

Chapter 12

Making the Virtual Real: Using Virtual Learning Communities for Research in Technical Writing

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ABSTRACT

The emerging critical global collaboration paradigm and the use of virtual learning communities can form structured domains that require complementary methods for educational research. The purpose of this chapter is to illustrate how the social nature of virtual worlds can be used to teach technical writing and the academic research process. A yearlong, mixed methodology, research study is used to demonstrate the effect of this blended learning pedagogical approach on writing apprehension in advanced technical writing courses. Students wrote manuals collaboratively for an audience of their peers. Second Life, the online 3D virtual world created entirely by its residents, was both their subject of study and a mode of meaningful communication.

INTRODUCTION

Globalization has triggered and is accelerating the disappearance of the competition paradigm so that the key issue is no longer whether students can compete with their global counterparts, but whether they can work with them (Suárez-Orozco & Qin-Hilliard, 2004). For instance, technical communication courses that are inherently interdisciplinary (i.e., merging writing with science, technology, engineering, and mathematics) pro-

mote the use of computer-supported collaborative learning and now extend beyond such Web 2.0 technologies as blogs (see Lansiquot, Rosalia, & Howell, 2009) to include 3D virtual worlds, notably Second Life. Furthermore, newly emerging mapping applications will soon expand this virtual space. (This model has been termed Second Earth [Roush, 2007].) Such virtual communities provide alternate spaces for real discussions and overcome geographic limitations. In virtual worlds, interaction is more explicit and uses gesture rather than needing to rely on purely text-based interactions because students can actually see virtual avatars of

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each other. They do not need to rely on conceptual ideas of presence, such as aliases in a knowledge forum (Padmanabhan, 2008). Meeting in virtual worlds can help create a sense of community that keeps students engaged in learning (Atkinson, 2008). What is evident, however, is that it is not enough to use this technology in the classroom for its novelty effect or even for engagement; the technology should encourage the use of academic skills so that students can transfer what they learn in a virtual world to traditional academics that use a highly structured or scientific method of collaborative investigation.

This chapter will illustrate the value of a broader and more interactive research design for understanding virtual learning communities by bringing into play the complementary methods commonly used in educational research with those common to technical usability testing. To facilitate an understanding of how learning communities function beyond traditional face-to-face communication, a brief overview of theory and practical application is given below.

BACKGROUND

Cognition and Cognitive Flexibility

Cognition is situated in social interactions. As Lave and Wenger (1991) observed, student learning styles are illustrated during the interaction and collaboration afforded by situated learning. The different learning styles employed by students depend on what students are working on and with whom they are working. Students tend to form a tentative community in which assuming distinct roles is helpful in order to gain knowledge and to use information in disciplined ways.

In terms of what students are learning, Bloom's taxonomy calls for students to gain knowledge, comprehension, application, analysis, synthesis, and evaluation. In Anderson and Krathwohl's (2000) revision of this taxonomy, the knowledge

dimension focuses on factual, conceptual, procedural, and meta-cognitive knowledge. The cognitive process dimension emphasizes remembering (recalling information), understanding (explaining ideas or concepts), applying (using the information in a new way), analyzing (distinguishing among the different parts), evaluating (justifying a stand or decision), and creating (producing a new product or point of view). Proponents of constructionism suggest in addition to considering the many dimensions of learning that educators should consider what personally meaningful artifacts their learners will have the chance to create and share in their learning (Papert, 1991). Adhering to these educational goals, the use of computer-supported collaborative learning can foster active, constructive, intentional, contextualized, and reflective learning (Jonassen, 1995). Learning is enhanced if it (a) is situated in real-world or simulated contexts, (b) fits new information with what is already known, (c) is collaborative, and (d) integrates assessment into the overall learning process. For advanced knowledge acquisition in ill-structured domains, cognitive flexibility theory (Spiro, Feltovich, Jacobson, & Coulson, 1991) explains the importance of fostering the ability to restructure knowledge in adaptive response to situational demands. Its relevance is embedded in "how multiple concept representations support comprehension and usability" (Passerini, 2007, p. 186). Understanding how cognition is distributed in effective groups can provide important implications for facilitating meaningful communication and scaffolding collaborative learning.

Distributed Cognition and Project-Based Learning

Cognition and knowledge are not confined to an individual; rather, they are distributed across objects, artifacts, and tools. As Rogers (2006) explained, distributed cognition is not a methodology that one can easily apply to a problem, but it is, nonetheless, an analytic framework for examin-

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