Learning in the Zone: A Social Constructivist Framework for Distance Education in a 3D Virtual World

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Abstract: Web-based technologies are the medium of choice for most universities as they move their offerings off-campus and online. As we move our own courses online, we are challenged to consider what elements of our traditional experiences to preserve online--and which ones to modify--and to recognize the impact of the tools we use on our abilities to do so. This paper describes the social constructivist conceptual framework of our college, and the 3D virtual world we have constructed as our online campus for learning. The design and delivery of experiences within our virtual world --called AET Zone--are guided by our framework. The result is a distance learning environment that is unlike traditional classroom- or web-based learning environments in important ways. A description of AET Zone is provided, and the implications of using a social constructivist framework for designing and delivering an online learning environment are discussed.

Introduction
Postsecondary enrollments are rising – and with 3 million online postsecondary learners by the 2000-2001 academic year in the U.S. (Waits and Lewis 2003) -- it is clear the growth is online. Each year brings a new college enrollment record in the United States, with nearly 18 million enrolled in postsecondary education by the end of this decade. Today, most colleges and universities offer some form of distance education (Jones 2005). One in five institutions offers at least one completely distance-based degree and/or certification program and two -thirds offer at least some distance-based courses (Waits and Lewis 2003). By Fall 2002, 7% of Internet users had taken a course online for college credit (Madden 2003), 11% of higher education students in the U.S. were learning online and more than 550,000 college students were taking all of their classes online (Allen & Seaman 2003).

The typical distance education student in our programs is a K-12 educator working full-time and attending graduate school part-time. Most are teaching within a 100-mile radius of the university. Distance students are not required to come to campus. All required courses are offered to cohorts of students who meet face-to-face in designated locations near their homes and/or their workplace. Although significant content and interactions may be found online, faculty and students do hold regular face-to-face meetings. As cohorts gain confidence and experience online, the number of face-to-face meetings is adjusted, accordingly. Most courses have a final class meeting for presenting projects; however, a handful of courses are entirely online.

Our online learning environment is unique. We are using a three-dimensional virtual world as the medium for content and significant interactions in our distance education courses. Three-dimensional virtual worlds offer an incomparable environment for creating spaces for teachers and learners to engage in the social activity of learning. We believe virtual worlds support deep learning and can help learners make meaning in ways similar to those used outside of virtual environments. Our experience suggests virtual worlds offer participants a sense of presence, immediacy, movement, artifacts, and communications unavailable within traditional Internet-based learning environments.

Our experience planning for, designing, and delivering our distance education courses within the 3D virtual world described below has reaffirmed our reliance on our conceptual framework as an important guide. Watkins and Kaufman (2003) provide a useful framework for analyzing traditional classroom-based instruction, distance education, current distance education, and what distance education might be in the future (Chart 1). They suggest that current distance education has more in common with traditional classroom-based instruction than it does with what distance education can become. It is with these two frameworks in mind that the faculty within our department decided to put online elements of our programs into a 3-D virtual world.
# Chart 1

**An Analysis of Distance Education Delivery Systems**

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Conventional Instruction</th>
<th>Classic/Historic Distance Education</th>
<th>Current Distance Education</th>
<th>Future Distance Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is it learner, teacher, organization, or society focused?</td>
<td>Teacher and organization focused</td>
<td>Learner focused</td>
<td>Learner and organization focused</td>
<td>Society, organization, and learner focused</td>
</tr>
<tr>
<td>Is it content driven or driven by the usefulness of what is learned?</td>
<td>Content Driven</td>
<td>Content Driven</td>
<td>Content Delivery Driven</td>
<td>Usefulness Driven</td>
</tr>
<tr>
<td>Are needs identified?</td>
<td>Needs assumed</td>
<td>Needs assumed</td>
<td>Needs assumed</td>
<td>Needs determined</td>
</tr>
<tr>
<td>Are the courses/programs linked to external usefulness?</td>
<td>Usefulness assumed</td>
<td>Usefulness assumed</td>
<td>Usefulness assumed</td>
<td>Usefulness linked to external value added</td>
</tr>
<tr>
<td>Location of course/program delivery</td>
<td>Institution</td>
<td>Remote site or home</td>
<td>Remote site or home</td>
<td>All sites possible</td>
</tr>
<tr>
<td>Course/program delivery mechanisms</td>
<td>Conventional means with some audio-visual support</td>
<td>Video, telephone, correspondence materials/books and workbooks</td>
<td>Computer, web, some video</td>
<td>All means possible</td>
</tr>
<tr>
<td>Frequency of interaction between learner and instructor and between learners</td>
<td>Some of the time</td>
<td>Rarely</td>
<td>Some of the time</td>
<td>Often</td>
</tr>
<tr>
<td>Is return on investment evaluated?</td>
<td>Return on investment assumed</td>
<td>Return on investment assumed</td>
<td>Evaluation of return on investment for learners and sometimes the institution</td>
<td>Evaluation of return on investment for all</td>
</tr>
</tbody>
</table>

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**Social Constructivist Framework for Distance Education**

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Like real spaces, virtual worlds in distance education must account for the social nature of learning. Distance education environments that support deep learning and high levels of engagement do so by fostering interaction among the people who use them (Palloff and Pratt 1999). Effective virtual worlds for learning support multiple means for students and instructors to interact with one another as both creators and consumers of the collective knowledge that emerges. Learners are compelled through action as members of a community of practice. Their growth and development lies at the confluence of effort and reflection, within the context of meaningful activity and performance, as individual learners become increasingly central participants within the community (Lave and Wenger 1991).

These principles of social constructivism are central to our college's conceptual framework (Reich College of Education 2004). This framework, in turn, informs our thinking as we construct our teaching and learning environments. The conceptual framework is an evolving construct, but the underlying basis remains firmly girded in the following assumptions:

- Learning is participatory;
- Knowledge is social;
- Learning leads development through predictable stages via shared activity;
- A useful knowledge base emerges through meaningful activity with others;
- Learners develop dispositions relative to the communities in which they practice.

**Learning is participatory**

Learning occurs first on the social level and next on the individual one (Vygotsky 1978). Communities of practice—loose collections of individuals with shared goals and both implicit and explicit ways of being, engaged in continuous collaborative activity—provide an important medium for learning because of their participatory nature. Participation within a community of practice prompts both more- and less-experienced members to engage in reflective thinking and complex problem-solving. Learning environments are most effective when they engage learners in meaningful activity within a community of practice.

**Knowledge is social**

Knowledge is meaning created with others. What we know is "situated" (Brown, Collins, and Duguid 1989) within the interactions and shared understandings among the peers that helped us craft it. What we know is the product of both psychological and sociological process that cannot be considered apart (Dewey 1897). As individuals think through the world around them, they do so among others with both more and less experience. The kind of problem-solving that results in information worth relating never occurs in a vacuum, but always in activity. Learning environments help learners gain knowledge by fostering interaction among experts, peers, content, and activities in formal, informal, and serendipitous ways.

**Learning leads development via shared activity**

Learners develop in predictable stages and as a result of the activities in which they engage with others. Learners begin as externally-driven reactors—appropriating the behaviors and strategies of those they believe to be more knowledgeable. Guided by meaningful interactions and driven by the explicit expectation to engage in something useful, learners over time begin to modify their own behaviors and create unique strategies. The more experienced learners become, the more adroit each becomes at organizing knowledge and calling upon theoretical constructs to solve contemporary problems. Effective learning environments allow learners to engage in meaningful activity with others—peripherally, at first, but at increasing levels of complexity as the learner develops into a more-experienced participant.

**Knowledge emerges from meaningful activity with others**

The artifacts of shared activity are the markers of what we know. As each community of practice evolves, their ways of being produce an identifiable knowledge base that is both general to the greater community and also specific to the domains that define the community. This knowledge base encompasses the shared beliefs, assumptions, and values that help shape and define the communities in which activity occurs. The knowledge base frames both the public and tacit principles that guide interactivity within the environment, and also documents the development of the community of practice over time. Effective learning environments provide participants seamless ways to turn interactions into artifacts and ways of knowing into expertise.

**Learning dispositions**
Each community of practice is defined by more than simply what they know or what they do. They are defined in part by their dispositions—that is, the subtle and explicit attitudes, beliefs and values that are shared by each member of the community. Dispositions provide the backdrop for interaction and communication between and among all members of the community. Therefore, dispositions are embedded in the knowledge that emerges from the community. Learners appropriate the dispositions of the community, and they also contribute to them. Learning environments are most effective when they reflect the nature of the community in which they occur, allow new members to contribute to them, and encourage all participants to think critically about the interaction between dispositions and what is known.

This conceptual framework describes a belief in the social construction of knowledge and the need to develop a community of practice. The framework has served as an effective guide for developing our distance education efforts. As we reflected on how to create a distance education environment that matches our framework (Chart 2), we realize that traditional web-based tools would be insufficient environments for offering social constructivist distance education courses.

### Chart 2
Analysis of the Principles of the RCOE Conceptual Framework

<table>
<thead>
<tr>
<th></th>
<th>Conventional Instruction²</th>
<th>Current Distance Education³</th>
<th>AET Zone⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge is socially constructed and</td>
<td>Usually only within the</td>
<td>Rarely and if so within</td>
<td>Within the entire</td>
</tr>
<tr>
<td>learning is social in nature</td>
<td>context of each individual class</td>
<td>the context of an individual class</td>
<td>virtual world community</td>
</tr>
<tr>
<td>Learning occurs through participation</td>
<td>Usually only within the</td>
<td>Rarely and if so within</td>
<td>Regularly throughout</td>
</tr>
<tr>
<td>in a Community of Practice</td>
<td>context of each individual class</td>
<td>the context of an individual class</td>
<td>the entire virtual world community</td>
</tr>
<tr>
<td>Development proceeds through stages from</td>
<td>Rarely; contact with</td>
<td>Rarely; contact with</td>
<td>Exposure to and</td>
</tr>
<tr>
<td>Novice to Expert under the guidance of</td>
<td>mentors usually limited</td>
<td>mentors usually limited</td>
<td>interaction with a</td>
</tr>
<tr>
<td>more experienced and knowledgeable</td>
<td>to the course instructor</td>
<td>to the course instructor</td>
<td>wide range of mentors</td>
</tr>
<tr>
<td>mentors in the community of practice</td>
<td></td>
<td></td>
<td>throughout the virtual world community</td>
</tr>
<tr>
<td>An identifiable knowledge base emerges</td>
<td>Limited by lack of</td>
<td>Limited by lack of</td>
<td>Regular contact with</td>
</tr>
<tr>
<td>out of the Community of Practice that is</td>
<td>exposure to the broader</td>
<td>exposure to the broader</td>
<td>the broader community</td>
</tr>
<tr>
<td>both general and specific</td>
<td>community of practice</td>
<td>community of practice</td>
<td>of practice develops a full and shared knowledge base</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

² Typical context is one teacher with many students meeting in a classroom for a finite amount of time and in a class that is not necessarily connected with other classes or other experiences.
³ Typical context is one teacher with many students who are in many different locations and in a class that is not necessarily connected with other classes or experiences.
⁴ Students and instructors of many classes intermingle at many different times and locations. Alumni and other experts are available throughout the virtual world and at many different times.
Traditional tools make it difficult to sense each other's presence and to work collaboratively, and they do not account for the serendipitous, informal contact typical on the college campus as effectively as virtual worlds. Virtual worlds extend users' abilities to communicate with each other. The three-dimensional virtual world described next is designed to serve our distance-based graduate education students and reflect the social constructivist principles of our conceptual framework.

AET Zone: A Virtual World for Learning

AET Zone is a three-dimensional virtual world designed to support a community of practice among distance-based students, faculty, graduates, and support staff. AET Zone offers users perceptions of space, movement and the presence of others. It also offers text- and audio-based conversational tools, interactive elements, and metaphors not found in traditional web-based instructional environments. AET Zone "citizens" select avatars to represent themselves. Each moves between courses and common spaces, interacting with other avatars and the objects that comprise the world, itself. Some objects are hyperlinked to web pages, synchronous and asynchronous tools, or other resources. Both text- and audio-based chat is available for large group, small group, and individual discourse.

AET Zone was created using Activeworlds, Inc.'s (Mauz 2001) universe server and is hosted by the university's technology services team. Citizens download a 3 Megabyte browser – Windows only – that connects each directly to the server. The browser has four distinct areas (Figure 1):
1. A first- or third-person three-dimensional view of the world;
2. A text-based chat for "whispering" or chatting to all who are online;
3. A browser that links user interactions with objects in the world to web-based content;
4. A utilities tab for accessing support, notes from other users, teleports (similar to bookmarks), and contacts (similar to buddies).

All students in AET Zone courses are provided with a username, a password, and a link to the browser. Whereas broadband access is useful, it is not necessary. Once logged on, students see the avatars of those who are logged on at the same time. Students interact with each other as well as with students in other courses, graduates of the program, and the instructors of various courses.
There are several areas within AET Zone. These include a library, an Alumni center, a student services building, and a Tele Port for transiting to and from course areas. This AET Zone Library connects to the distance-based services of the physical library on campus. Available services include: full-text articles from the university databases, book check-outs, and chats with university research librarians. The Alumni Center links to the Appalachian State University Alumni resources designed specifically for graduates of the Instructional Technology program. On the opposite side of the park is the Tele Port. Each gate within the teleport leads to a different course area.

Each course area within AET Zone is unique and reflects the nature of the content and the form of interaction the faculty wish to foster as students strive to meet course goals. For instance, "hypermazes" dot the landscape in a course on hypermedia. Students learn about hypermedia by experiencing it as they choose their own paths through information and resources. Students in the telecommunications course learn components of a network by walking through one. Each level of the web design course represents a set of skills upon which ensuing levels build. As students progress through the physical levels of the course, they gain an increasingly complex set of skills that is dependant upon the skills developed within the previous level. Finally, a case-based course on issues in learning with computers (Figure 2) is set in a fictitious school building in which characters present their point of view on a realistic dilemma (Figure 3).

Planning a course often starts with a discussion of what metaphor might best represent a class. This discussion facilitates our further consideration of what the class is really about and what we hope our students will gain from taking it. Sometimes the metaphor may be implemented in the design of the class, as is the case of the class on issues (using an open Roman Forum as the meeting place) or in the case of class on planning (using a street down which the students progress with side streets representing further exploration and/or a place to introduce further skills). Students move freely between and among course areas according to their needs and interests and guided by timelines for projects, sharing (discussion, brainstorming entries, etc.) and other prompts that dictate the flow of the class. All classes use discussion boards, ASP forms for sharing with classmates, resource and reading links, and audio chat rooms for large or small group meetings.
Multiple sections of the same course are often conducted at the same time within the same virtual world. Although sections may meet on different days, at different times and are led by different instructors, all explore the same content in the same world and use the same threaded discussion board to discuss the same issues across sections. Faculty from each section are engaged in the discussions, projects and efforts of the entire group. Cross-section and even cross-course groups form to work collaboratively on projects, assignments, discussions, and other activities. Former students return occasionally to AET Zone to both explore new resources and also to add to the rich discussions. Citizens have many and frequent opportunities to interact with not only their own classmates, but also with others who are in different sections of the course, with instructors from other sections of the course they are in, and with students who are at different stages of their program of study.

Conclusion

As a result of our experiences in our three-dimensional world, we are thinking about our classes very differently now. In the past, we considered our classes as a series of sessions held on certain days. Even our web-supported classes followed this pattern. But the three-dimensional world has helped us to interact with our students in more fluid and natural ways.

We have found ourselves thinking very differently about the way we interact with each other and our students, as well. We no longer think of students in one section of a class as “my” students but instead, we interact with all students across sections and across classes. The "flattening" of our thinking is trickling down to our students, as well. We have students just beginning the program interacting with students who are nearing graduation. We have school administration and reading students interacting with each other and with instructional technology majors. Guided by our social constructivist conceptual framework, AET Zone has become a focal point for a learning community that reaches far beyond what our normal classroom settings have been able to accomplish and which, we believe, is moving our distance education effort toward what distance learning might become.

Virtual worlds such as AET Zone are uniquely situated to serve as rich environments for engaging students in meaningful communities of practice. But, like all instructional technologies, three-dimensional virtual worlds for learning are only as effective as the vision and the pedagogy that guide them. Careful consideration of the factors that characterize innovative delivery systems for distance education helps us design environments that reflect the ethos of our on-campus programs, yet allows students and teachers to interact in ways otherwise impossible. Taking the time to reflect on our conceptual framework has allowed us to provide graduate education courses in a distance education environment that matches our beliefs about the social nature of teaching and learning.

References


