh & Snowdon, 1997).
10. When virtually interacting with people with physical disabilities, be sensitive to how they are interfacing with the computer and virtual world. Provide them with multiple ways of communicating, give them ample time to respond and be sensitive to cues that indicate the participant may require a break from the interview.

These guidelines were written in the hopes that they may be helpful for researchers exploring the prospect of conducting qualitative research involving interviewing with avatars in virtual worlds and with avatars of people with physical disabilities. Ethical standards for research in virtual worlds may still be in development, but until then I encourage researchers to be cautious and carefully reflect on their methodologies and procedures for potential ethical issues in this new research environment and find solutions to minimize potential harm on the human subjects behind the screen.

References

Adrian, A. (2008). No one knows you are a dog: identity and reputation in virtual worlds. *Computer Law Security Report*, *24*(4), 366-374. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S0267364908000290

Aldrich, C. (2009). Virtual worlds, simulations, and games for education: a unifying view the swimming pool. *Innovate, 5*(5). Retrieved from http://www.innovateonline.info/index.php?view=article&id=727

Arakji, R. Y., & Lang, K. R. (2008). Avatar business value analysis: a method for the evaluation of business value creation in virtual commerce. *Journal of Electronic Commerce Research, 9*(3), 207-218. Retrieved from: http://ssrn.com/abstract=1146769

Areheart, B. A. (2008). When disability isn't "just right": The entrenchment of the medical model of disability and the Goldilocks dilemma. *Indiana Law Journal, 83*(1), article 5. Retrieved from http://www.repository.law.indiana.edu/ilj/vol83/iss1/5

Bailenson, J. N., Swinth, K., Hoyt, C., Persky, S., Dimov, A. & Blascovich, J. (2005). The independent and interactive effects of embodied-agent appearance and behavior on self-report, cognitive and behavioral markers of copresence in immersive virtual environments. *Presence, 14*(4), 379–393. doi:10.1162/105474605774785235

Baker, S., Wentz, R., & Woods, M. (2009). Using virtual worlds in education: second life® as an educational tool. *Teaching of Psychology*, *36*(1), 59-64. doi: 10.1080/00986280802529079.

Barfield, W., Sheridan, T., Zeltzer, D., & Slater, M. (1995). Presence and performance within virtual environments. In: Barfield W, Furness TA, eds. Virtual Environments and Advanced Interface Design. Oxford, England: Oxford University Press; 473-513.

Bartle, R. (n.d.). Avatar, character, persona. Retrieved from http://www.mud.co.uk/richard/acp.htm

Bartle, R. A. (2007). “Making Places.” In Borries, Friedrich von, Walz, Steffen P. & Böttger, Matthias (eds.), Space Time Play. Computer Games, Architecture and Urbanism: The Next Level. Basel: Birkhäuser Publishing. pp. 158-163.

Beck, C. T., Keddy, B. A., & Cohen, M. Z. (1994). Reliability and validity issues in phenomenological research. *Western Journal of Nursing Research, 16*(3), 254-267. doi: 10.1177/019394599401600303

Belk, R. W. (1988). Possessions and the extended self. *Journal of Consumer Research*, 15(2), 139-168. Retrieved from http://www.jstor.org/stable/2489522

Bell, M. W. (2008). Toward a definition of "virtual worlds". *Journal of Virtual Worlds Research, 1*(1), 1-5. Retrieved from http://journals.tdl.org/jvwr/article/view/283

Benford, S., Bowers, J., Fahlén, L. E., Greenhalgh, C., & Snowdon, D. (1997). Embodiments, avatars, clones and agents for multi-user, multi-sensory virtual worlds. *Multimedia Systems, 5*(2), 93-104. doi:10.1007/s005300050045

Blake, C. (1976). Recognizing physical disability as a social problem., Report: ED156959. 17p.

Boellstorff, T. (2008). *The Coming Age of Second Life: An Anthropologist Explores the Virtually Human.* Princeton, NJ: Princeton University Press.

Boyd, G., & Zemen, V. (2007). Designing cybersystemically for symviability. *Kybernetes*, *36*(9/10), 1255-1265. doi: 10.1108/03684920710827274

Boyle, M. A. (1997). Social barriers to successful re-entry into mainstream organizational culture: perceptions of people with disabilities. *Human Resource Development Quarterly, 8*(3), 259-268. doi: 10.1002/hrdq.3920080308

Brey, P. (1999). The ethics of representation and action in virtual reality. *Ethics and Information Technology, 1,* 5-12. doi: 10.1023/A:1010069907461

Carr, D. (2010). Constructing disability in online worlds: Conceptualising disability in online research. *London Review of Education, 8*(1), 51-61. doi: 10.1080/14748460903557738

Cassidy, M. (2008). Flying with disability in Second Life. *Eureka Street, 18*(1), 22-24. Retrieved from http://www.eurekastreet.com.au/article.aspx?aeid=4849

Childs, M. (2011). Identity: A Primer. In Peachey, A., & Childs, M. (eds). Reinvention Ourselves: *Contemporary Concepts of Identity in Virtual Worlds.* New York, NY: Springer.

Clark, D. A. (2005). *The Capability Approach: Its Development, Critiques and Recent Advances.* Oxford: Global Poverty Research Group. Retrieved on October 10th, 2012. Retrieved from: http://www.gprg.org/pubs/workingpapers/pdfs/gprg-wps-032.pdf

Conger, S. A. (2011). Physical Activity Assessment in Wheelchair Users. PhD Dissertation, University of Tennessee, 2011. Retrieved on September 29th, 2012 from http://trace.tennessee.edu/utk_graddiss/1069

Coombs, N. (1993). Global empowerment of impaired learners: data networks will transcend both physical distance and physical disabilities. *Educational Media International, 30*(1), 23-25. doi: 10.1080/0952398930300105

Crichton, P. (2007, April 27). Second Hand Look at Second Life. Access 2.0; accessible digital life. *BBC.* Retrieved on September 25, 2012, from http://www.bbc.co.uk/blogs/access20/2007/04/second_hand_look_at_second_lif.shtml

Dietrich, D.R. (2013). Avatars of whiteness: racial expression in video game characters. *Sociological Inquiry, 83*(1), 82-105. doi: 10.1111/soin.12001

Ducheneaut, N., Yee, N., Wen, M. D., Wadley, G. (2009). Body and mind: a study of avatar personalization in three virtual worlds. *CHI '09 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, USA,* 1151-1160. doi: 10.1145/1518701.1518877

Duncan, I., Miller, A. & Jiang, S. (2012). A taxonomy of virtual worlds usage in education. *British Journal of Educational Technology, 43*(6), 949-964. doi:10.1111/j.1467-8535.2011.01263.x

Finlay, L. (2009). Debating Phenomenological Research Methods. *Phenomenology & Practice, 3*(1), 6-25. Retrieved from http://lindafinlay.co.uk/Debating%20phenomenological%20research%20methods.doc

Ford, P. J. (2001a). A further analysis of the ethics of representation in virtual reality : Multi-user environments. *Ethics and Information Technology*, *3*(2), 113-121. doi: 10.1023/A:1011846009390

Ford, P. J. (2001b). Virtual shifts in disabling realities: Disability, computer-mediated environments, and selves. (ProQuest Information & Learning). *Dissertation Abstracts International Section A: Humanities and Social Sciences, 61* (11-)

Ford, P. J. (2001c). Paralysis lost: impacts of virtual worlds on those with paralysis. *Social Theory and Practice, 27*(4), 661-680.

Frankel, M. S., & Siang, S. (1999). Ethical and legal aspects of human subjects research on the Internet. *Published by AAAS online*. Retrieved on October 25, 2012. Retrieved from: http://www.aaas.org/spp/sfrl/projects/intres/main.htm

Freeman, J., Lessiter, J., Pugh, K., & Keogh, E. (2005). When presence and emotion are related, and when they are not. *Proceedings from Presence 2005: The 8th Annual Workshop on Presence*, London. 213-219.

Fullinwider, R. (Winter, 2011). Affirmative Action. In the *Stanford Encyclopedia of Philosophy* (Winter 2011 Edition), Edward N. Zalta (ed.). Retrieved from http://plato.stanford.edu/archives/win2011/entries/affirmative-action

Gee, J. P. (2007). *What Video Games Have to Teach Us About Learning and Literacy*. New York, NY: Palgrave Macmillan. pp 55-64.

Giorgi, A. (1965). Phenomenology and experimental psychology: I. *Review of Existential Psychology and Psychiatry, 5*(3), 228-238.

Giorgi, A. (1966). Phenomenology and experimental psychology: II. *Review of Existential Psychology and Psychiatry, 6*(1), 37-50.

Giorgi, A. (1970). *Psychology as a Human Science: A Phenomenology Based Approach.* New York, NY: Harper & Row Publishers.

Giorgi, A. (1975a). Convergence and divergence of qualitative and quantitative methods in psychology. *Duquesne Studies in Phenomenological Psychology, Volume II.* (A. Giorgi, C. Fischer, E. Murray Eds.), Pittsburgh, PA: Duquesne University Press. pp.73-79.

Giorgi, A. (1975b). An application of phenomenological method in psychology. *Duquesne Studies in Phenomenological Psychology, Volume II.* (A. Giorgi, C. Fischer, E. Murray Eds.), Pittsburgh, PA: Duquesne University Press. pp.82-103.

Giorgi, A. (1979). The Relationships Among Level, Type, and Structure and their Importance for Social Science Theorizing: A Dialogue with Schütz. *Duquesne Studies in Phenomenological Psychology, Volume III.* (A. Giorgi, R. Knowles, D. L. Smith, Eds.), Pittsburgh, PA: Duquesne University Press. pp. 81-92.

Giorgi, A. (2005). The phenomenological movement and research in the human sciences. *Nursing Science Quarterly, 18*(1), 75-82. doi: 10.1177/0894318404272112

Giorgi, A. (2006). Difficulties encountered in the application of the phenomenological method in the social sciences. *Analise Psicologica, 3*(XXIV), 353-361.

Giorgi, A. (2009). *The Descriptive Phenomenological Method in Psychology: A Modified Husserlian Approach.* Pittsburgh, PA: Duquesne University Press.

Giorgi, A. (2011). IPA and Science: A Response to Jonathan Smith. *Journal of Phenomenological Psychology, 42*, 195-216. doi: 10.1163/156916211X599762

Gobbetti, E. & Scateni, R. (1998). Virtual reality: Past, present and future. In G. Riva, B. Wiederhold & E. Molinari (Eds.) *Virtual Environments in Clinical Psychology and Neuroscience: Methods and Techniques in Advanced Patient-Therapist Interaction.* (pp. 3-20). Amsterdam, The Netherlands: IOS Press. Retrieved from: www.cybertherapy.info/ves%20in%20clinical%20psycho/Gobbetti.doc.pdf

Gorini, A., Gaggioli, A., Vigna, C., & Riva, G. (2008). A second life for eHealth: prospects for the use of 3-D virtual worlds in clinical psychology. *Journal of medical Internet research*, *10*(3), e21. doi:10.2196/jmir.1029

Gottschalk, S. (2010). The presentation of avatars in second life : self and interaction in social virtual spaces. *Symbolic Interaction*, *33*(4), 501-525. doi:10.1525/si.2010.33.4.501.502

Gourlay, D., Lun, K.C. & Liya, G. (2000). Virtual reality and telemedicine for home health care. *Computers and Graphics, 24*(5), 695-699. doi: 10.1016/S0097-8493(00)00072-8

Grimes, J. M., Fleischman, K. R. & Jaeger, P. T. (2009). Virtual guinea pigs: ethical implications of human subjects research in virtual worlds. *International Journal of Internet Research Ethics, 2*(1), February 2009. Retrieved from Http:// www.ijire.net/issue_2.1/grimes.pdf

Grimes, J. M., Fleischmann, K. R., & Jaeger, P. T. (2010). Research ethics and virtual worlds. In C. Wankel, & S. Malleck (Eds), *Emerging Ethical Issues of Life in Virtual Worlds* (pp. 73-99) Charlotte, NC: Information Age Publishing.

Groenewald, T. (2004). A phenomenological research design illustrated. *International Journal of Qualitative Methods, 3*(1). Article 4. Retrieved on September 20th, 2012 from http://www.ualberta.ca/~iiqm/backissues/3_1/pdf/groenewald.pdf

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds*.), Handbook of qualitative research* (pp. 105-117). Thousand Oaks, CA: Sage.

Guo, Y., & Barnes, S. (2009). Virtual item purchase behavior in virtual worlds: an exploratory investigation. *Electronic Commerce Research*, *9*(1-2), 77-96. doi: 10.1007/s10660-009-9032-6

Hartz Søraker, J. (2010). The Neglect of Reason: A Plea for Rationalist Accounts of the Effects of Virtual Violence. In C. Wankel, & S. Malleck (Eds), *Emerging Ethical Issues of Life in Virtual Worlds* (pp. 15-31) Charlotte, NC: Information Age Publishing.

Heim, M. (1998). *Virtual Realism.* New York, NY: Oxford University Press.

Hew, K. F., & Cheung, W. S. (2010). Use of three-dimensional (3-D) immersive virtual worlds in K-12 and higher education settings: A review of the research. *British Journal of Educational Technology, 41*(1), 33-55. doi: 10.1111/j.1467-8535.2008.00900.x

Hickey-Moody, A., & Wood, D. (2010). Ethics in Second Life. In C. Wankel, & S. Malleck (Eds), *Emerging Ethical Issues of Life in Virtual Worlds* (pp. 153-175), Charlotte, NC: Information Age Publishing.

Husserl, E. (1983). *Ideas Pertaining to a Pure Phenomenology and to a Phenomenological Philosophy: First Book, General Introduction to a Pure Phenomenology.* (F. Kersten, Trans.) The Neatherlands: Martinus Nijhoff Publishers. (Original Work Published 1913)

Imrie, R. & Kumar, M. (1998). Focusing on disability and access in the built environment, *Disability & Society, 13*(3), 357-374.

Imrie, R & Thomas, H. (2008). The interrelationships between environment and disability, *Local environment: The International Journal of Justice and Sustainability, 13*(6), 477-483. doi: 10.1080/13549830802259748

Jones, H. (1996). Virtual reality: panacea or pandora's box? *Virtual Reality, 2*(1), 147-154. doi: 10.1007/BF02534448

Jones, D. E. (2006). I, Avatar: Constructions of Self and Place in Second Life and the Technological Imagination. *Gnovis 6*, 1-32. Retrieved from http://gnovisjournal.org/files/Donald-E-Jones-I-Avatar.pdf

Judge, A. (2012, May). *(Dis)Ability in Second Life: A Grounded Theory Approach.* Paper presentation at CSSE 2012, Canadian Society for the Study of Education Conference, Waterloo, Ontario.

Knorr, R., Bronack, S., Switzer, D., & Medford, L. (2010). Methodology of a novel virtual phenomenology interview technique. *Journal Of Virtual Worlds Research, 3*(3). Retrieved October 27, 2012, from https://journals.tdl.org/jvwr/article/view/1400/1782

Kockelmans, J. J. (1994). *Edmund Husserl's Phenomenology.* West Lafayette, Indiana: Purdue University Press.

Kraut, R., Olson, J., Banaji, M., Bruckman, A., Cohen, J., & Couper, M. (2004). Psychological research online: report of Board of Scientific Affairs' Advisory Group on the conduct of research on the internet. *American Psychologist*, *59*(2), 105-117.

Kromand, D. (2007, September). *Avatar categorization*. Situated Play, Proceedings of DiGRA 2007 Conference, Tokyo, Japan.

Krueger, A. & Stineman, M. G. (2011). Assistive technology interoperability between virtual and real worlds. *Journal of Virtual Worlds Research, 4*(3), 1-8. Retrieved from http://journals.tdl.org/jvwr/index.php/jvwr/article/view/6125

Kuhlen, T. & Dohle, C. (1995). Virtual reality For physically disabled people. *Computer, Biology, Medicine, 25*(2), 205-211. doi: 10.1016/0010-4825(94)00039-S

Kushner, D. (2004). My avatar, my self. *Technology Review, 107*(3), 50-55.

LaPlante, M. P. (2003, October). *Demographics of wheeled mobility device users.* Conference Proceedings from Space Requirements for Wheeled Mobility, Buffalo, New York, October 9-11, 2003.

Lastowka, F. G. & Hunter, D. (2004). The laws of the virtual worlds. *California Law Review,* 92(1), 1-75.

Laverty, S. M. (2003). Hermeneutic phenomenology and phenomenology: a comparison of historical and methodological considerations. *International Journal of Qualitative*

Methods, 2(3), 21-35. Retrieved from http://wigan-ojs.library.ualberta.ca/index.php/IJQM/article/view/4510

Lee, K. M. (2004). Presence, explicated. *Communication Theory*, *14*(1), 27-50. doi: 10.1111/j.1468-2885.2004.tb00302.x

Lehdonvirta, V. (2008, April). *Virtual worlds don't exist.* Conference Proceedings from Breaking the Magic Circle, Tampere, Finland, 10-11 April, 2008.

Lincoln, Y. S. & Guba, E. G. (1985). *Naturalistic Inquiry.* Newbury Park, California: Sage.

Livingstone, D. W. (2001). Adults' informal learning: Definitions, findings, gaps and future research. NALL Working Paper 21, *New Approaches to Lifelong Learning (NALL),* Ontario Institute for Studies in Education, University of Toronto, Toronto, Canada.

MacInnes, I. (2006). Property rights, legal issues, and business models in virtual world communities. *Electronic Commerce Research*, *6*(1), 39-56. doi:10.1007/s10660-006-5987-8

Manders-Huits, N. (2010). Practical versus moral identities in identity management. *Ethics and Information Technology, 12*(1), 43-55. doi: 10.1007/s10676-010-9216-8

McKee, H. A. & Porter, J. E. (2009). Playing a good game: ethical issues in researching MMOGs and virtual worlds. *International Journal of Internet Research Ethics, 2*(1), February 2009. Retrieved from: http:// www.ijire.net/issue_2.1/mckee.pdf

McKeown, L. (2007). Taking action learning online in the 3D virtual world of Second Life. *The International Review of Research in Open and Distance Learning, 8,* 3. Retrieved on 25 September 2012, from http://www.irrodl.org/index.php/irrodl/article/view/507/984

Messinger, P. R., Stroulia, E. & Lyons, K. (2008). A typology of virtual worlds: historical overview and future directions. *Journal of Virtual Worlds Research, 1*(1). Retrieved from http://journals.tdl.org/jvwr/article/view/291

Messinger, P. R., Stroulia, E., Lyons, K., Bone, M., Niu, R., Smirnov, K., & Perelgut, S. (2009). Virtual worlds – Past, present, and future: New directions in social computing. *Decision Support Systems, 47*(3), 204-228. doi:10.1016/j.dss.2009.02.014

Milgram, P., & Kishino, F. (1994). A taxonomy of mixed reality visual displays. *IEICE Transactions on Information Systems*, *E77-D*(12), 1-15. Citeseer. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.102.4646&rep=rep1&type=pdf

Monkey, C. (2007). Disability in Second Life. Ouch! It's a disability thing. Retrieved on September 25, 2012, from http://www.bbc.co.uk/blogs/ouch/2007/05/virtual_disability_nightclub.html

Moran, D. (2005). *Edmund Husserl: Founder of Phenomenology.* Cambridge, UK: Polity Press.

Moustakas, C. (1994). *Phenomenological Research Methods.* Thousand Oaks, California: Sage Publications.

Neustaedter, C., & Fedorovskaya, E. (2009, May). *Presenting identity in a virtual world through avatar appearances.* GI' 09 Proceedings of Graphics Interface 2009, Kelowna, BC. pp. 183-190.

Nussbaum, M. (2003). Capabilities as fundamental entitlements: Sen and social justice. *Feminist Economics, 9*(2-3), 33-59. doi: 10.1080/1354570022000077926

Papagiannidis, S., Bourlakis, M. & Li, F. (2008). Making real money in virtual worlds: MMORPGs and emerging business opportunities, challenges and ethical implications in metaverses. *Technological Forecasting & Social Change, 75,* 610–622. doi:10.1016/j.techfore.2007.04.007

Pasquinelli, E. (2010). The illusion of reality: cognitive aspects and ethical drawbacks: The case of Second Life. In C. Wankel, & S. Malleck (Eds), *Emerging Ethical Issues of Life in Virtual Worlds* (pp. 197-215) Charlotte, NC: Information Age Publishing.

PopCap Games. (June 11, 2008). "Disabled Gamers" Comprise 20% of Casual Video Game Audience. Retrieved on February 15th, 2013 from: http://popcap.mediaroom.com/index.php?s=30836&item=96032

Radermacher, H., Sonn, C., Keys, C. & Duckett, P. (2010). Disability and participation: It's about us but still without us! *Journal of Community and Applied Social Psychology, 20,* 333-346. doi: 10.1002/casp.1039

Richie, J. & Lewis, J. (Eds) (2003). *Qualitative research practice: A guide for social science students and researchers.* Thousand Oaks, California: Sage Publications.

Rizzo, A. S. & Kim, G. J. (2005). A SWOT analysis of the field of virtual reality rehabilitation and therapy. *Presence: Teleoperators & Virtual Environments*, *14*(2), 119-146. doi:10.1162/1054746053967094

Salmon, G., Nie, M., & Edirisingha, P. (2010). Developing a five-stage model of learning in "second life". *Educational Research, 52*(2), 169-182. doi: 10.1080/00131881.2010.482744

Santo, R. (2012). *Playing a mage, becoming an advocate: Games as civic learning spaces.* Indiana University. Retrieved on October 25, 2012. Retrieved from Http://dev.gamesandimpact.org/wp-content/uploads/2012/09/Santo-GamesAsCivicLearningSpaces1.pdf

Schroeder, R. (1996). *Possible worlds: the social dynamic of virtual reality technologies*. Boulder: Westview Press.

Seidman, I. (2006). *Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Sciences.* Third Edition. New York, NY: Teachers College Press.

Seigel, J. (2005). *The Idea of Self.* Cambridge University Press: New York, NY.

Sen, A. (2005). Human Rights and Capabilities. *Journal of Human Development, 6*(2), 151-166. doi: 10.1080/14649880500120491

Shaw, I., G., R., & Warf, B. (2009). Worlds of affect : virtual geographies of video games. *Environment and Planning, A avance online publication*. doi:10.1068/a41284

Shepherd, T. (2013). *Grid Statistics*. Retrieved on March 31st, 2013, from: http://gridsurvey.com/economy.php

Shields, R. (2003). *The Virtual.* New York, NY: Routledge.

Shields, M. (2004). Use of wheelchairs and other mobility support devices. *Health Reports, 15*(3), 37-41.

Singh, D. K. (2005). Students with disabilities and higher education. *Journal of American College Health, 53*(5), 210.

Slater M, Usoh M, & Steed, A. (1994). Depth of presence in immersive virtual environments, presence: teleoperators and virtual Environments, *Presence, 3*(2), 130-144.

Smith, J. A., Flowers, P. & Larkin, M. (2009). *Interpretative Phenomenological Analysis: Theory, Method and Research.* Washington, DC: Sage Publications.

Specht, J. A., Polgar, J. M., Willoughby, C., King, G., & Brown, E. (2000). A retrospective look at the educational experiences of individuals with disabilities. *Exceptionality Education Canada, 10*(3), 25-39.

Spagnolli, A., Lombard, M. & Gamberini, L. (2009). Mediated presence : virtual reality, mixed environments and social networks. *Virtual Reality*, *13*, 137-139.

Stanney, K. (1995, March). *Realizing the full potential of virtual reality: Human factors issues that could stand in the way*. Proceedings of the Virtual Reality Annual International Symposium (VRAIS '95), IEEE.

Statistics Canada, (2009). Criminal victimization and health: A profile of victimization among persons with activity limitations or other health problems. Retrieved on September 25, 2012 from: http://www.statcan.gc.ca/pub/85f0033m/85f0033m2009021-eng.htm

Stepanova, A.N. (2005, June). *Virtual reality as concept and the ontological phenomenon.* Conference Proceedings from the 9th Russian-Korean International Symposium on Science and Technology (KORUS 2005), June 26th to July 2nd 2005, Novosibirsk State Technical University, Russia.

Stendal, K., Molka-danielsen, J., & Balandin, S. (2011). Virtual worlds : A new opportunity for people with lifelong disabilities. *Journal of Intellectual and Developmental Disability, 36*(1), 80-83. doi:10.3109/13668250.2011.526597

Sutherland, I. E. (1968). A head-mounted three dimensional display. Proceedings from the Fall Joint Computer Conference, December 9th to 11th, 1968, San Francisco, CA. doi: 10.1145/1476589.1476686

Talamo, A., & Ligorio, B. (2001). Strategic Identities in Cyberspace. *CyberPsychology & Behavior, 4*(1), 109-122. doi:10.1089/10949310151088479

Taylor, T., L. (1999). Live in virtual worlds: Plural existence, multimodalities, and other online research challenges. *American Behavioral Scientist, 43*(3), 436-449. doi: 10.1177/00027649921955362

Taylor, T., L. (2003). Intentional bodies: Virtual environments and the designers who shape them. *International Journal of Engineering Education, 19*(1), 25-34.

Taylor, K. C., & Chyung, Y. (2008). Would you adopt Second Life as a training and development tool? *Performance Improvement, 47*(8), 17-26. doi: 10.1002/pfi.

Thurmond, V. A. (2001). The point of triangulation. *Journal of Nursing Scholarship, 33*(3), 253-258. doi: 10.1111/j.1547-5069.2001.00253.x

Tregaskis, C. (2002). Social model theory: The story so far… *Disability and Society, 17*(4), 457-470. doi:10.1080/0968759022014037

Turkle, S. (1994). Constructions and reconstructions of self in virtual reality. Playing in MUDs. *Mind, Culture, Activity*, *1*(3), 158-167. doi: 10.1080/10749039409524667

Turkle, S. (1995). *Life on the Screen.* La Jolla, CA: Simon & Schuster.

Turkle, S. (1997). Multiple subjectivity and virtual community at the end of the Freudian century, *Sociological Inquiry, 67*(1), 72-84. doi : 10.1111/j.1475-682X.1997.tb00430.x

Turkle, S. (2005). *The Second Self: Computers and the Human Spirit.* Cambridge, MA: The MIT Press.

Van der Woude, L. H. V., de Groot, S. & Janssen, T. W. J. (2006). Manual wheelchairs: Research and innovation in rehabilitation, sports, daily life and health. *Medical Engineering & Physics, 28*(9), 905-915. doi:10.1016/j.medengphy.2005.12.001

Vicdan, H., & Ulusoy, E. (2008). Symbolic and experiential consumption of body in virtual worlds: from (dis) embodiment to symembodiment*, Journal of Virtual Worlds Research, 1*(2), 1-22. Retrieved from http://journals.tdl.org/jvwr/index.php/jvwr/article/view/347/257

Warburton, S. (2009). Second Life in higher education: Assessing the potential for and the barriers to deploying virtual worlds in learning and teaching. *British Journal of Educational Technology*, *40*(3), 414-426. doi: 10.1111/j.1467-8535.2009.00952.x

Weiss, P. L., Bialik, P. & Kizony, R. (2003). Virtual reality provides leisure time opportunities for young adults with physical and intellectual disabilities. *CyberPsychology and Behavior, 6*(3), 335-342. doi:10.1089/109493103322011650.

WHO, (2011). World report on disability. Retrieved on September 25, 2012 from http://www.who.int/disabilities/world_report/2011/en/index.html

Williams, D., Martins, N., Consalvo, M. & Ivory, J.D. (2009). The virtual census: presentations of gender, race and age in video games. *New Media and Society, 11*(5), 815-834. doi: 10.1177/1461444809105354

Wolfendale, J. (2006). My avatar, my self: Virtual harm and attachment. *Ethics and Information Technology*, *9*(2), 111-119. doi: 10.1007/s10676-006-9125-z.

Wright, S. E. (1993). Presidential address: Blaming the victim, blaming society or blaming the discipline: Fixing responsibility for poverty and homelessness. *The Sociological Quarterly, 34*(1), 1-16. doi: 10.1111/j.1533-8525.1993.tb00127.x

Virtual Ability, (2012). Disability resources. Retrieved on September 25, 2012 from: http://www.virtualability.org/disability-resources

Yee, N. (2006). Motivations for play in online games. *Cyberpsychology & behavior : the impact of the Internet, multimedia and virtual reality on behavior and society*, *9*(6), 772-5. doi: 10.1089/cpb.2006.9.772.

Young, G. (2010). Virtually real emotions and the paradox of fiction: Implications for the use of virtual environments in psychological research. *Philosophical Psychology*, *23*(1), 1-21.

Zielke, M., Roome, T., & Krueger, A. (2009). A pedagogical model for virtual world residents: A case study of the virtual ability Second Life island. *Journal Of Virtual Worlds Research, 2*(1). Retrieved November 14, 2010, from http://journals.tdl.org/jvwr/article/view/417

Zimmer, L. (2000). Identity versus reputation: wandering and wondering in virtual spaces. Retrieved on June 24, 2012 from: http://freshtakes.typepad.com/sl_communicators/2007/05/identity_versus.html

Zimmerman, J. (2009, April). Design for self: Making products that help people become the person they desire to be. *In Proc. CHI 2009, Boston, USA, ACM Press,* 395-404. Retrieved from http://onemvweb.com/sources/sources/products_help_people

Appendix A

Call for Participation Group Notice

Let your voice be heard: an invitation to participate in a study that wishes to explore the subjective experiences of physically disabled individuals who are residents of Second Life. More info attached.

(Attached Information Below)

Call for Participation Notecard

About This Project:

With desire to give voice and share the perspectives and experiences of the physically disabled who inhabit the world of Second Life, this study will explore your personal stories and experiences interacting in Second Life, as you perceive them and what they mean to you.

I invite you to participate and take this opportunity to share and voice your personal experiences within Second Life. If you are interested in participating, please read through the consent form and provide the researcher with your Second Life information in the following link:

Consent form and information: http://fluidsurveys.com/surveys/slresearch/participant-recruitment/

If you have any questions or would like to contact the researcher, please contact Ambrosia108 Azalee in-world, or by email at: EMAIL

Appendix B

CONSENT TO PARTICIPATE IN DISABILITIES AND VIRTUAL WORLDS: A PHENOMENOLOGICAL EXPLORATION INTO THE EXPERIENCE OF LEARNING

I understand that I have been asked to participate in a research project being conducted by Amber Judge of the Department of Education of Concordia University (*sl.pheno.research@gmail.com),* under the supervision of Professor Ann-Louise Davidson of the Department of Education of Concordia University (*ann-louise@education.concordia.ca).*

A. PURPOSE

I have been informed that the purpose of the research is to explore meaning-making and perceived experiences of physically disabled individuals who use and interact in the virtual world of Second Life. Specifically, this study wishes to explore this group's subjective experiences of learning about the self and other through interaction in virtual worlds.

B. PROCEDURES

I understand that this research will require me to respond to questions in three separate interviews. These interviews will be conducted within Second Life and take between 30 to 90 minutes each to complete. I have been informed that it will be my choice whether to take this interview through text chat or voice chat.

I understand that the researchers will be aware of my avatar identity in Second Life, and that my identity will be kept confidential. I am assured that at any point in time I may withdraw from this study by contacting the researchers, at which point any information that may have been collected will be discarded.

C. RISKS AND BENEFITS

I understand that there is a potential emotional vulnerability that comes with personal disclosure, and I am aware of the referral to contact if the need arises. The benefits include giving my voice to represent people with physical disabilities in present research, which can inform policy makers, educators and future use, research, design and development in virtual worlds. In addition it can inform individuals with disabilities of what can be done in Second Life.

D. CONDITIONS OF PARTICIPATION

- I understand that I am free to withdraw my consent and discontinue my participation at anytime without negative consequences.

- I understand that my participation in this study is CONFIDENTIAL (i.e., the researcher will know, but will not disclose my real and virtual identity).

- I understand that the data from this study may be published.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.

AVATAR NAME

____

SIGNATURE (or press button to agree)

____

If at any time you have questions about the proposed research, please contact the study's Principal Investigator, Amber Judge of the Department of Education of Concordia University (*sl.pheno.research@gmail.com*); or Professor Ann-Louise Davidson of Department of Education of Concordia University (*ann-louise@education.concordia.ca)*.

If at any time you have questions about your rights as a research participant, please contact the Research Ethics and Compliance Advisor, Concordia University, 514.848.2424 ex. 7481 ethics@alcor.concordia.ca

Appendix C

Participant Recruitment through Fluidsurveys.com

After the consent form (see Appendix B), the potential participant will have seven questions to answer to provide the researcher with some basic information:

1. For the researcher to contact you in Second Life, please provide your full avatar name:
2. How long have you been using Second Life?

   Less than a month

   1-3 months

   3-6 months

   1 year

   2 years

   3 years

   4 years

   5 years

   6 years or more
3. Do you consider yourself physically disabled in real life?

   Yes

   No
4. Do you consider yourself homebound in real life?

   Yes

   No
5. What kind of disability do you experience?

6. For the interviews, what medium would you prefer to communicate through?

    Text

    Voice

    Either Text or Voice

7. Please type in when you might be available for participating in interviews for this study. Include dates and times (SLT):

Thank you, I greatly appreciate your time and effort!!
If you have any questions regarding this research please contact Ambrosia108 Azalee via notecard in-world in Second Life, or by email at sl.pheno.research@gmail.com

Appendix D

The Unstructured Interview Guide

This instrument is merely a guide or sample of potential interview questions, divided into three sections each relating to one of the three interviews explained by Seidman (2006). The first interview explores the past and the context, the second interview explores the present experiences or daily life of the participant and the third interview explores the meaning that participants make out of these experiences (Seidman, 2006). Naturally, as the interviews progress questions will be tailored to each participant based on prior interviews with the researcher (Seidman, 2006). Each interview may take anywhere from 30 to 90 minutes, and be conducted in voice or text chat in Second Life.

Interview 1: Understanding the Context

Introduction by the researcher

Hi, thank you for volunteering to participate in this study. I just want to ensure that you have read the consent form (give the participant a notecard copy in-world), and know that any private information tied to your identity in the real and virtual world will be kept confidential. You are also free to stop the interview process or your participation in the study at any time. This interview is the first of three interviews, and is very informal. For this interview I would like to get to know more about you and your history or background. Feel free to share any thoughts or experiences that come to you, at any time. Are you ready to begin?

Possible Questions

If you could tell me your life story in a few sentences, what would it be?

What do you like most about your life?

If there were anything you could change in your life, what would it be?

Tell me more about yourself.

What you would consider to be your best qualities?

What would people who know you best say are your best qualities?

If there were anything you could change about yourself, what would it be?

(How) Have you changed over the years? In what ways have you changed?

Are there particular experiences in your life that have taught you about yourself?

Describe these to me.

Describe your typical day from the time you wake up to when you go to bed.

What do you do?

Do have persistent feelings or moods throughout your day? Describe them.

Are there people you spend the most time with in your real life?

What is most pleasant about your day?

What is most difficult about your day?

Tell me about your family and friends.

What do you do with them?

Describe your interactions with them.

Do you meet new people and make friends easily in the real world? Why or why not?

Describe how you feel when you interact with other people? Family, friends, strangers?

What do you like to do in the physical world?

Are there limitations to what you can do in the real world? Tell me about them.

You mentioned that you experience disability. What does disability mean to you?

In what ways do you feel the disability affects your life?

Describe your experience of disability to me in as much detail as possible.

What would you say that disability has taught you about yourself or other people?

End of the Interview

Thank you for your time, and for sharing your experiences with me. If any other thoughts or reflections come to mind later on regarding what we've spoken about, and that you'd like to share, please feel free to notecard them or contact me at any time. Our next interview will explore your experiences here in Second Life. When would you like to meet next? (Schedule the next interview session). Again, thank you and I'm looking forward to next time. Have a great day/evening.

Interview 2: Exploring the Present

Greetings and introduction by the researcher:

Hello! It's a pleasure to meet with you again. How are you today? (spend some time getting to know how they're doing). This interview will be exploring your experiences in Virtual Worlds and Second Life. Are you ready?

Possible Questions:

What brought you into Second Life?

Describe your typical day in Second Life.

Tell me about how you first created your avatar.

What did he/she look like?

Tell me how you went about designing your avatar's appearance.

Describe how it felt to create your avatar. What was your first reaction?

How did you make your avatar: the same or different than you in real life?

What is similar between you and your avatar?

What is different between you and your avatar?

Are there features you wish your avatar had, that it does not or cannot have?

Are there features you wish you could change about your real life body, since you created your avatar? What would those be?

Tell me about the people you have met, and the community here in Second Life.

Are people different in Second Life than in real life? How?

How does interacting with avatars differ than in real life?

Is it easier or harder to get to know people?

Do you find it easier or harder to open up to people here? In what way?

What do you like most about Second Life?

If there were anything you could change about Second Life, what would that be?

End of the Interview

Thank you again for your time, and for sharing your experiences with me. I'd like to remind you that if any other thoughts or reflections come to mind later on regarding what we've covered that you'd like to share, please feel free to notecard them or contact me. Our next interview will be diving into what these experiences you've described earlier mean to you. When would you like to meet next? (Schedule the next interview session). Again, thank you and I'm looking forward to next time. Have a great day/evening.

Interview 3: Meaning

Greetings and introduction by the researcher:

Hi! It’s great to see you again. Thank you again for participating in this study and for sharing with me. This interview is the last interview of the study, and it is all about what these experiences mean to you. Feel free to talk about any thoughts or feelings that come to you at any point in the interview. Are you ready to begin?

Possible Questions:

What has SL added to your life? How?

Are there any ways in which SL takes away from your real life?

Has SL changed your perception of yourself in any way? How?

Has Second Life changed your perceptions of other people? How?

What have you learned about people here in-world?

What have you learned about yourself in Second Life?

(If this is the case:) You chose to portray your real life disability in Second Life.

- How did you go about modifying your avatar to show your real life disability?
- Why did you choose to emulate your disability in-world?

(Otherwise:) Have you ever thought about portraying your real life disability on your avatar in Second Life?

- How did you decide to make your avatar as it is now?
- Would ever consider portraying your disability? Why or why not?

What does it mean to you, to have this avatar in Second life?

After your experiences here in Second Life, have your feelings about disability changed? How?

Do you think disability still exists in Second Life? If so, how? or Why not?

What do you think the real world could learn about disability from Second Life?

Are there any other thoughts you would like to share with me?

End of the interview:

I want to thank you again for spending this time with me and sharing your thoughts and experiences. If any other thoughts come to you that you would like to add to what we've discussed, please feel free to notecard them and send them to me at any time. I will be contacting you again once the study is near completion, to go over the findings incase you would like to change or add anything. Thank you for your collaboration and I wish you a great day/evening.

Appendix E

Additional research questions addressed:

This appendix will address the additional research questions listed below. These questions can be classified into identity-related questions, disability-related questions, and questions comparing virtual life with real life:

1. How do individuals with physical disabilities experience their avatars?
2. How does the design of the virtual platform affect the experience of the avatar construction for individuals with physical disabilities?
3. In what ways does the person experience a difference and/or similarities between the in-world identity and the real world identity?
4. How do people with physical disabilities perceive these experiences as affecting their real lives?
5. How do avatar-avatar interactions subjectively affect knowledge of self and of other people in general?
6. How do avatar-world interactions subjectively affect knowledge of real and virtual environments?
7. How does the meaning grasped from these experiences affect or reflect the meaning of disability for the individual?

The first question addresses how individuals in the real world experience their avatars in the virtual world. As explored in the multiple narrative descriptions in the analysis chapter, participants describe their avatars as: extensions; alter egos; them without visible disabilities; identities they wish to be or wish to explore themselves with;

and as liberation from physical disabilities. These aspects of this experience as related to identity are congruent with how avatars have been defined in the current literature (Benford, Bowers, Fahln, Greenhalgh & Snowdon, 1997; Ford, 2001a; Kushner, 2004) and how virtual worlds are said to affect disabilities (Carr, 2010; Cassidy, 2008; Ford, 2001b, 2001c; 2001a; Stendal, Molka-danielsen & Balandin, 2011).

The second question addresses the virtual environment's design and its effect on the experience of virtual identity construction. Based on the interviews with participants, I would say that the virtual environment affects the choices people make with regards to constructing their virtual identities because of the freedom the environment and avatar customization tools allow. This freedom of self-design and expression, and the inherent ability given in the virtual world to do and be whoever one wishes affects how they choose to self-present. Being able to do or be in the realm of possible makes it likely to become virtually actual, for example: the ability to walk; the ability to be anonymous and hide real-world disabilities; the ability to change gender and appearance with a few clicks of a button.

The third question relates to how the participants experienced difference or similarity between their virtual and real-world identities. All participants seemed to suggest that mentally and emotionally they are the same person in real life as they are through the avatar. The difference appears in that the avatar identity was visually different depending on whether they were using their avatars for role-play and fantasy or as ideal enhancements of their real selves. It also was expressed in one case, as they learn about the extent of their freedom to be anyhow they wish with the avatar it allowed for self-exploration and increasingly divergent avatar self-representations until they felt that they connected with their avatar.

The fourth question addresses the ways in which the participants perceive the virtual world as affecting their real lives. First, participants said that they feel the mental and emotional crossover between both worlds; what they experience in-world affects them in the real world through their thoughts and emotions but not their bodies. Second, they also say that friends they have met in Second Life have become friends on other online platforms (Facebook) as well. Third, each participant mentioned how their sense of identity or role has changed through interactions they have had in-world either with other people or with their avatars. Specifically, one said that her understanding of her gender changed through interactions with her avatar and other people that she knew she had to also deal with it in the “real world”. The other two participants had stated that their role had changed in-world by realizing through interacting with others that they could use their real-world knowledge and skills to help other people in-world and one even wants to build a professional presence in Second Life. Last, they also stated that Second Life helps them cope and learn to cope with their disabilities in the instance of degenerative disease affecting physical ability, and that simply being able to “exist” and “do” in-world helped them with the disabilities in their real lives.

The fifth question asks how avatar-avatar interactions may affect self-knowledge and knowledge of the other. It would seem that most importantly they learn that they are not alone; they are not the only ones dealing with the same health issues and that by knowing how other people have dealt with it they learn that they too can deal with it in a similar manner. They also learn that people are still people regardless of whether they appear as avatars or not, that everyone has a connection with their avatar(s) and one reason or another for being in Second Life. All these interactions result from the sharing of information that instigates self-reflection and discovery, and in certain instances, confirmation of their discoveries.

The sixth question explores how avatar and virtual world interactions might affect their knowledge of real and virtual places. Based on the participants' responses, it appears that they become aware that the virtual world is more malleable than the real world and thus that it allows for unbound creativity. This creativity is demonstrated through the way they can build and shape virtual object and the world around them to express themselves artistically. Though one could argue that the physical world also allows for building, shaping and self-expression, it requires more time, energy and resources than just a few clicks on a computer to generate those changes. Furthermore, the actualization of the realm of fantasy is not always possible in the real world, but it can often be simulated in the virtual world.

The seventh and final secondary question inquires into disability as perceived by the participants and how the virtual world affected their definitions or meaning of disability. It was found that for all participants, disability does not define a person, it simply means that there are things people can not do like other people can. Through

Second Life and assistive technologies, the meaning shifts from “what one can not do” to “what one can do given the right knowledge and tools”.

These additional questions addressed important aspects of this research inquiry beyond the primary scope and also highlighting details covered during interviews with participants.