Research Statement
Selen Turkay

My research interests lie at the intersection of learning, motivation, and new media. I am particularly interested in games and game-like virtual environments that allow self-expression and individualized learning opportunities for students. To date, I have worked in three different but interrelated research areas: 1) using games and virtual worlds for learning, 2) the psychology and effects of choice in video games as vehicles for learning, 3) affordances of new media for self-expression and identity play.

Games and virtual worlds for learning

I seek to synthesize a comprehensive approach to learning with games and virtual worlds from media, video game, and cognitive studies. I have been conducting research about how video games and other virtual environments can be designed to act as "scaffolds and tools to enhance learning" (Bransford, Brown, & Cocking, 2000, p. 207). Working mostly in the domains of science and mathematics, I have been exploring the interplay of learner-content and learner-interface interactions.

I have designed and studied the effectiveness of virtual learning environments based on the theory of situated learning. In one of my studies, high school students learned with a semester long innovative science curriculum aimed to create an engaging learning environment. Utilizing the virtual world Second Life and other applications such as blogs in the larger Internet ecology, this curriculum not only increased students' grades but also improved their engagement in science learning (Turkay, 2010). As part of a Microsoft Research funded project, my team at Teachers College contrasted pedagogical orientations, the "calculational" and the "conceptual" (Thompson, Philipp, Thompson, & Boyd, 1994). This was done using two versions of the same educational game by manipulating the type of feedback and choice in each version. The results show that changing the symbolic representations of some game assets affects how middle school students think and ultimately learn about angles (Kinzer et al., 2012). While studying how specific game design features contribute to learning and self-expression, the role of user choice was salient. This finding paved the path to my dissertation inquiry.

The psychology and effects of choice in video games and virtual worlds

I study choice and effects of choice in video games as vehicles to understanding users' dynamic relationships with new media. Providing users with choices can increase their enjoyment, as well as self-efficacy, intrinsic motivation, sense of control, and task persistence (Zuckerman, Porac, Lathin, Smith, & Deci, 1978). Previous research has indicated user control to be a motivating factor for continued engagement (Wise & Reeves, 2009; Rozendaal, Keyson & Ridder, 2009), and one common form of user control found in games and virtual worlds is the ability to customize. Customization is a combination of choices that users make; some choices interact with each other in either synergistic or oppositional ways, others are linear, immediate and "self-contained." Each type of choice has implications for motivation and learning.

My dissertation research concerns how customization, as a way of providing users control, affects players' motivation, engagement, and subjective experiences in game play as seen through measures of their enjoyment, identification, and valence in complex multiplayer game play. In this investigation, I use the theoretical lenses of Self-Determination Theory (Ryan & Deci, 2000), Flow Theory (Csikzentmihalyi, 1990) and acknowledgement of individual differences (e.g., Big Five Personality traits, Need for Cognition and Need for Uniqueness).

Through an analysis of multiple measures, including eye tracking data, interviews, observations, and in-game user interactions, my preliminary results indicate that customization

not only supports users' sense of autonomy but also increases competence satisfaction, which leads to increased engagement and motivation over time. One of the most influential customization in games is avatar customization. This raises many questions, from design (How much avatar customization should a particular game have and how can those be linked to learners' self-perceptions in content areas?) to effect (How can we link customization to specific learning and engagement goals in ways that affect achievement?).

Affordances of new media for self-expression and identity play

Avatars, as players' virtual representations, facilitate social presence and present rich potentials for research (Bainbridge, 2007). In many video games and virtual worlds people create avatars, assume (or adopt) identities, and explore interactive narratives through these virtual bodies. Avatars mediate the affordances of virtual worlds and games for self-representation, and increase users' sense of agency. I have investigated the notion that video games and virtual worlds are intrinsically motivating partly because they provide a context where players can explore different aspects of their own selves. Recently, I studied how people create and customize their avatars in social virtual worlds and games and how these different environments influence the relationships between users and their avatars (Turkay, 2012).

According to the persona effect, the presence of a lifelike character in a learning environment can have strong positive effects on students' perception of that environment (Lester, Towns, Callaway, Voerman, & Fitzgerald, 2000). Student choice for onscreen agents has received little attention and is a potentially fruitful variable that needs further investigation (Mayer & DaPra, 2012). Recently, I explored: What would happen if middle school students could choose what their science mentors (computer agents) look like in an educational game? Would they be more interested in the game? Would they learn more? Results showed that providing students with choice of agent not only increased their engagement, but the "choice" group also learned more than the group who did not have choice options (Turkay et al., 2012). This line of research has the potential to affect design principles in an effort to facilitate the creation of more engaging learning environments.

Future research

My immediate goals for future research involve extending my dissertation findings to explore how customization and personalization affect different demographics of users' experiences when interacting in/with digital environments such as digital games, virtual worlds and social media tools. I have already determined several design principles regarding customization. I will apply those principles to further explore, assess and refine them in ways that will enhance learners' self-expression and increase their sense of agency, motivation and learning within these environments.

I believe in the value of multiple measures and assessment perspectives in conducting my research. I have used objective data collection methods such as eye tracking (using the Tobii X60 eye tracking system), and subjective methods ranging from surveys to interviews. Consequently, I am also thoroughly conversant with the various data analysis tools associated with these methods. I have a good background in both quantitative measures and analysis, in part as a result of my BS and MS in mathematics, and also in qualitative measures and analysis through graduate-level coursework and application in my research projects and dissertation. My future research will continue to take advantage of multiple methodologies facilitated by various technological tools.

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