

## 3D Web-Based Worlds for Instruction

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**Abstract:** The instructional technology faculty at Appalachian State University has developed its graduate program courses within a 3D world. Based upon an Active World server and a social constructivist philosophy, each course is designed to take place in different 3D scenes, such as a frontier town, a park, or Roman palace. A library for distance education students has been developed as a part of the world. Each participant in the world is represented by an avatar, which is moved throughout the scene by keyboard commands. Active web links and other resources are available with hyperlinked objects. Learning communities develop as small and large groups form to consider, reflect and complete various tasks and assignments. Both linear and non-linear activities are provided for individuals and groups. Several forms of individual and group communication tools are provided to enhance student to student and student to professor contacts.

### Introduction

Current literature cites a significant movement of traditional course instruction into web-based learning environments. A close examination of such reports suggests an underlying assumption that traditional classroom instruction can be transferred mostly intact to the web. For instance, commercial shell programs such as *BlackBoard* and *WebCT* allow information to be distributed at a distance to students who then demonstrate in various ways that they have acquired knowledge. This is like early movies that were conventional stage plays captured on film. Conventional distance education instruction remains learner and organization focused, content delivery driven, needs assumed, usefulness assumed, and provides for some interaction between learners and learners and instructors (Watkins and Kaufman, 2003). But films changed into very different venues when scenes were interspersed in terms of time and place and cameras developed new angles and caught close-ups. The stories engaged the audiences in very different ways. 3D virtual worlds provide a sense of presence and develop learning communities (Bronack, Riedl and Tashner, 2005) often lacking in current distance learning environments. Coupled with social constructivist pedagogy, a powerful new learning environment is evolving.

### AppEdTech: A 3 Dimensional Virtual World

The instructional technology faculty at Appalachian State University has developed its graduate program in a three-dimensional virtual world named AppEdTech. Based on an Active World server (<http://www.activeworlds.com>), each of seven courses is developed around a metaphor that represents a central theme for the course (see Sanders and Tashner, 2005). The participant's computer screen is divided into several windows (Figure 1): the 3D scene that

changes perspective as one moves and provides objects linked to web pages, an area that shows web pages, and a section that provides tools such as help menus, contacts, and other aids. Below the 3D window is a text based chat. Above the window is a tool bar. Specific sites for audio and text chats are also available within each course for participants to communicate in various small and large groups.

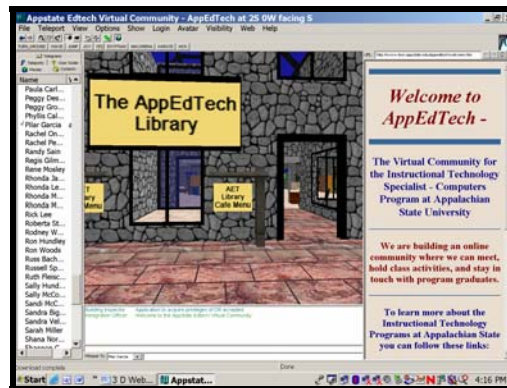


Figure 1: AppEdTech 3D browser

Students, instructors and guests enter the world as avatars (graphical representations of themselves (Figure 2); move around; interact with each other and with linked objects within the world (Riedl, 2004).



Figure 2: Avatars representing participants

## The Central Plaza

Students enter the world at a central plaza that is surrounded by a Library, a Student Services Center, an Alumni Center and a path leading to the Teleport (portals to the various courses). The Library has been designed by the IT and library faculty specifically for our instructional technology students. Links are provided to various on-line databases, e-journals, and reference resources available to our on-campus students. In addition, reference librarians are available for on-line help and will mail books, articles and other resources to our distance education students upon request. The Student Services Center currently contains information concerning administrative aspects of the university. This includes schedules of courses, programs of study, and application forms for movement through the graduate program, distance education information and university contacts. The Alumni Center is still under construction but our intension is to create ways to actively involve our graduates in our program and with our students as we continue to evolve.

## Courses

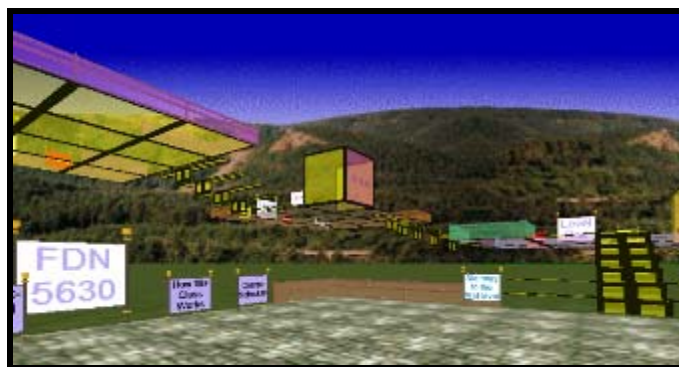
Each course scene is constructed around a central theme that represents the very essence of the course. For instance, a frontier town represents the first course in the program. The theme involves the frontier of education, a new beginning and developing new ways of thinking about teaching and learning. The students are presented with a "So What? Saloon" that engages them in major questions to be considered as we integrate technology in the classroom. Input forms are provided for individual and group responses as well as output forms to indicate what others have said. Audio and text-based chat rooms are also set up to encourage small group discussions concerning collaborative assignments and tasks to be completed. The scene also provides a "General Store with a special on Mindtools". This store is organized around various clusters of ways computers might be used as mindtools (Jonassen, 2000). Students explore many computer tools and ways to use these in instructional settings. A "Seekers Corral" is a fenced-in area that provides many web-linked resources to explore consult discuss and reflect. Students move through this course in

a non-linear fashion, identifying problems and issues and completing tasks that are meaningful to them (Tashner, Riedl, and Bronack, 2005); (Figure 3).



**Figure 3: Frontier course scene**

A second example involves a course in web design. This course differs from the first in that it is, by necessity, a more sequenced course. A series of levels consists of multiple tasks and resources to complete before moving to the next level. Students progress from one physical level to another as they complete tasks and assignments that build one upon another (Figure 4).



**Figure 4: Levels of sequences**

Another course is set in a Greek-Roman Forum scene that involves students in discussing and analyzing several case studies. Students learn to analyze problem identification, multiple perspectives, information needed, actions and consequences in a non-linear fashion (Figure 5). In similar ways, other themes are represented in other course scenes.



**Figure 5: Greek-Roman forum**

## **Pedagogy**

Our students are typically mid-career, k12 teachers who are working on a graduate degree in instructional technology. Completion of this degree leads to a graduate teacher licensure and provides one the knowledge and skills necessary for integrating technology into instruction, building new forms of learning environments and to lead school districts as Chief Technology Officers. Several years ago, our College of Education adopted a Conceptual Framework that guides instruction within the college. This conceptual framework ([http://www.fd.appstate.edu/rcoe\\_framework/cover\\_page.htm](http://www.fd.appstate.edu/rcoe_framework/cover_page.htm)) for teacher preparation is based upon six assumptions:

- Knowledge is socially constructed and learning is social in nature;
- Learning occurs through participation in a Community of Practice;
- The development of educators proceeds through stages from Novice to Expert under the guidance of more experienced and knowledgeable mentors in the community of practice;
- Cognition is distributed; that is individual thinking and problem solving are revealed through socially contextual practices.

This social constructivist pedagogy forms the foundation for what we do in terms of teaching and learning in these environments. Students are taught to take responsibility for their own learning. Instructors take the role of guiding students as they apply content and processes to their own needs and situations. Much emphasis is placed on developing collaborative learning communities (see Dede, 2004; Bronack, Riedl and Tashner, 2005). Students in these courses fall on a continuum from novice to expert. In small collaborative groups, students learn to assist each other in developing skills, understandings and applications of the content. Multiple sections of classes use this same course environment at the same time. For instance, up to seven sections (150 students) used the frontier environment together at the same time during one semester. Together they discussed issues, questioned current practice and explored possible actions. Many participants began to think very differently about their own schools, policies and teaching environments and the role technology might have as we continue to explore educational reformation.

### **Students' Responses to 3D Virtual World**

At this point, we have collected only anecdotal evidence on the nature of students' experiences as they work and learn in a 3D virtual environment. What we can report is that we have experienced a very low attrition rate for our courses. Students indicate that they are able to create meaning as they explore and apply their knowledge and skills to their own environments. While many suggest apprehension in the beginning, they seem very positive as they gain experience in working in this form of learning environment. Many suggest that they learn more in these environments than in their experiences in more traditional learning environments (both web-based as well as classroom). While much formal research is needed, we are significantly impressed to continue to explore teaching and learning in these 3 D worlds.

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