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V-Learning: How Gaming and Avatars are Engaging Online Students

by Len Annetta, Marta Klesath, and Shawn Holmes

As I watched my 12-year-old nephew play [Halo 2](#) online while strategizing with his friends over his microphone-enabled headset, I realized that his play environment might well be the next distance learning platform. In cooperative online video games like *Halo 2*, players win by working together to understand and overcome the obstacles set forth in the storyline. Essentially, cooperative learning is occurring in these games. The virtual worlds in which today's video games take place can be reshaped as real-time synchronous virtual classrooms; the advance of technology and increasing accessibility of that technology mean that virtual reality is a viable distance education option. As [Net Generation](#) students, already the leading population in online gaming, bring their well-documented learning styles and demands for flexibility and adaptability into higher education venues, the three-dimensional gaming environment remade as a virtual classroom could become the natural next step in online learning (Oblinger [2006](#)).

The educational analogue to the three-dimensional gaming world is the virtual learning environment (VLE). The VLE is an online space where learners represent themselves through images called avatars, graphical personifications that represent the learner's identity, presence, location, and interaction within the VLE. Within this environment, students, represented by their individual avatars, can interact in real time with each other and with computer-based agents, digital artifacts, and virtual contexts. These three-dimensional worlds promise to extend the classroom and offer an engaging medium for distance education (Dickey 2000).

However, if avatars serve a vital role in supporting interactions among learners in a VLE, the typical relationship between an avatar and a given learner's sense of identity remains an open question for researchers. To what extent does a learner's selection of an avatar correspond to his or her self-perception, personality traits, or overall character outside the virtual environment? Is such a correspondence based upon a relatively consistent, coherent personality type, or does it invoke a more fluid sense of identity that depends on the learner's state of mind from one day to the next? How flexible should a VLE platform be in allowing users to modify their avatars? As designers continue to explore new ways of creating VLEs for instructors and students, further research into these questions can provide a helpful foundation for such innovations. This article offers a preliminary exploration of such issues based on a study of avatar selection among students at North Carolina State University ([NCSU](#)).

WolfDen

Created with the support of an internally funded NCSU grant, *WolfDen*, the first three-dimensional VLE used for distance education on the NCSU campus, is designed to investigate how synchronous interaction could be facilitated online. The [inaugural course](#) offered via *WolfDen* was a graduate-level course on game design for education students; that course and subsequent offerings have served as a test bed for research on the connections between avatar choice, personality, and social presence in a VLE.

WolfDen virtually simulates parts of the NCSU campus, giving students a sense of being on campus and engaged in the student community even as they work from home ([Exhibit 1](#)). Within the virtual campus, students can access teacher-designed objects to complete class activities and facilitate learning. The online environment was created using tools provided by [Activeworlds](#), a 3-D chat room and virtual reality platform. The same Voice over Internet Protocol (VoIP) technology typically used to connect players in online games supports real-time verbal communication among students in the VLE.

The *WolfDen* format reflects that of multiplayer video games; up to 50 people can interact in the environment in real time. This format creates an engaging and interactive virtual environment that students find appealing. The three-dimensional virtual environment also addresses some customary problems in online learning in terms of teamwork, labs ([Exhibit 2](#)), and discrepant events. The Activeworlds interface offers students a choice of 100 avatar designs of different genders and various ethnicities and species ([Exhibit 3](#)).

Avatars and Social Presence in the VLE

Gamers have long been aware, at least intuitively, of the importance of avatars; the gaming world thrives on software that gives participants the ability to express their personalities through avatars (Kushner 2004). The choice of avatar can reflect a player's gender, ethnicity, and personality—or allow a student to assume a completely different identity, in itself a learning experience (Lee and Hoadley 2007). The avatar is the key to communication within the VLE as well; participants speak to one another via their avatars, responding to the virtual representation of the person.

In this way, avatars tap into one of the most powerful forces in the human psyche: the need for social interaction (Garrison, Anderson, and Archer 2000; Moshell and Hughes 2002) and [social presence](#). A positive sense of social presence has been associated with enhanced online social interaction (Tu and McIsaac 2002) and has been shown to be a strong predictor of satisfaction with computer-mediated communication (Gunawardena and Zittle 1997). The concept of social presence suggests that the presence of other people (in the form of avatars) in a VLE provides evidence that the VLE actually exists. Correspondingly, the acknowledgment of a participant's presence in the VLE by other participants offers affirmation that one actually exists in that environment (Sadowski and Stanney 2002). Hence, the existence of avatars and the interactions between them can build and sustain group commitment (Rourke, Anderson, Garrison, and Archer 2001). Richardson and Swan (2003) demonstrate that a student's positive perceptions of his own social presence within the online community positively correlated with better performance in general, not only in online activities generally designated as group projects, but also in those activities usually designated as individual projects.

In this context, avatar design takes on real importance as the mechanism by which students develop an identity and a corresponding sense of presence within the VLE. A case study by Annetta and Holmes (2006) investigated the use of avatars in a synchronous online science education course as a tool for demonstrating social presence and building community within the course. Two cohorts of students were analyzed to ascertain each individual's sense of presence in a VLE. Data were collected through class observations, written server-side bots (a record of avatar changes and conversations), and interviews at the conclusion of the course. Group I was given the choice of 100 different avatars ranging from humans to abstract objects such as a motorcycle, helicopter, or animal. Group II was given two choices, male or female, both depicted as tourist characters. Social presence was measured by focus group interviews in which the selected participants were asked to articulate why they chose their avatars and how that choice affected course satisfaction.

In the results of this study we found that, when given the choice, students frequently changed avatars to reflect their roles in the class assignment, the avatar's effect on the students as individuals, or even just the student's mood ([Table 1](#)). This behavior does not differ greatly from what happens with students' self-presentation in the traditional classroom, where dress, attitude, and physical posture offer insights about a student's mood and approach to the class, as well as about the student's personality more generally. This study indicated that students preferred greater avatar selection within the VLE and that a lack of selection negatively affected students' sense of social presence; such results suggest that providing multiple avatar choices can help students establish themselves in the online community as unique individuals.

Personality and Presence in Avatar Choice

Given our earlier results on avatar choice and social presence, we hypothesized that personality might play a role in avatar choice. Our earlier work suggested that students choose particular avatars based on the look and function of the avatar; we hypothesized that the attraction to a particular avatar could be connected to the student's personality, perhaps in ways that are not obvious. For example, a student who is quiet or introverted in a traditional classroom setting and chooses an avatar who looks like Julius Caesar might be hiding behind the avatar, in a sense; that avatar could make the student feel more confident participating in the class. Whether a person is introverted, intuitive, thoughtful, or judgmental might be a factor in social presence and the attributes directly related to it, and thus may shed light on a student's predisposition to be a successful learner in such an environment.

To investigate the hypothesis that avatar choices are connected to personality types, data were collected from seventeen undergraduates—2 males and 15 females—participating in a seminar class, held in *WolfDen*, for seniors majoring in science education. The course is offered during the student teaching professional semester and is designed to facilitate discussions around emerging topics the students face in their daily teaching practices. The class met in the VLE in real time; discussions were led by the instructor synchronously interacting with the students. Students were offered a choice of 100 avatars and could change avatars at any time, so long as they noted the names of the avatars they chose.

Before the first class, students took a Jung-Myers-Briggs ([JMB](#)) personality test to ascertain their personality types. An online version of the most well-known and reliable personality test seemed to be the best approach to obtaining this information. The test, developed by Carl Jung, David Kiersey, Isabel Myers, and Katherine Briggs, is a hybrid of the Myers-Briggs Type Indicator and the Kiersey Temperament Sorter. The JMB categorizes individuals based on [four primary dichotomies](#) that define psychological function: introvert vs. extrovert, thinking vs. feeling, intuition vs. sensing, and judging vs. perceiving. We chose this measure to see if conscious or subconscious factors influenced a student's choice of avatar. Thus, we hoped to determine whether or not students were representing themselves according to their psychological profiles.

During the final class, students were asked to share their avatar choices and describe what prompted these selections. Responses were recorded and compared to the JMB results from the first class. Avatars were mapped to JMB categories by asking students to explain how they thought their JMB results might relate to their avatar choices. Students struggled to find this alignment, indicating that personality, at least as defined by the JMB, was not part of their process in choosing avatars. Following a double-blind review process to ensure interrater reliability, we concluded that there is not a very strong correlation between results from the JMB personality test and the avatars chosen.

The negative results of this study may have been partially an effect of the use of the JMB model as a measure of personality type. The lack of relationship between personality and avatar choice in a three-dimensional VLE may be explained, at least in part, by the general disagreement among students with their JMB results, which did not reflect their preconceived notions of their own personalities. For example, one student thought she was introverted, while the JMB said she was extroverted. In turn, the fact that the students knew the results of their personality tests prior to immersing themselves in the VLE could have affected some students' avatar choices, but this is not likely. This was the first experience any of these students had had in a VLE for educational purposes, and the results of the JMB were soon forgotten after the first class.

Instead, when the students learned how to change their avatars, many tried them all to see which one best represented them on a given day—and that seems to be the catalyst to avatar choice: a student's mood on a given day. Whether a student has a performance task or is simply interacting with his or her peers, avatar choice aligns closely with how a student wants to be seen on that day and in that particular situation. While not conforming to any static, consistent personality profile, such student choices nevertheless remained consistent with our earlier findings and indicate the key role of avatars in maintaining a sense of social presence.

Conclusion

This study provides evidence that suggests that while identity and presence are critical components of student satisfaction in virtual learning environments, personality type does not align with avatar choice in any singular or schematic fashion. It is crucial to expand on this new knowledge when building synchronous, online environments that are sufficiently flexible for the purposes of distance learning. We would suggest a mechanism that allows both instructors and students to create their own avatars and manipulate them throughout the duration of the course. Although our results point in this direction, the study was limited in its research design and rigor. A controlled study that investigates student personality and avatar choice might be more telling if the students could create their own avatars. This measure would eliminate the lack of choice and would allow students to represent their personalities visually. Not unlike smilies or emotional icons in some course management software and chat rooms, avatars are a vehicle for student expression, and this expression gives them a uniqueness that builds a sense of social presence and satisfaction. As each day brings a different mood, allowing course participants to showcase their individuality on a daily basis might be the key element that connects attitudes to learning in an online environment.

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