

Learning through Virtual Representations

Miki Kritz

Miki_kri@smkb.ac.il

Miri Shonfeld

Miri_sho@smkb.ac.il

Kibbutzim College of Education Technology & Arts

Abstract

This research explores Avatars' appearance on students from different countries and cultures, in three-dimension (3D) virtual learning environments. Analysis of observations, questionnaires and interviews examine the ways participants use Avatars to represent themselves. Seeking educational opportunities in technology based learning environments, 3D virtual environments enable learning which simulates face to face encounters while retaining the advantages of online learning. The study examines the choice of students' Avatar appearance in relation to their appearance and their prevailing social and cultural norms. Results indicated that although virtual 3-Dimension environments provide freedom in appearance, external contexts create powerful boundaries and expectations, leading many participants to seek online social acceptable appearance influenced by their offline cultural norms, as well as by online group identity. We extend the dual-congruity perspectives of Avatar Choice Model to a conceptual framework based on quad-congruity perspectives, adding the importance of online group and focus on the constraining effect of offline culture and norms on virtual representations.

Keywords: Avatars, virtual worlds learning environments, distance learning, collaborative learning, multicultural.

Introduction

As broadband Internet access and virtual reality technology rapidly expands, virtual worlds and three-dimensional Avatars are becoming widely adopted (Suh, Kim, Suh, 2011). Therefore, during their studies, pre-service teachers are exposed to virtual teaching environments that are becoming part of our world. In this research, students from different teachers' colleges in Israel and USA participated in a joined course, designed to prepare them for advance teaching environments (Hoter, Shonfeld & Ganayem, 2009; Resta & Shonfeld, 2012). They were trained to use virtual environments for teaching and learning while getting acquainted with virtual worlds such as *second life* where they were represented by Avatars. They worked in groups, creating educational activities such as role-playing or touring and exploring different countries, museums and archeological sites (see an example: <http://www.youtube.com/watch?v=Tbl7m2gJ7zo&feature=youtu.be>). These educational activities were also used in other groups of students from different cultures to study culture, and in other groups of students from different countries (USA-Israel) to study language.

This research examined the contribution of virtual representations of students to their learning experience and to the new teaching opportunities and possibilities. The objectives were to theorize how users form attitudes and intentions regarding Avatars in realistic, task-focused virtual world settings. We examined learning in 3D online learning environments through the lens of the single user by comparing learners' Avatars and offline appearance, culture and norms of the user.

Second Life (SL) and other 3D learning environments are being used in growing numbers. Kibbutzim College, like many other academic institutions, invested resources in that area, including the purchasing of an island in *SL*, upon which virtual Kibbutzim College was constructed. Such an investment requires research, evaluation and supervision of the various components of these environments, in order to estimate their effectiveness on teaching. In this study we hope to promote the understanding of some of the factors that encourage learning in 3D environments and can contribute to the improvement of educational products and encourage further research in this field, in the framework of teachers' education.

Literature Review

An Avatar is an electronic image that represents and is manipulated by a computer user as in a computer game (Merriam-Webster, 2012). When students interact with others in 3D Learning Environments, they present themselves by selecting an Avatar. Avatars are often interpreted as symbolic messages about the people they represent and have been found to increase the perceived social potential of an online partner (Barret, 1997; Breazeal, 2003; Reeves & Nass, 1996; Nass & Moon, 2000; Bailenson et al., 2005). As an indication of intelligence and warmth, social potential can, in turn, influence communication outcomes, including attention and learning (DiSalvo & Gemperle, 2003; Galanxhi & Nah, 2007).

Earlier studies related to the arguments of learning advantages by using virtual environments and interactive Avatars, in supporting students' achievement and learning goals within conventional educational contexts. Gaming and Avatar use, ranging from enhanced engagement in learning activities, to more purposeful and focused communication, and better cooperation and collaboration between students when used on group (Falloon, 2010). In addition, Shonfeld, Resta and Yaniv (2011) speak about enhancing engagement and social presence by using *SL* environment. Falloon extends these studies and explores the potential of Avatar environments to act as powerful communication mediums for students to display knowledge and understanding, and to engage in the development of higher order thinking skills, such as interpreting, analyzing, evaluating, synthesizing and solving complex problems (Falloon, 2010).

The manner in which users, in a synchronous shared environment, are represented affects their ability to communicate. Therefore, the design of an Avatar affects the communicative possibilities within a virtual world. The visual affects the verbal when both are mediated by technology (Kolko, 1999). That is, people are prone to develop deeper relationships with entities that have greater social potential (Hamilton & Nowak, 2010).

As viewers appraise potential Avatars, they evaluate the extent to which the image communicates intellect, social competence, honesty, and reliability. Viewers desire to know if their image tells them that the entity it represents is credible (Hamilton & Nowak, 2010). Anthropomorphic intensity and realism (or believability) enhances the credibility of an Avatar (Brahnam, 2009). More credible Avatars are more likely to be selected for future interactions (Garau et al., 2003; Nowak & Rauh, 2008; Nowak et al., 2009; Sherman et al., 2001; Taylor, 2002; Yee et al., 2007).

This study examined the model describing the factors involved in choosing an Avatar. Suh, Kim and Suh (2011) propose a dual-congruity perspectives model: self-congruity (how does my Avatar represent me) and functional congruity (What is the purpose for using the Avatar: roll-playing, dating, etc.). Martey & Consalvo (2011) add the importance of online group perspective. We seek to form a quad-congruity perspectives model by adding a fourth factor to

that conceptual framework - the constraining effect of offline culture and norms, on which this study focused.

Methodology

Looking at the differences between the Avatars we examined the ways participants use Avatars to present themselves. We looked for similarity between the user's appearance and his/ her Avatar – within a set of possible Avatars in *SL* – while examining the users' culture and norms.

Research Questions

1. Does users' physical appearance affect their Avatar's appearance? In particular, is there a similarity between students' appearance in real life and their Avatars?
2. Does the user's culture effects his/her choice of Avatar?
3. Does virtual 3D environment blurs multicultural differences?
4. Does similarity between students and their Avatars contributes to their learning experience?

Study Type

This was a mixed-methods study employing observation, interviews, and surveys.

Subjects

Data was collected from the following sources:

1. Undergraduate Israeli students (N=62): 20 from Arab colleges of Education (Al-Qasemi and the Academic Arab College of Education in Haifa), 12 from Jewish religious colleges of Education (Lifshitz and Talpiot) and 30 from Jewish secular colleges of Education (Kibbutzim and Kaye). Most of them females (80%).
2. Israeli graduate students (N=26) from Kibbutzim College.

Research Variables

Dependent variable: Avatar appearance.

Independent variables: Students' appearance (hair, skin and hair color, age, weight); Culture, nationality, religious, tradition, race, gender, dressing and fashion norms; Dressing and fashion norms in the student' group.

Instruments

Three research tools were used:

1. Original questionnaire was constructed. The questionnaire enabled us to collect appearance data of students and their Avatars and to answer research question 1 by comparing the appearance data of students with the appearance data of their Avatars. The answer to research question 1 was compared with students' culture to provide an answer to research questions 2-3, and with students' opinion regarding the contribution of similarity between students and their Avatars to their learning, and if so, in what way – to answer research question 4.
2. Interviews (qualitative) helped clarifying unclear data collected in (1) and were compared with its analysis for cross-over checking. We also collected students' opinion regarding the contribution of similarity between students and their Avatars to their learning, and if so, to the way it does so – to answer research question 4.
3. Observation of photos and movies of Avatars (qualitative) – same as (2).
4. Original rubric for collecting data about students' appearance, photos and movies of Avatars (quantitative) will aid in the comparison of data for the analysis required.

The qualitative tools enabled a deeper analysis of students' opinions relating the research questions. They verified questionnaires data and clarified additional issues that emerged from questionnaires analysis.

Procedure

Undergraduate Israeli students (N=97) from different cultures participated in a pilot research (2011). They were scheduled into 20 themed groups of six members, each from a different college and culture (Hotter, Shonfeld & Ganaim, 2009). Group members collaborated in recording a meeting of the group in a place that suited the group theme which they chose in *Second Life*. The outcome of that pilot created criteria for analyzing Avatars, and revised questionnaires. A similar group of undergraduate Israeli students (N=62) from different cultures (from six Education Colleges – two from each culture: Arab, Secular and religious Jewish) participated in the research (2012).

Israeli graduate students from Kibbutzim College (N=26) and American graduate students from Texas University (N=15) also participate in the research (2012). They were scheduled into ten groups according to members' availability and were strangers to one another offline. They worked in *SL* adjusting or reshaping their Avatar, choosing the colors and texture. Group members collaborated to accomplish a task related to their group subject. Chat, Avatar movement, and use of digital objects such as clothing was recorded and sent to course site – see an example at <http://www.youtube.com/watch?v=Tb17m2gJ7zo&feature=youtu.be>.

The students that participated in the study took a survey that measured cultural norms such as being conservative – liberal, similarity to Avatar, demographics, religion, Internet experience, as well as social indicators such as leadership. Questioners, field notes from session observations, interview transcriptions, and session recordings were analyzed qualitatively for themes and patterns in participant appearance, use of clothing and accessories, and individual identity cues. Survey results were used to identify participants' offline appearance, race, culture, gender, demographics and provide basic Avatar appearance measures.

Data Analysis

This research includes both quantitative and qualitative tools. Data was organized in tables for analysis and conclusions. The quantitative data was analyzed with description statistic tools, comparing appearance and dressing data of students and their Avatars. The qualitative data (interviews and open questions) was phenomenographically analyzed (Marton, 1981, 1993; Marton & Fai, 1999; Svensson, 1997). Findings were cross-examined with similar research and theories.

Results

Appearance characteristics of students (physical and dressing) were compared with those of their Avatars and were crosschecked by Interviews and questionnaires. We found 85% similarity for skin color (all white skin color students chose white skin color Avatars, half of dark skin color students chose white skin color Avatars), 73% similarity for hair color, 81% for dressing style, 92% for accessories, 69% for height and weight (31% chose taller and thinner Avatars).

Most of the subjects (73%) believe that similarity in appearance characteristics to their Avatars contribute to success in the course and enhance their learning experience. They explain that these similarities, together with a slight improvement in Avatar's height and weight (and skin color as we found) make them feel better about their Avatars, that is, about themselves in the

learning virtual environment. This contributes to their self-confidence and self-esteem in the virtual group. These, in turn, help them to better assimilate in the group, interact with group members, collaborate in course tasks and succeed in the course.

Discussion and Conclusions

Considering all the factors found to be taking part in Avatar choice and in creating appearance, this study extends the dual-congruity perspectives proposed by Suh, Kim and Suh (2011) to a conceptual framework based on quad-congruity perspectives, adding the importance of online group perspective (Martey & Consalvo 2011) and the constraining effect of offline culture and norms.

Seeking educational opportunities in technology based learning environments, 3D virtual environments enable learning which simulates face to face encounters while retaining the advantages of online learning. The collaboration of students to accomplish teaching and learning tasks which offer new opportunities can be a part of many courses as we demonstrated. Not only gender similarities help the collaboration of group members to accomplish course tasks but also, according to the students' opinions, appearance similarities between them and their Avatars are important factors in devising such learning activities. This is because an Avatar's visual features and behavior influence social aspects of communication behavior, including disclosure, nonverbal behaviors, and perceived presence (Bailenson, Yee, Merget, & Schroeder, 2006; Bente, mer, & Eschenburg, 2008).

An image chosen by a person as an Avatar promotes stronger relational ties with others. Avatar choice is an important decision for those interested in becoming better connected in online environments. Creating an Avatar not only helps students to interact with others, but as this research shows, according to their opinions, it also contributes to their learning experience and online abilities by collaborating with group members, accomplishing tasks, and becoming part of the group.

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