Chapter 3.2
Science through Second Life:
A Case Study of MUVE's in an Urban 9th Grade Classroom

Elizabeth Wellman
Educational Consultant, Los Angeles, USA

Cathy Arreguin
San Diego State University, USA

ABSTRACT

The purpose of this chapter is to provide educators with a case study of the design, development, and implementation of a Multi User Virtual Environment as a core medium in a high school based blended learning system. Science through Second Life focuses on the opportunities and challenges encountered by educators in the creation and realization of a series of virtual learning environments in Teen Second Life on the topic of environmental sustainability. This chapter considers instructional approaches to support scientific literacy and thinking, the optimal use of multiple media for supporting media literacy growth, and the use of the blended environment to motivate students, gain their attention, and foster a longer term interest in science. Specific examples of learning activities, supportive instructional materials and the pedagogical reasoning are woven into a larger narrative detailing a semester long, 9th grade science class. By reporting the design and development process and the subsequent course of implementation of instructional activities, this chapter provides pre- and in-service teachers and instructional designers with a model of instructional design and practical considerations for developing MUVEs in a blended instructional environment.

DOI: 10.4018/978-1-4666-0011-9.ch3.2

INTRODUCTION

Incorporating technology into classroom practice is a significant process for teachers. There is the practical issue of having convenient access to the technology. There is also the need to have some flexibility in the curriculum as well as to meet state and school district mandated standards for content curriculum. Teachers need to be adequately prepared both technically and in strategies for the use of technology to support disciplinary learning. Finally for optimal implementation of technology for learning, many believe that the teachers need to hold constructivist pedagogical beliefs (Ertmer, 2005 after Becker, 2001). It is these last two points – designing MUVEs to support disciplinary learning and designing blended MUVE and classroom environments grounded on social constructivist learning principles - which we will focus on.

This is a case study of the design, development and implementation of a MUVE in a 9th grade urban science classroom. As instructional designers who collaborated on this MUVE we are interested in examining how the availability of a MUVE as an integral aspect of the learning environment impacts the instructional and virtual environment design. As an integral part of our examination of our process, we will look at how the Science through Second Life MUVE supported science learning through the manifestation of social constructivist principles. We will do this through the presentation, discussion and analysis of four learning modules that embody social constructivist instructional approaches. We will describe and analyze how those instructional approaches manifested themselves in the design and deployment of the MUVE, and the student activity, which resulted.

Unlike a research study, the goals here are to capture, describe and illustrate specific learning moments to better understand the shared impact of design, instruction and learning. These moments are exemplified through narrative and vignettes to:

- Portray the essence and feel of learning and teaching in a MUVE.
- Relate these descriptions to the impact of the MUVE on the instructional design process.
- Identify how the MUVE supported disciplinary learning.
- Identify how social constructivist principles were manifested.

BACKGROUND

Instructional Design is the process of systematically developing learning materials through the analysis of learner needs, content structure and available media. (Culatta, 2010). In general, the instructional design for this science based MUVE is based on social constructivist principles and learning theories such as authentic learning. Lemke (1990, in Palincsar, 1998) suggests examples of the social construction of science understanding includes: observing, describing, comparing, classifying, analyzing, discussing, hypothesizing, theorizing, questioning, challenging, arguing, designing experiments, following procedures, judging, evaluating, deciding, concluding, generalizing, reporting and writing in and through the language of science. Palinscar goes on to posit that this involves the use of tools and discourses. Through engagement with these processes students identify themselves with scientific activity.

The Science through Second Life (StSL) curriculum concentrated on sustainability concepts and scientific thinking, applying these to local and global concerns. We saw scientific thinking as students engaged in scientific inquiry to understand interrelationships, using a scientific process and applying scientific understandings to local and global problem solving (Bransford, 2000).

Learning for these students took place in an authentic context. Authentic implies a realistic situation withstudents actively involved in cognitive, physical and social realms (Grabinger,