

## Building Creativity: Collaborative Learning and Creativity in a Virtual Gaming Environment

Kylie Peppler, Maria Solomou, Indiana University, 201 N. Rose Ave, Bloomington, IN 47405  
Email: [kpeppler@indiana.edu](mailto:kpeppler@indiana.edu), [msolomou@indiana.edu](mailto:msolomou@indiana.edu)

**Abstract:** Using a systems-based approach to creativity and situated approach to learning, this study is a pilot exploration into how creative ideas emerge within a community and are spread amongst its members. This study takes place within the Multi-User Virtual Environment, Quest Atlantis, and uses chat data, screenshots, and offline conversation to explore creativity and collaborative learning in the context of virtual 3D architectural building.

21<sup>st</sup> century Internet culture has produced a growing number of public forums in the digital realm geared toward the sharing of creative ideas. Blogs, wikis and chatrooms are all spaces where millions of dispersed members create community around new or shared ideas from within simulated environments. A more elaborate form of social interaction in online spaces is the Multi-User Virtual Environment (MUVE), where players contribute to virtual communities by putting forth original ideas, actions or physical objects that, in turn, shape the aesthetic/philosophical landscape of the community. If other community members engage and value these contributions, the contributions then become recognized as meaningful expressions of creativity. A creative idea, object, or action is thus in part a socially-determined process, consistent with Csikszentmihalyi's (1996) systems model of creativity. In this model, a system is composed of individuals, knowledge domains, and the related social contexts that form a field. An individual builds on culturally valued meanings, practices and designs to produce new variations of the domain, which, if deemed valuable by the community (field) become part of what constitutes the evolving domain. This field component implies that colleagues and domain norms are essential to the realization of individual creativity (Schneiderman, 2000). Such a view removes the aura of mystery around creativity and, instead, emphasizes the importance of sustained discussion with peers and the need for appreciation of the constraints that one is augmenting or violating while producing a creative contribution.

Central to this model is the relation of creativity to a system, with the idea that how one's social group takes up the work ultimately defines its value as a creative act. Our study takes place within the MUVE, Quest Atlantis (QA), an educational virtual world that engages players with educational content while supporting dynamic interaction between a live community of players (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005). The reflexive relationship between users and the environment makes this an ideal setting to study how creative ideas emerge within a community and are spread amongst its members. For these purposes, we created an architectural world within QA based on Ayn Rand's novel, *The Fountainhead*, to explore how communities take up the themes of creativity and constraint within their 3D virtual building. Our questions for this study are: Using a systems-based approach to creativity, what ideas are seen as creative and taken up by the field? Further, how do learners collaboratively engage in the learning process to enable the spread of such ideas?

### Methods

Quest Atlantis is a 3D MUVE that immerses players in educational tasks, combining commercial gaming elements and educational lessons. Players engage in socially and academically meaningful activities, being part of stories, interacting, and developing social and academic skills. 124 elementary- and middle-school students from several countries around the world participated in this study, engaging in the architecture mission in schools, afterschool centers or at home. Our architecture mission, following the themes of the Rand novel, has players join an architecture firm where they must choose whether to align with individualistic head Architect, Howard Roark, which guarantees members complete freedom over their 3D building in the virtual world, or align with the more capitalistic architect, Peter Keating, which guarantees the member lots of city contracts but under the condition that they adhere to strict building restrictions. Regardless of their choice, players have the opportunity to rent real estate and practice their creative ideas.

Data was collected from multiple sources throughout the architecture trajectory, including submitted review reports throughout the gaming missions, screenshots from Questers' buildings, chat and messages, as well as online interviews from the researchers' online interactions with several players. We extracted

Questers' architectural review reports, the chat logs in all the relevant worlds, as well as the chat logs for specific Questers whose creations were of special interest. Using a qualitative approach to data analysis, we used a top-down approach to coding derived from our theoretical frame to code and analyze chat data, log files, artifacts and player responses. Coded events were then further analyzed to better understand how players learn about such "spreadable" ideas and collaborate with one another to learn about how to build their own architectural structures.

## Findings

Using a systems-based approach to creativity, we identified architectural ideas that were seen as creative by the larger field of Questers. In other words, creative ideas were those that new builders wanted to appropriate and the field of participant observers (those without a building license spent time discussing and highly valued for one reason or another). After the thematic analysis of our categories, we have focused on the following "creative" ideas within the community: fire textures, mushroom shaped houses, glass, bright colors/aesthetics, and animated objects. Further analyses of each of these ideas are presented below as well as insights are shared about how a community learns to adopt creative innovations through shared collaborative learning. Further analysis of how Questers learned to take up these ideas is presented in our poster. One of the creative ideas is presented below in further detail.

## Playing with Fire

A number of Questers found changing the specific texture of objects challenging but a key space for creativity in their buildings. At the start of August 2008, several buildings began to have fire textures on their walls and on some of the objects. Questers seemed to like the particular texture because of its animated fire image. They also seemed to associate it with the feelings they had viewing the buildings and some Questers also link the fire texture to their real life experiences. Jath554mse observed a house and reported: *"It makes me feel cool and very warm inside. It is this way because of its fiery color and the way the color moves.... I like what it looks like on the inside when you are in it because it looks like you are in a fire."* However, learning to change the textures was difficult. As a result, several of the Questers built tutorials for others to follow and a flurry of chat activity (both an and offline) resulted around this activity. Chat records, screenshots, and interviews were further analyzed to better understand how creative ideas evolved over time within the community and how knowledge of these practices were spread within the community.

## Discussion

Implications for creativity and collaborative learning are discussed. While the use of video games as an educational medium continues to entail issues of deep concern, we are seeing more and more games that are gender-neutral, have pro-social narratives at their core, and that support collaborative inquiry and deep learning. Moreover, the utility or even indispensability of creativity in meeting this need is evident but even less well understood, and this poster brings together two domains to harness and foster children's creativity: Spreadable ideas and collaborative learning. Indeed, the social dimension involves not simply the presentation of the building artifacts, but the critical reception and discussion around the work, contributing to the legitimacy and caliber of the work and, in turn, to the community and their engagement in practices relating to computer programming and interactive narrative composition.

## References

- Barab, S. A., Dodge, T., Thomas, M., Jackson, C., & Tuzun, H. (2007). Our designs and the social agendas they carry. *Journal of the Learning Sciences*, 16(2), 263–305.
- Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York: HarperCollins.
- Schneiderman, B. (2000). *Creating creativity: User interfaces for supporting innovation*. ACM Transactions on Computer-Human Interaction, 7(1), pp. 114–138.