Towards Frictionless Collaboration: Teaching Creativity in a 3D Virtual World

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Summary

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I. INTRODUCTION

The International Center for Studies in Creativity (ICSC) at Buffalo State offers the world's oldest Master of Science degree in the study of creativity. The Center's mission is to "ignite creativity worldwide", and it pursues that mission by offering its courses in creative thinking and creative problem solving, around the world.

Until recently, the prevailing assumption within the center had been that many of the Center's, highly interactive, courses could only be delivered through face-to-face teaching. Clearly, this requirement produced a basic tension between the Center's global mission, and its means.

While pondering the scaling problem, the Center's faculty also began to recognize that the nature of their students was gradually changing. Many of their students represented what Prensky (2001) called "digital natives". These were people who were completely comfortable with the idea of digital collaboration, and who had high expectations regarding the quality of their digital experiences.

The level of their expectations became increasingly apparent, to the faculty, through their reaction to the 'traditional' distance education systems that the Center used for some of its courses. Students reported that systems such as Blackboard, left them feeling emotionally disconnected from both topic and teacher. Their comments reflected a number of research studies that examined "emotions and online learning strategies for minimizing students' negative emotions of loneliness, isolation, and anxiety and finding ways to promote connectedness" (as cited in Regan, et al., 2011).

What the students wanted was an emotionally engaging learning experience, available anywhere, anytime. And they wanted it without sacrificing any of the benefits obtained by students in the campus-based Creative Problem Solving (CPS) courses. These 'home' students regularly reported that, in addition to the development of confidence and accuracy in the descriptive use of CPS, they also experienced transformational change in the way complex problems were approached and solved; their openness to novelty, tolerance for ambiguity, and complexity. In essence, the digital natives wanted it all!

Enter, virtual worlds. Buffalo State had been experimenting with 3D worlds, as teaching environments, for a while. Unfortunately, although they offered a sophisticated set of capabilities, most of them did not deliver a frictionless and intuitive user experience, which would allow faculty members to easily adopt them in their teaching. For example, in a review of the Second Life virtual world, Berge (2008) concluded that the steep learning curve, and cumbersome user interface, outweighed the benefits of this platform. These findings were reinforced by one of the authors, who conducted, a number of Second Life studies (Uribe Larach & Cabra, 2010) exploring the effectiveness of virtual environments for creative collaboration.

Fortunately, the impasses were broken when the authors discovered an open source system that appeared to be more amenable to creative collaboration. The platform - called QUBE – offered an interesting combination of features that made it particularly appropriate for teaching creative problem solving at a distance.

Like many virtual worlds, QUBE allowed users to design, and build spaces for, holding meetings, facilitating ideation sessions, classes, social networking and other functions. Moreover, Qube provided out-of-the-box virtual post-its, virtual paper, drag and drop capabilities for entering files generated from all kinds of software programs, and Skype-like audio video conferencing.

II. RESEARCH STUDY

To study the potential of this platform a participatory action research method was selected. Dick (2002) defined participatory action research as a collaborative way to test new ideas and implement changes based on the learning garnered from these testing procedures. The authors of this study were directly involved in designing and delivering the QUBE workshops to both faculty and students in a graduate course in Creative Problem Solving. They have utilized this experience to monitor and evaluate the effects of their facilitation approach, QUBE features and pedagogical activities with the aim of improving and generalizing practice (Whyte, 1991).

The objectives of this pilot study were to: (1) explore the potential of the virtual world, QUBE, for Creative Problem Solving (CPS) activities; (2) determine possible instructional design approaches for using QUBE for CPS activities (e.g., CPS facilitation using virtual sticky notes, interactive warm-up activities, and prototyping assignments); (3) understand the limitations of QUBE for CPS activities; (4) understand the barriers, solutions, and costs to using QUBE, including participant and presenter training; (6) measure participant learning outcomes and feedback.

III. RESULTS

Overall, the results of the study were encouraging, and supported the initial belief that a collaborative, 3D, platform could be used to teach CPS in an interactive manner. In post-course evaluations, students agreed that course objectives were met. They also reported that their number of original ideas had increased and that their ideas had greater breadth. What could not be determined, at the time, was whether the course transformed them, i.e. did the students change the way they approached and solved complex problems in a sustained manner.

Additional outcomes included: learner cues on visual, auditory and spatial elements of 3D environments, led to better recall and application of learning. The sense of shared place allowed students, at a distance, to occupy a single 'location' and more naturally practice behaviors, with their classmates. Students became more emotionally involved in and connected to the learning, in part due to the realism. Experienced students explored more possibilities of dialogue than in a scripted simulation, and overall there was a strong a sense of "being there" for the learner.

Further to these core outcomes, a number of students – voluntarily - began to customize the environment, with the intention of building spaces that they felt were more conducive to their creative processes. The building process enabled students to demonstrate their ideas in ways that would have been very difficult to replicate in a traditional face-to-face teaching environment.

IV. DRAWBACKS

Although the study identified some significant benefits, the project also identified technical barriers.

Interestingly, the technical problems were not, in themselves, significant. That is to say, they didn't represent serious issues with the underlying software. Rather, they were due to the overall technical 'ecosystem' in which the students were operating. For example, underpowered, or misconfigured computers, poor internet connection speeds, and low quality audio/video equipment. Unfortunately, from the students' perspective, these problems tended to paint the whole experience in a poor light, and – for some - became a large barrier to the adoption of cutting-edge technology.

Although most of the problems identified in this study related to the technical ecosystem in which the students operated, there were other issues that had an impact. The largest of these was the problem of bringing each student's ambient environment into the shared classroom. Until the introduction of Qube, students were able to take part in online discussions without any consideration of their current surroundings. However, once live audio, and video, were introduced into the equation, issues such as the background noise of family life, become a significant problem.

V. CONCLUSIONS

Given the technical challenges it might seem surprising that the students reported that they had had a successful learning experience. The authors ascribe this to the fact that simple, collaborative, 3D worlds really can have a significant impact of students' learning experiences.

Clearly, we are at an early stage in the development of these sorts of tools. But, given this early experience, we believe 3D collaborative environments are likely to become part of future mainstream learning platforms especially because modern web browsers are capable of rendering highly realistic images, even on tablet devices. For this reason, many of the 'ecosystem' challenges we experienced are likely to become less of an issue.

We believe that virtual worlds could significantly enhance students' ability to engage in collaborative creativity, despite being separated in space, and time.

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