

EFFECTS OF DETAILED CUSTOMIZATION OF STUDENT AVATARS ON TEACHER
EXPECTATIONS OF STUDENTS

By

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To my sweet Jennifer: You encourage and inspire me. Soli Deo Gloria

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Abstract of Dissertation Presented to the Graduate School
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By

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Major: Curriculum and Instruction

The gender and ethnicity of students have been shown to specifically affect teacher expectations of students in real-life classrooms. As part of a Multi User Virtual environment (MUVE), people socially interact via avatars which have the capability to be customized to minute details of ethnicity and gender. Currently, teachers in MUVES instruct students with little to no knowledge of their own potential biases and prejudices toward students of different genders and ethnicities. Our purpose was to examine the impact of the gender and ethnicity of student avatars on teachers' expectations and perceptions. Our study surveyed 453 teachers in Second Life, a popular MUVE. Teachers were asked to review a transcript, image and video of student avatar in Second Life and then respond to a questionnaire about the student's intellectual and relational abilities. Teachers also responded to a demographic questionnaire. Results indicate that choice of avatar gender and ethnicity does influence teachers' expectations and perceptions in a MUVE. Results may aid teachers in MUVES to discover potential biases and prejudices toward some student avatars, as well as level the playing field for student avatars of all ranges of gender and ethnicity.

CHAPTER 1 INTRODUCTION

Purpose Statement

Social interaction is important to learning (Vygotsky, 1978) and can occur in technology mediated forms (e.g., 5th dimension project – Cole, 1995; Nicolopolou & Cole, 1993; CSILE - Scardamalia & Bereiter, 1996; Scardamalia, et al., 1994; LaFerriere, 2002). One form of technology mediated interaction that is increasingly being used in education is the Multi-User Virtual Environment (MUVE; New Media Consortium, 2007; Castronova, 2001). These environments allow users to experience a graphically engaging world while interacting with others as an avatar (Lastowka & Hunter, 2004). An avatar is a person's graphical representation of himself or herself (Meadows, 2008; Wood, et al, 2005; Dieterle & Clarke, in press). Users can choose the physical appearance of their avatar by customizing minute details of shape, skin, hair, eyes, ethnicity and gender (Damer, 1998; Rehak, 2003; Lastowka & Hunter, 2004). Unfortunately, we know little about the effect of this avatar choice on student success in these environments (Lastowka & Hunter, 2004).

We also have an inadequate understanding about the effect of avatar choice on teacher expectations and perceptions of student success. The gender and ethnicity of students has been shown to specifically effect teacher perceptions and expectations of students in face-to-face classrooms (Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Walther & Tidwell, 1996; Ferguson, 2003; Frawley, 2005; Van Duzer, 2006; Auwarter & Aruguete, 2008). If we were to discover the influence of avatar choice (i.e. gender and ethnicity) on teacher expectations and perceptions of student success, then we would be able to help teachers and students to avoid the problems of unintentional disadvantage and unfair advantage. These problems threaten the possibility of bias against student avatars of particular genders and ethnicities. Furthermore,

teacher bias in their perceptions of students often results in lower academic performance by students (Auwarter & Aruguete, 2008; Rist, 1970). As a result of these problems, we need to study the influence of avatar choice (i.e. gender and ethnicity) on teacher perceptions and expectations of student success.

Face-to-Face Expectations and Perceptions in Education

Interactions between teachers and students are important in the face-to-face classroom because these interactions form most teachers' expectations and perceptions of the student (Levy et al, 2003; Irvine, 1986). As a result, learning to interact with teachers is an important social interaction skill for students to learn in the classroom. Teacher-student interaction is a two-way process: Each participant influences the other's behaviors (Levy et al, 2003; Irvine, 1986). Brophy & Evertson (1981) and Muijs & Reynolds (2005) describe this process as a two-sided relationship between teachers and students who are active, initiating, and relevant in their interactions.

Teacher perceptions and expectations regarding student ethnicity are critical to students' academic accomplishments (Dee, 2004; Ferguson, 2003; Roscigno, 1998; Alexander, Entwisle, & Thompson, 1987; Irvine, 1986; Rist, 1970). Socio-economic trends translate into hardship for ethnic minority students, considering that the majority of lower socioeconomic students are from an ethnic minority (Ferguson, 2003; Roscigno, 1998). In general, instructors expect students from a poor background to do worse than middle- and upper-class students, not considering aptitude (Dee, 2004; Ferguson, 2003; Alexander, Entwisle, & Thompson, 1987; Beady & Hansell, 1981; Gay, 1975; Rist, 1970; Simpson & Erickson, 1983). Teacher gender biases also influence their expectations and perceptions of student success (Beaman, et al., 2006). Oyserman et al. (2001) contend that females are socialized to be more involved with

relationships and the approval of others than are males. Due to this socialization, females' academic self-worth may be hurt more when they experience negative interactions from teachers. These characteristics may well shape teachers expectations and perceptions of their female students. Perceptions and expectations are indeed a powerful force in education.

Multi User Virtual Environments in Education

Teachers are increasingly expressing their perceptions and expectations of students through the use of technology (New Media Consortium, 2007). One type of technological environment used for learning is known as the Multi-User Virtual Environment (MUVE) (New Media Consortium, 2007; Castronova, 2001). MUVES are technology-based simulations that engage people in a different, yet cohesive reality. Users navigate the world, view and control items using technology varying from a keyboard and mouse to a head-mounted display with gloves (Laferriere, et al., 2002). This world is usually seen as a two or three-dimensional graphical depiction of other people (avatars) who can be represented as animals, humans, or whatever they want. Not considering subject matter and intended audience, all MUVES allow numerous users to concurrently (a) log on to a virtual world, (b) manipulate virtual items, (c) customize their own person through an avatar, (d) interact with other users and artificial intelligences, and (e) experience modeling and mentoring in simulated environments that help them to think about a difficulty in their physical context (Dede et al., 2004).

Experts predict that 80 percent of active Internet users will regularly participate in an MUVE by the end of 2011 (Gartner, 2007). Today's array of virtual world environments has evolved through the synthesis of social networking, simulation and online role playing games. The MUVE *Second Life* (<http://www.secondlife.com>) currently boasts more than 6.6 million residents worldwide and over 7 million U.S. dollars are spent in a given month. The top 80

percent of residents hail from more developed nations, but a significant portion also log on from places like Africa, Southeast Asia, and Latin America. The typical resident is male, between 25-34 years old, and among the top 5% of the world's wealthiest individuals.

A significant number of universities, colleges, schools, organizations, and businesses are exploring the educational potential of Second Life. According to the Chronicle of Higher Education (Foster, 2007), as of September 21, 2007, more than 150 colleges in the United States and in 13 other countries have a presence in SL. Additionally, according to the Second Life Wiki (SimTeach, 2007), 17 educational organizations; 4 libraries; and 4 museums are currently active in SL. Second Life education related websites number more than two hundred. The purposes of these groups' involvement in SL are as varied as their creators. Foreman (2003) envisages virtual worlds as "the learning environments of the future" (p. 14), but it is safe to say that MUVES have significant educational potential.

Students have the ability to choose the minute details of their avatars in MUVE environments (Damer, 1998; Rehak, 2003; Lastowka & Hunter, 2004). For example, in Second Life, an avatar can be changed on a 0 to 100 scale for shape (Body, Head, Eyes, Ears, Nose, Mouth, Chin, Torso, Legs, Male/Female, etc.), skin (skin Color, Face Detail, Makeup, Body Detail, etc.), hair (Color, Style, Eyebrows, Facial), and eyes (Color, texture, etc.). Specifically, gender and ethnicity can be clearly expressed in a variety of ways. The influence of student avatar choice on teacher expectations and perceptions is currently unknown.

Problem Statement

Unfortunately, little research has been done regarding the influence of avatar choice (i.e. gender and ethnicity) on teacher perceptions and expectations of student success. Student gender and ethnicity does influence teacher expectations and perceptions of student success in face-to-

face classrooms (Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Ferguson, 2003; Frawley, 2005; Van Duzer, 2006; Auwarter & Aruguete, 2008; Beaman, et al., 2006; Roscigno, 1998; Alexander, Entwisle, & Thompson, 1987; Irvine, 1986; Rist, 1970; Dee, 2005). This research needs to also be done in MUVES because students in these environments can become anyone by customizing their avatar. Student avatar customization and teacher gender and ethnicity biases may combine to create the problems of unintentional disadvantage and unfair advantage. For example, let's say that a male teacher in SL was biased toward their own gender in their rating of IQ for student avatars. Students who didn't know this information could end up choosing a female avatar when taught by a male teacher, which could result in unintentional disadvantage to this student. However, a student who did know this information could end up choosing a male avatar when taught by a male teacher, resulting in unfair advantage. Both possibilities are troubling because the academic playing field in MUVES may not be level – it could be biased toward student avatars of particular genders and ethnicities. Furthermore, teacher bias in their perceptions of students often results in lower academic performance by students (Auwarter & Aruguete, 2008; Rist, 1970). Thus, this is more than just a concern about a few students who may or may not have knowledge of the results of this study. The results of this study concern all teachers and students because all students can be affected in their academic performance by teacher expectations and perceptions. As a result, we need to study the influence of avatar choice on teacher perceptions and expectations of student success.

Research Questions

The overarching question in this study was whether avatar choice affected teacher expectations and perceptions of student academic success. Many references have been given that have convincingly shown that teacher biases based on the gender and ethnicity of students do

exist in face-to-face classrooms. However, this study was done in a MUVE. The sample selected mirrors the overall population of Second Life, which is mostly Caucasian and from western nations.

Thus, we appear to have a sample that accurately represents the overall population of SL. The question then becomes: How does the world of the physical compare to the virtual? Does SL mirror the real world in terms of biases, prejudices, and discrimination? Each of the next 15 research questions is examined with that intent. When you are in SL, does that capture the biases that are inherent in the real world? For ease of perspective, questions are broken down into those that are ethnicity related, gender related, and gender/ethnicity interactions.

- Ethnicity related questions
 - Does the ethnicity of the avatar affect teacher perceptions and expectations?
 - Does the ethnicity of the participant affect teacher perceptions and expectations?
 - Is there an interaction between the ethnicity of the avatar and the ethnicity of the participant?
- Gender related questions
 - Does the gender of the avatar affect teacher perceptions and expectations?
 - Does the gender of the participant affect teacher perceptions and expectations?
 - Is there an interaction between the gender of the avatar and the gender of the participant?
- Interactions between gender and ethnicity
 - Is there an interaction between the ethnicity and gender of the avatar and teacher perceptions and expectations?
 - Is there an interaction between the gender of the avatar and the ethnicity of the participant?

- Is there an interaction between the ethnicity of the avatar and the gender of the participant?
- Is there an interaction between the ethnicity of the participant and the gender of the participant?
- Is there an interaction between the ethnicity of the avatar, the gender of the avatar, and the ethnicity of the participant?
- Is there an interaction between the ethnicity of the avatar, the gender of the avatar, and the gender of the participant?
- Is there an interaction between the ethnicity of the avatar, the ethnicity of the participant, and the gender of the participant?
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- Is there an interaction between the ethnicity of the avatar, the gender of the avatar, the ethnicity of the participant, and the gender of the participant?

Significance

MUVES have significant and largely untapped educational potential (Table 1-1). Foreman (2003) envisages virtual worlds as, “the learning environments of the future” (p. 14). MUVES hold considerable potential for the development of complex social practices such as leadership, collaboration, and relationships. These worlds are complex rational groups distinguished by their social practices (Steinkuehler, 2004). Virtual worlds are compelling because social relations, collaboration, and information sharing are essential ingredients, and encourage collaboration both within and beyond game parameters (Delwiche, 2006). According to Yee (2006), more than half of those involved in virtual worlds have gained proficiency in mediation and leadership, such as solving conflict in groups. The educational potential of MUVES becomes clear with these kinds of potential learning outcomes.

As a well-known and widely distributed MUVE, Second Life possesses significant potential for innovations in learning and research. For example, Dave Taylor, knowledge transfer leader at the National Physical Laboratory, says that the use of SL opens up, “new opportunities for collaboration across disciplines and geographies that would not otherwise occur” (Edwards, 2006, p. 32). These online environments are also being explored as potential sites for research in the social sciences and therapy due to the apparent transference of social norms such as gender, interpersonal space and eye gaze (Yee, et al., 2007; Blascovich et al., 2002) as well as the affordances of recorded interactions and customizable environments.

Unfortunately, instructional practices in MUVES remain adaptations of those used in web-based and face-to-face classrooms (Delwiche, 2006; Keesey, 2007). With the similarity in appearance and movement in MUVES to real life appearance and movement, there is reason to believe that the impact of student avatar physical characteristics could be as important as their impact in traditional schooling. Unfortunately, research only addresses face-to-face and two dimensional online student populations. Therefore, the study of student avatar physical characteristics and their effect on expected current and future performance of the student by the teacher could help teachers in MUVES to discover potential biases and prejudices toward some students, as well as level the playing field for student avatars of all ranges of detailed customization. Once we understand the effect of detailed customization of student avatars on expected current and future performance of the student by the teacher, we will begin to understand the implications of how these characteristics could impact social interaction in work, learning, and other environments. Additionally, with the benefits to using MUVES in education mentioned above, any hindrance to a teacher’s expectations and perceptions about a student’s

ability to socially interact, participate, and conceptually and spatially grasp content needs to be addressed. Gender and ethnicity biases are two such hindrances that this study will address.

Definition of Terms

This study determines the effects of detailed customization of student avatars on grades and treatment given by teacher avatars. The following are definitions of terminology used in this study:

1. “An *Avatar* is an Internet user's representation of himself or herself, whether in the form of a three-dimensional model used in computer games, a two-dimensional icon (picture) used on Internet forums and other communities, or a text construct found on early systems such as MUDs” (Wood, et al, 2005; Meadows, 2008, Wikipedia, 2008, Retrieved October 22, 2007 from http://en.wikipedia.org/wiki/Avatar_%28virtual_reality%29, paragraph 1).
2. A Multi User *Virtual World Environment* is a computer-based simulated environment intended for its users to inhabit and interact via avatars. This habitation usually is represented in the form of two or three-dimensional graphical representations of humanoids (or other graphical or text-based avatars). MUVE's enable multiple simultaneous participants to (a) access virtual contexts, (b) interact with digital artifacts, (c) represent themselves through “avatars”, (d) communicate with other participants, and (e) take part in experiences incorporating modeling and mentoring about problems similar to those in real world contexts. From: Dieterle, E., & Clarke, J. (in press). Multi-user virtual environments for teaching and learning. In M. Pagani (Ed.), *Encyclopedia of multimedia technology and networking (2nd ed)*. Hershey, PA: Idea Group, Inc.
3. Computer Mediated Communication is any form of data exchange across two or more networked computers. More frequently, the term is narrowed to include only those communications that occur via computer-mediated formats (i.e., instant messages, e-mails, chat rooms) between two or more individuals (Thurlow, et al, 2004; Wikipedia, 2008; Retrieved January 25, 2008 from http://en.wikipedia.org/wiki/Computer-mediated_communication).
4. Multi-User Dungeon (MUD) — a virtual environment that supports the simultaneous participation of multiple users in a text-based game. From Dieterle, E., & Clarke, J. (in press). Multi-user virtual environments for teaching and learning. In M. Pagani (Ed.), *Encyclopedia of multimedia technology and networking (2nd ed)*. Hershey, PA: Idea Group, Inc.

Table 1-1. Various selected educational uses of Second Life

Institution	Purpose	Location
Idaho State University	Bioterrorism preparedness Program	http://irhbt.typepad.com/play2train
Dartmouth College	Simulation for distribution of medical supplies in crisis.	http://iml.dartmouth.edu/index.html
National Oceanic and Atmospheric Administration	Interactive educational simulations about the ocean and weather	http://www.esrl.noaa.gov/
Global Kids Island	Place for teen residents to learn about social and world issues.	http://holymeatballs.org/
Kids Connect Island	Youth collaborate via performing, storytelling and collaboration	http://zoomlab.org/kc/
The Social Simulation Research Lab	Library with papers, websites, homepages, and references of interest to social scientists.	http://tinyurl.com/y3wlat
BrainTalk Communities Inc.	A place for autistic and cerebral palsy patients to interact socially	http://braintalk.blogs.com/brigadoon http://braintalk.blogs.com/live2give/
American Cancer Society	Walkathon raised more \$ in a short time than what they would make in real life over many months.	http://www.cancer.org/docroot/GI/content/GI_1_8_Second_Life_Relay.asp
Seattle University	Property law course applies issues of law to virtual environments.	http://fizzysecondlife.blogspot.com
University of Houston	Design Economics course students try their entrepreneurial skills	http://www.arch.uh.edu
New Media Consortium	Virtual laboratory constructed to provide dozens of settings for social interaction experiments.	http://sl.nmc.org/wiki/Main_Page

CHAPTER 2 LITERATURE REVIEW

Introduction

Social interaction is an important component of student learning in traditional schooling environments (Vygotsky, 1978). Several researchers have suggested that interaction is also of importance to Multi-User Virtual Environments (MUVE's) (Taylor, 1999; Qvortrup, 2001, 2002; Siggard Jensen, 2007). As part of a MUVE, people socially interact via avatars (Lastowka & Hunter, 2004). These avatars have the capability to be customized to minute details (Damer, 1998; Rehak, 2003; Lastowka & Hunter, 2004). Unfortunately, we know little about the influence of avatar choice on teacher expectations and perceptions of student success. In particular, the gender and ethnicity of students have been shown to specifically effect teacher expectations of students in face-to-face classrooms (Clifford & Walster, 1973; Guttman & Bartal, 1982; Ferguson, 2003; Frawley, 2005; Van Duzer, 2006; Auwarter & Aruguete, 2008). If we were to discover the effect of the choice of avatar (i.e. gender and ethnicity) on teacher expectations and perceptions of student success, we would be able to help teachers in MUVES to discover potential biases and prejudices toward some student avatars, as well as handle the problems of unfair disadvantage and unfair advantage mentioned earlier. This study explores the effect of the gender and ethnicity of student avatars on teacher expectations and perceptions of student success.

The goal of this chapter is to explore the current state of research in MUVES by establishing it within the context of existing research that explores social interaction and its impact on teachers' expected student performance. This chapter delves into the literature surrounding Multi-User Virtual Environments, face-to-face interaction, computer-mediated interaction, avatar-based interaction, and the history of gender and ethnicity bias in schools. This

literature review a) distinguishes what has been done in the fields in question from what needs to be done, b) places the topic or problem in the broader scholarly literature, and c) synthesizes and gains a new perspective on the literature (Boote & Beile, 2005). This review of literature will function to establish a context for multi-user virtual environments and provide a basis for discussing the effect of detailed customization of student avatars on expected current and future performance of the student by the teacher.

An Overview of Multi User Virtual Environments

In many ways, the growth of MUVES parallels the growth of the Internet, as new technologies shift from small scale products that are the first of their kind and created at great expense toward large scale, typical products available to all (Bartle, 1999). These technologies are both used and co-constructed by the general public. With the Web, this occurred through the use of hypertext, wikis, blogs, mashups and other similar technologies. In the case of MUVES, users can create 3D artifacts, buildings, and social spaces where people interact. The social nature of these MUVES is a critical component of understanding their fundamental nature and utility (Qvortrup, 2001, 2002).

While the magnitude of MUVES is very different than what has come before, the idea of a persistent space that offers users the ability to socially interact with others and take part in the co-construction of the world with which they interact is not. Trubshaw and Bartle authored the first multi-user dungeon (MUD) in 1978 (Bartle, 1999). This was a game that allowed multiple players to engage in role-playing adventures. MUDs were multi-player and persistent and users often found the social interaction experienced within MUDs the most compelling aspect. In 1989, the MOO (MUD, Object Oriented) was developed to allow users to create and modify

places within a MUD space, enabling the construction of various types for social, educational, and other uses (Bartle, 1999; Castronova, 2006).

Even though the development of three dimensional rendering technologies, such as Virtual Reality Modeling Language (VRML) paralleled MOO development, it lacked the capability to create multi-user environments (Durbridge, 2004). Companies such as ActiveWorlds (<http://www.activeworlds.com>) created persistent, multi-user spaces that provided many of the same characteristics that MOOs had, but in three dimensions. At the same time, graphic role playing games, the successor to the MUD, were transitioning to the Web. These MMORPG's (Massively multi-player online role playing games) moved to full online-based networks in 1997 with the launch of *Ultima Online* (Bartle, 1999). Membership in massively multi-player online role-playing games (MMORPGs) expanded quickly, and by mid-2006 exceeded 16 million subscriptions to various MMOG environments (Castranova, 2006; <http://www.mmogchart.com>).

Multi-User Virtual Environments are deeply immersive and highly scalable three-dimensional systems (Dieterle & Clark, in press). Several interesting examples of MUVes are currently available:

1. *Second Life* (<http://www.secondlife.com>) possesses a small amount of the total number of participants in MMOGs worldwide, but it is one of the largest and most rapidly developing of the new wave of persistent MUVes.
2. Linden Labs created *Teen Second Life* (<http://teen.secondlife.com>) that requires adults aged 18 and over to complete a background check before they enter. *There* (<http://www.there.com>) offers similar defining characteristics, but restrains user activities in order to limit immoral activity.
3. *Multiverse* (<http://www.multiverse.net>) is creating an open platform for the development of both MUVes and MMOGs through a common set of standards and clients.

4. A consortium of academic institutions is developing the *Croquet* project (<http://www.opencroquet.org>) as an open-source environment for building collaborative virtual learning environments.
5. The Acceleration Studies Foundation has established a Metaverse Roadmap Project (<http://www.metaverseroadmap.org>) to forecast and shape the development of the new 3D web.

Multi User Virtual Environments in Education

MUVE's have significant and largely untapped educational potential. Foreman predicts that shared graphical worlds are "the learning environments of the future" (2003, p. 14). In many MUVE's, people enter the virtual world through the use of an avatar, a character that embodies their presence and intent (Taylor, 1999; Qvortrup, 2001, 2002; Siggard Jensen, 2007). Many popular MUVE's allow for multiple users to be in the same virtual space and interrelate with each other at the same time (New Media Consortium, 2007). Even in their nascent state, virtual worlds allow for the development of real life cultures through the use of individuated dialects, political configurations, multifaceted social customs, social networks, social capital and common history (Steinkuehler, 2004; Jakobsson and Taylor, 2003). MUVE's combine social networking, seamless sharing of rich media, and a feeling of presence in a generalized, persistent non-contextual environment that is applicable to almost all disciplines (Castronova, 2001).

MUVE's offer the prospect for users to interrelate in a way that delivers a sense of presence that is wanting in other technology (Castronova, 2001; New Media Consortium, 2007). This aspect lends itself to role-playing and situation construction, freeing up learners to assume the responsibilities of a physicist, artist, physician, or architect without the real-world training (or the real-world consequences (Steinkuehler, 2004). The effect is two-fold, providing an environment free of the limited thinking that often accompany deep single-disciplinary training, while allowing for risk-free experimentation and thinking outside the box (Delwiche, 2006).

This can lead to expanded learning of cultural and societal experiences as well as broad experimentation with new forms of human expression and endeavor (Delwiche, 2006).

MUVE's hold considerable potential for development and training in complex social practices such as leadership, collaboration, and relationships. These worlds are complex rational groups distinguished by their social practices (Steinkuehler, 2004). When novices enter a virtual world, they can be progressively initiated into intricate social scaffolding by means of the support of other group members (Steinkuehler, 2004). Virtual worlds are compelling because social relations, collaboration, and information sharing are essential ingredients, and encourage collaboration both within and beyond the environment's parameters (Delwiche, 2006). According to Yee et al., (2007), more than half of those involved in virtual worlds have gained proficiency in mediation and leadership, such as solving conflict in groups. Although scholarly evidence is lacking on whether these skills transfer to real world situations, they have been recognized by employers (Brown and Thomas, 2006).

Multi-User Virtual Environments can also facilitate enhanced exploration of and experimentation with various social roles (Turkle, 1995). The student can explore new social roles in an authentic situation while interacting with other individuals, a situation that has been shown to have significant psychological and learning advantages (Turkle, 1995). Virtual worlds have been shown to promote role-playing behaviors (Delwiche, 2006), which have been shown to help students break away from the control of modern customs and beliefs (Luff, 2000), affect attitudes and behavior (Bell, 2001), and can have significant therapeutic benefits (Douse & McManus, 1993; Hughes, 1998). For example, Peter Yellowlees (2006) documents the use of Second Life to help students experience the role of the patient. Students learn about the subjective experience of psychosis as they navigate through a virtual psychiatric ward. "In this

environment, users can literally see and hear hallucinations as a patient might, as they walk through the halls of the virtual hospital (Yellowlees, 2006, p. 441).” This application of Second Life enables students to explore and experiment with the role of the patient, thus gaining important insights into particular psychoses and developing a deeper empathy than through more traditional means.

Second Life in Education

As a well-known and widely distributed MUVE, Second Life possesses significant potential for innovations in education (Edwards, 2006). For example, Dave Taylor, knowledge transfer leader at the National Physical Laboratory, says that the use of SL opens up, “new opportunities for collaboration across disciplines and geographies that would not otherwise occur” (Edwards, 2006, p. 32). The development of complex social practices such as collaboration is enhanced by two major benefits: social context and visual context (Harris & Lowendahl, 2007). In a learning experience, students are more likely to develop as leaders, collaborators, and relaters, experience flow, and deeply experience alternative roles when there is a social and visual context (Harris & Lowendahl, 2007).

Second Life and other virtual worlds also possess great potential for research. According to Yee, et al. (2007) and Blascovich et al. (2002), social customs of gender, interpersonal space and eye gaze transfer into virtual environments even though the method of movement is entirely different (i.e., via keyboard and mouse as opposed to eyes and legs). As a result, these online environments are also being investigated as unique research sites for clinical therapy, the social sciences, and other academic fields. The New Media Consortium (2007) is attempting to work toward interdisciplinary research in the social sciences, but the inclusion of other academic disciplines could provide great benefit. Much could be learned by including biology, chemistry,

physics, and other disciplines not typically included in social science research. These environments can be customized through the use of in-world 3D construction tools. Locations can be produced to be relevant to any academic discipline or content area, places and artifacts can be as true to life and customized, or as general and vague as desired. Even objects of large or micro scale can be easily portrayed. The combined effect of recorded interactions and customizable environments provide the ideal conditions for future research.

For all of its potential and current uses, there are still major educational aspects that are underdeveloped in MUVE's such as SL – in particular, scalable, replicable, objective, empirical investigations, as well as development of best practices (Oliverio & Beck, 2009; Delwiche, 2006; Keesey, 2007). Whereas the Second Life Best Practices in Education Conferences (<http://slbestpractices2007.wikispaces.com>) are a major step forward in developing best practices in education, they also served to highlight the need to move beyond simple re-creation of the classroom experience to more of an emphasis on creative practices when using MUVES (Keesey, 2007). However, many emergent educational aspects of MUVES still need to be researched. One such aspect is the influence of avatar choice (i.e. gender and ethnicity) on teacher's expectations and perceptions of student success. This is important because teacher expectations and perceptions regarding student gender and ethnicity are critical to students' academic accomplishments (Dee, 2004; Ferguson, 2003; Roscigno, 1998; Alexander, Entwisle, & Thompson, 1987; Irvine, 1986; Rist, 1970). As a result, it is important to study the influence of avatar choice (i.e. gender and ethnicity) on teacher perceptions and expectations of student success. Differing kinds of interaction that are pertinent to teacher-student interactions are discussed below.

Face-to-face Interaction

In face-to-face interaction, physical proximity is a given. Interaction and communication are inseparable from the physical body. In essence, interaction is on a basis of what-you-see-is-what-you-get. Because physical presence gives immediate representation, identity is more tied to that physical presence (Goodwin, 1986). Previous research on face-to-face interaction has shown that participants use audio–visual cues to coordinate their activities. For example, Goodwin (1986) found that participants use gaze direction to coordinate turn taking and that gestures and hand motions may be used to indicate story structure and transitions from one conversational activity to another. Also, Jefferson (1989) found that the placement of laughter particles may indicate how to interpret and respond to a speaker’s utterance. The accountability of real-life social activities enables participants to achieve tight coordination in interaction (Moore et al, 2007). Individuals employ a various types of observational information regarding the actions of others so as to understand their actions and to closely synchronize their actions with those of others. This information consists of: (1) live unfolding of turns-at-talk; (2) the understanding of embodied activities; and (3) the focus of eye gaze for gesturing purposes (Moore et al., 2007). As a result, gaps and overlaps between turns are minimal. Turn-taking in real-life conversation tends to be tightly coordinated and fast, which is made possible by the predictability of turns-at-talk (Moore et al., 2007).

In face-to-face interaction a person can easily display their on-going activities through their visual conduct and demeanor (Hindmarsh et al., 1998). People use gestures in at least four distinct ways: (1) to perform an action through the gesture alone, such as a greeting with a wave or an agreement with a nod; (2) to refer to objects by pointing; (3) to emphasize particular words; and (4) to describe objects by simulating their shape, spatial relationships or motions (Kendon,

1980; McNeill, 1992). A key factor in the production of gestures, regardless of the type, is that they must be coordinated with the eye gaze of the intended recipient (Hindmarsh et al., 1998; Moore et al., 2007). Because gesture is a visual mode of communication, it doesn't count if the recipient does not see it. A basic resource in this kind of coordination is holding (Kendon, 1980; Hindmarsh et al., 1998) the gesture until you can see that the recipient has seen and understood it (Moore et al., 2007). In face-to-face interaction, participants can read and sense a situation, respond to it, and adjust communication and action according to this reading. In general, in these interactions participants monitor each other's utterances-in-progress to determine when and how to respond to each other (Moore et al., 2007). In oral conversation without face-to-face contact (such as telephone calls), participants can rely on verbal information and paralinguistic cues to coordinate turn exchange (Sacks et al., 1974).

One of the advantages of face-to-face interaction is that interpersonal effects develop faster than with technology based methods (Walther and Tidwell, 1996, McQuillen, 2003). Face-to-face interaction occurs in a collaborative environment continuously kept in sync by joint modification and improvement and includes the cooperative dedication of individuals in the co-construction of the message (Galimberti, 1994; Goodwin & Heritage, 1990). It permits criticism that allows the social significance of the message to be processed directly. This type of feedback has shown to lead to superiority in distinguishing between relevant and irrelevant ideas, ability to achieve consensus in discussion, and an increased conformity and convergence of ideas (Kerr and Murthy, 2004).

The limitations of face-to-face communication are inherent in its properties. Because interaction is inseparable from the physical body, many-to-many communication is not possible (Warschauer, 1997). Also, less reflection is encouraged in face-to-face discussion because of the

real time immediacy of conversation (Zornoza, Ripoll, & Peiró, 2002). Fewer ideas are generated in a problem solving process due to having to face the others' non-verbal objections and interruptions, and a high frequency of interpersonal conflict occurs in face-to-face discussion (Zornoza, Ripoll, & Peiró, 2002).

As stated above, participants know more about each other in face-to-face communication because of the presence of audio-visual cues and identity markers (Moore et al, 2007). This leads to a more realistic perception of self (Walther & Tidwell, 1996). Relationships are initially anchored by the everyday social and cultural construction of gender, age, race, or by cultural conventions that cover other human relationships (Carter, 2004). Communication is unequal in participation due to these same factors. As we turn to examine computer-mediated interaction, it will be important to keep in mind the characteristics of face-to-face interaction. Seeing the differences and similarities between different forms of interaction will help us to compare them with interactions in MUVes.

Computer Mediated Communication Interaction

Berger (2005) posits that new technologies do not simply provide communicators with more channels, but potentially alter the way they conduct face-to-face interactions. Through computer mediated communication, users and information hosts are interconnected within the existing telecommunication infrastructure, enabling computers to process messages and serve as a mass medium (Berger, 2005). The responsiveness, the interconnected, point-to-point configuration of participants, and the rising popularity of CMC have led some to talk about it as an interpersonal and many-to-many mass media cluster (Rafaeli, 1986, 1988). This is in contrast to the more traditional one-to-many description of broadcast and print media formats that have defined mass media since the Gutenberg press. CMC has been shown to be a type of

communication that is significantly different than non-digital written communication (Warschauer, 1997). The primary cause for this difference is that interaction with a traditional computer interface takes a longer amount of time than regular face-to-face interaction (Warschauer, 1997). Additionally, the lack of qualities like posture, facial appearance, and voice tone also contribute to this difference. Another difference is the time and place independent nature of communication which allows participants to compose and collect mail at any time in any location (Warschauer, 1997).

CMC tools have been proven to increase social interaction in the online environment (Repman, Zinskie, & Carlson, 2005). Prior research on CMC support systems has revealed two robust effects on the group interaction process (Zornoza, Ripoll, & Peiró, 2002). First, CMC promotes more equal participation and influence among group members. Second, by restricting the exchange of interpersonal cues, CMC seems to exert a depersonalizing, task-orientating effect on group interaction compared to FTF meetings (Kiesler et al., 1984; Siegel et al., 1986). A positive outgrowth of this effect seems to be that the frequency of conflict that commonly occurs in face-to-face interaction is reduced by the leaner nature of CMC (Harmon, 1998). This seems to occur by focusing on ideas and issues rather than on personalities (Poole et al., 1991). A number of studies also show that a higher proportion of group communications deals with instrumental versus expressive functions in CMC interactions as compared to face-to-face discussions (Hiltz, Johnson, & Turoff, 1986; Siegel et al., 1986).

CMC studies that have examined the role of gender and ethnicity have attempted to extend theories of face-to-face communication patterns (Eakins & Eakins, 1978; Lakoff, 1975; Tannen, 1990) to CMC modes. For example, women's online interaction is more similar to a rapport based style, compared to a report based style that men seem to support (Kaplan and Farrell,

1994). Similarly, Kaplan and Farrell (1994) show that messages composed by females are shorter and their involvement is motivated by their intent to continue the conversation, as compared to the intent to reach agreement on an issue. Historically, face-to-face communication situations that recognize the individuals involved have put women in a less empowered position in contrast to men (Tannen, 1990). The absence of gesture and socio-cultural information that identifies gender acts to lessen conversational gender-based limitations in a CMC environment (Matheson & Zanna, 1992; We, 1993). Thus, men may sense less of a requirement to present an appearance of social independence (Lee & Michael, 1999). This may result in men using interactional approaches that are normally seen in women (Lee & Michael, 1999). Conversely, women in a CMC environment may exhibit interactional traits that are traditionally more masculine (Lee & Michael, 1999).

Face-to-face communication takes place in a collaborative environment that is continually kept in balance through mutual modification and adjustment (Galimberti, 1994; Goodwin & Heritage, 1990). However, CMC takes place in a very different environment that is much less collaborative because of the special affordances of the technology (Brennan, 1991). Two normal characteristics of face-to-face communication are absent in most CMC environments: The cooperative dedication of individuals, and the co-construction of the message. Second, the constructive criticism that permits a true understanding of the message to be processed (Mantovani, 1996).

CMC's characteristic of enabling communication between large groups of people is similar to a group verbal face-to-face communication. However, two differences exist. First, CMC communication allows a group to tie reflection and interaction together by collaboratively developing knowledge. Second, CMC has proven to vary from face-to-face conversation

concerning interruption, balance, turn-taking, decision making, equality, and consensus.

Research has shown that CMC based communication tends to allow those who are regularly left out of conversation in a face-to-face environment to benefit from increased participation (Riva & Galimberti, 1998; Sproull and Kiesler, 1991; McGuire, Kiesler, and Siegel, 1987; Huff and King, 1988). Why does equal opportunity occur more in a CMC environment than in a face-to-face environment? CMC lessens social cues such as associated with status, gender, race, accent, and handicap (Sproull & Kiesler, 1991). It also lessens gestures or facial appearance like scowling and uncertainty (Finholt, Sproull & Kiesler, 1989). Finally, CMC seems to permit people to participate when and how fast they want (Sproull & Kiesler, 1991).

As stated above, participants know less about each other in CMC interactions because of the absence of audio-visual cues and identity markers (Dubrovsky, Kiesler, & Sethna, 1991; Kiesler, Siegel, & McGuire, 1984; Kiesler, Zubrow, Moses, & Geller, 1985; Siegel, Dubrovsky, Kiesler, & McGuire, 1986). This leads to a more idealistic perception, and a selective self-presentation of self (Walther & Tidwell, 1996). Also, relationships are not based in the everyday social and cultural construction of gender, age, race, or by cultural conventions that cover other human relationships (Carter, 2004). As a result, communication seems to be more equal in participation due to these same factors (Carter, 2004). As we turn to examine MUVE-based interactions, it will be important to keep in mind the characteristics of CMC and face-to-face interaction. Seeing the differences and similarities between these different forms of interaction will help us to compare them with interactions in MUVES.

Avatar-based Interaction in a Multi User Virtual Environment

The word avatar became popular in the modern technology based sense when it was used by Neal Stephenson in his 1992 novel *Snow Crash*. Generally defined, an avatar is not only a

representation produced for use by an individual in a MUVE, but can be any image used to represent a person online (Lee & Shin, 2004). Types of avatars may include: animal, cartoon, celebrity, evil, real face, idiosyncratic, positional, power, seductive, and many other options (Lee & Shin, 2004). As early as 1985, Chip Morningstar coined the usage of the term avatar to denote "...the image of a person in virtual reality: a movable three-dimensional image that can be used to represent somebody in cyberspace, for example, an Internet user" (Castranova, 2001, p. 6). Seen from the perspective of virtual worlds, avatars may be described as the citizens of these worlds. These avatars, unlike those in video games, can be thoroughly customized and are intended for communication (Lastowka & Hunter, 2004). The normal participant dedicates much time and money to create and customize the avatar (Lastowka & Hunter, 2004). The player can freely within the confines of the world's reality select sex, appearance, profession, and physical features (Damer, 1998). This possibility of rich customization is important to our study because it enables avatar choice (i.e. gender and ethnicity) to be expressed in understandable ways.

Identity experimentation with Avatars

In 1995, Sherry Turkle pointed out that playing with identity might become one of the most important aspects of avatars. Like the anthropological concept of masking, people use avatars to experiment with being another person or trying out different roles and functions (Turkle, 1995). Avatars allow users to construct their identity by choosing a name, changing physical characteristics and apparel, and through talking, discussing, and negotiating about the identity that users want to show in real time (Talamo & Ligorio, 2001). When people use avatars, they choose to use certain relevant characteristics of their identities as strategic resources to enhance their participation and the overall effectiveness of the community (Widdicombe, 1998). Some researchers consider the characteristics of gender and ethnicity as socially

constructed within communities (Waters, 1990; Nagel, 1994). Evidence of this type of identity experimentation can be seen in the wide range of gender and ethnicities that populate current MMORPGs and MUVES.

Social Interaction with Avatars

In face-to-face interaction, knowing the identity of the people with whom we interact is crucial to comprehending and assessing the interaction (Matusitz, 2005). However, in MUVE's identity is often unknown (Turkle, 1995). Regardless, MUVES create a sense of presence, immersion and engagement that seems to enhance social interaction (Schiano, 1999). The social interactions that players have and the social networks they build up are what make virtual worlds able to retain players long-term (Bartle, 2003). Some scholars argue that as the avatar begins to resemble human communication behaviors, the interactions will also become more effective (Taylor, 1999). Some research on avatar-based communication does exist. In 2002, Lars Qvortrup published comprehensive findings from a Danish research project on virtual reality, also covering some early studies of avatars' social interaction (Qvortrup, 2001, 2002). Also, Ralph Schroeder (2002) and Siggaard Jensen (2007) have published the findings from several international projects on avatar interaction. For example, for the purpose of project focused meetings:

1. It is challenging to arrange meetings between avatars, manage attention and focus, and construct a group focal point (Siggaard Jensen, 2007)
2. Meetings between two avatars seem to occur without difficulties (Siggaard Jensen, 2007).
3. Large group meetings between avatars often experience problems managing, interacting, and concentrating. This is especially the case if the content of their meeting goes beyond mere exploration and play (Siggaard Jensen, 2007).
4. It is challenging to maintain a conversation between more than two avatars in text chat while exploring the virtual environment (Siggaard Jensen, 2007).

5. The avatar's movements do not accurately reflect a physical body's movements and gestures that are regularly utilized to manage interaction (Siggaard Jensen, 2007).

Conversation analysis has shown that a generic feature of real-life social interaction is that gaps and overlaps between turns are minimal (Sacks et al., 1974). In real life, one second is considered the "maximum standard" length of a pause within conversational sequences (Jefferson, 1989; Schegloff and Sacks, 1973). Turn-taking in real-life conversation tends to be tightly coordinated and fast, which is made possible by the projectability of turns-at-talk (Jefferson, 1989). By hearing a turn unfold in real-time, a hearer can anticipate where the turn is likely to end and can start his or her turn promptly at the next "transition relevance place" (Sacks et al., 1974). In MUVE's that only employ CMC communication this kind of projectability and tight coordination among turns-at-chat is usually not possible. Most MUVE's employ a text-chat system very similar to IM in which you cannot see a player's turn unfold in real time (Garcia and Jacobs, 1999; Herring, 1999; and also Cherny, 1999). In IM the construction of chat messages is private and only becomes public all at once when the player presses the ENTER key (Garcia and Jacobs, 1999). This simple feature makes the organization of turns and sequences dramatically different from voice interaction as Garcia and Jacobs (1999) demonstrate: you cannot achieve "one speaker at a time," pairs of actions (e.g., question-answer, greeting-greeting) become interspersed with other pairs, lengthy pauses develop between pairs, turns are not repaired by others mid-course, and more (Curtis, 1996). Because they employ IM-style messaging systems, chat in today's virtual worlds exhibits all of these organizational characteristics (Curtis, 1996).

Voice-enabled chat has somewhat changed this situation. Turns are now heard unfolding in real time, which appear to eliminate many of the problems discussed above. The results of voice enabled chat are still inconclusive as no research has yet been done on them, but they may

be similar to research done on oral conversation without face-to-face contact (such as telephone calls). This research shows that people can rely on whether utterances are possibly complete (Sacks et al., 1974) and intonation that indicates a speaker is done to coordinate turn exchange. However, users are still not able to see and process the visual cues present in a face-to-face conversation. One feature of human bodies, which has an enormous social impact, is that you can see what a person is doing, to varying degrees, simply by looking at them (Moore et al, 2007). More research is needed on voice enabled chat to determine the full effect of this technology on social interaction.

Condition Awareness and Gestures

Despite the fact that MUVE's provide avatars, they actually reveal very little information about a user's condition than the physical body does (Moore, et al., 2007). In face-to-face communication, individuals utilize various types of information about the actions of others so that they can understand these actions and then proceed in synching their own actions with them (Moore et al., 2007). Avatars can approach each other, face each other, gesture to each other, in some cases exchange facial expressions, and more. Social interaction in MUVE's is neither only an instance of computer-mediated communication nor voice enabled chat (Oliverio & Beck, 2009). In both cases, communication involves two different kinds of awareness information: (1) "real-world," or what a player is currently doing in the physical world and (2) "in-game," or what a player is currently doing in the virtual world (Moore, et al., 2007). For example, when initiating a conversation with another avatar, one may be interrupting a real-world conversation the person is having with a family member or an in-game conversation the avatar is having with a third avatar. Ideally it would be useful for a player who is about to initiate a conversation to know if the recipient is currently busy in the real world or in the game world. However, the

strategies for providing these two types of awareness information are very different. Real-world awareness information, because it is external to the system, requires the use of sensors to monitor the player's physical environment (Schroeder, 2002). On the other hand, in-game awareness information is internal to the system itself and so sensing is not an issue, only how to present player-activity information to other players (Schroeder, 2002). In today's MUVE's, like in earlier CMC (Bowers et al., 1996), little of either type of awareness information is usually made available to players (Qvortrup, 2001, 2002). Relaying in-game awareness information about a fellow player's current on-going activities in the game world is vital for managing player-to-player interaction. Accountability and tight coordination depend on participants' access to these kinds of observational information (Qvortrup, 2001, 2002).

In face-to-face interaction, people communicate not only with their mouths but also with their hands and bodies (Moore et al., 2007). They can use their bodies to create an infinite number of unique gestures, just as they can put words together in an infinite number of unique combinations (Moore et al., 2007). People use gestures in at least four distinct ways: (1) to perform an action through the gesture alone, such as a greeting with a wave or an agreement with a nod; (2) to refer to objects by pointing; (3) to emphasize particular words; and (4) to describe objects by simulating their shape, spatial relationships or motions (Kendon, 1980; McNeill, 1992). In most MUVE's, gestures cannot be tightly coordinated with words in the chat because gesture and chat must be done as separate commands (Qvortrup, 2001, 2002). And in most systems, a gesture consists of two parts, an animation in the avatar and a text emote describing the gesture (Schroeder, 2002). Solving the technical challenges in simulating face-to-face interaction will become increasingly important as MUVE's are used more and more as

simulations for training in real-world skills. This is also one of the reasons why the study of social interaction by avatars is so important.

Understanding MUVE's and interactions within MUVE's helps us to grasp the importance of this study. Because social interaction is important to learning (Vygotsky, 1978), and people interact via avatars in MUVES (Lastowka & Hunter, 2004), then it is important to study social interaction in MUVES. Additionally, because avatar attributes can be customized to fine detail, it is important to study the impact of these attributes on avatar based social interaction (Lastowka & Hunter, 2004). Gender and ethnicity are probably the most obvious among the many possible avatar attributes that are available. The gender and ethnicity of students have been shown to specifically influence teacher expectations and perceptions of student success in real life classrooms (Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Walther & Tidwell, 1996; Ferguson, 2003; Auwarter & Aruguete, 2008). Therefore, it is important to explore the influence of avatar choice (i.e. gender and ethnicity) on teacher expectations and perceptions of student success. However, in order to do that we need to develop a historical and research based perspective on issues of gender and ethnicity in the classroom.

Issues of Gender and Ethnicity in the Classroom

The purpose of this study is to understand the influence of avatar choice (i.e. gender and ethnicity) on teacher perceptions and expectations of student success. The gender and ethnicity of students has been shown to impact teacher expectations of students in face-to-face classrooms (Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Ferguson, 2003; Frawley, 2005; Van Duzer, 2006; Auwarter & Aruguete, 2008). However, no research has been found on the impact of gender and ethnicity biases in MUVES.

History of Gender and Ethnicity Issues

An understanding of historical precedent in the education of women and ethnic minorities is needed in order to set the stage for this study. Having a historical perspective will help us to avoid the pitfalls of those who have gone before us and to create gender and ethnicity equitable classrooms in MUVE's. Current educational practice is founded on educational history. How teachers teach, interact with, and evaluate their students is rooted in historical precedent. Therefore, the examination of that history will help us to continue our ongoing improvement of instructor practices, interactions, and evaluations.

Women and minorities have struggled to achieve equity in the classroom for over 300 years. For many years, women were raised to be no more than wives and mothers and to keep an orderly house (Beecher, 1842). Ethnic minorities were taught to be content with positions in manual labor that favored their inferior intellects (Anderson, 1988). Historical records show that educational classrooms were segregated according to gender and ethnicity (Anderson, 1988). Curriculum was also very different, despite efforts by many in touting the importance of women receiving an equal education with men (Wollstonecraft, 1792; Beecher, 1842). Even in the present, many researchers have shown that gender and ethnic equity has not yet been achieved in the classroom (Campbell, 1990; Fennema & Peterson, 1985; LaFrance, 1981; Masland, 1994; Noddings, 1992; Sadker & Sadker, 1994; Ferguson, 2003; Auwarter & Arugete, 2008).

Much of what has been done on behalf of gender equity for women has had ulterior motives. For example, Horace Mann's teacher professionalization opened the door to the teaching profession for women, although it was primarily financially motivated and not an assertion of the equality of women. In *The Indispensable Teacher*, Mann wrote that women can teach just as good as a man, will cost only 2/3 the expense, and will infuse moral purity that a

man cannot (Cremin, 1957). His reasoning went a long way toward seeing women enter the teaching workforce. This in turn led to the creation of teaching colleges for women. However, even then the quality of the curriculum was inferior to those offered to men (Cremin, 1957).

Throughout the course of American educational history, established, wealthy groups continually sought to marginalize and control the influence and education of minority groups (Anderson, 1988). Foremost among the minority groups affected were African-Americans. Blacks withstood a barrage of attacks from Southern planters, poor white farmers, and northern philanthropists that were designed to eliminate or limit their access to equal education (Anderson, 1988). These efforts led to little or poor quality education for African-Americans (Anderson, 1988). The efforts of the above mentioned groups to marginalize and control the education of African-Americans highlight the educational goals of these interest groups. Far from academic excellence and intellectual development, they desired African-Americans to learn the skills that would keep them in low income rural and urban employment (Anderson, 1988). In short, they wanted to use education to control the socio-economic makeup of the United States and particularly the South, in order to promote their own capitalistic goals of more wealth and power (Anderson, 1988).

Lieutenant Henry Pratt's approach to the education of Native American youth epitomized common educational approaches toward ethnic minorities (Reyhner & Eder, 1989). In essence, he wanted to kill the Indian and save the man. He completely removed Native American youth from their homes and geographic surroundings and immersed them into a way of life that emphasized the English language, religion and culture (Reyhner & Eder, 1989). This approach was also adopted by the public schools in the 1800's and early 1900's (Tyack, 1974). They combined this approach of immersion into American culture with a Social Darwinist justification

of unfair segregation of minorities into special educational tracks focused on manual labor and women into home economics tracks that prepared them for life as a homemaker, wife, and mother (Tyack, 1974). One example of this was the development of standardized tests to determine what track a student should pursue in high school. Tyack (1974) showed that poor and minority students were overwhelmingly placed in the vocational or industrial tracks, while students from middle and high income families were regularly placed in the college track. Women were regularly shifted into a home economics track. Although scientific management resulted in more courses, the courses were still limited by track, and the tracks seemed to be limited according to race, gender, and class (Tyack, 1974).

Research on Gender and Ethnicity Issues

Research continues to level the playing field for women and minorities. Researchers such as the Sadkers (1994), Greenberg (1994), Campbell (1991), Noddings (1992), and Singer (1995) have worked tirelessly to raise the consciousness of public school educators and institutions on the issue of gender equity. Similarly, researchers such as Irvine (1986), Simpson and Erickson (1983), and Chavous, et al., (2008) have labored to increase awareness of ethnic inequities for teachers and their schools. However, many believe that gender and ethnicity biases still exist, even at the college level. Women and minorities still have to endure humiliation at the hands of insensitive instructors (Chavous, et al., 2008). Decision makers must attend to the plight of women and ethnic minorities. The equitable education of women and minorities is an absolute necessity in order to overcome our world's major problems (Sadker & Sadker, 1994; Chavous, et al., 2008).

Gender and ethnicity stereotypes have a big impact on first impressions and for wider personal evaluations. These stereotypes affect juror decisions (Sigall & Ostrove, 1975), helping

behavior (Benson, Karabenick, & Lerner, 1976), employment opportunities, and job evaluations (Dipboye, Arvey, & Terpstra, 1977). Stereotypical bias based on gender and ethnicity is pervasive in many aspects of society, including the educational system. Education provides, at least in theory, equal opportunities to all individuals. In practice, however, differential expectations about students are typically present. Many physical characteristics are capable of evoking initial expectations and impressions, including ethnicity and gender (Braun, 1976; Brophy, 1983; Brophy & Good, 1974; Dusek, 1985; Finn, 1972; Ferguson, 2003; Auwarter & Aruguete, 2008).

Many studies done in educational contexts choose head shot images and put them in a file that also contains the student's school record. Teachers tend to utilize a student's image and record to form impressions of the student. The file is used to study the expectations and perceptions of teachers toward students of particular features. For example, teachers might receive a folder containing an academic profile of a student or a statement of a student's transgression along with a photograph (e.g., Clifford & Walster, 1973; Marwit, Marwit, & Walker, 1978). The academic description or the transgression is held constant while the attached photo is varied to portray different physical characteristics of the student. Patzer (1985) felt that the cumulative folder technique was an acceptable method for studying physical characteristics because, when teachers review students, they commonly receive an academic description and a photo in the student's record.

The cumulative folder procedure, however, is not without limitations. Relying on photographs for evaluating physical characteristics may be problematic because photographs provide a static cue for basing attributions and evaluations. Providing only a static cue may oversimplify the conceptualization of physical characteristics by viewing them as a one-

dimensional construct. Argyle and McHenry (1971) argued that photographs and brief exposure time do not simulate a real world situation. In that study subjects viewed an individual with or without glasses for either a brief duration (15 seconds) or an extended interval (5 minutes). Individuals wearing glasses were evaluated as other cues such as dynamic expressive style, body characteristics, and attractiveness of dress contribute to forming overall impressions (Riggio et al, 1991). These cues are typically neglected in this type of research. On the other hand, Zajonc (1980) claimed that clear affective reactions to another person can develop in just a fraction of a second. Of course, it is possible that both positions are correct. That is, judgments may be formed in a few seconds or less, but, nevertheless, those judgments may well change when the target person is presented for a sustained period of time. The effects of physical characteristics have been studied with respect to a wide variety of judgments, including: (a) intelligence and academic potential, (b) grades and achievements, (c) various social skills, and (d) miscellaneous attributions.

Ethnic Minorities Biases

Research on stereotypes has often scrutinized the degree to which different signs, such as ethnic origin, social class, gender, or physical appearance trigger stereotypic reactions. For example, studies that have explored stereotypic perception of people due to their ethnicity have revealed that Israeli Jews of Asian-African ancestry are perceived as less intelligent, less disciplined, less motivated to achieve, less polite, less sociable, less rational, less considerate, but more emotional, more generous, and more peaceful than Israeli Jews of European-American origin (e.g., Peres, 1971; Rim & Aloni, 1969; Yinon, Abend, & Chirer, 1975).

Many of the attributes that changed as a function of the signs revealing stereotypic perceptions are applicable to teachers' evaluations and expectations of academic achievement in

classroom situations (Braun, 1976; Brophy & Good, 1974). As a result, it is not surprising that teachers perceive African-American children as being less accountable for achievement and ascribe their triumphs mostly to luck or the hard work of the school system. However, teachers ascribe their failures to environmental limitations (Wiley & Eskilson, 1978). Studies found that teachers perceive students of different ethnicities more negatively and expect them to have lower grades than students of similar ethnicities (e.g., Cooper et al., 1975; Miller, McLaughlin, Haddon, & Chansky, 1968; Ferguson, 2003).

Ethnicity is a potent source of input into teachers' impressions. The influence of ethnic stereotypes in teacher expectancies was first suggested by Kenneth Clark in 1963. Later research found that teachers (a) rated Black students less favorably, (b) treated Black students less favorably in the classroom, and (c) held lower academic expectations for Black students than they did for White students (e.g., Cooper, Baron, & Lowe, 1975; DeMeis & Turner, 1978; Rubovits & Maehr, 1973; Ferguson, 2003). Furthermore, in a study of the perception of facial beauty, Cross and Cross (1971) found that Blacks were rated less positively than Whites by both Black and White teachers.

Adams (1978) interviewed 112 African American and 128 Caucasian Head Start teachers with regard to initial teacher expectancies based on physical characteristics, gender, and race. Caucasian students and girls were rated as more intelligent and as higher achievers than were African American students and boys. The author concluded that, although the physical characteristics of an individual influenced the initial expectation of the preschool teachers, ethnicity exerted the strongest influence. Kehle, Bramble, and Mason (1974) had previously found similar effects for Caucasian females compared to African American females and males.

Gender biases

Gender is another factor that may affect teacher judgments. Compared to females, males are called on more frequently and given more attention (e.g., Hall & Sandler, 1984; Sadker & Sadker, 1994). Girls, however, tend to be favored by their teachers, perhaps because of the stereotype of the quiet and passive female (Worrall, Worrall, & Meldrum, 1988). Females are seen as more sensitive to the feelings of others, more tactful, more dependent, more motivated, more passive, more subjective, neater, and quieter than males (Broverman et al., 1972; Feldman & Kiesler, 1974; Richmond-Abbott, 1979; Rim & Aloni, 1969; Ruble & Ruble, 1980). Males appear to view school as less important in their lives as females (Clark et al., 2006). In a national survey, male students consistently reported that they did not listen in class, complete assignments, and did not do their best work (NCES, 2005). Females viewed their academic work as interesting and meaningful compared to males who did not appear to see the critical nature of their academic performance as it relates to future occupation (NCES, 2005). Also, current data on academic performance clearly shows males falling behind females (Burns and Bracey 2001; Clark et al. 2006; Kafer 2004).

The evidence of the influence of student gender on teacher perceptions and expectations of intelligence, academic potential and academic performance is mixed. Kehle, Bramble, and Mason (1974) gave teachers photographs of students and had the teachers rate the essay performance and personality characteristics of the students. Teachers held higher expectations for Caucasian females than they did for Caucasian males. Other studies also found that the effect was stronger for females than for males (Adams, 1978; Hore, 1971). However, other studies on physical characteristics and teacher expectancies have not found significant gender differences in

teacher expectations and perceptions (Clifton & Baksh, 1978; Felson, 1980; Salvia, Algozzine, & Sheare, 1977).

Ethnicity and Gender Issues Conclusion

The stereotypic perception is alive. In face-to-face classrooms, student gender and ethnicity influences teacher perceptions and expectations of student success. With the increasing prevalence of MUVES in society and in education, we need to determine the influence of avatar choice (i.e. gender and ethnicity) on teacher perceptions and expectations of student success.

Conclusion

New technologies are not created in a vacuum. Instead they are already rooted deeply into an established culture (Rogers, 2003). MUVES may be relatively newly born, but they are already filled with cultural ideas about gender and ethnicity. As a result, it is important that we do not assume a blank slate mentality about concepts like these in the virtual world. We need to remember that they have roots in the physical world that support and extend into the virtual and then study how the virtual world changes the expressions of these concepts.

Understanding social interaction within face-to-face, CMC-based and MUVES environments along with the history and research of issues of gender and ethnicity in the classroom help us to see the need for this study. The importance of social interaction in technological and non-technological learning environments highlights the need to study these kinds of interactions in all environments, especially MUVES. Additionally, because students in MUVES can choose their avatar attributes to fine detail, it is important to study their impact on avatar based social interaction. Among the many possible choices of avatar attributes are gender and ethnicity. Gender and ethnicity discrimination against students has been a perennial concern for researchers and practitioners in education (Sadker & Sadker, 1994; Ferguson, 2003; Auwarter & Aruguete,

2008). Specifically, the gender and ethnicity of students have been shown to specifically effect teacher expectations of students in real life classrooms (Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Walther & Tidwell, 1996; Ferguson, 2003; Frawley, 2005; Van Duzer, 2006; Auwarter & Aruguete, 2008). Unfortunately, the current lack of research on the influence of avatar choice in MUVES lead to the problems of unfair disadvantage and unfair advantage mentioned earlier. As a result, it is important to study the influence of avatar choice (i.e. gender and ethnicity) on teacher expectations and perceptions of student success.

In this chapter, a review of literature was introduced that established the foundation for an understanding of Multi-User Virtual Environments and their use in education. The use of a particular MUVE called Second Life was also discussed as well as its uses in Education. A context was also developed for the study's impact on social interaction through a discussion of face-to-face, computer-mediated and avatar-based interaction in a multi-user virtual environment. Finally, a discussion of the issues of gender and ethnicity biases in education was presented.

This literature review sets the stage for the argument that an understanding of the impact of avatar choice (i.e. gender and ethnicity) on teacher expectations and perceptions of student success will help teachers in MUVE's to discover potential biases and prejudices toward some students, as well as address the problems of unfair disadvantage and advantage for student avatars of all ranges of detailed customization.

CHAPTER 3 METHODOLOGY

Introduction

The purpose of this study was to examine the influence of avatar choice (i.e. gender and ethnicity) on teachers' perceptions and expectations of student success. This chapter describes the plan for answering the research questions described in chapter 1. It also explains why the procedures for studying this topic were used, and divides the research process into three major steps: 1) conducting an exhaustive search of the sources of teachers in Second Life; 2) from these sources, extracting a sample, administering the survey, and analyzing the data; and 3) accumulating and summarizing the findings. This is then followed by a conclusion.

Research Design

Mayer (2003) calls for a return to evidence-based rather than dogma based research in education, asking for the identification and formulation of specific studies that involve rigorous testing. Other researchers have joined this movement, requiring higher standards of experimental and non-experimental methods. Schrum, et al. (2005) renewed Mayer's (2003) call, stating that educational faculty need to endorse a platinum standard for "...scientific research that involves rigorous research" (Schrum, et al., 2005, p. 204). Dawson & Ferdig (2006) clarified that this standard needs to be very specific, containing strong definitions, heuristics, and rubrics; as well as be inclusive of all research methodologies. Schrum, et al. (2005) suggest that the future research agenda should address a) the connection between teacher beliefs about technology, b) teacher practices with technology, and c) student learning outcomes, while Dawson & Ferdig (2006) broaden the scope of the agenda to include all educational technology subfields.

A quantitative research design was used to assess the impact of the gender and ethnicity of the student avatar on the teachers' expectations and perceptions. This outcomes focused, positivistic methodology was selected to provide for a scalable, replicable, objective, empirical investigation. The adoption of a positivistic perspective made it possible to test theory through analysis of data collected from research subjects, develop best possible estimations and an indication of the accuracy of outcomes (Dooley, 2001; Duncan, 1975). Additionally, through the use of quantitative data collection we were able to sample a large number of individuals and project these results onto a population. Quantitative data generated in this study was analyzed using statistical procedures.

The purpose of a quantitative study is to uncover the connection between an independent variable and a dependent variable in a population. The quantitative research design chosen for this study was descriptive – participants are only measured one time. Descriptive studies describe observations in a systematic manner in order to show patterns and connections that might otherwise go unnoticed. A descriptive study needs a large sample in order to obtain a precise estimate of the relationship between two variables. There is a smaller chance that an estimate of relationship between two variables will be biased if the participation rate is high and if the sample has been randomly chosen from a population. Additionally, random assignment of participants to treatment conditions also lower the chance of bias.

Population and Sample

The proposed research study sought to survey teachers in Second Life regarding how avatar choice influences teachers' perceptions and expectations of student success. A partnership with the Social Research Foundation (<http://www.socialresearchfoundation.org>) was established to facilitate the collection of data. The Social Research foundation was a non-profit

organization dedicated to changing lives through online, interactive education programs. This organization operated the First Opinions Panel, which was the largest consumer research panel in Second Life. Through this organization panelists were identified who were teachers in Second Life or who planned to teach in Second Life. If not enough teachers were identified through the First Opinions Panel, other sources of data were to be the Second Life for Researchers and Second Life for Educators listservs, and the following Second Life groups that operate in Second Life: Real Life Education in Second Life, Second Life Grad Student Colony, Second Life Research, K-12 Educators, and Community Colleges in Second Life.

The Social Research foundation and the First Opinions Panel have already collected data on 33 different ‘real life’ attributes of their panelists ranging from gender, age, marital status, # of children in household, family income, family net worth, home ownership, car ownership, education completed, business ownership, personal investing, television viewership, news source, Internet daily use, research topic preference, time in second life each week, residency (overall time in Second Life), SL land ownership, spending in SL, primary motivation for coming to SL, primary business in SL, SL business size, significance of SL business to real life business, types of events most attended in SL, and groups led in SL. The Social Research Foundation describes itself as being initially focused on the research of online educational solutions for vulnerable groups in society, e.g. children/youth, immigrants, seniors. It is a non-profit organization established in 2003 that is dedicated to changing lives through online, interactive education programs. The organization has created the First Opinions Panel, which is the largest standing panel in Second Life with thousands of members.

Teachers and prospective teachers in Second Life come from a wide variety of backgrounds and teach students ranging from 13 to 83 in courses and informal seminars that vary

from the biological sciences to English as a second language. A significant number of universities, colleges, schools, organizations, and businesses are exploring the educational potential of Second Life. Second Life education related websites number more than two hundred. The purposes of these groups' involvement in SL are as varied as their creators.

Individuals were recruited from the First Opinions Panelists who indicated that they were teachers in Second Life. The Social Research Foundation recruited participants by sending an instant message to all panelists who fit their profile of being a teacher or prospective in Second Life. Interested participants then clicked on a link to be taken to the study survey. The top 80% of Second Life residents hail from more developed nations, but a significant portion also log on from places like Africa, Southeast Asia, and Latin America. The typical resident is male, between 25-34 years old, and among the top 5% of the world's wealthiest individuals. This was a concern because it was not completely representative of teacher demographics worldwide, but is typical of SL teachers.

Privacy and Confidentiality

This research study fell under the scrutiny of the University of Florida Institutional Review Board (IRB). Behavioral and Non-Medical IRB, designated IRB02 within the University of Florida system, is responsible for reviewing and monitoring research with human subjects conducted at the University of Florida. The board reviews research studies that involved behavioral observations and recordings, non-invasive physiological recordings, analysis of documents that were previously gathered for non-research purposes, evaluation of behavioral/social interventions or manipulations, educational assessments, interviews, surveys, cognitive tests, and taste/food evaluations of wholesome food within FDA guidelines. The University of Florida IRB (2007) accepts as basic principles those expressed in the Nuremburg

Code (1947), the Declaration of Helsinki (revised 1975), and the Belmont Report (1979). Before engaging study participants, a research proposal was prepared, presented, and approved by the University of Florida IRB (Appendix A).

Data Integrity and Security

The dawn and progression of the Internet has made data privacy and protection issues of prime importance for government entities, educational institutions, private industry and individuals. It is the priority of the researcher to ensure the privacy and protection of the data collected from the participants. Therefore, a structured policy has been adopted for data storage, transformation, and reporting. The Social Research Foundation offers a secure website and database from which panelists could log in and take surveys and in which data was securely stored. All data was de-identified by the Social Research Foundation prior to the researcher receiving it and was then password protected on the researcher's hard drive.

Sampling Procedure

A large sample of at least 383 participants was selected for this study. This was important because a large sample is usually needed for an accurate estimate of the relationship between variables. However, the sample for this study was not random in nature. This is due to the fact that the number of teachers available to participate in the study were only a little more than the sample needed. This is a concern because random sampling procedures are utilized to ensure an unbiased cross section of participants (Dillman, 2007) and control for selection threats to validity (Dooley, 2001). A selection threat is any factor other than the program that leads to differences in results. Whenever we suspect that outcomes differ in a group because of prior sample differences we are suspecting a selection bias.

Instrumentation

This study employed an online survey adapted from research by Clifford & Walster (1973) and Guttman, J., & Bar-Tal, D. (1982). The instruments developed in these studies were originally created in the context of the impact of gender, ethnicity and physical attractiveness on teacher expectations and perceptions. The procedure and instrument developed by Clifford & Walster (1973) were part of a study that was planned to discover the impact of the physical attractiveness of students on teachers' expectations and perceptions of their students' intellectual and social behavior. Results of Clifford & Walster's 1973 study were:

1. Teachers did perceive attractive students to have higher educational potential than unattractive children (Clifford & Walster, 1973, p. 251).
2. Attractive students were expected to have higher IQ's, to have parents who were interested in academic achievement, and to have a higher future education prediction than less attractive students (Clifford & Walster, 1973, p. 254).
3. Attractive students were expected to related better with fellow classmates than unattractive students (Clifford & Walster, 1973, p. 254).

The procedure developed by Guttman & Bar-Tal (1982) was part of a study that was designed to determine the stereotypic impression of academic performance triggered by providing information only on the ethnic origin and sex of the student. On the basis of previous literature, it was assumed that given information about a student's ethnicity and gender, the teachers' judgments would be based on their stereotypic impression of the corresponding ethnic groups and gender. The study successfully described the stereotypic impression of academic performance triggered by providing information only on the ethnic origin and sex of the student.

Multivariate analysis yielded a significant main effect only for ethnic origin ($F(8,90) = 3.33; p < .001$). Univariate analysis yielded main effects for ethnic origin on ability ($F(1,97) = 14.51, p < .001$ ($M = 4.11$ vs. $X = 3.62$)); interest ($F(1,97) = 18.43, p < .001$ ($M = 4.16$ vs. $M =$

3.55); and conditions at home ($F(1,97) = 6.30, p < .001$ ($M = 4.21$ vs. $M = 3.62$)). The results of the analysis on diligence only approached significance ($F(1,97) = 3.40, p < .07$). Thus, for example, subjects expected a student of Asian-African origin to have lesser intellectual aptitude, less interest, and lower economic home conditions than a student of European-American origin. Finally, the analysis of variance of the rating of expectations of student's future achievement yielded a main effect only for ethnic origin ($F(1,97) = 6.30, p < .001$). That is, for example, a student of Asian-African origin ($M = 4.02$) was expected to have lower academic achievement than a student of European-American origin ($M = 3.71$). This study shows that when teachers are presented with information regarding a student's ethnicity they evaluate that student based on their own stereotypes. In this case, they expect Asian-African students to have lesser intellectual aptitude, lower interest in academics, less diligence, and lower economic background than students of European-American origin. These results are in line with findings that show that Israeli Jews of Asian-African origin are perceived as less intelligent and less motivated than Israeli Jews of European-American origin (see e.g., Rim & Aloni, 1969; Yinon, Abend & Chirer, 1975). The results of these studies reveal the presence of teacher stereotypic perceptions. They also show that these stereotypes impact teachers' expectations and perceptions. As typically conducted, there is no real contact with the people being judged. This type of research shows what people believe in the absence of any physical contact.

These results provide evidence to support the utilization of these instruments and procedures with the study population.

Data Collection

The survey was administered through the secure website of The Social Research Foundation's First Opinion's Panel. Participants were contacted via an email and in SL with a

pre-survey notification letter (see Appendix B) and instant message. This email briefly explained the study and notified them that an email was to be sent containing a link to a web-based survey. The email offered participants the opportunity to remove themselves, through the use of an unsubscribe link, from the sample population and to contact the research team for more information about the study. Approximately seven days after the pre-survey notification letter was sent to participants an email was sent directing them to the survey website. Non-respondents received two subsequent follow-up emails soliciting their participation, the first follow up was sent four days after the first solicitation. After another four days, solicitation 3 was sent. Before sending solicitations email addresses were removed by those who had requested nonparticipation and those who have already responded. At the beginning of the survey, participants were asked to sign an informed consent form (see Appendix C) that explained the study and requested their involvement. After informed consent was given, participants were given phases one and two of the surveys explained below.

Rationale for Study Format

Careful consideration was given to the format of the survey. According to Reeves and Nass (2002), putting information on different screens can be used to effectively chunk visual segments into meaningful pieces. This defines the important breaks, the equivalent of placing periods and commas in text. The placement of a break to another screen is a strong signal that one unit is finished and another will begin. The information that surrounds the cut, just like information that surrounds any unit of actual behavior, will be the most memorable. At the same time, the sequences of computer screens studied by Reeves and Nass (2002) showed that those that had many cuts were given less attention than those that had none. In other words, media can easily exceed human processing capabilities. When this occurs people tune out. According to

Mayer and Moreno (2003), humans possess separate systems for processing visual and audio content, each of these systems is restricted in terms of the quantity that can be dealt with at one time, and significant learning engages cognitive processing that builds connections between visual and audio content. As a result, cognitive overload happens when the anticipated cognitive processing of the learner surpasses their available cognitive capacity.

Consideration was given to both Reeves and Nass' (2002) and Mayer and Moreno's (2003) research. The following is an explanation of each page:

1. Page 1: The informed consent form was placed on a separate page due to the requirement that the user must indicate agreement in order to continue with the survey.
2. Pages 2 and 3: The letter to the teacher and the high school transcript were included on separate pages in order to provide a visual orienting response by the participant (Nass and Reeves, 2002).
3. Pages 4 and 5: Page 4 in the survey contained the image of the avatar and the machinima video of the avatar. Page 5 contained the opinion survey questions from Clifford and Walster (1972).
4. The video, image and transcript were separated from the opinion survey questions (Clifford and Walster, 1972, next page) due research that has shown that putting questions on a different screen lessens the potential bias of the participant (Reeves and Nass, 2002). Cognitive overload was also a consideration because participants had to process a transcript, image, video, and answer the questions all on separate screens (Mayer and Moreno, 2003). That was four separate activities (transcript, image, video, questions) plus the activity of representational holding (recalling information from the transcript, image, video and questions on the previous pages after participant has moved on to another page). On one hand, placing all of the activities on one page could have led to a cognitive overload in essential processing. Essential processing consists of the cognitive processes that are utilized to understand the presented material (Mayer and Moreno, 2003). One solution to this difficulty was to allocate a certain amount of time between parts of the survey. In this way, the survey would be divided into smaller, more easily processed parts. The individual could choose relevant words and pictures in each part and as a result has the necessary time and ability to manage synthesize this information. When the participant is ready, he or she can then continue onward to the next part by clicking a button. This approach is also supported by research that has found that cuts between segments that are semantically related will be less intrusive than cuts between segments that are semantically

unrelated (Nass and Reeves, 2002). However, the problem of representational holding still exists. The participant must now hold a mental representation of the transcript, image and video in working memory while answering the opinion survey questions. Mayer and Moreno (2003) consider a method for reducing cognitive load is to be sure that the learners possess skill in holding mental representations in memory. Because our sample is composed of teachers in Second Life, it is assumed that they would possess skill in holding mental representations in memory with a minimum of mental effort. Thus the approach was selected to keep the transcript, image, video, and questions on separate pages.

5. Page 6: The next section of the survey was presented on one page listing several demographics questions (17). This format was decided on because it was desired for participants to be freshly visually oriented at the beginning of each part of the survey (Reeves and Nass, 2002). Cuts to a new screen demand attention, and research has shown that brain wave response changes where cuts to a new screen appeared (Reeves and Nass, 2002).
6. Pages 7: The last section of the survey consisted of a page with the image and the video that was identical to the page mentioned above followed by three questions asking the three most salient characteristics of the avatar, the ethnicity of the avatar, and the gender of the avatar. These questions were separated from the image and video due to the fact that research has show that putting questions on a different screen lessens the potential bias of the participant (Reeves and Nass, 2002). Segmentation was also used in order to avoid cognitive overload (Mayer and Moreno, 2003).

Avatar Creation

Every effort was made to create avatars that would be correctly identified by the teachers in the study. Groups of 4 (2 male, 2 female) from each ethnicity (Caucasian, African American, Hispanic/Latino, and Asian) were gathered to participate in the avatar customization process. These groups took hours to tailor the avatars from their own ethnicities to the point where they clearly represented an individual from their own ethnicity. This was done in order to make sure that each avatar accurately represented its ethnicity and gender.

Study Progression

During the first phase of the study, teachers were given a letter explaining the study, a student transcript, a photograph and machinima video of the student avatar and an opinion

survey (Table 3-1; Clifford & Walster, 1973). Each teacher was randomly assigned to one of 8 possible conditions. Conditions were based on the ethnicity and gender of the avatar photographs (see Appendix D).

The letter explaining the study appeared on the page after the informed consent (see Appendix E). The letter was used primarily to explain the study's purpose and to seek the teacher's cooperation. It began by discussing the value and rationale of school records and the purpose of permanent record files, and transcripts. The letter then proceeded to explain that in an attempt to answer these questions, we were examining a variety of transcript forms used by different universities in Second Life. Of course, this was not the true purpose of the study. This letter was meant to deceive teachers into believing that this study was about the evaluation of transcripts so they would express any gender and ethnicity biases they might have.

The high school transcript appeared on the next page. A high school student transcript was used in place of a student summary report since the Clifford & Walster study was used with 5th grade teachers. High school transcripts best approximated the information given regarding achievement on the 5th grade student summary report (Appendix F).

The next page contained the avatar photograph and machinima video of the student avatar. The photograph and image was one of four male and four female avatars of the following ethnic categories: (U.S. Census Bureau, 2008): Asian, Hispanic or Latino, Black or African American, White or Caucasian American (see Appendix D).

The next page of the survey consisted of the following five items:

1. I would estimate that the student has an IQ of. In the original study (Clifford & Walster, 1973), possible answers ranged from 1 (96-100) to 7 (126-130). Our study rescaled the IQ variable as a ratio variable in order to achieve greater accuracy.
2. I would speculate that the student's social relationships with classmates are ---. Range of possible answers: from 5 (very good) to 1 (very bad).

3. I would speculate that the student's relationships with instructors are ---. Range of possible answers: from 5 (very good) to 1 (very bad).
4. I would guess that the student's attitude toward school is one of -. Range: from 6 (strong interest) to 1 (strong indifference).
5. I would predict that the student would continue their education through ---. Range: from 1 (1 year of college) to 10 (Ph.D.).

Space was also provided for the teachers to comment on their reactions to the transcript format and the type of information it provided. On the next page of the survey, teachers were asked to complete some demographic information (See Appendix G).

Model Equation

The model for this study is as follows:

$$\text{Dep variable (Q1-Q5)} = F(\text{Ethnicity, Gender, Ethnicity*Gender}) + \varepsilon \quad (3-1)$$

After this model was run and analyzed, the following interacting variables were added, one by one, and separately analyzed:

1. Gender of participant
 - a. Dep variable (Q1-Q5) = F(Ethnicity, Gender, Ethnicity*Gender, ParticipantGender, ParticipantGender*Ethnicity, ParticipantGender*Gender, ParticipantGender*Ethnicity*Gender) + ε (3-2)
2. Ethnicity of participant
 - a. Dep variable (Q1-Q5) = F(Ethnicity, Gender, Ethnicity*Gender, ParticipantEthnicity, ParticipantEthnicity*Ethnicity, ParticipantEthnicity*Gender, ParticipantEthnicity*Ethnicity*Gender) + ε (3-3)

Data Analysis Techniques

The overarching question in this study was whether avatar choice affected teacher expectations and perceptions of student academic success. Many references have been given that have convincingly shown that teacher biases based on the gender and ethnicity of students do exist in face-to-face classrooms. But how does the world of the physical compare to the virtual?

Does SL mirror the real world in terms of biases, prejudices, and discrimination? Each of the next 15 research questions was examined with that intent. For ease of perspective, questions were broken down into those that are ethnicity related, gender related, and gender/ethnicity interactions. An Analysis of Variance (ANOVA) was used with data on teacher expectations and perceptions as dependent variables attempting to answer the following questions:

- Ethnicity Related
 - **Research question 1:** Does the perceived ethnicity of the avatar affect teacher perceptions and expectations?
 - **H₀:** The ethnicity of the student avatar does not affect expected current and future performance of the student by the teacher.
 - **Independent Variable(s):** Perceived ethnicity of the avatar
 - **Research question 2:** Does the participant ethnicity of the avatar affect teacher perceptions and expectations?
 - H₀: The ethnicity of the participant does not affect teacher perceptions and expectations.
 - **Independent Variable(s):** Participant ethnicity
 - **Research question 3:** Is there an interaction between the perceived ethnicity of the avatar and the ethnicity of the participant?
 - **H₀:** There is no interaction between the perceived ethnicity of the avatar and the ethnicity of the participant.
 - **Independent Variable(s):** Perceived Ethnicity by Participant Ethnicity
- Gender Related
 - **Research question 4:** Does the perceived gender of the avatar affect teacher perceptions and expectations?
 - **H₀:** The perceived gender of the avatar does not affect expected current and future performance of the student by the teacher.
 - **Independent Variable(s):** Perceived gender of the avatar

- **Research question 5:** Does the gender of the participant affect teacher perceptions and expectations?
 - **H₀:** The gender of the participant does not affect teacher expectations and perceptions.
 - **Independent Variable(s):** Participant gender
- **Research question 6:** Is there an interaction between the perceived gender of the avatar and the gender of the participant?
 - **H₀:** There is no interaction between the perceived gender of the avatar and the gender of the participant.
 - **Independent Variable(s):** Perceived gender by Participant gender
- Interactions Between Gender and Ethnicity
 - **Research question 7:** Is there an interaction between the perceived ethnicity and gender of the avatar and teacher perceptions and expectations?
 - **H₀:** There is no interaction between ethnicity and gender of the avatar and teacher expectations and expectations.
 - **Independent Variable(s):** Perceived ethnicity by Perceived gender
 - **Research question 8:** Is there an interaction between the perceived gender of the avatar and the ethnicity of the participant?
 - **H₀:** There is no interaction between the perceived gender of the avatar and the ethnicity of the participant.
 - **Independent Variable(s):** Perceived gender by Participant ethnicity
 - **Research question 9:** Is there an interaction between the perceived ethnicity of the avatar and the gender of the participant?
 - **H₀:** There is no interaction between the perceived ethnicity of the avatar and the gender of the participant.
 - **Independent Variable(s):** Perceived ethnicity by Participant gender
 - **Research question 10:** Is there an interaction between the ethnicity of the participant and the gender of the participant?

- **H₀**: There is no interaction between the ethnicity of the participant and the gender of the participant.
 - **Independent Variable(s)**: Participant ethnicity by Participant gender
- **Research question 11**: Is there an interaction between the perceived ethnicity of the avatar, the perceived gender of the avatar, and the ethnicity of the participant?
 - **H₀**: There is no interaction between the perceived ethnicity of the avatar, the perceived gender of the avatar, and the ethnicity of the participant.
 - **Independent Variable(s)**: Perceived ethnicity by Perceived gender by Participant ethnicity
- **Research question 12**: Is there an interaction between the perceived ethnicity of the avatar, the perceived gender of the avatar, and the gender of the participant?
 - **H₀**: There is no interaction between the perceived ethnicity of the avatar, the perceived gender of the avatar, and the gender of the participant.
 - **Independent Variable(s)**: Perceived ethnicity by Perceived gender by Participant gender
- **Research question 13**: Is there an interaction between the perceived ethnicity of the avatar, the ethnicity of the participant, and the gender of the participant?
 - **H₀**: There is no interaction between the perceived ethnicity of the avatar, the ethnicity of the participant and the gender of the participant.
 - **Independent Variable(s)**: Perceived ethnicity by Participant ethnicity by Participant gender
- **Research question 14**: Is there an interaction between the perceived gender of the avatar, the ethnicity of the participant, and the gender of the participant?
 - **H₀**: There is no interaction between the perceived gender of the avatar, the ethnicity of the participant, and the gender of the participant.
 - **Independent Variable(s)**: Perceived gender by Participant ethnicity by Participant gender
- **Research question 15**: Is there an interaction between the perceived ethnicity of the avatar, the perceived gender of the avatar, the ethnicity of the participant, and the gender of the participant?

- **H₀** : There is no interaction between the perceived ethnicity of the avatar, the perceived gender of the avatar, the ethnicity of the participant, and the gender of the participant.
- **Independent Variable(s)**: Perceived ethnicity by Perceived gender by Participant ethnicity by Participant gender

After the study was closed and data collected, a debrief email was sent to inform participants of the true purpose of the study and assured them of confidentiality (see Appendix H).

Limitations

Limitations of this study include:

1. The length of time that the survey was available may be a limitation. Individuals who respond to Internet-based surveys tend to respond much quicker than traditional paper-based surveys. As a result, the potential exists that the survey was biased toward early responders and left out late responders. Future studies should consider making the survey available for a longer period of time in order to obtain responses from all types of participants.
2. Issues of external validity exist due to the fact that the study was done in one Multi User Virtual Environment, Second Life. This may potentially prevent the generalizability of this study to other virtual environments. Additionally, the surveys was only provided in an English format, thus non or limited English speaking individuals may be underrepresented in the sample population. Finally, threats to external validity may exist because the typical resident of Second Life is male, between 25-34 years old, and among the top 5% of the world's wealthiest individuals. Future studies should consider replicating this experiment in multiple virtual environments, languages, and targeting a wider demographic.
3. The possibility for socially desirable responses by the participants exists as the nature of topical matter covered by the survey may lead respondents to skew responses to paint their attitudes toward issues of ethnicity and gender in a more favorable light. Future efforts should focus on strengthening the deception portion of this study in order to lessen the probability of socially desirable responses.
4. The sample for the study was non-random in nature. This is due to the fact that the number of teachers available to participate in the study was only a little more than the sample needed. As a result, the study may not be generalizable to the larger population. This will

no longer be a problem in the future as educational institutions increase their involvement in MUVes and the population of teachers in MUVes increases significantly.

5. This was an experimental study in which teachers were given only limited information about hypothetical students. Naturalistic studies (those taking place in real classrooms) in which teachers have access to large amounts of information and feedback may show less expectancy effect than experimental ones do. Future studies should consider observing teacher-student interaction in a MUVE and compare these results with the results of this study.
6. This was a deception study in which teachers were led to believe that they were attempting to evaluate different forms of transcripts used in MUVes. As a result, some of the teachers may have guessed the researchers' motives for this study from the content of the survey. This is important because many times study participants think about what the researcher wants them to do. Future efforts should focus on strengthening the deception portion of this study in order to lessen the probability of participants guessing the true purpose, as well as providing a debrief survey to determine the effectiveness of the deception.
7. Avatars were created by groups of Caucasian, African American, Hispanic/Latino, and Asian college students. Results would probably change if the characteristics of the avatars were changed. Future studies should consider replicating this study with different avatars.
8. The question asked in order to qualify a person to be a participant of this study could have been interpreted in many different ways. "Are you teaching in Second Life?" could have been interpreted by a person who uses SL as a tool, lecture platform, or a variety of different teaching methods. This study does not touch on the impact of the teaching method used on teacher perspectives and expectations. However, future studies should consider this as a potential control variable.

Table 3-1. Overview of instruments/materials used and what they are used to measure

Instrument/Materials used	What does it measure?/How is it used?
Presurvey Notification letter	Notified potential participants that a survey was available to take and how much they would be paid for taking the survey.
Informed consent form	Used to obtain informed consent from participants
Introductory Letter (Clifford & Walster, 1973)	Introduces teachers to the study and explains the study's purpose.
Student Transcript (Clifford & Walster, 1973)	Used as a deception to make teachers think that the study's purpose is to examine different teacher transcripts and give comments.
Opinion survey (Clifford & Walster, 1973)	Measures teacher's estimate of student's IQ, relationships with classmates, relationships with instructors, attitude toward school, and prediction of student's future education level
Student image - Information about the student's sex and ethnicity (Clifford & Walster, 1973; Guttman & Bartal, 1982)	Used to measure teacher bias for or against specific ethnicities and genders
Machinima video of student – information about the student's sex and ethnicity (Clifford & Walster, 1973; Guttman & Bartal, 1982)	Used to measure teacher bias for or against specific ethnicities and genders. A video was added to what the original study used in order to contextualize the study to the MUVE environment of Second Life.
Demographic questionnaire (Pohan & Aguilar, Social Research Foundation)	Used to measure potential covariates. List of demographics obtained from suggested list by Pohan & Aguilar (2001) and by attributes already collected by Social Research Foundation.
Debrief email	All participants received an email which debriefed them on the true purpose of the study and assured them of it being confidential.

Table 3-2 List of variables

Variable Name	Variable Description	Variable Type
ParticipantID	Participant identification #	Numeric
Session ID	Session ID #	Numeric
Submit Time	Time/Date the survey was submitted	Date/Time
AvatarGENDER	Gender of the Avatar as designated by the Researcher	Categorical
AvatarETHNICITY	Ethnicity of the Avatar as designated by the Researcher	Categorical
InformedConsent	Whether or not they agreed to Informed Consent	Dichotomous
StudentIQ	Estimation of student's IQ	Numeric
RELwithClassmates	I would speculate that the student's social relationships with classmates are _____.	Likert (1-5)
RELwithINSTRUCTORS	I would speculate that the student's relationships with instructors are _____.	Likert (1-5)
ATTITUDEtowardschool	I would guess that the student's attitude toward school is one of _____.	Likert (1-5)
EDUCATIONPrediction	I would predict that the student would continue their education through _____.	Likert (1-10)
TRANSCRIPTComments	Please provide your comments and reactions to the transcript format. Be as specific as possible in your criticism	Alphanumeric
ParticipantGENDER	What is your gender?	Categorical
ParticipantAGE	What is your age?	Categorical
NumberofCHILDREN	How many children do you have in your household?	Categorical
MARITALSTATUS	What is your marital status?	Categorical
ParticipantEDUCATION	What level of Education have you completed?	Categorical
ParticipantETHNICITY	What is your race/ethnicity?	Categorical
ParticipantEthnicityOther	Space to enter other race/ethnicity	Alphanumeric
Participantorigin	What is your continent of origin?	Categorical
ParticipantOriginOther	Space to enter other origin	Alphanumeric
ParticipantRELIGION	What is your religious affiliation?	Categorical
ParticipantReligionOther	Space to enter other religion	Alphanumeric
ParticipantFAMILYINCOME	What is your annual family Income?	Categorical
ParticipantINTERNETuse	What is your Internet daily use? (NOT including time spent in Second Life)	Categorical
TimeInSLeachweek	How much time do you spend in Second Life each week?	Categorical
SLResidencyLength	How long have you been a resident of Second Life?	Categorical
PrimarymotivationforComingtoSL	What is your primary motivation or reason for coming to SL?	Categorical

Table 3-2. Continued

Variable Name	Variable Description	Variable Type
ParticipantsStudentsTaught	You are a teacher of what kind of students?	Categorical
ParticipantsStudentsTaughtOther	Space to enter other type of students	Alphanumeric
AvatarSalientCharacteristics1	What are the three most salient characteristics of the student in this video and picture? (Please use 1 or 2 word description) part 1	Alphanumeric
AvatarSalientCharacteristics2	What are the three most salient characteristics of the student in this video and picture? (Please use 1 or 2 word description) part 2	Alphanumeric
AvatarSalientCharacteristics3	What are the three most salient characteristics of the student in this video and picture? (Please use 1 or 2 word description) part 3	Alphanumeric
PerceivedAvatarGENDER	What gender is the student in the picture?	Categorical
PerceivedAvatarETHNICITY	What race/ethnicity is the student in the picture?	Categorical

CHAPTER 4
RESULTS
Introduction

As stated in Chapter 1, the study reported here examined in detail the relationship of perceived student avatar gender and ethnicity to teacher expectations and perceptions. This chapter is organized in terms of a) participant demographics, b) preliminary analyses, and c) main analyses.

The preliminary analyses section first checks for ceiling, floor, and non-normality issues for all dependent and independent variables. Secondly, it examines the proportion of participants who misidentified the gender and ethnicity of the avatars (according to the researcher's categories).

The main analyses section is organized in terms of the ethnicity related, gender related, and gender/ethnicity interaction related research questions posed in Chapter 1. It examines the impact of student avatar gender and ethnicity on teacher perceptions of: student IQ, relationships with classmates, relationships with instructors, attitudes toward school, and prediction of the level of education the student will complete.

Participant Demographics

The data for survey participants indicated that 489 surveys were attempted. Of those attempted, 455 were completed. Those who did not complete the survey appeared to cease taking the survey on the first few questions. A summary of the descriptive statistics can be found in Tables 4-1 to 4-14 which summarize basic demographic information related to the participants in the study.

The participants were primarily teachers who taught either adult (37.8%) or K-12 students (29%; Table 4-1) and possessed an undergraduate (26.6%) or graduate degree (30.1%; Table 4-

2). Gender (Table 4-4), religious affiliation (Table 4-8) and age (Table 4-3) appeared to vary widely, although a majority of participants were under 30 years of age (51.5%; Table 4-3). They were mostly from Europe (34.9%) or North America (48.6%; Table 4-9), single (52.1%; Table 4-5), Caucasian/White (77.4%; Table 4-7), with no children (66%; Table 4-5), and possessing an annual income below 75,000 U.S. dollars (53%; Table 4-10). The greater part of participants spent more than 3 hours daily on the Internet (60.8%; Table 4-11) and more than 6 hours in Second Life each week (63.2%; Table 4-12). They had also resided in SL for more than 12 months (56.9%; Table 4-13) for non-work related motivations (68.2%; Table 4-14).

Descriptive Statistics

The first step in the preliminary analyses was to run descriptive statistics for all independent and dependent variables checking for ceiling, floor, and non-normality issues.

The mean and standard deviation for the dependent (Table 4-15) and independent (Table 4-17) variables reflected the inclusion of extreme outlier points in the data. These were corrected through the trimming of these data points as described below in the section entitled Discussion of Outliers for IQ variable. The mean and standard deviation for the dependent and independent variables with these deletions are displayed in Table 4-16 and Table 4-18.

Discussion of Outliers for IQ variable

Upon visual inspection, the IQ data contained several data points that initially appeared to be far outside of what would be a normal IQ estimate. For example, several participants estimated IQ's below 10 or above 300. These data points became a problem when attempting to analyze the IQ data for statistical relationships. As a result, 19 outliers were deleted by the following method. A different outlier analysis was run for each equation used in order to determine which IQ scores to keep. The outlier analysis relied only on standardized residuals as

the outlier detection strategy (Cohen, Cohen, West, and Aiken, 2003). Any standardized residual higher than 3 and less than -3 was considered an outlier and eliminated. This was an iterative process: the analysis was run, cases were found that were outliers, these were eliminated, the analysis was rerun, more cases were found that were outliers, the analysis was rerun, etc., until there were no more outliers (i.e. all the data points had a standardized residual between 3 and -3). This took as many as eight iterations before there were no more outliers. The form of outlier detection run eliminated participants whose IQ estimations were much farther away from what would be expected relative to everyone else (Cohen, Cohen, West, and Aiken, 2003).

CrossTabs Table Analysis

Due to the study's focus on avatar choice, it was important to identify the proportion of participants who misidentified the gender and ethnicity of the avatars (according to the researcher's categories). The analysis of the gender of the avatar as designated by the researcher against the perceived gender of the avatar by the participants showed that of the 248 total participants who were assigned a male avatar, 199 or 80.2% of those participants perceived the avatar as male. The analysis also showed that of the 241 total participants who were assigned a female avatar, 221 or 91.7% of those participants perceived the avatar as female (Table 4-19).

Another analysis necessary to the study was to identify whether certain genders designated by the researcher are more likely to have their ethnicity misidentified by the participants. The ethnic percentages for male avatars vs. female avatars appeared to be very close, so avatar gender did not influence the ethnic identification process (Table 4-20).

It was also critical to this research to identify whether certain avatar ethnicities designated by the researcher are more likely to have their gender misidentified by the participants. Avatars designated as Caucasian and Hispanic/Latino were most likely to be perceived to correspond

with the researcher designated gender category. However, the analysis shows that avatars designated as African American and Asian by the researcher were more likely to have misidentifications of the researcher designated gender category. In both the African American and Asian researcher designated ethnicity categories, males were being perceived as females (Table 4-21).

The analysis of the ethnicity of the avatar as designated by the researcher against the perceived ethnicity of the avatar revealed that:

1. Of the 129 total participants who were assigned an African-American avatar, 115 or 89.1% perceived the avatar as African-American (Table 4-22).
2. Of the 116 who were assigned an Asian avatar, 78 or 67.2% perceived the avatar as Asian (Table 4-22).
3. Of the 125 who were assigned a Caucasian avatar, 106 or 84.8% perceived the avatar as Caucasian (Table 4-22).
4. Of the 119 who were assigned a Hispanic/Latino avatar, 77 or 64.7% perceived the avatar as Hispanic/Latino (Table 4-22).

Participants who misidentified either the gender or ethnicity of the avatar according to the researcher's categories were assigned to the group that they perceived it to be. For example, if they received an Asian male avatar but perceived it as a Hispanic/Latino female avatar, they were assigned to the Hispanic/Latino group.

As a result of this crosstabs analysis, the sample for this study was not randomly assigned to the eight different ethnic categories and analyzed based on the researcher categories. This was due to the fact that several participants indicated that the avatar they were assigned to was of a different ethnicity or gender than what the researcher originally intended. See Table 4-23 for a detailed description of these differences. The Asian male and Hispanic/Latino female were the most difficult for participants to identify. As a result, because the purpose of this study was to

determine the impact of student avatar's gender and ethnicity on teacher's expectations and perceptions, it was logical to use the teacher's perceptions to self-assign them to one of the eight categories.

Analyses of Research Questions

This section contains the results of the analyses of the research questions. Results of these analyses were considered significant if $p < .05$. It is important to note that there were a low number of Black/African-American, Hispanic/Latino, Asian, and Other participants. As such, there were also empty cells in the research design because of the low number of participants in certain categories. As a result, the sample may be unrepresentative of those ethnic groups in SL because of the low number of participants in some categories, which could in turn cause the results to be skewed in the direction of those few participants' responses, rather than those of a larger group (Miller, 1991).

The overarching question in this study was whether avatar choice affected teacher expectations and perceptions of student academic success. Many studies have been cited that have convincingly shown that teacher biases based on the gender and ethnicity of students do exist in face-to-face classrooms. However, this study was done in a MUVE. The results below are discussed in terms of the ethnicity related, gender related, and interactions between gender and ethnicity questions.

Ethnicity Related Questions

The main question addressed in this section of questions was "Does ethnicity (of the student or teacher) influence teacher perceptions and expectations of student success?" Each question is described and addressed separately.

- **Research question 1:** Does perceived ethnicity of the avatar predict teacher perceptions and expectations?

Research question 1 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions and the perceived ethnicity of the avatar. No significance was found for any of these relationships at $p < .05$ (Table 4-24).

- **Research question 2:** Does the ethnicity of the participant predict teacher perceptions and expectations?

Research question 2 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions and the ethnicity of the participant. The relationship between participant ethnicity and relationships with instructors was significant at $p < .05$ ($F(4) = 2.65$, $p = .03$; Table 4-24). Other ethnicity teachers in SL estimated students (regardless of ethnicity or gender) as having the highest levels of relationships with instructors ($M = 3.12$), compared to Hispanic or Latino teachers in SL ($M = 3.04$), Caucasian/White teachers in SL ($M = 2.99$), Asian teachers in SL ($M = 2.71$), and African American/Black teachers in SL ($M = 2.26$; Table 4-25).

- **Research question 3:** Is there an interaction between the ethnicity of the avatar and the ethnicity of the participant?

Research question 3 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions and the interaction between the ethnicity of the avatar and the ethnicity of the participant. No significance was found for any of these relationships at $p < .05$ (Table 4-24).

Summary: Ethnicity Related Questions

The ethnicity-related questions asked the overarching question, “Does ethnicity (of the student or teacher) influence teacher perceptions and expectations of student success?” The results of this study found that under certain circumstances ethnicity does influence teacher perceptions and expectations of student success. For example, Other ethnicity teachers in SL

estimated students (regardless of ethnicity or gender) as having the highest levels of relationships with instructors, compared to Hispanic or Latino, Caucasian/White, Asian, and African American/Black teachers in SL.

Gender Related Questions

The main question addressed in this section of questions was “Does gender (of the student or teacher) influence teacher perceptions and expectations of student success?” Each question is described and addressed separately.

- **Research question 4:** Does perceived gender of the avatar predict teacher perceptions and expectations?

Research question 4 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions and the gender of the student avatar. The relationship between the estimated attitude of the student toward school and the perceived gender of the student avatar was significant at $p < .05$ ($F(1) = 7.15$, $p = .01$; Table 4-24). Teachers in SL estimated male avatars as having higher levels of attitude toward school ($M = 3.36$) compared to female avatars ($M = 3.15$; Table 4-26).

- **Research question 5:** Does the gender of the participant predict teacher perceptions and expectations?

Research question 5 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions and the gender of the participant. No significance was found for any of these relationships at $p < .05$ (Table 4-24).

- **Research question 6:** Is there an interaction between the gender of the avatar and the gender of the participant?

Research question 6 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions and the interaction between the gender of the avatar and the gender of the participant. The following relationships were significant (Table 4-24):

- A significant Participant gender by Avatar Gender interaction emerged for attitude of the student toward school ($F(1) = 5.846, p = .016$; Table 4-24).
 - Male teachers in SL estimated male student avatars as having higher levels of attitude toward school ($M = 3.54$) compared to female student avatars ($M = 3.00$; Table 4-27).
 - Female teachers in SL estimated female student avatars as having higher levels of attitude toward school ($M = 3.28$) compared to male student avatars ($M = 3.23$; Table 4-27).
 - The difference in attitude toward school between male and female avatars was larger for male teachers while the difference for female teachers was trivial.

Summary: Gender Related Questions

The gender-related questions asked the overarching question, “Does gender (of the student or teacher) influence teacher perceptions and expectations of student success?” The results of this study found that under certain circumstances gender does influence teacher perceptions and expectations of student success. For example, male teachers in SL estimated male student avatars as having better attitudes toward school compared to female student avatars (Table 4-29), while the difference for female teachers was negligible.

Interactions Between Gender and Ethnicity

The main question addressed in this section of questions was “Do any of the interactions between gender and ethnicity (of the student and/or teacher) influence teacher perceptions and expectations of student success?” Each question is described and addressed separately.

- **Research question 7:** Is there an interaction between the perceived ethnicity and gender of the avatar and teacher perceptions and expectations?

Research question 7 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions and the ethnicity and gender of the avatar. No significance was found for any of these relationships at $p < .05$ (Table 4-24).

- **Research question 8:** Is there an interaction between the perceived gender of the avatar and the ethnicity of the participant?

Research question 8 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions and the interaction between the gender of the avatar and the ethnicity of the participant. The following relationships were significant:

- A significant Perceived gender by Participant Ethnicity interaction emerged for Student IQ ($F(3) = 2.67, p = .04$; Table 4-24).
 - Caucasian/White ($M_{\text{males}} = 110.08$; $M_{\text{females}} = 107.98$), African American/Black ($M_{\text{males}} = 102.88$; $M_{\text{females}} = 102.50$), and Other ($M_{\text{males}} = 115.00$; $M_{\text{females}} = 110.83$) ethnicity teachers in SL estimated that male student avatars have a higher level of Student IQ compared to female student avatars (Table 4-28).
 - Hispanic or Latino ($M_{\text{females}} = 117.50$; $M_{\text{males}} = 99.69$) and Asian ($M_{\text{females}} = 112.80$; $M_{\text{males}} = 99.27$) ethnicity teachers in SL estimated that female student avatars have a higher level of Student IQ compared to male student avatars (Table 4-28).
- A significant Perceived gender by Participant Ethnicity interaction emerged for attitude toward school ($F(3) = 2.81, p = .03$; Table 4-24).
 - Caucasian/White ($M_{\text{female}} = 3.28$; $M_{\text{male}} = 3.25$) and African American/Black ($M_{\text{female}} = 3.25$; $M_{\text{male}} = 3.00$), and Other ($M_{\text{female}} = 3.61$; $M_{\text{male}} = 3.41$) ethnicity teachers in SL estimated female student avatars as having a higher level of Attitude toward school compared to male student avatars (Table 4-29).
 - Hispanic or Latino ($M_{\text{male}} = 3.68$; $M_{\text{female}} = 2.87$) and Asian ($M_{\text{male}} = 3.28$; $M_{\text{female}} = 2.85$) ethnicity teachers in SL estimated male student avatars as having a higher level of attitude toward school compared to female student avatars (Table 4-29).

- **Research question 9:** Is there an interaction between the ethnicity of the avatar and the gender of the participant?

Research question 9 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions and the ethnicity of the avatar and the gender of the participant. No significance was found for any of these relationships at $p < .05$ (Table 4-24).

- **Research question 10:** Is there an interaction between the ethnicity of the participant and the gender of the participant?

Research question 10 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions and the ethnicity of the participant and the gender of the participant. No significance was found for any of these relationships at $p < .05$ (Table 4-24).

- **Research question 11:** Is there an interaction between the ethnicity of the avatar, the gender of the avatar, and the ethnicity of the participant?

Research question 11 was analyzed using ANCOVAs to examine the relationships between teacher expectations and perceptions with the ethnicity of the avatar, the gender of the avatar, and the ethnicity of the participant. The following relationship was significant:

- A significant Perceived Avatar ethnicity by Perceived Avatar gender by participant ethnicity interaction emerged for Student IQ ($F(8) = 2.89, p = .01$; Table 4-24).
 - Caucasian/White teachers in SL estimated female, Caucasian/White student avatars ($M = 110.50$) as having higher levels of Student IQ compared to male, Caucasian/White student avatars ($M = 103.02$). Caucasian/White teachers in SL estimated male, Black/African-American ($M = 117.16$), Hispanic/Latino ($M = 109.90$), and Asian ($M = 110.23$) ethnicity student avatars as having higher levels of Student IQ compared to female, Black/African-American ($M = 109.73$), Hispanic/Latino ($M = 101.97$), and Asian ($M = 109.71$) ethnicity student avatars (Table 4-30).
 - Hispanic or Latino teachers in SL estimated female, Caucasian/White ($M = 93$), Black/African-American ($M = 114.5$), Hispanic/Latino ($M = 147.5$) student avatars as having higher levels of Student IQ compared to male, Caucasian/White ($M = 101.018$) and Black/African-American ($M = 107.247$) and Hispanic/Latino ($M = 86.52$) student avatars (Table 4-30).
 - Other ethnicity teachers in SL estimated female, Caucasian/White ($M = 118.75$) student avatars as having higher levels of Student IQ compared to male, Caucasian/White ($M = 105$) student avatars. Other ethnicity teachers in SL estimated male, Black/African-American ($M = 132.50$) and Hispanic/Latino ($M = 111.25$) student avatars as having higher levels of Student IQ compared to female, Black/African-American ($M = 106.66$) and Hispanic/Latino ($M = 97.5$) student avatars (Table 4-30).
- **Research question 12:** Is there an interaction between the ethnicity of the avatar, the gender of the avatar, and the gender of the participant?

Research question 12 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions with the ethnicity of the avatar, the gender of the avatar, and the gender of the participant. No significance was found for any of these relationships at $p < .05$ (Table 4-24).

- **Research question 13:** Is there an interaction between the ethnicity of the avatar, the ethnicity of the participant, and the gender of the participant?

Research question 13 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions with the ethnicity of the avatar, the ethnicity of the participant, and the gender of the participant. The following relationship was significant:

- A significant Perceived Avatar ethnicity by Participant gender by participant ethnicity interaction emerged for Student IQ ($F(8) = 2.13, p = .03$; Table 4-24).
 - Male, Caucasian/White teachers in SL estimated Black/African American ($M = 113.30$) student avatars as having higher levels of Student IQ compared to Caucasian/White ($M = 108.27$) student avatars, Asian ($M = 106.83$) student avatars, and Hispanic/Latino ($M = 103.53$) student avatars. Female, Caucasian/White teachers in SL estimated Black/African American ($M = 113.6$) student avatars as having higher levels of Student IQ compared to Asian ($M = 113.11$) student avatars, Hispanic/Latino ($M = 108.34$) student avatars, and Caucasian/White ($M = 105.24$) student avatars (Table 4-31).
 - Male, African American/Black teachers in SL estimated Black/African American ($M = 115$) student avatars as having higher levels of Student IQ compared to Asian ($M = 111$) student avatars. Female, African American/Black teachers in SL estimated Hispanic/Latino ($M = 100$) student avatars as having higher levels of Student IQ compared to Asian ($M = 94$) student avatars and Caucasian ($M = 93.66$) student avatars (Table 4-31).
 - Male, Asian teachers in SL estimated Black/African American ($M = 122.5$) student avatars as having higher levels of Student IQ compared to Caucasian ($M = 106$) student avatars, Asian ($M = 104.37$) student avatars, and Hispanic/Latino ($M = 98.25$) student avatars. Female, Asian teachers in SL estimated Hispanic/Latino ($M = 117.5$) student avatars as having higher levels of Student IQ compared to Black/African American ($M = 106.17$) student avatars, Caucasian ($M = 105.8$) student avatars, and Asian ($M = 99.33$) student avatars (Table 4-31).

- Male, Other ethnicity teachers in SL estimated Caucasian (M = 107.5) student avatars as having higher levels of Student IQ compared to Hispanic/Latino (M = 106.25) and Black/African American (M = 100) student avatars. Female, Other ethnicity teachers in SL estimated Asian (M = 130) student avatars as having higher levels of Student IQ compared to Black/African American (M = 122.91) student avatars, Caucasian (M = 117.5) student avatars, and Hispanic/Latino (M = 102.5) student avatars (Table 4-31).
- **Research question 14:** Is there an interaction between the gender of the avatar, the ethnicity of the participant, and the gender of the participant?

Research question 14 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions with the gender of the avatar, the ethnicity of the participant, and the gender of the participant. No significance was found for any of these relationships at $p < .05$ (Table 4-24).

- **Research question 15:** Is there an interaction between the ethnicity of the avatar, the gender of the avatar, the ethnicity of the participant, and the gender of the participant?

Research question 15 was analyzed using ANOVAs to examine the relationships between teacher expectations and perceptions with the ethnicity of the avatar, the gender of the avatar, the ethnicity of the participant, and the gender of the participant. The following relationships were significant:

- A significant Perceived Avatar gender by Perceived Avatar ethnicity by participant ethnicity by participant gender interaction emerged for Student IQ ($F(4) = 3.7, p = .01$; Table 4-24).
 - Male, Other ethnicity teachers in SL estimated female, Hispanic/Latino (M = 110) student avatars as having higher levels of Student IQ compared to male, Hispanic/Latino student avatars (M = 102.5; Table 4-32).
 - Female, Other ethnicity teachers in SL estimated male, Hispanic/Latino (M = 120) and Black/African-American (M = 132.5), student avatars as having higher levels of Student IQ compared to female, Hispanic/Latino (M = 85) and Black/African-American (M = 113.33) student avatars. Female, Other ethnicity teachers in SL also estimated female Caucasian (M = 130) student avatars as having higher levels of Student IQ compared to male, Caucasian (M = 105) student avatars (Table 4-32).

- Male, Caucasian/White ethnicity teachers in SL estimated female, Caucasian (M = 113.61) student avatars as having higher levels of Student IQ compared to male, Caucasian (M = 2.706) student avatars. Male, Caucasian/White ethnicity teachers in SL also estimated male, Black/African-American (M = 114.66), Hispanic/Latino (M = 109.85), and Asian (M = 108) student avatars as having higher levels of Student IQ compared to female, Black/African-American (M = 111.94), Hispanic/Latino (M = 97.21) and Asian (M = 105.66) student avatars (Table 4-32).
- Female, Caucasian/White teachers in SL estimated female, Caucasian (M = 107.38) and Asian (M = 113.76) student avatars as having higher levels of Student IQ compared to male, Caucasian (M = 103.1) and Asian (M = 112.46) student avatars. Female, Caucasian/White teachers in SL also estimated male, Black/African-American (M = 119.66) and Hispanic/Latino (M = 109.95) student avatars as having higher levels of Student IQ compared to female, Black/African-American (M = 107.53) and Hispanic/Latino (M = 106.73) student avatars (Table 4-32).
- Male, Hispanic/Latino teachers in SL estimated male, Caucasian (M = 104.6) and Black/African American (M = 120) student avatars as having higher levels of Student IQ compared to female, Caucasian (M = 86) and Black/African American (M = 115) student avatars (Table 4-32).
- Female, Hispanic/Latino teachers in SL estimated female, Caucasian (M = 100), Black/African American (M = 115), and Hispanic/Latino (M = 95) student avatars as having higher levels of student IQ compared to male, Caucasian (M = 80), Black/African American (M = 105), and Hispanic/Latino (M = 78.25) student avatars (Table 4-32).

Summary: Interactions Between Gender and Ethnicity

The questions dealing with the interactions between gender and ethnicity asked the overarching question, “Do any of the interactions between gender and ethnicity (of the student and/or teacher) influence teacher perceptions and expectations of student success?” The results of this study found that under certain circumstances some of these interactions do influence teacher perceptions and expectations of student success. For example, Caucasian/White teachers in SL estimated female, Caucasian/White student avatars as having higher levels of Student IQ compared to male, Caucasian/White student avatars. Caucasian/White teachers in SL also estimated male, Black/African-American, Hispanic/Latino, and Asian ethnicity student avatars as

having higher levels of Student IQ compared to female, Black/African-American, Hispanic/Latino, and Asian ethnicity student avatars (Table 4-34).

Conclusions

This chapter has attempted to answer the overarching question of whether avatar choice influences teacher perceptions and expectations of student success. In doing so, results have been given for the study of the influence of student avatar gender and ethnicity on teacher expectations and perceptions of student success. The results of this study found that under certain circumstances gender and ethnicity does influence teacher perceptions and expectations of student success. This study reported on a) participant demographics, b) preliminary analyses, and c) main analyses. Chapter five focuses on the discussion of these results and their implications.

Table 4-1. Type of Students Taught

Type of Students	Frequency	Percent
K - 12 Students	132	29.0
College or University Students	93	20.4
Adult Students	172	37.8
Mixed age group	25	5.5
Subject Matter expert	25	5.5
Other	8	1.8
Total	455	100.0

Table 4-2. Education Completed

Education Level	Frequency	Percent	Cumulative Percent
High School	48	10.5	10.5
Some college	127	27.9	38.5
Undergraduate Degree	121	26.6	65.1
Graduate degree (MA, MFA, Ph.D.)	137	30.1	95.2
Professional degree (CPA, etc.)	22	4.8	100.0
Total	455	100.0	

Table 4-3. Age

	Frequency	Percent	Valid Percent	Cumulative Percent
18-21	81	17.8	19.2	19.2
21-25	64	14.1	15.2	34.4
26-30	72	15.8	17.1	51.5
31-35	46	10.1	10.9	62.5
36-40	55	12.1	13.1	75.5
41-50	59	13.0	14.0	89.5
51-60	36	7.9	8.6	98.1
60+	8	1.8	1.9	100.0
Total	421	92.5	100.0	
Missin G System	34	7.5		
Total	455	100.0		

Table 4-4. Gender

Gender	Frequency	Percent
Male	232	51.0
Female	223	49.0
Total	455	100.0

Table 4-5. Number of children

	Frequency	Percent	Cumulative Percent
0	303	66.6	66.6
1	63	13.8	80.4
2	62	13.6	94.1
3	25	5.5	99.6
4 or More	2	.4	100.0
Total	455	100.0	

Table 4-6. Marital status

	Frequency	Percent
Single	237	52.1
Married	148	32.5
Domestic Partners	32	7.0
Divorced	24	5.3
Widowed	2	.4
Other	12	2.6
Total	455	100.0

Table 4-7. Ethnicity

	Frequency	Percent
Caucasian/White	352	77.4
African American/Black	9	2.0
Hispanic or Latino	30	6.6
Asian	45	9.9
Other, please specify	19	4.2
Total	455	100.0

Table 4-8. Religious affiliation

	Frequency	Percent
Atheist	49	10.8
Agnostic	68	14.9
Protestant Christian	70	15.4
Roman Catholic	86	18.9
Evangelical Christian	22	4.8
Jewish	11	2.4
Muslim	5	1.1
Hindu	6	1.3
Buddhist	14	3.1
None	87	19.1

Table 4-9. Continent of origin

	Frequency	Percent
Europe	159	34.9
Asia	36	7.9
North America	221	48.6
South America	21	4.6
Australia	14	3.1
Africa	2	.4
Other, please specify	2	.4
Total	455	100.0

Table 4-10. Annual family income

	Frequency	Percent	Cumulative Percent
< \$50k	124	27.3	27.3
\$50 to 75k	117	25.7	53.0
\$75 to 100k	102	22.4	75.4
\$100 - 150k	63	13.8	89.2
\$150 - 200k	27	5.9	95.2
\$200k+	22	4.8	100.0
Total	455	100.0	

Table 4-11. Daily Internet use

	Frequency	Percent	Cumulative Percent
< 1 hour	22	4.8	4.8
1 -2 hours	79	17.4	22.2
2 to 3	78	17.1	39.3
3 to 5	104	22.9	62.2
5 to 8	74	16.3	78.5
8 to 10	43	9.5	87.9
10 to 12	23	5.1	93.0
More than 12	32	7.0	100.0
Total	455	100.0	

Table 4-12. Time spent in Second Life each week

	Frequency	Percent	Cumulative Percent
< 1 hour	18	4.0	4.0
1 to 2 hours	28	6.2	10.1
2 to 4 hours	55	12.1	22.2
4 to 6 hours	66	14.5	36.7
6 to 10 hours	68	14.9	51.6
11 to 15 Hours	52	11.4	63.1
16 to 20 Hours	59	13.0	76.0
21 to 30 Hours	51	11.2	87.3
31 to 40 Hours	22	4.8	92.1
More than 40	36	7.9	100.0
Total	455	100.0	

Table 4-13. Residency length in Second Life

	Frequency	Percent	Cumulative Percent
< 3 months	25	5.5	5.5
3 - 6 months	50	11.0	16.5
6 - 12 Months	121	26.6	43.1
12 - 24 Months	183	40.2	83.3
24 months+	76	16.7	100.0
Total	455	100.0	

Table 4-14. Primary motivation for coming to SL

	Frequency	Percent
Fun	109	24.0
Work	32	7.0
Socializing	81	17.8
Playing	21	4.6
Education	42	9.2
Designing and Building	52	11.4
Experimenting/ Exploring	99	21.8
Other	19	4.2
Total	455	100.0

Table 4-15. Dependent Variables Descriptive Statistics: without IQ Deletions

	N	Mean	Std. Deviation
Estimation of Student's IQ	453	1738916.41	36537289.513
I would speculate that the student's social relationships with classmates are ____.	455	3.33	.736
I would speculate that the student's relationships with instructors are ____.	455	2.99	.792
I would guess that the student's attitude toward school is one of ____.	455	3.25	.816
I would predict that the student would continue their education through ____.	455	4.83	1.650
Valid N (listwise)	453		

Table 4-16. Dependent Variables Descriptive Statistics: with IQ Deletions

	N	Mean	Std. Deviation
Estimation of Student's IQ	425	107.90	18.748
I would speculate that the student's social relationships with classmates are ____.	427	3.33	.722
I would speculate that the student's relationships with instructors are ____.	427	2.97	.781
I would guess that the student's attitude toward school is one of _____.	427	3.26	.784
I would predict that the student would continue their education through _____.	427	4.79	1.608
Valid N (listwise)	425		

Table 4-17. Independent variables Descriptive Statistics: without IQ Deletions

	N	Mean	Std. Deviation
PerceivedAvatarGENDER	454	1.56	.498
PerceivedAvatarETHNICITY	454	2.29	1.095
What is your gender?	455	1.49	.500
What is your race/ethnicity?	455	1.62	1.211
Valid N (listwise)	454		

Table 4-18. Independent variables Descriptive Statistics: with IQ Deletions

	N	Mean	Std. Deviation
PerceivedAvatarGENDER	426	1.55	.498
PerceivedAvatarETHNICITY	426	2.29	1.100
What is your gender?	427	1.49	.500
What is your race/ethnicity?	427	1.62	1.222
Valid N (listwise)	426		

Table 4-19. Gender of the Avatar as Designated by the Researcher by Perceived Gender of the Avatar Crosstabs

		What gender is the student in the picture and video?				
		FEMALE	MALE	Total		
Gender of the avatar as designated by the researcher	Female	Count	17	221	3	241
		% within Gender of the avatar as designated by the researcher	7.1%	91.7%	1.2%	100.0%
		% within What gender is the student in the picture and video?	48.6%	87.7%	1.5%	49.3%
		% of Total	3.5%	45.2%	.6%	49.3%
	Male	Count	18	31	199	248
		% within Gender of the avatar as designated by the researcher	7.3%	12.5%	80.2%	100.0%
Total		% within What gender is the student in the picture and video?	51.4%	12.3%	98.5%	50.7%
		% of Total	3.7%	6.3%	40.7%	50.7%
		Count	35	252	202	489
		% within Gender of the avatar as designated by the researcher	7.2%	51.5%	41.3%	100.0%
		% within What gender is the student in the picture and video?	100.0%	100.0%	100.0%	100.0%
		% of Total	7.2%	51.5%	41.3%	100.0%

Table 4-20. Gender of the Avatar as Designated by the Researcher by Perceived Ethnicity of the Avatar Crosstabs

		What race/ethnicity is the student in the picture and video?					
		Asian	Black/ African- American	Caucasian	Hispanic/ Latino	Total	
Gender of the avatar as designated by the researcher	Female						
	Count	17	49	68	67	40	241
	% within Gender of the avatar as designated by the researcher	7.1%	20.3%	28.2%	27.8%	16.6%	100.0%
	% within What race/ethnicity is the student in the picture and video?	48.6%	56.3%	50.7%	48.6%	42.1%	49.3%
Male	% of Total	3.5%	10.0%	13.9%	13.7%	8.2%	49.3%
	Count	18	38	66	71	55	248
	% within Gender of the avatar as designated by the researcher	7.3%	15.3%	26.6%	28.6%	22.2%	100.0%
	% within What race/ethnicity is the student in the picture and video?	51.4%	43.7%	49.3%	51.4%	57.9%	50.7%
Total	% of Total	3.7%	7.8%	13.5%	14.5%	11.2%	50.7%
	Count	35	87	134	138	95	489
	% within Gender of the avatar as designated by the researcher	7.2%	17.8%	27.4%	28.2%	19.4%	100.0%
	% within What race/ethnicity is the student in the picture and video?	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	7.2%	17.8%	27.4%	28.2%	19.4%	100.0%

Table 4-21. Ethnicity of the Avatar as Designated by the Researcher by Perceived Gender of the Avatar Crosstabs

		What gender is the student in the picture and video?				
			FEMALE	MALE	Total	
Ethnicity of the avatar as designated by the researcher	African American	Count	13	68	48	129
		% within Ethnicity of the avatar as designated by the researcher	10.1%	52.7%	37.2%	100.0%
		% within What gender is the student in the picture and video?	37.1%	27.0%	23.8%	26.4%
		% of Total	2.7%	13.9%	9.8%	26.4%
	Asian	Count	4	70	42	116
		% within Ethnicity of the avatar as designated by the researcher	3.4%	60.3%	36.2%	100.0%
		% within What gender is the student in the picture and video?	11.4%	27.8%	20.8%	23.7%
		% of Total	.8%	14.3%	8.6%	23.7%
	Caucasian	Count	13	57	55	125
		% within Ethnicity of the avatar as designated by the researcher	10.4%	45.6%	44.0%	100.0%
		% within What gender is the student in the picture and video?	37.1%	22.6%	27.2%	25.6%
		% of Total	2.7%	11.7%	11.2%	25.6%
Hispanic/Latino	Count	5	57	57	119	
	% within Ethnicity of the avatar as designated by the researcher	4.2%	47.9%	47.9%	100.0%	
	% within What gender is the student in the picture and video?	14.3%	22.6%	28.2%	24.3%	
	% of Total	1.0%	11.7%	11.7%	24.3%	
Total	Count	35	252	202	489	
	% within Ethnicity of the avatar as designated by the researcher	7.2%	51.5%	41.3%	100.0%	
	% within What gender is the student in the picture and video?	100.0%	100.0%	100.0%	100.0%	
	% of Total	7.2%	51.5%	41.3%	100.0%	

Table 4-22. Ethnicity of the Avatar as Designated by the Researcher * Perceived Ethnicity of the Avatar Crosstabs

		What race/ethnicity is the student in the picture and video?						
			Asian	Black/ African- American	Caucasian	Hispanic/ Latino	Total	
Ethnicity of the avatar as designated by the researcher	African American	Count	13	1	115	0	0	129
		% within Ethnicity of the avatar as designated by the researcher	10.1%	.8%	89.1%	.0%	.0%	100.0%
		% within What race/ethnicity is the student in the picture and video?	37.1%	1.1%	85.8%	.0%	.0%	26.4%
	Asian	% of Total	2.7%	.2%	23.5%	.0%	.0%	26.4%
		Count	4	78	3	16	15	116
		% within Ethnicity of the avatar as designated by the researcher	3.4%	67.2%	2.6%	13.8%	12.9%	100.0%
	Caucasian	% within What race/ethnicity is the student in the picture and video?	11.4%	89.7%	2.2%	11.6%	15.8%	23.7%
		% of Total	.8%	16.0%	.6%	3.3%	3.1%	23.7%
		Count	13	3	0	106	3	125
	Hispanic/Latino	% within Ethnicity of the avatar as designated by the researcher	10.4%	2.4%	.0%	84.8%	2.4%	100.0%
		% within What race/ethnicity is the student in the picture and video?	37.1%	3.4%	.0%	76.8%	3.2%	25.6%
		% of Total	2.7%	.6%	.0%	21.7%	.6%	25.6%
Total	Count	5	5	16	16	77	119	
	% within Ethnicity of the avatar as designated by the researcher	4.2%	4.2%	13.4%	13.4%	64.7%	100.0%	
	% within What race/ethnicity is the student in the picture and video?	14.3%	5.7%	11.9%	11.6%	81.1%	24.3%	
	% of Total	1.0%	1.0%	3.3%	3.3%	15.7%	24.3%	
	Count	35	87	134	138	95	489	
	% within Ethnicity of the avatar as designated by the researcher	7.2%	17.8%	27.4%	28.2%	19.4%	100.0%	
	% within What race/ethnicity is the student in the picture and video?	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	7.2%	17.8%	27.4%	28.2%	19.4%	100.0%	

Table 4-23. Random Assignment Versus Perceived Assignment Category Differences

Assigned Categories	Perceived Categories
56 Asian females	55 Asian females
57 Asian males	32 Asian males
56 Black/African American females	84 Black/African American females
60 Black/African American males	50 Black/African American males
56 Caucasian female	70 Caucasian females
56 Caucasian male	70 Caucasian males
56 Hispanic Latino female	45 Hispanic Latino females
56 Hispanic Latino male	50 Hispanic Latino males

Table 4-24. Continuous Data Set Hypotheses Results

Hypotheses	IQ Estimate		Social Relationships with Classmates		Relationships with Instructors		Attitude toward School		Education level Prediction	
	F	P	F	P	F	p	F	P	F	P
Hypothesis #1: PerceivedAvatarEthnicity	1.67	.17	.72	.54	1.44	.23	1.09	.35	.41	.73
Hypothesis #2: PerceivedAvatarGender	2.51	.113	.01	.89	.08	.77	7.15	.01*	.07	.78
Hypothesis #3: ParticipantGender	.58	.44	1.15	.28	1.91	.16	.038	.53	.45	.50
Hypothesis #4: ParticipantEthnicity	.31	.86	1.18	.31	2.65	.03*	1.67	.15	.26	.89
Hypothesis #5: PerceivedAvatarGender * PerceivedAvatarEthnicity	1.65	.17	.67	.56	.10	.95	1.63	.18	.49	.68
Hypothesis #6: PerceivedAvatarGender * ParticipantGender	.54	.46	2.65	.10	.20	.65	5.38	.02*	.50	.47
Hypothesis #7: PerceivedAvatarEthnicity * ParticipantEthnicity	.77	.65	1.58	.10	.74	.68	.46	.91	.60	.81
Hypothesis #8: PerceivedAvatarGender * ParticipantEthnicity	2.67	.04*	.63	.59	.14	.93	2.81	.03*	1.03	.37
Hypothesis #9: PerceivedAvatarEthnicity * ParticipantGender	1.18	.31	.76	.51	.66	.57	2.15	.09	1.33	.26
Hypothesis #10: ParticipantGender * ParticipantEthnicity	2.16	.07	.74	.56	.98	.41	.38	.82	.80	.52
Hypothesis #11: PerceivedAvatarGender * PerceivedAvatarEthnicity * ParticipantEthnicity	2.89	.004	.50	.85	.95	.46	1.24	.27	.66	.72
Hypothesis #12: PerceivedAvatarGender * PerceivedAvatarEthnicity * ParticipantGender	.27	.84	.31	.81	.75	.51	.29	.82	.76	.51
Hypothesis #13: PerceivedAvatarEthnicity * ParticipantGender * ParticipantEthnicity	2.13	.03*	.56	.80	1.61	.12	.79	.60	.62	.75
Hypothesis #14: PerceivedAvatarGender * ParticipantGender * ParticipantEthnicity	.65	.58	1.73	.15	.43	.73	1.79	.14	1.00	.38
Hypothesis #15: PerceivedAvatarGender * PerceivedAvatarEthnicity * ParticipantGender * ParticipantEthnicity	3.70	.006*	.28	.89	.95	.43	.61	.65	1.04	.38

Table 4-25. Participant Ethnicity with Student's Relationships with Instructors Estimated Marginal Means

What is your race/ethnicity?	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Caucasian/White	2.999	.046	2.907	3.090
African American/Black	2.267 ^a	.307	1.664	2.870
Hispanic or Latino	3.043 ^a	.171	2.706	3.380
Asian	2.714 ^a	.134	2.451	2.977
Other, please specify	3.121 ^a	.197	2.734	3.509

a. Based on modified population marginal mean.

Table 4-26. Perceived Gender with Attitude toward School Estimated Marginal Means

PerceivedAvatarGENDER	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Male	3.361(a)	.095	3.175	3.548
Female	3.149(a)	.099	2.955	3.343

a Based on modified population marginal mean.

Table 4-27. Perceived Gender * Participant Gender Interaction for Attitude toward School Estimated Marginal Means

What is your gender?	PerceivedAvatar GENDER	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Male	Male	3.542 ^a	.150	3.247	3.837
	Female	3.008 ^a	.146	2.721	3.295
Female	Male	3.233 ^a	.122	2.993	3.474
	Female	3.281 ^a	.134	3.018	3.544

a. Based on modified population marginal mean.

Table 4-28. Perceived Gender * Participant Ethnicity Interaction for Student IQ Estimated Marginal Means

What is your race/ethnicity?	PerceivedAvatar GENDER	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Caucasian/White	Male	110.080	1.615	106.904	113.257
	Female	107.982	1.377	105.273	110.690
African American/Black	Male	102.889 ^a	9.131	84.933	120.845
	Female	102.500 ^a	10.981	80.905	124.095
Hispanic or Latino	Male	99.693 ^a	5.302	89.267	110.119
	Female	117.500	5.715	106.262	128.738
Asian	Male	99.274 ^a	4.375	90.670	107.877
	Female	112.806	4.282	104.385	121.228
Other, please specify	Male	115.000 ^a	7.088	101.061	128.939
	Female	110.833 ^a	5.916	99.199	122.468

a. Based on modified population marginal mean.

Table 4-29. Perceived Gender * Participant Ethnicity Interaction for Attitude toward School Estimated Marginal Means

What is your race/ethnicity?	PerceivedAvatar GENDER	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Caucasian/White	Male	3.255	.070	3.117	3.394
	Female	3.284	.060	3.166	3.402
African American/Black	Male	3.000 ^a	.398	2.217	3.783
	Female	3.250 ^a	.479	2.309	4.191
Hispanic or Latino	Male	3.681 ^a	.231	3.226	4.135
	Female	2.875	.249	2.385	3.365
Asian	Male	3.286 ^a	.191	2.911	3.661
	Female	2.850	.187	2.483	3.217
Other, please specify	Male	3.417 ^a	.299	2.830	4.004
	Female	3.619 ^a	.258	3.112	4.126

a. Based on modified population marginal mean.

Table 4-30. Participant Ethnicity * Perceived Gender * Perceived Ethnicity Interaction for Student IQ Estimated Marginal Means

Dependent Variable: Estimation of Student's IQ

What is your race/ethnicity?	PerceivedAvatar ETHNICITY	PerceivedAvatar GENDER	Mean	Std. Error	95% Confidence Interval		
					Lower Bound	Upper Bound	
Caucasian/White	Caucasian	Male	103.019	2.556	97.993	108.045	
		Female	110.500	2.487	105.610	115.390	
	Black/African-American	Male	117.167	3.245	110.786	123.547	
		Female	109.737	2.246	105.321	114.154	
	Hispanic/Latino	Male	109.905	3.094	103.821	115.988	
		Female	101.972	3.097	95.882	108.062	
	Asian	Male	110.231	3.888	102.585	117.877	
		Female	109.718	3.088	103.646	115.790	
	African American/Black	Caucasian	Male	93.667 ^a	10.353	73.307	114.027
			Female
Black/African-American		Male	115.000 ^a	17.932	79.736	150.264	
		Female	.	.	.	.
Hispanic/Latino		Male	100.000 ^a	17.932	64.736	135.264	
		Female	.	.	.	.
Asian		Male	.	.	.	.
		Female	102.500	10.981	80.905	124.095	
Hispanic or Latino		Caucasian	Male	92.300	9.822	72.985	111.615
			Female	93.000	12.680	68.064	117.936
	Black/African-American	Male	112.500	10.981	90.905	134.095	
		Female	114.500	12.680	89.564	139.436	
	Hispanic/Latino	Male	86.625	10.024	66.912	106.338	
		Female	147.500	10.981	125.905	169.095	
	Asian	Male	115.000 ^a	10.353	94.640	135.360	
		Female	115.000	8.966	97.368	132.632	
	Asian	Caucasian	Male	108.750	8.966	91.118	126.382
			Female	103.050	7.502	88.298	117.802
Black/African-American		Male	103.750 ^a	8.966	86.118	121.382	
		Female	115.550	7.502	100.798	130.302	
Hispanic/Latino		Male	92.500	8.966	74.868	110.132	
		Female	123.250	10.981	101.655	144.845	
Asian		Male	94.333	7.321	79.937	108.730	
		Female	109.375	7.765	94.105	124.645	
Other, please specify		Caucasian	Male	105.000 ^a	12.680	80.064	129.936
			Female	118.750	10.981	97.155	140.345
	Black/African-American	Male	132.500 ^a	12.680	107.564	157.436	
		Female	106.667	10.353	86.307	127.027	
	Hispanic/Latino	Male	111.250	10.981	89.655	132.845	
		Female	97.500	10.981	75.905	119.095	
	Asian	Male	.	.	.	.
		Female	130.000 ^a	17.932	94.736	165.264	

a. Based on modified population marginal mean.

b. This level combination of factors is not observed, thus the corresponding population marginal mean is not estimable.

Table 4-31. Participant Ethnicity * Participant Gender * Perceived Ethnicity Interaction for Student IQ Estimated Marginal Means

What is your race/ethnicity?	What is your gender?	PerceivedAvatar ETHNICITY	Mean	Std. Error	95% Confidence Interval		
					Lower Bound	Upper Bound	
Caucasian/White	Male	Caucasian	108.276	2.367	103.621	112.932	
		Black/African-American	113.304	2.488	108.410	118.198	
		Hispanic/Latino	103.534	3.158	97.323	109.744	
		Asian	106.833	3.505	99.941	113.725	
	Female	Caucasian	105.242	2.667	99.998	110.487	
		Black/African-American	113.600	3.063	107.577	119.623	
		Hispanic/Latino	108.343	3.031	102.382	114.304	
		Asian	113.115	3.517	106.199	120.031	
	African American/Black	Male	Caucasian	.	^a	.	.
			Black/African-American	115.000 ^b	17.932	79.736	150.264
			Hispanic/Latino	.	^a	.	.
			Asian	111.000 ^b	17.932	75.736	146.264
Female		Caucasian	93.667 ^b	10.353	73.307	114.027	
		Black/African-American	.	^a	.	.	
		Hispanic/Latino	100.000 ^b	17.932	64.736	135.264	
		Asian	94.000 ^b	12.680	69.064	118.936	
Hispanic or Latino	Male	Caucasian	95.300	9.822	75.985	114.615	
		Black/African-American	117.500	12.680	92.564	142.436	
		Hispanic/Latino	147.500	12.680	122.564	172.436	
		Asian	115.000 ^b	12.680	90.064	139.936	
	Female	Caucasian	90.000	12.680	65.064	114.936	
		Black/African-American	109.500	10.981	87.905	131.095	
		Hispanic/Latino	86.625	7.765	71.355	101.895	
		Asian	115.000	8.185	98.904	131.096	
	Asian	Male	Caucasian	106.000	8.966	88.368	123.632
			Black/African-American	122.500 ^b	12.680	97.564	147.436
			Hispanic/Latino	98.250	8.966	80.618	115.882
			Asian	104.375	6.848	90.908	117.842
Female		Caucasian	105.800	7.502	91.048	120.552	
		Black/African-American	106.175	6.015	94.347	118.003	
		Hispanic/Latino	117.500	10.981	95.905	139.095	
		Asian	99.333	8.185	83.237	115.429	
Other, please specify	Male	Caucasian	107.500 ^b	12.680	82.564	132.436	
		Black/African-American	100.000 ^b	17.932	64.736	135.264	
		Hispanic/Latino	106.250	10.981	84.655	127.845	
		Asian	.	^a	.	.	
	Female	Caucasian	117.500	10.981	95.905	139.095	
		Black/African-American	122.917	8.185	106.821	139.013	
		Hispanic/Latino	102.500	10.981	80.905	124.095	
		Asian	130.000 ^b	17.932	94.736	165.264	

a. This level combination of factors is not observed, thus the corresponding population marginal mean is not estimable.

b. Based on modified population marginal mean.

Table 4-32. Participant Ethnicity * Participant Gender * Perceived Gender * Perceived Ethnicity Interaction for Student IQ Estimated Marginal Means

What is your race/ethnicity?	What is your gender?	PerceivedAvatar ETHNICITY	PerceivedAvatar GENDER	Mean	Std. Error	95% Confidence Interval		
						Lower Bound	Upper Bound	
Caucasian/White	Male	Caucasian	Male	102.938	3.170	96.704	109.171	
			Female	113.615	3.517	106.699	120.531	
		Black/African-American	Male	114.667	3.913	106.971	122.362	
			Female	111.941	3.075	105.893	117.989	
		Hispanic/Latino	Male	109.857	4.793	100.432	119.282	
			Female	97.211	4.114	89.120	105.301	
		Asian	Male	108.000	5.977	96.245	119.755	
			Female	105.667	3.660	98.468	112.865	
		Female	Caucasian	Male	103.100	4.010	95.215	110.985
				Female	107.385	3.517	100.469	114.301
			Black/African-American	Male	119.667	5.177	109.487	129.847
				Female	107.533	3.274	101.095	113.972
	Hispanic/Latino		Male	109.952	3.913	102.257	117.648	
			Female	106.733	4.630	97.628	115.839	
	Asian	Male	112.462	4.973	102.681	122.242		
		Female	113.769	4.973	103.989	123.550		
	African American/Black	Male	Caucasian	Male	.	.	.	.
				Female	.	.	.	.
			Black/African-American	Male	115.000	17.932	79.736	150.264
				Female	.	.	.	.
			Hispanic/Latino	Male	.	.	.	.
				Female	.	.	.	.
			Asian	Male	.	.	.	.
				Female	.	.	.	.
Female			Caucasian	Male	111.000	17.932	75.736	146.264
				Female	93.667	10.353	73.307	114.027
			Black/African-American	Male	.	.	.	.
				Female	.	.	.	.
		Hispanic/Latino	Male	100.000	17.932	64.736	135.264	
			Female	.	.	.	.
Asian		Male	.	.	.	.
		Female	.	.	.	.
Hispanic or Latino		Male	Caucasian	Male	94.000	12.680	69.064	118.936
				Female	104.600	8.020	88.829	120.371
			Black/African-American	Male	86.000	17.932	50.736	121.264
				Female	120.000	17.932	84.736	155.264
			Hispanic/Latino	Male	115.000	17.932	79.736	150.264
				Female	95.000	17.932	59.736	130.264
			Asian	Male	200.000	17.932	164.736	235.264
				Female	.	.	.	.
	Female		Caucasian	Male	115.000	12.680	90.064	139.936
				Female	80.000	17.932	44.736	115.264
			Black/African-American	Male	100.000	17.932	64.736	135.264
				Female	105.000	12.680	80.064	129.936
		Hispanic/Latino	Male	114.000	17.932	78.736	149.264	
			Female	78.250	8.966	60.618	95.882	
	Asian	Male	95.000	12.680	70.064	119.936		
		Female	115.000	10.353	94.640	135.360		
	Asian	Male	Caucasian	Male	115.000	12.680	90.064	139.936
				Female	102.500	12.680	77.564	127.436
			Black/African-American	Male	109.500	12.680	84.564	134.436
				Female	.	.	.	.
			Hispanic/Latino	Male	122.500	12.680	97.564	147.436
				Female	95.000	12.680	70.064	119.936
			Asian	Male	101.500	12.680	76.564	126.436
				Female	98.000	10.353	77.640	118.360
Female			Caucasian	Male	110.750	8.966	93.118	128.382
				Female	115.000	12.680	90.064	139.936
			Black/African-American	Male	96.600	8.020	80.829	112.371
				Female	103.750	8.966	86.118	121.382
		Hispanic/Latino	Male	108.600	8.020	92.829	124.371	
			Female	90.000	12.680	65.064	114.936	
Asian		Male	145.000	17.932	109.736	180.264		
		Female	90.667	10.353	70.307	111.027		
Other, please specify		Male	Caucasian	Male	108.000	12.680	83.064	132.936
				Female	.	.	.	.
		Black/African-American	Male	107.500	12.680	82.564	132.436	
			Female	.	.	.	.
		Hispanic/Latino	Male	100.000	17.932	64.736	135.264	
			Female	.	.	.	.

CHAPTER 5 IMPLICATIONS

This chapter presents a summary of the study and conclusions drawn from the data presented in chapter four. It provides a discussion of the implications for action and recommendations for further research.

Social interaction is important to learning (Vygotsky, 1978) and can occur in technology mediated forms (e.g., 5th dimension project – Cole, 1995; Nicolopolou & Cole, 1993; CSILE - Scardamalia & Bereiter, 1996; Scardamalia, et al., 1994; LaFerriere, 2002). One form of technology mediated interaction that is increasingly being used in education is the Multi-User Virtual Environment (MUVE; New Media Consortium, 2007; Castronova, 2001). These environments allow users to experience a graphically engaging world while interacting with others as an avatar (Lastowka & Hunter, 2004). Users can choose the physical appearance of their avatar by customizing minute details (Damer, 1998; Rehak, 2003; Lastowka & Hunter, 2004).

Unfortunately, we have an inadequate understanding about the effect of avatar choice on teacher expectations and perceptions of student success. The gender and ethnicity of students has been shown to specifically effect teacher perceptions and expectations of students in face-to-face classrooms (Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Walther & Tidwell, 1996; Ferguson, 2003; Frawley, 2005; Van Duzer, 2006; Auwarter & Aruguete, 2008). Therefore, we need to study the influence of avatar choice (i.e. gender and ethnicity) on teacher perceptions and expectations of student success.

The impact of the gender and ethnicity of the student's avatar on the teacher's expectations and perceptions begins in the classroom. Teacher's expectations and perceptions of their students do change with regard to their students' gender and ethnicity in a face-to-face classroom

environment (Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Ferguson, 2003; Frawley, 2005; Van Duzer, 2006; Auwarter & Aruguete, 2008). However, traditional Internet-based learning environments, such as learning management systems, conceal the gender and ethnic identity of students by giving them anonymity (Walther & Tidwell, 1996). The lack of visual and audio cues in these environments acts to remove gender and ethnic identity to a large extent (Walther & Tidwell, 1996). However, MUVES allow for the customization of gender and ethnicity in student avatars (Lastowka & Hunter, 2004). With over 180 universities present in Second Life, it is easy to recognize that a large number of students are entering these environments in search of an education. It is also easy to surmise that these students represent a wide variety of different ethnicities and genders. The critical question then is: Are they faced with the prejudiced environment experienced by students of different ethnicity and gender in the face-to-face classroom (Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Ferguson, 2003; Frawley, 2005; Van Duzer, 2006; Auwarter & Aruguete, 2008), by the environment presented by traditional Internet learning (Walther & Tidwell, 1996), or by another still to be determined environment?

Research Questions and Discussion

The overarching question in this study was whether avatar choice affected teacher expectations and perceptions of student academic success. Many references have been given that have convincingly shown that teacher biases based on the gender and ethnicity of students do exist in face-to-face classrooms. However, this study was done in a MUVE. The sample selected mirrors the overall population of Second Life, which is mostly Caucasian and from western nations. It should be noted that the Internet has been primarily adopted by Caucasian

populations in the U.S. (77% Caucasian; Lenhart et al, 2002), so SL appears to be following the same pattern. The sample selected is also representative of teachers in SL (Mallon, 2008).

We will consider ethnicity related, gender related, and interactions between gender and ethnicity results in that order.

Ethnicity Related Questions

Researchers have shown that the ethnicity of students impacts teacher expectations of students in the face-to-face classrooms (Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Ferguson, 2003; Auwarter & Aruguete, 2008). Studies have also shown that the ethnicity of the teacher is applicable to teachers' perceptions and expectations of academic achievement in classroom situations (Braun, 1976; Brophy & Good, 1974; Ferguson, 2003; Auwarter & Aruguete, 2008). Because most avatars in MUVES have the capability to graphically display differences in ethnicity (Damer, 1998; Rehak, 2003; Lastowka & Hunter, 2004), it was deemed important to determine the relationship between the ethnicity of the student avatar and the teacher with teacher perceptions and expectations in a Multi User Virtual Environment. There was one significant result for the ethnicity-related questions:

1. Teachers in SL with an ethnicity of “Other” estimated students across all ethnicities and genders as having the highest levels of relationships with instructors, followed by Hispanic or Latino SL teachers, Caucasian/White SL teachers, Asian SL teachers and African American/Black SL teachers (Table 4-25).

These results agree with current literature from face-to-face classrooms. Stereotypical bias based on teacher ethnicity is pervasive in the educational system (Campbell, 1991; Fennema & Peterson, 1985; LaFrance, 1981; Masland, 1994). Education provides, at least in theory, equal opportunities to all individuals. In practice, however, differential expectations about students are typically present. Many physical characteristics are capable of evoking initial expectations and

impressions, including teacher ethnicity (Braun, 1976; Brophy, 1983; Brophy & Good, 1974; Dusek, 1985; Finn, 1972; Ferguson, 2003; Auwarter & Aruguete, 2008).

Teachers' ethnicities have been shown to relate to their perceptions of children's behavior, independent of the student's ethnicity (Beady & Hansell, 1981; Pigott & Cowen, 2000; Zimmerman, Khoury, Vega, Gil, & Warheit, 1995). In these studies teacher ethnicity was strongly related to college expectations. Non-Caucasian teachers had significantly greater expectations that their students would successfully enter and complete college than Caucasian teachers (Beady & Hansell, 1981). Also, Non-Caucasian teachers rated all children more positively, as having more competencies and fewer problems than teachers of other ethnicities (Pigott & Cowen, 2000). As a result, this positive attitude of Non-Caucasian teachers may have expressed itself in the Other ethnicity teachers' estimations of higher relationships with instructors.

Results also showed that teacher ethnicity did not influence their perceptions and expectations of Student IQ, relationships with classmates, attitude toward school and prediction of future final education level. Thus, the question is why were relationships with instructors affected by the ethnicity of the teacher and not these other areas? It may be because relationships with instructors are the only dependent variable that personally involves the instructor in their estimation. The attributes of each party are related to the quality of the relationship that develops between teachers and students (Kesner, 2000). For example, ethnic variation between teachers and students may influence how each perceives the other. The teacher brings his or her own cultural values, beliefs and practices to the relationship (Bowlby, 1982). Thus, teacher ethnicity may be an issue if the cultural norms of each party are in conflict.

This is important because it may suggest that factors that personally involve the instructor in their estimation are more subject to discrimination by teachers in MUVES.

Should all students seek out instructors from an “Other ethnicity in order to put themselves in position for a better relationship with their instructor? These questions touch on the problem of unfair advantage mentioned earlier. But is it really unfair if a student uses the knowledge they have to give them the best opportunity to succeed? It is if one believes that opportunity to succeed should be solely based on an objective standard of academic achievement. However, the literature cited in this study has clearly shown that teachers do not follow an objective standard in their perceptions and evaluations of students. Is it then unrealistic to attempt to hold students to a higher standard of academic success than teachers themselves?

The answer needs to address both sides. Teachers and students in MUVES need to work together to develop new ways to measure student success that are not artificially biased. The IQ scale was created by Caucasians within one cultural context (American; Suzuki & Aronson, 2005), but the MUVE is clearly a completely different context. As test creators, teachers and students address this problem, there are many opportunities to think differently in examining what constitutes an intelligence measure and how to examine issues of bias (White, 2000). For example, given growing concerns regarding the usage of intelligence tests for selection purposes, Jensen (2000) suggested using criteria that go beyond standardized measures and the inclusion of indicators of past performance (i.e., portfolio, learning artifacts, etc.). Future studies should consider the use of different kinds of measures of intelligence that may be more conducive to use in a MUVE in order to address this issue.

Three possible reasons emerge for these conflicts with the literature. First, this may be a new finding that has to do with the unique properties and affordances that a MUVE has to offer.

Research has found that MUVES have unique strengths in simulation (Dieterle & Clark, in press), personal expression and creation (Perkins, 2007), 'real world', collaborative learning, and role-playing (Rappa et al, 2008), and identity experimentation (Turkle, 1995). Thus, future research is needed to confirm these results and, if confirmed, determine the underlying factors in a MUVE that may have created this conflict with the literature.

Second, the teachers in this study may be quite different than the teachers discussed in the above studies. For example, most of the above studies examined K-12 teachers, while our sample was more evenly split between adult and K-12 teachers (Table 5-1). Also, most of the cited literature surveyed teachers that were mostly female, while our sample was evenly split between male and female representation. Finally, the above studies were either a) Run during a time period when the Internet either did not exist or was not as popular, or b) Did not measure teacher Internet usage. The combination of these may have been enough to explain these different results for teachers in SL.

Third, the artificial experimental setting used for the experiment may have enabled teachers in SL to remove themselves from the setting (the classroom) of their discriminatory behavior. Elashoff and Snow (1971) suggest that teacher expectations are more likely to be affected in their natural classroom environment. Strong attempts were made to make the experimental conditions a close simulation of natural MUVE conditions. Teachers received an image and 3-D movie of a student avatar, as well as an actual student transcript. However, the study was not conducted in an actual MUVE classroom, which could have separated teachers from the setting of their discriminatory behavior. This is important to consider because of the potential confounding effect of the artificial experimental setting.

Ethnicity biases inherent in real world teachers were not mirrored in these results. Future research should consider replicating this experiment for three reasons. First, because these results conflicted with a long history of literature on ethnicity biases, we need to replicate the experiment to determine if we get similar results from a similar sample. Second, we need to replicate the experiment because the SL teachers were from a significantly different demographic than those in the literature. If we get the same results with a similar real life sample demographically, then future research will be needed. This research should attempt to determine differences between real life and MUVE studies and the underlying factors behind these differences (i.e. identity exploration in MUVES, experimental setting, etc.).

Finally, the experiment should be replicated in a more naturalistic setting (a classroom) in order to determine if the experimental setting led to these results. This research would be important in order to determine if these results are the result of the experimental methodology that was used, the teacher demographics, or if they are due to other reasons.

Gender Related Questions

Research has shown that the gender of teachers and students impacts teacher expectations of students in the face-to-face classrooms (Braun, 1976; Brophy & Good, 1974; Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Frawley, 2005; Van Duzer, 2006). Because most avatars in MUVES have the capability to graphically display differences in gender (Damer, 1998; Rehak, 2003; Lastowka & Hunter, 2004), it was deemed important to determine the relationship between the gender of the student avatar and teacher perceptions and expectations in a Multi User Virtual Environment. There were three main significant results for the gender-related questions:

1. Teachers in Second Life estimate male student avatars as having a higher level of attitude toward school compared to female student avatars (Table 4-26).

2. Male teachers in SL estimated male student avatars as having a higher attitude toward school compared to female student avatars ($M = 3.27$; Table 4-27).
3. Female teachers in SL estimated female student avatars as having a higher attitude toward school compared to male student avatars (Table 4-29; Table 4-27).

It is important to note that the differences in attitude toward school between male and female avatars were larger for male teachers while the difference for female teachers was negligible. These results are in conflict with current literature from face-to-face classrooms. Males appear to view school as less important in their lives as females (Clark et al., 2006). In a national survey, male students consistently reported that they did not listen in class, complete assignments, and did not do their best work (NCES, 2005). Females viewed their academic work as interesting and meaningful compared to males who did not appear to see the critical nature of their academic performance as it relates to future occupation (NCES, 2005). It is important to confirm these results because if teachers in MUVES (especially males) estimate males as having higher attitudes toward school then this goes against current data on academic performance that clearly shows males falling behind females (Burns and Bracey 2001; Clark et al. 2006; Kafer 2004). This result could indicate evidence of male teacher discrimination against female students in MUVES, which should be addressed through teacher education and professional development opportunities.

Non-significant results for the relationship between avatar and/or participant gender and Student IQ and future final education level may be explained by numerous studies that have frequently failed to find significant differences between male and female academic development and IQ (McNemar, 1942; Havighurst and Janke, 1944; Hughes, 1953; Jorm et al, 2004; Colom et al., 2000; Aluja-Fabregat et al., 2000). Thus, it may be that teachers in SL viewed both Student

IQ and future final educational level as measures of intelligence that had no difference for males and females.

Non-significant results for the relationship between avatar gender and student's relationships with classmates and instructors seem to conflict with current research from the face-to-face classroom. Research has shown that males in a classroom environment tend to be more aggressive and take more initiative in the classroom than females (Tuddenham, 1952; Spach, 1951; Sears, 1961; Feshbach, 1956; Sanford, Adkins, Miller, and Cobb, 1943; Digman, 1963), while females are seen as more sensitive to the feelings of others, more dependent, more motivated, more passive, and quieter than males (Broverman et al., 1972; Feldman & Kiesler, 1974; Richmond-Abbott, 1979; Rim & Aloni, 1969; Ruble & Ruble, 1980). This literature would appear to indicate that teachers would preference females as having better relationships with students and instructors than males. However, results from this study did not agree. This disagreement between the literature and this study is important because knowing whether teachers' preference students of a particular gender as having better relationships with classmates and instructors could be an indicator of teacher bias in MUVES toward students of their gender.

As for the student, the lesson to learn appears to be unfortunately all too clear: Be aware of your teacher's gender and customize your avatar to the gender that is most advantageous to your success. Although this might come across as insensitive, results have shown that teachers in MUVES may discriminate on the basis of gender. However, MUVE's allow for detailed customization of avatar physical characteristics, including gender (Lastowka & Hunter, 2004). Students who are being discriminated against in an MUVE have power that a student in a real life classroom does not. They can change their gender as they move from class to class and

instructor to instructor. Therefore, the affordance of detailed customization in a MUVE empowers students to level the academic playing field.

However, it may be argued that it is unjust to require students to change their gender as they move from instructor to instructor. Is this the same thing as past real life efforts by public education to force female students into historically accepted feminine roles like homemaker and mother? During that time period it was argued that the mere availability of education empowered women by giving them the choice to be educated (Beecher, 1842). We are repeating the mistakes of history by encouraging students to embrace changing their avatar gender for their own academic advantage. The solution is to focus on the source of the apparent discrimination – in this case the male teacher in SL. What methods have been used successfully to eliminate discrimination and increase acceptance of students from different genders in the face-to-face classroom? What programs have been created that have successfully helped teachers to avoid judgment of students based on gender? Research seems to suggest that analysis and argument is likely to challenge and change attitudes (Petty and Cacioppo, 1986). Observations of others' actions may change normative beliefs and enhance self-efficacy through social modeling and persuasion (Bandura, 1998), and, in doing so, is likely to prompt protective intention formation (Ajzen and Madden, 1986). Behavior-specific cognitions and practice are most likely to be effective (Wight *et al.*, 1998).

Four possible reasons emerge to explain these results. First, this new result may have to do with some interaction between teachers and the strengths that MUVEs allow. MUVEs allow teachers and students enhanced learning through simulations (Dieterle & Clark, in press), personal expression and creation (Perkins, 2007), collaborative learning, and role-playing (Rappa et al, 2008) and identity experimentation (Turkle, 1995). Therefore, future research is needed to

confirm these results and, if confirmed, determine the underlying factors in a MUVE that may have created this conflict with the literature.

Second, because this results conflicts with a large body of literature, it is important to ask whether there was something in the data, experimental setting, or analysis methods that might explain this difference. The teachers in this study (in SL) may be quite different than the teachers discussed in the above studies. For example, most of the above studies examined K-12 teachers, while our sample was more evenly split between adult and K-12 teachers (Table 5-1). Also, most of the cited literature surveyed teachers that were mostly female, while our sample was evenly split between male and female representation. Finally, the above studies were either a) Run during a time period when the Internet either did not exist or was not as popular, or b) Did not measure teacher Internet usage. The combination of these may have been enough to explain these conflicting results.

Third, the artificial experimental setting used for the experiment may have enabled teachers in SL to remove themselves from the setting (the classroom) of their discriminatory behavior. Elashoff and Snow (1971) suggest that teacher expectations are more likely to be affected in their natural classroom environment. Strong attempts were made to make the experimental conditions a close simulation of natural MUVE conditions. Teachers received an image and 3-D movie of a student avatar, as well as an actual student transcript. However, the study was not conducted in an actual MUVE classroom, which could have separated teachers from the setting of their discriminatory behavior. This is important to consider because of the potential confounding effect of the artificial experimental setting.

Finally, the experimental methods may need to be examined. It may be that the deception used was not effective resulting in teachers having knowledge of the true purpose of the study. If

this occurred, it would be likely that participants may choose to purposely bias their answers as they believe the researcher would want them to.

Future research should consider replicating this experiment for three reasons. First, because these results conflicted with a long history of literature on the subject, we need to replicate the experiment to determine if we get similar results from a similar sample. Second, we need to replicate the experiment because the SL teachers were from a significantly different demographic than those in the literature. If we get the same results with a similar real life sample demographically, then future research will be needed. This research should attempt to determine differences between real life and MUVE studies and the underlying factors behind these differences (i.e. identity exploration in MUVES, experimental setting, etc.).

Finally, we should replicate the experiment in order to explore which aspects of males' attitude toward school are appealing to teachers in MUVE environments. This is important because it may help us to develop effective interventions for teachers in MUVES so they may be able to interact with students of every gender without prejudice.

Further research is needed to determine if interventions that have been successful with teachers in the face-to-face classroom will also be successful in the MUVE classroom. Future research should also explore the effect of changing avatar gender on teachers' expectations and perceptions of attitude toward school and relationships with classmates. Research should also consider the effect of androgynous avatars on teacher expectations and perceptions. This is important to consider because this study found that male teachers' expectations and perceptions were biased toward student avatars of their own gender. Considering the effect of androgynous avatars on teacher expectations and perceptions may reveal a category that is free from gender bias or may open up completely new categories that may be subject to discrimination.

Interactions Between Gender and Ethnicity

Teachers in SL did not appear to be impacted by the interaction between the ethnicity and gender of student avatars in their estimates of: Student IQ, relationships with classmates, relationships with instructors and prediction of future final education level. This is surprising due to the significant results that were individually found for the gender and ethnicity of the avatar. It also conflicts with the literature from face-to-face classrooms that state that gender and ethnic equity has not yet been achieved in the face-to-face classroom (Campbell, 1991; Fennema & Peterson, 1985; LaFrance, 1981; Masland, 1994; Sadker & Sadker, 1994). In particular, the gender and ethnicity of students has been shown to impact teacher expectations of students in the face-to-face classrooms (Clifford & Walster, 1973; Guttman & Bar-Tal, 1982; Ferguson, 2003; Frawley, 2005; Van Duzer, 2006; Auwarter & Aruguete, 2008). There were two main significant results for the interaction questions:

1. Caucasian/White and Other ethnicity teachers in SL estimated that male student avatars have a higher level of Student IQ compared to female student avatars (Table 4-28).
2. Hispanic or Latino and Asian ethnicity (and Non-Caucasian) teachers in SL estimated that female student avatars have a higher level of Student IQ compared to male student avatars (Table 4-28).
3. Caucasian/White teachers in SL estimated female, Caucasian/White student avatars as having higher levels of Student IQ compared to male, Caucasian/White student avatars. Caucasian/White teachers in SL estimated male, Black/African-American, Hispanic/Latino, and Asian ethnicity student avatars as having higher levels of Student IQ compared to female, Black/African-American, Hispanic/Latino, and Asian ethnicity student avatars (Table 4-29).
4. Hispanic or Latino teachers in SL estimated female, Caucasian/White, Black/African-American, Hispanic/Latino student avatars as having higher levels of Student IQ compared to male, Caucasian/White, Black/African-American and Hispanic/Latino student avatars (Table 4-29).
5. Other ethnicity teachers in SL estimated female, Caucasian/White student avatars as having higher levels of Student IQ compared to male, Caucasian/White student avatars.

Other ethnicity teachers in SL estimated male, Black/African-American and Hispanic/Latino student avatars as having higher levels of Student IQ compared to female, Black/African-American and Hispanic/Latino student avatars (Table 4-29).

Differences in IQ ratings were only negligible for African American/Black teachers (males = 102.88; females = 102.50; Table 4-30). The largest differences in IQ ratings were from Hispanic/Latinos and Asians while African American/Black teachers rated male and female avatars virtually the same. It appears that Asian and Hispanic/Latino teachers have the largest differences in ratings of IQ. Also, Asian and Hispanic/Latino teachers who rated females over males in IQ had the largest effects. White teachers gave higher IQ ratings to males of other ethnicities but not of their own ethnicity. Hispanic/Latino teachers appeared to be the only ethnicity of teacher that rated avatars the same across the board. Interestingly, Other ethnicity teachers agreed with Caucasian teachers.

A large body of literature exists that has shown that the gender and ethnicity of the teacher does affect their perceptions and expectations of academic achievement in classroom situations (Braun, 1976; Brophy & Good, 1974; Ferguson, 2003; Auwarter & Aruguete, 2008; Frawley, 2005; Van Duzer, 2006). From this literature it would have been expected that results would have revealed teacher bias in SL against students based on interactions between their own gender and ethnicity and the student avatar's gender and ethnicity.

Combining the results above, it appears that Caucasian teachers in SL rate females of their own ethnicity as having a higher IQ than males, while they rate males of other ethnicities higher than females of those ethnicities. This is important because current data on academic performance clearly shows males falling behind females (Burns and Bracey 2001; Clark et al. 2006; Kafer 2004). Additionally, males appear to view school as less important in their lives as females (Clark et al., 2006, 2008). In a national survey, male students consistently reported that

they did not listen in class, complete assignments, and did not do their best work (NCES, 2005). Females viewed their academic work as interesting and meaningful compared to males who did not appear to see the critical nature of their academic performance as it relates to future occupation (NCES, 2005). From this literature it would have been expected that Caucasian teachers in SL would have rated all females as having a higher IQ than males. It is important to consider the reasons why these differences with the literature exist.

The calculations involved in the ethnic choices of Caucasians seem to be different from those of other ethnic groups, since resources targeted for minority populations are generally not available to Caucasians (Nagel, 1994). In some situations, Caucasian ethnicity can express itself as a reaction against perceived advantages of non-Caucasians (Burstein 1991). In other situations, Caucasian ethnicity represents a personal choice exercised for social, emotional, or spiritual reasons (Waters 1990; Fischer 1986). Using the criteria listed in the literature above, it makes sense to conclude that these Caucasian teachers rated students in this way due to one of the reasons listed above. If either is true, then these Caucasian teachers in SL are allowing gender and ethnicity biases to cloud their evaluation of students' academic success. Teachers in SL should receive training to help them to identify their personal motivations toward students' academic success and to help them to see potential discriminatory effects of these motivations.

Other results showed that Hispanic/Latino teachers in SL rated female student avatars of every ethnicity as having a higher IQ than male student avatars of those ethnicities. Both attitudes and behaviors with respect to one's own ethnicity and others are conceptualized as changing as one develops and resolves issues and feelings about one's own and other groups (Nagel, 2000). These results may possibly be explained by Asian and Hispanic or Latino

stereotypes that cast females from these cultures as responsible, decisive, and ambitious (Hofstede, 1980, 1996).

Non-significant results showed that the majority of these gender and ethnicity interactions did not appear to impact teachers in SL estimates of: Relationships with classmates, relationships with instructors, attitude toward school, and prediction of future final education level. What caused teachers in SL to discriminate on the basis of their own ethnicity and gender and the ethnicity and gender of the student avatar for estimates of intelligence (Student IQ) while seemingly being free from discrimination when it came to the other dependent variables? This is important because we may be able to focus our attention toward the development of interventions that focus on teachers' perspectives of differing ethnicity and gender student intelligence.

These results also conflict with literature from the face-to-face classroom which states that gender and ethnicity biases in these interactions should be present (Ferguson, 2003). These conflicting results are most likely due to a) a problem with the experimental method or setting, b) a difference in the samples' demographics vs. real world teacher demographics, or c) true conflicting results. We need to replicate this study in order to determine if this result is true. If such a replication has similar findings, then studies into the underlying factors that caused these differences would be in order. Of particular interest would be the exploration of why teacher biases in SL seem to have an effect on estimates of intelligence. This is important because future study may reveal the factors that underlie gender and ethnicity in a MUVE and answer questions as to why some biases seem to mirror results from face-to-face classrooms while others do not. As MUVE use becomes more and more frequent in education, business, and society in general, the impact of gender and ethnicity in these diverse environments will need to be taken into

account in order to create fair, impartial educational, work, and life settings in which we can interact and live. Future research should focus on the development and testing of impartial educational settings in MUVES that benefit students of every gender and ethnicity.

Summary: Direct Implications

Much has been revealed by this study of the impact of student avatars' gender and ethnicity on teachers' expectations and perceptions. Our overarching question coming into this study was whether avatar choice in SL affected teacher perceptions and expectations of student success. The answer was yes, in a few contexts. Overall, only 8 out of a possible 75 results showed that gender or ethnicity or an interaction had an influence on teacher perceptions and expectations of student success. Some teachers showed the real world gender and ethnicity biases talked about in the literature when they rated students on IQ (4 significant results), attitude toward school (3 significant results), and relationships with instructors (1 significant result). However, no teachers showed the biases described in the literature when rating students on relationships with classmates and prediction of future education level, and many did not show biases on the other measures. Also, only 1 result was significant for ethnicity as a main effect, 2 results were significant for gender as a main effect, and 5 results were significant for interactions between gender and ethnicity. Several reasons for this lack of agreement with the literature exist:

1. First, these may be new findings that have to do with the unique properties and affordances that a MUVES has to offer. Research has found that MUVES have unique strengths in simulation (Dieterle & Clark, in press), personal expression and creation (Perkins, 2007), 'real world', collaborative learning, and role-playing (Rappa et al, 2008), and identity experimentation (Turkle, 1995). Thus, future research is needed to confirm these results and, if confirmed, determine the underlying factors in a MUVES that may have created this conflict with the literature.

2. Because some of these results conflict with a large body of literature, it is important to ask whether there was something in the data, experimental setting, or analysis methods that might explain this difference. Teachers in SL may be quite different than the teachers discussed in the above studies. For example, most of the above studies examined K-12 teachers, while our sample was more evenly split between adult and K-12 teachers (Table 5-1). Also, most of the cited literature surveyed teachers that were mostly female, while our sample was evenly split between male and female representation. Finally, the above studies were either a) Run during a time period when the Internet either did not exist or was not as popular, or b) Did not measure teacher Internet usage. The combination of these may have been enough to explain these conflicting results.
3. The artificial experimental setting used for the experiment may have enabled teachers to remove themselves from the setting (the classroom) of their discriminatory behavior. Elashoff and Snow (1971) suggest that teacher expectations are more likely to be affected in their natural classroom environment. Strong attempts were made to make the experimental conditions a close simulation of natural MUVE conditions. Teachers received an image and 3-D movie of a student avatar, as well as an actual student transcript. However, the study was not conducted in an actual MUVE classroom, which could have separated teachers from the setting of their discriminatory behavior. This is important to consider because of the potential confounding effect of the artificial experimental setting.
4. The experimental methods may need to be examined. It may be that the deception used was not effective resulting in teachers having knowledge of the true purpose of the study. If this occurred, it would be likely that participants may choose to purposely bias their answers as they believe the researcher would want them to.
5. Some of these estimated marginal means may be a problem, or perhaps suggests a bias on the part of the participants (Miller, 1991). In traditional research design, you use a sample big enough to detect the smallest worthwhile effect (Miller, 1991). However due to the demographics of Second Life, this analysis had low numbers of participants in some categories (i.e. only 9 African Americans; Table 4-7). As a result, some significant effects may not have been detected. Additionally, a bias may exist due to these low numbers, which would in turn cause the results to be skewed in the direction of those few participants' responses, rather than those of a larger group.

Future research should consider replicating this experiment in order to address these differences. First, because these results conflicted with a long history of literature on the subject, we need to replicate the experiment to determine if we get similar results from a similar sample.

Second, we should replicate the experiment in order to explore the specific aspects of student gender and ethnicity that may underlie teacher bias in MUVE environments. This is important because it may help us to develop effective interventions for teachers in MUVES so they may be able to interact with students of every gender without prejudice. Finally, we need to replicate the study with a more diverse population in order to ensure that these results were not due to an unrepresentative sample for some of the categories.

Results of this study revealed that student gender and ethnicity on the whole does not influence teacher expectations and perceptions in a MUVE. As a result, the problems of unintentional disadvantage and unfair advantage may exist to a much lower degree in a MUVE than originally expected. If this is correct, then the academic playing field in MUVES may be more level than that of the face-to-face classroom (Auwarter & Aruguete, 2008; Rist, 1970). It could actually be free of many of the gender and ethnicity biases currently present in face-to-face classrooms. Thus, future research should explore the reasons why this bias doesn't appear to exist in MUVES.

However, this study showed that in a few cases, teachers do show gender and ethnicity biases in their perceptions and expectations of students in MUVES. Unfortunately, this means that SL teacher biases in their perceptions of students could lead to some problems with unintentional disadvantage and unfair advantage. For example, male and female teachers in SL estimated that their own gender student avatars have a higher level of attitude toward school as compared to student avatars of the other gender. Students who didn't know this information could end up choosing a male avatar when taught by a female teacher, which could result in unintentional disadvantage to this student. However, a student who did know this information could end up choosing a male avatar when taught by a male teacher, resulting in unfair

advantage. Both possibilities are troubling because the academic playing field in MUVES is not level – it is biased toward student avatars of particular genders and ethnicities. Furthermore, teacher bias in their perceptions of students often results in lower academic performance by students (Auwarter & Aruguete, 2008; Rist, 1970). Thus, this is more than just a concern about a few students who may or may not have knowledge of the results of this study. The results of this study concern all teachers and students in MUVES because all students can be affected in their academic performance by teacher expectations and perceptions.

Because of these problems, support programs need to be developed that help teachers in SL acquire teaching and interaction techniques to address imbalances in attention and instruction that students of different genders and ethnicities receive. For example, African American/Black teachers in SL estimated the lowest levels of student's relationships with instructors regardless of avatar gender or ethnicity. Whether due to personal experiences with racism or some other factor, African American/Black teachers in SL tended to see students as being either unwilling or unable to build relationships with their instructors. These results can be used as a springboard for development of a professional development program designed to help Black/African American teachers in SL to change this perspective. When considering development of a program that addresses these kind of biases, it is important to consider research that seems to suggest that analysis and argument is likely to challenge and change attitudes (Petty and Cacioppo, 1986), social modeling and role playing may change normative beliefs and enhance self-efficacy (Bandura, 1998; Ajzen and Madden, 1986), and practice in a safe, yet authentic environment is most likely to be effective in changing biases (Wight *et al.*, 1998). Interestingly, the pedagogical strengths of MUVES lie in simulation, role play and practice, so the development of a program to help these teachers that is located in a MUVE would provide an intriguing

solution. Programs like these would directly address teacher biases in MUVES and indirectly address the problems of unintentional disadvantage and unfair advantage mentioned earlier.

Future research should consider determining the factors that may explain why some teachers in MUVES hold these perceptions about students' relationships with instructors.

Based on the results of this study, it is also important to determine which aspects of students' intelligence, attitude, and the way they relate to classmates and instructors affect particular groups of teachers in MUVES. For example, male, Asian teachers in SL estimate that Black/African American student avatars have the highest level of Student IQ, followed by: Asian student avatars, Caucasian student avatars, Asian student avatars, and Hispanic or Latino student avatars. If we knew that male, Asian teachers in SL considered particular stereotypical behavior or appearance that is typically attributed to African Americans as markers of intelligence, we could address that in a training program that could help teachers to evaluate students more fairly. This is important because teachers without biases can interact with students of every gender and ethnicity without prejudice. Richardson (1996) suggested that personal beliefs of teachers such as gender and ethnicity biases are well established and are primarily shaped by personal experience. As a result, we should not simply expect that an increase in multicultural knowledge would necessarily enhance the development of culturally diverse educators. Instead, it is important that we consider the development of interventions that focus on the acquisition of a set of personal experiences that will help to shape teacher expectations and perceptions of students of every gender and ethnicity in MUVES.

Future research should consider a variety of approaches to measuring MUVE teacher perceptions and expectations of Student IQ, relationships with classmates, relationships with instructors, attitude toward school, and prediction of future final education level in MUVES.

Achieving triangulation in research is an important goal in our progress toward validating the results of a study, as well as in deepening our understanding. Although much thought and planning went into the selection of these measures and variables, it may be that other measures, variables and settings may more accurately gauge these aspects of teacher perceptions and expectations in MUVES. Future studies should vary the measures used and mix qualitative and quantitative methodologies in order to achieve a well-rounded set of results.

Teachers and students in MUVES need to work together to develop new ways to measure student success that are not artificially biased. The IQ scale was created by Caucasians within one cultural context (American; Suzuki & Aronson, 2005). A MUVES is clearly a different context than the one in which the IQ scale was created. As test creators, teachers and students address this problem, there are many opportunities to think differently in examining what constitutes an intelligence measure and how to examine issues of bias (White, 2000). For example, given growing concerns regarding the usage of intelligence tests for selection purposes, Jensen (2000) suggested using criteria that go beyond standardized measures and the inclusion of indicators of past performance (i.e., portfolio, learning artifacts, etc.). Future studies should consider the use of different kinds of measures of intelligence that may work better in MUVES in order to address this issue.

More broadly, the results of this study have provided evidence that choice of avatar does affect some aspects of teachers' expectations and perceptions. We turn to a more indirect discussion of these ramifications next.

Indirect Implications: Detailed Customization

The results of this study have confirmed that the gender and ethnicity of student avatars do have an impact on some aspects of SL teachers' expectations and perceptions, including student

IQ, relationships with classmates, and relationships with instructors, and attitude toward school. Taking a step back, gender and ethnicity are only two aspects of a wide range of physical details that can be customized within most MUVES. For example, in Second Life, an avatar can be changed on a 0 to 100 scale for shape (body, head, eyes, ears, nose, mouth, chin, torso, legs, etc.), skin (skin color, face detail, makeup, body detail, etc.), hair (color, style, eyebrows, facial), and eyes (color, texture, etc.; Damer, 1998; Rehak, 2003; Lastowka & Hunter, 2004). The question then becomes: Does this research present sufficient evidence to support an agenda of exploring the impact of detailed customization of avatar physical characteristics on teachers' expectations and perceptions?

This study does present sufficient evidence to support this research agenda. First, many of the details of avatar customization are strongly related to gender and ethnicity stereotypes, so an attempt to extract them from the stereotypical perspective in which they are viewed would be extremely difficult. At the same time, these strong connections provide a logical link for the continuation and broadening of this research into the overall physical characteristics of avatars and their impact on teachers' expectations and perceptions.

It may be possible to say that stereotypical gender and ethnic attributes are what actually have an impact on teacher expectations and perceptions in MUVES. Thus, one could potentially state that these physical characteristics of avatars were what actually had the effect on teacher expectations and perceptions. For example, one of our results states that regardless of their ethnicity or gender, teachers in SL estimate male student avatars as having a higher level of attitude toward school than female student avatars. Following this line of logic, we could then make the proposition that stereotypically masculine attributes such as large physical size, a high level of musculature, short hair length, casual dress, a low level of make-up, high weight level,

rugged attractiveness, tall height, and hairy face (Hegelson, 1994; Brigham, 1971; Devine & Elliot, 1995) were what effected teacher expectations and perceptions. It would then be possible to test each of these stereotypical traits to determine which one had an impact on teacher's expectations and perceptions in MUVES. It would also be expected that the impact of these characteristics would vary according to the type of measure that teachers are estimating about students (relational, attitudinal, intelligence, etc.).

Thus, there is a wealth of future research that could be accomplished to determine the effect of specific stereotypical gender and ethnic avatar physical characteristics on specific areas of teacher's expectations and perceptions in MUVES. This research is important because it will help to a) map out the factors involved in teachers' perspective on gender and ethnicity traits in MUVES, b) enable us to test potential gender and ethnicity mediation effects of MUVES on these specific stereotypical physical characteristics, and c) make possible the development of specific interventions that are focused on the specific stereotypical physical characteristics that seem to trigger gender and ethnicity bias in teachers in MUVES.

Ambient Implications

Cumulative folder method

Some broader based implications of this study also need to be discussed. First, the study was patterned after a face-to-face classroom study (Clifford & Walster, 1973). It used a common approach used in many education-based research studies that manipulate ethnicity and gender. It chose head shots of students and put them in a file that also contained the school record of the student. The reasoning is that teachers commonly use a student's image and academic transcript to form impressions. The file is used to observe teachers' expectations and perceptions about students of different genders and ethnicities. The academic description is held constant while the

attached photo is varied to portray a different gender/ethnicity combination. Patzer (1985) felt that the cumulative folder technique was an acceptable method for studying ethnicity and gender differences because, when teachers review students, they commonly receive an academic description and a photo in the student's record. The cumulative folder procedure, however, is not without limitations. Relying on photographs for evaluating gender and ethnicity may be problematic because photographs provide a static cue for basing attributions and evaluations. Providing only a static cue oversimplifies the conceptualization of gender and ethnicity as one-dimensional constructs. Argyle and McHenry (1971) showed that photographs and brief exposure time do not simulate a real world situation.

This study used a variation on the cumulative folder design. A transcript was substituted for the academic record, and an image of an avatar for the photograph. However, in order to provide a less static representation of the avatar, a short video of the avatar was also included. The video showed the same background for each avatar, gave a view of the avatar from afar, and then slowly zoomed in to a close face shot of the avatar. The Fraps (version 2.9.4) screen recording software was used to record the videos.

This variation on the cumulative folder design appeared to work well. Results were collected quickly with little negative feedback from participants. Results showed significant effects of the gender and ethnicity of student avatars on teachers' perceptions and expectations. However, as with any experiment that utilizes an artificial setting, (something other than the classroom), the possibility exists that the experimental setting used may have enabled teachers to remove themselves from the setting (the classroom) of their discriminatory behavior. Giving credence to this argument, Elashoff and Snow (1971) suggest that teacher expectations are more likely to be affected in their natural classroom environment. With that said, strong attempts were

made to make the experimental conditions a close simulation of natural MUVE conditions. Both the image and the 3-D movie accurately portrayed MUVE conditions, and teachers' received an actual student transcript. Future research should pursue studies that test these results yet are conducted in a natural MUVE classroom setting. This is important because it will assure us that the results of this study are due to actual discriminatory behavior on the part of teachers and not the result of the study format.

Demographics Implications

Other broader based implications of this study touch on the demographics of the SL teachers who were surveyed. For example, only 29% of the respondents were K-12 teachers, 20.4% were college or university instructors and 37.8% were instructors of adult students (Table 4-1). In this case, the large percentage of teachers of adult instructors may have skewed the data. It may also be that the large number of instructors who were under 25 years of age (34.4%) as well as only possessing a high school education (10.5%, Table 4-2) or an undergraduate degree (26.6%, Table 4-2) may reflect a less well trained body of instructors when it comes to gender and ethnicity biases. Other demographic trends revealed that 66% of the teachers surveyed had zero children and 52.1% were single. This indicates a highly mobile group that would correlate with the relative youth of the sample.

Perhaps one of the most provoking aspects of the demographics was the data on ethnicity. 77.4 percent of the 455 participants were Caucasian/White, 2 percent were African American/Black, 6.6 percent were Hispanic or Latino, 9.9 percent were Asian, and 4 percent considered themselves in an Other category. Data on religious affiliation confirms the ethnicity demographics, revealing that 39.1% of the teachers were of some type of Christian affiliation (Table 4-8), a common affiliation among Caucasian/Whites. Other demographic trends of note

are that 83.5% of the teachers surveyed were from either North America or Europe (Table 4-9), areas in which Caucasian/White ethnicity populations are in the majority. These demographics are provoking because of their slant toward a Western, Caucasian, Christian population. We may have received very different results if the population had been more evenly divided among ethnicities, geographic areas, and religious affiliation.

Interestingly, 56.9% of the SL teachers surveyed had resided more than one year in Second Life (Table 4-13), yet only 9.2% had a primary motivation for coming to Second Life of “education” (Table 4-14). This leaves 90.8% of the teacher’s surveyed as having a non-educational motive for coming to Second Life. These statistics would make sense if the younger individuals in the survey were originally drawn to this MUVE for entertainment. Demographic data confirms this as 68.2% of the teachers surveyed were primarily motivated to come to Second Life for fun, socializing, playing, and experimenting/exploring. As a result, it appears that younger teachers with a gaming background may have composed the majority of this population. We may have received very different results if the population had been more evenly divided among motivations and length of residency in SL.

Future studies that focus on the ethnicity of the MUVE teacher as an important variable should ensure that enough teachers from non-Caucasian ethnicities, different age groups, and geographic areas are recruited to participate. This will be a difficult objective to meet due to the current demographics of Second Life and other MUVES. The current demographics possibly could color the results of this study toward expectations and perceptions of gender and ethnicity that are part of the majority young professional culture in Europe and North America. It appears that the perceptions and expectations of student avatar gender and ethnicity expressed in this study may be primarily those of young, Caucasians who reside in the Western world.

Implications of Virtual Representations of Self

Other broader implications of this study touch on how the virtual representation of the self in MUVES impacts the perceptions and expectations of others. This section considers the effects of gender and ethnicity misrepresentation on students, identity exploration on teachers and others; as well as several other implications.

The sample for this study was not randomly assigned to the eight different ethnic categories due to the misrepresentation of avatar gender/ethnicity by several participants (Table 4-23). As a result, because the purpose of this study was to determine the impact of student avatar's gender and ethnicity on teacher's expectations and perceptions, it was logical to use the teacher's perceptions to self-assign them to the category that they thought they were in. The Asian male and Hispanic/Latino female were the most difficult for participants to identify. This is important because students in MUVES who are Asian males and Hispanic/Latino females may be judged as being in a different ethnicity and/or gender than they were intended. This could result in these students being misunderstood by teachers who are seeking to be ethnically and gender conscious. For example, if an Asian male student avatar was perceived by a teacher as a Hispanic/Latino female, then he would most likely be treated as a Hispanic/Latino female. This could result in the student experiencing unintentional disadvantage due to stereotypes that exist on academic performance for Asian males (Hofstede, 1980, 1996). Future research should consider the impact that such misrepresentations have on student avatars in MUVES.

Identity experimentation appears to be prevalent in MUVES (Turkle, 1995). In these environments teachers interact with students as avatars. The teacher can explore new roles, beliefs, and positions in an authentic situation while interacting with other individuals, a situation that has been shown to have significant psychological advantages (Turkle, 1995). When teachers

use avatars, they choose to use certain relevant characteristics of their identities as strategic resources to enhance their participation and the overall effectiveness of the community (Widdicombe, 1998). Thus, teachers may have effectively overcome their discriminatory biases based on their own ethnicity when it came to their perceptions and expectations of Student IQ, relationships with classmates, attitude toward school and prediction of future final education level, through the construction of a new identity that enables them to interact with students without prejudice. This is crucial because if identity experimentation acts to mediate the effects of discriminatory biases, then it could be applied in virtual and face-to-face classrooms, thus giving teachers of different ethnicities a more equal opportunity to help all students to succeed. Future research should explore whether online instructors more conducive to this type of identity experimentation than those in the face-to-face classroom.

This is also important because it implies that the face-to-face classroom may be less conducive to identity experimentation and exploration than a virtual classroom. This makes sense because in a MUVE students and teachers have a wider range of possibilities for altering their persona than in a face-to-face classroom. For example, a face-to-face classroom teacher may encourage a role play of a historical event, even to the point of dressing the part, but the simulation will still fall short of reality. In the MUVE, the environment and avatars can be customized to how that historical event looked, thus allowing students to walk in the shoes of historical figures.

Identity experimentation and exploration like this has an additional implication for teachers. Teachers interacting with students in MUVEs now have the opportunity to not only discuss important issues and teach critical concepts; they also can potentially develop a deeper sense of empathy for their students. Teacher education programs often emphasize being fair to

students by putting teachers, “in their shoes,” but it is taken metaphorically. In MUVES, putting a teacher in a student’s shoes is literally possible. A teacher and student can swap avatars and roles and role play a discussion, activity, or anything they desire. This has significant potential for how we think about teacher education. How do we believe teachers should strive to understand (cognitively and emotionally) their students? What conditions are best for fostering that kind of inclination? Future research is needed to consider these important questions.

It is also important to consider the ramifications of this study in light of a larger population and wider range of characteristics. Beyond gender and ethnicity, physical characteristics of bodily attractiveness and physical disabilities present intriguing possibilities to explore. For example, one of the results of this study was that male, Caucasian/White teachers in SL estimate that male, Asian student avatars have the second lowest level of Student IQ; despite common stereotypes that portray Asian males as intelligent and hard working. A potential explanation for this could be summed up in a remark from a colleague when looking at the avatars, who said that the Asian male looked unattractive. As a result the Asian male could have possibly been rated lower on Student IQ due to his lack of physical attractiveness.

Other aspects of how the virtual representation of the self in MUVES impacts the perceptions and expectations of others may include psychological, emotional, and intellectual characteristics of the virtual self. Constructs such as personality traits, emotional intelligence, internal and external locus of control, positive attitudes, negative attitudes and many more attributes could be potentially measured and their impact determined on others’ expectations and perceptions. As an example, one of the results from this study was that teachers in SL rate male avatars as having a higher level of attitude toward school than female avatars. This may indicate a higher level of emotional intelligence for male avatars because they may be possibly better at

being aware of and managing their own emotions in a healthy and productive manner. Thus, it would be important to focus interventions on helping female avatars to develop their emotional intelligence in order to improve their attitude toward school.

Finally, because some gender and ethnicity biases are present in MUVES in some circumstances, what old forms of prejudice might reassert themselves due to the unique affordances of MUVES? For example, the Gorean simulations in Second Life boast a rather large slave community that involves sadomasochism. Another question is what new types of discrimination will emerge due to the distinct affordances of MUVES? For example, in SL, a person can be whatever they want – animal, vegetable, mineral, etc. As a result, a new race has surfaced called furies. This race is not limited to male or female gender, but also includes an androgynous gender. Thus new biases may emerge based on these new categories of ethnicity and gender.

Other Future Study Ideas

Several other ideas for future study occurred that are not connected with one of the sections above. They are presented here.

This was a deception study in which teachers were led to believe that they were attempting to evaluate different forms of transcripts used in MUVES. However, some of the teachers may have guessed the researchers' motives for this study from the content of the survey. Thus, the study should be replicated and include the following safeguards to ensure deception:

1. Ask a question at the end of the survey about what this study was about.
2. Ask a question about at what point in the survey they understood the true purpose.

Ensuring deception is important because participants tend to think about what the researcher wants them to do. As a result, if a significant number of participants knew the study's true purpose when they were evaluating the avatars it would bias the study.

Another related question to ask is that if teachers in SL know that their students might not represent themselves accurately, why then would they react with any bias? In other words, if I knew that what I was seeing did not represent my student's physical self, even if I held a bias, why would I express that bias? Research by Black et al. (2008) has revealed that different people create different avatars. Some are exact representations of self, others are ideal selves, and still others are extremely different (Black et al., 2008). What is interesting is that biases in this study did appear despite the fact that the teachers surveyed did not know if the avatar represented the student's real life appearance. Future research should consider tapping into subconscious gender and ethnicity biases through the use of other methodologies better suited to the task. Other research should look at whether the participant believes that the person they are interacting with is the actual person with whom they are interacting. For example, if I am talking to an Asian female in SL, is that really who I believe I'm interacting with? And does that make a difference in terms of how I am interacting with that person?

Another important consideration is the question that was asked at the beginning of this study in order to qualify a person to be a participant. This question could have been interpreted in many different ways. "Are you teaching in Second Life?" could have been interpreted by a person who uses SL as a tool, lecture platform, or a variety of different teaching methods. Although this study did not touch on the impact of the teaching method used on teacher perspectives and expectations, it is still an interesting thought. Future research should consider controlling for the primary teaching method used as a way to determine if gender and ethnicity biases are more potent with one method than another.

Conclusion

Our purpose was to determine the influence of avatar choice on teacher expectations and perceptions of student success. Results showed that beliefs about ethnicity and gender in the physical world translated into the virtual world in surprising ways. Several suggestions for how this occurred were given, as well as a rich discussion of indirect and ambient implications of this study. Biases/prejudices held by teachers must be identified, challenged, and reconstructed if educational institutions are going to improve their ability to meet the needs and interests of every student, particularly students from ethnic and gender groups that have received much discrimination in the American educational system.

Results of this study lead to deep questions about ethnic and gender identity that border on spiritual and moral considerations. If identities are socially constructed, then what does that mean? The constructivist argues that every person has an intellectual bias and everything that they see and interact with is influenced by that bias. The constructivist claims that the products of human action and speech are social categories, their membership rules, content, and valuations; and that these categories can and do change over time. Yet the results of this study appear to challenge this claim in some areas with regard to ethnicity and gender. The key here is in the phrase, “over time.” Over time, the rules, content, and valuations of ethnicity and gender do change. Yet it is helpful to remember that gender and ethnicity have been around for thousands of years and have changed over that time period. Can we really expect conceptions about gender and ethnicity to change over a few years or decades? Results from this study may indicate that although quick change can occur, it does not occur without the presence of recalcitrant areas that resist transformation. The mere introduction of virtual world technology was hailed by many as a locale for identity experimentation and re-creation, but the prophets of

technology forgot that although technology may change quickly, people do not, and when they do change they do so in rather surprising ways. The evolution of ethnicity and gender is a process inherently dependent on humanity, and although gender and ethnicity may be subject to potentially significant mediation effects of MUVES, much research is still needed to prove and quantify these effects.

Table 5-1. Similarities and Differences in demographics of Real Life vs. Second Life Teachers

Real Life Teachers	SL Teachers
K-12 teachers	Split between adult and K-12 teachers
From North America	From North America and Europe
Caucasian	Caucasian
Sample Size = 396	Sample Size = 453
66 male, 330 female	232 male, 223 female
Average age was 32.7	Under 30 years of age
?	Graduate or undergraduate degree
?	Single
?	No children
None	> 3 hours daily on the Internet
None	> 6 hours per week in SL
None	Resident of SL for more than a year

APPENDIX A
IRB

UFIRB 02 – Social & Behavioral Research Protocol Submission	
Title of Protocol: Education in a Multi-User Virtual Environment: The Importance of the Student Record	
Principal Investigator: Dennis Beck	UFID #: 4638-1920
Degree / Title: Doctoral Candidate Department: Educational Technology	Mailing Address: 13604 NW 137 th Place Alachua, FL 32615 Email Address & Telephone Number: denbeck@ufl.edu 352-219-0223
Co-Investigator(s):	UFID#:
Supervisor: Dr. Rick Ferdig	UFID#: 9525-2390
Degree / Title: PhD/Associate Professor Department: Educational Technology	Mailing Address: School of Teaching and Learning College of Education University of Florida PO BOX 117048 GAINESVILLE FL US 32611-7048 Email Address & Telephone Number:

	<p>rferdig@ufl.edu</p> <p>352-392-9191 ext. 275</p>
<p>Date of Proposed Research: May 1, 2008 to December 31, 2008</p>	
<p>Source of Funding (<i>A copy of the grant proposal must be submitted with this protocol if funding is involved</i>):</p> <p>Unfunded</p>	
<p>Scientific Purpose of the Study:</p> <p>Social interaction is important to learning (Vygotsky, 1978). Social interaction can occur in technology mediated forms (e.g., 5th dimension project – Cole, 1995; Nicolopolou & Cole, 1993; CSILE - Scardamalia & Bereiter, 1996; Scardamalia, et al., 1994; LaFerriere, 2002). One kind of technology mediated social interaction is Internet-based social interaction (Repman, Zinskie, & Carlson, 2005). This type of social interaction is as pervasive as traditional approaches to communication (Bakardjieva, 2003). Therefore, it is important that we study the impact of Internet based social interaction on learning. One form of Internet based social interaction that has the potential to be used for learning is the Multi-User Virtual Environment (MUVE) (The Horizon Report, 2007; Castronova, 2001). Experts predict that 80 Percent of active Internet users will regularly participate in a MUVE by the end of 2011 (Gartner, 2007). Therefore, it is important that our study of the impact of Internet based social interaction on learning be extended to the study of the impact of social interaction in a MUVE. As part of a MUVE, people socially interact via avatars (Lastowka & Hunter, 2004). These avatars have the capability to be customized to minute details (Damer, 1998; Rehak, 2003; Lastowka & Hunter, 2004). Unfortunately, we know little about the effect of the detailed customization of avatars on learning. Therefore, it is important that we study the effect of the detailed customization of avatars on learning (Lastowka & Hunter, 2004). We also know little about the effect of detailed customization of student avatars on teacher expectations of students. In particular, gender and ethnicity have been shown to specifically effect teacher expectations of students in real life classrooms (Clifford & Walster, 1973; Guttmann & Bar-Tal, 1982). If we were to discover this information, we would be able to help teachers in MUVE's to discover potential biases and prejudices toward some students, as well as level the playing field for student avatars of all ranges of detailed customization. Therefore, we need to study the effect of detailed customization of student avatars on expected current and future performance of the student by the teacher.</p>	
<p>Describe the Research Methodology in Non-Technical Language: (<i>Explain what will be done with or to the research participant.</i>)</p> <p>During the first phase of the study, teachers will be given a letter explaining the study, a student transcript with an attached photograph, a recommendation letter from a high school teacher, and an opinion survey (Clifford & Walster, 1973). Each teacher will be randomly assigned to one of 8 possible</p>	

conditions. Conditions are based on the ethnicity and gender of the avatar photographs. Avatar photographs will be four male and four female avatars of the following ethnic categories: (U.S. Census Bureau Statistics, 2007): Asian, Hispanic or Latino, Black or African American, White or Caucasian American (see Appendix A).

The letter explaining the study to the teacher will be used primarily to seek his or her cooperation. It begins by questioning the value of school records, the purpose of permanent record files, and transcripts. The letter then proceeds to explain that in an attempt to answer these questions, we are examining a variety of transcript forms used by different universities in Second Life. The teacher's reactions will guide us in identifying the best forms. The full text of this letter can be found in Appendix B.

High school and college student transcripts will be used in place of a student summary report since the Clifford & Walster study was used with 5th grade teachers. High school and college student transcripts best approximate the information given regarding achievement on the 5th grade student summary report. See Appendices C and D for the full text of these transcripts. **These transcripts were made-up for the study purpose and do not belong to a real person.**

The opinion survey consists of the following five items:

- (1) "I would estimate that the student has an IQ of." In the original study (Clifford & Walster, 1973), possible answers ranged from 1 (96-100) to 7 (126-130). Our study will rescale the IQ variable as a ratio variable in order to achieve greater accuracy.
- (2) "I would speculate that the student's social relationships with classmates are ---." Range of possible answers: from 5 (very good) to 1 (very bad).
- (3) "I would speculate that the student's relationships with instructors are ---." Range of possible answers: from 5 (very good) to 1 (very bad).
- (4) "I would guess that the student's attitude toward school is one of -." Range: from 6 (strong interest) to 1 (strong indifference).
- (5) "I would predict that the student would continue their education through ---." Range: from 1 (1 year of college) to 11 (Ph.D.).

On the next page of the survey, teachers are asked to complete some demographic information regarding the control variables used in the study. Space will also be provided for the teachers to comment on their reactions to the transcript format and the type of information it provided (See Appendix E).

Phase two of the study will occur immediately after the completion of phase one. This phase will involve the completion of some demographic information as well as completion of the 25 item "Professional Beliefs About Diversity Scale" and the 15 item "Personal Beliefs about Diversity Scale" (Pohan & Aguilar, 2001). These scales assess teacher's personal and professional beliefs about diversity, including attitudinal measures of ethnicity and gender. Participants will respond to each item by rating their response on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly*

agree). The full text of the Personal Beliefs About Diversity Scale can be found in Appendix F. The full test of the Professional Beliefs About Diversity Scale can be found in Appendix G.

At the end of the study, a short explanation of the study's true purpose will be read by the participants. They will also be assured that their responses will be kept in the strictest confidentiality and their names will not be associated with their responses.

Describe Potential Benefits and Anticipated Risks: *(If risk of physical, psychological or economic harm may be involved, describe the steps taken to protect participant.)*

No anticipated risks or harm will befall the participants.

Potential benefits include helping teachers in Multi-User Virtual Environments to discover potential biases and prejudices toward some students, as well as level the playing field for student avatars of all ranges of gender and ethnicity.

Describe How Participant(s) Will Be Recruited, the Number and AGE of the Participants, and Proposed Compensation:

A partnership with the Social Research Foundation has been established to facilitate the collection of data. The Social Research foundation is a non-profit organization dedicated to changing lives through online, interactive education programs. This organization operates the First Opinions Panel, which is the largest consumer research panel in Second Life. Through this organization panelists have been identified who are teachers in Second Life or who plan to teach in Second Life. If not enough teachers are identified through the First Opinions Panel, other sources of data will be the Second Life for Researchers and Second Life for Educators listservs, and the following Second Life groups that operate "in world": Real Life Education in Second Life, Second Life Grad Student Colony, Second Life Research, K-12 Educators, and Community Colleges in Second Life.

There will be approximately 500 participants, ranging in age from 18 to 65. Participants will be compensated approximately 500 Linden dollars (\$2 US) to complete the survey.

Describe the Informed Consent Process. Include a Copy of the Informed Consent Document:

Participants will be directed to the survey site through an email sent by the Social Research Foundation. The first page of what they see will be the Informed Consent Form (see Appendix F). There will be two buttons on the bottom of the form: "I Consent" and "I DO NOT Consent". If a participant chooses the "I Consent" button, they will be immediately directed to the online survey. However, if a participant chooses the "I DO NOT Consent" button, they will be directed to a screen that thanks them for their time and wishes them well in their endeavors.

Those consenting to the study will then be directed to the survey, which is explained in detail in the section entitled, "Describe the Research Methodology in Non-Technical Language."

Principal Investigator(s) Signature:	Supervisor Signature:
Department Chair/Center Director Signature:	Date:

APPENDIX B
PRE-SURVEY NOTIFICATION LETTER

A Survey opportunity exists for you from the First Opinions Panel of the Social Research Foundation. The Survey will begin on July 7, 2008. It will pay 1000 Linden for completion of the survey.

Please answer the question below to see if you qualify to take this survey:

Do you teach or plan to teach in Second Life?

- Yes
- No

{We sent this as a question in a screener, really a one question survey where they identified which response they matched. The Yes responses were then sent the appropriate survey.}

APPENDIX C
INFORMED CONSENT FORM

Informed Consent

Protocol Title: Education in a Multi-User Virtual Environment: The Importance of the Student Record

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study:

The purpose of this study is to examine a variety of transcript forms used by different schools and universities in Second Life as to their effectiveness in providing information that really helps us understand the student as an individual.

What you will be asked to do in the study:

You will be given a letter explaining the study, a student high school and college transcript, an attached photograph, and an opinion survey (consisting of 5 questions) for you to complete. You will be asked to examine all of the materials and then complete the opinion survey. After completing the opinion survey, you will be asked to complete a follow up survey consisting of 40 questions. After completion of the follow up survey, you will read a short conclusion to the study.

Time required:

30 minutes

Risks and Benefits:

No anticipated risks or benefits

Compensation:

You will be paid 500 Linden in compensation for participating in this research.

Confidentiality:

Your identity will be kept confidential to the extent provided by law. Your information will be assigned a code number. The list connecting your name to this number will be kept in a locked file in my faculty supervisor's office. When the study is completed and the data have been analyzed, the list will be destroyed. Your name will not be used in any report.

Voluntary participation:

Your participation in this study is completely voluntary. There is no penalty for not participating.

Right to withdraw from the study:

You have the right to withdraw from the study at anytime without consequence.

Whom to contact if you have questions about the study:

Dennis Beck, Graduate Student, Educational Technology Program Area, School of Teaching and Learning, College of Education, University of Florida, PO BOX 117048, GAINESVILLE FL US 32611-7048, phone 352-219-0223.

Dr. Rick Ferdig, School of Teaching and Learning, College of Education, University of Florida, PO BOX 117048, GAINESVILLE FL US 32611-7048, phone 352-392-9191 ext. 275

Whom to contact about your rights as a research participant in the study:

IRB02 Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; phone 392-0433.

Agreement:

I have read the procedure described above. I voluntarily agree to participate in the procedure and I have received a copy of this description.

I CONSENT

**I DO NOT
CONSENT**

APPENDIX D
AVATAR PHOTOGRAPHS

Hispanic or Latino Male



Hispanic or Latino Female



African-American/Black Male



African-American/Black Female



Asian Male



Asian Female



Caucasian/White Male



Caucasian/White Female



Figure C-1. Avatar Photographs

APPENDIX E
LETTER TO TEACHERS

Dear Instructor,

How purposeful are permanent record files? How revealing are transcripts? Do they provide information that really helps us understand the student as an individual? All of us educators realize the importance of dealing with students on a one-to-one basis-the importance of establishing a unique, personalized relationship with each student. Does the permanent record file, summary report card, or transcript facilitate "getting acquainted?" Can the teacher, confronted with a new class of students, use the files to get a "head start?" As a result, we are asking you to examine the student materials provided and give their best estimate of four important pieces of information: (1) student's IQ, (2) student's social status with peers, (3) student's attitudes toward education, and (4) student's future educational accomplishments.

Thank you for participating in this study. We hope that it will result in better information available to all instructors and better relationships between instructors and students.

Sincerely,

Dennis E. Beck
Researcher
University of Florida

APPENDIX F STUDENT HIGH SCHOOL TRANSCRIPT

School of Record

School Name:
High School
School Address:
123 Main St.
Anywhere, USA 12345
School Telephone:
(757) 555-1212
District
Hampton

Report Date
4/25/08

HIGH SCHOOL TRANSCRIPT (Grades 9-12)

Enroll Date: 09/01/03
Graduation Date: 06/01/07

Student Information

Name (Last, First, MI): Grad Yr:
Johnson, Lee J. 2007
Address:
123 Main St.
Anywhere, USA 12345
Parent/Guardian:
John P. Johnson
Student ID/SSN: Sex: Birth Date: Home Telephone:
123-45-6789 F 02/17/89 (123) 555-1234

Mo/Yr	Course Title	Final Grade	Credits Earned	Credits Attempted	Grade Level	Mo/Yr	Course Title	Final Grade	Credits Earned	Credits Attempted	Grade Level
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COURSE STUDY

06/96	English 9	B	1	1	09
06/96	Algebra 1	B-	1	1	09
06/96	United States History	B+	1	1	09
06/96	Biology/Lab	C	1	1	09
06/96	Personal Fitness/PE	A	1	1	09
06/96	Guitar	A	1	1	09

Total Credits 6

COURSE STUDY

06/97	English 10	B-	1	1	10
06/97	Algebra 2	C	1	1	10
06/97	World History	A	1	1	10
06/97	Chemistry/Lab	C	1	1	10
06/97	Personal Fitness/PE	A	0.50	0.50	10
06/97	Spanish 1	B	1	1	10
06/97	Music Theory	A	0.25	0.25	10
06/97	Art/Drawing	B-	0.25	0.25	10
06/97	Health	A	0.50	0.50	10

Total Credits 6.5

SUMMARY BY YEAR

Mo/Yr GPA Earn Attempt

06/96	3.16	6	6
06/97	2.98	6.5	6.5
06/98	2.66	6	6
06/99	2.56	6.5	6.5

Grade Table
Grade Points

A+ = 4.3
A = 4.0
A- = 3.7
B+ = 3.3
B = 3.0
B- = 2.7
C+ = 2.3
C = 2.0
C- = 1.7
D+ = 1.3
D = 1.0
F = 0

COURSE STUDY

06/98	English 11	B	1	1	11
06/98	Geometry	C	1	1	11
06/98	US Government	B	0.50	0.50	11
06/98	Economics	C	0.50	0.50	11
06/98	Physics	C	1	1	11
06/98	Spanish 2	B	1	1	11
06/98	Piano	A	0.50	0.50	11
06/98	Art History	B	0.50	0.50	11

Total Credits 6

COURSE STUDY

06/99	Pre-Calculus	C	1	1	12
06/99	Spanish 3	B	1	1	12
06/99	Anatomy	C	1	1	12
06/99	English 101	C	1	1	12
06/99	Western Civ.	B	1	1	12
06/99	Constitutional Law	A	0.50	0.50	12
06/99	Speech 101	B-	1	1	12

Total Credits 6.5

END OF TRANSCRIPT

Cumulative Summary	Total Credits	GPA Credits	GPA Points	Cum. GPA
	25	25	68.075	2.723

- f. Other
- 5) What level of Education have you completed?
- a. High school
 - b. Some college
 - c. Undergraduate degree,
 - d. Graduate degree (MA, MFA, Ph.D.)
 - e. Professional degree (CPA, etc.)
- 6) What is your race/ethnicity?
- a. Caucasian/White
 - b. African American/Black
 - c. Hispanic or Latino
 - d. Asian
 - e. Other
- 7) What is your religious affiliation?
- a. Protestant Christian
 - b. Roman Catholic
 - c. Evangelical Christian
 - d. Jewish
 - e. Muslim
 - f. Hindu
 - g. Buddhist
 - h. Other
- 8) What is your annual family Income?
- a. < \$50k
 - b. \$50 to 75k
 - c. \$75 to 100k
 - d. \$100 - 150k
 - e. \$150 - 200k
 - f. \$200k+
- 9) What is your Internet daily use? (NOT including time spent in Second Life)
- a. < 1 hour
 - b. 1 - 2 hours
 - c. 2 to 3
 - d. 3 to 5
 - e. 5 to 8
 - f. 8 to 10
 - g. 10 to 12
 - h. More than 12
- 10) How much time do you spend in Second Life each week?
- a. < 1 hour
 - b. 1 to 2 hours
 - c. 2 to 4 hours

- d. 4 to 6 hours
 - e. 6 to 10 hours
 - f. 11 to 15 hours
 - g. 16 to 20 hours
 - h. 21 to 30 hours
 - i. 31 to 40 hours
 - j. More than 40
- 11) How long have you been a resident of Second Life?
- a. < 3 months
 - b. 3-6 months
 - c. 6-12 months
 - d. 12 - 24 months
 - e. 24 months+
- 12) What is your primary motivation or reason for coming to SL?
- a. Fun
 - b. Work
 - c. Socializing
 - d. Playing
 - e. Education
 - f. Designing and building
 - g. Experimenting/Exploring
 - h. Other
- 13) You are a teacher of what kind of students?
- a. K-12 Students
 - b. College or University Students
 - c. Adult Students
 - d. Other

APPENDIX H DEBRIEF EMAIL

Thank you for participating in the recent First Opinions Panel Survey entitled, “Education in a Multi-User Virtual Environment: The Importance of the Student Record.” Please read the email below for more information on the purpose of the study.

Sometimes in research it is necessary not to tell the participants the hypothesis. However, now that you are finished participating, we would like to tell you the purpose of this study.

We are not really interested in the importance of the student record for education in a Multi-User Virtual Environment. What we are most interested in is the effect of detailed customization of student avatars on teacher expectations and perceptions of students. In particular, gender and ethnicity have been shown to specifically effect teacher expectations of students in real life classrooms. If we discover this information, we will be able to help teachers in Multi User Virtual Environments to discover potential biases and prejudices toward some students, as well as level the playing field for student avatars of all ranges of detailed customization.

For this study, you looked at transcripts for a student, along with an image and video of the student which had a specific gender and ethnicity. You then responded to an opinion survey and answered some demographic questions.

The transcripts you examined were made-up for the study purpose and do not belong to a real person. The data gathered in this study is completely anonymous. It will be used to help determine if teachers in Multi User Virtual Environments hold biases or prejudices toward students of varying gender and ethnicity. It will also be used to help determine the nature of these biases or prejudices.

Thank you very much for your participation in this study.

If you have any questions about this study, desire further information on this study, or do not understand the true purpose of this study, please contact:

Dennis Beck
School of Teaching and Learning
College of Education
University of Florida
PO BOX 117048
GAINESVILLE FL US 32611-7048

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BIOGRAPHICAL SKETCH

Dennis Beck completed his PhD in educational technology at the University of Florida. He also has over 17 years of experience as an educational technologist in the non-profit industry, focusing on implementing and using basic technologies to maximize training and learning. He enjoys teaching technology and learning classes and is interested in researching social constructs in virtual world environments and the development of narrative identity in virtual world environments.