Instructional Design and Pedagogical Issues with Web 2.0 Tools

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Abstract

As educators move into online environments for teaching and learning, production, socialization and collaboration technologies, such as 3D virtual immersive worlds and other Web 2.0 technologies, reveal significant challenges for us for how best to use them. Each provides a new opportunity to foster deeper online student engagement, to support new forms of learning communities and to develop new teaching and learning environments when compared with more traditional tools. For eight years, faculty at Appalachian State University has employed these types of technologies in a 3D environment called AET Zone. From this work, a pedagogical framework known as Presence Pedagogy (P2) has emerged, which provides a model for utilizing these tools to promote active, engaged teaching and learning, P2 allows educators to engage students in authentic learning experiences, the types of which will be necessary for these tools to find their place in today’s educational system.
Introduction

Students in a cohort in the Instructional Technology Master's program are challenged: how can each discover instructional resources that are personally relevant and meaningful, and how might they best share their findings with colleagues and others? They find that calling out URLs during their rare face-to-face meetings or sharing findings through a group listserv is cumbersome, and posting on the class discussion board is no guarantee that all who may benefit from the resource will find it easily. The instructor offers a suggestion: What about Del.icio.us? Within minutes, keyboards are clicking as the class participants search for the suggested site and learn more. One student begins the process, and as others begin to contribute, they work together to develop commonalities in the way they tag the sites they find to optimize their value. In this scenario, students find that traditional ways of sharing knowledge are inadequate, and adapt their own community tool to accomplish their goal and further their own learning opportunities.

As educators move into online environments for teaching and learning, production, socialization and collaboration technologies, such as the Del.icio.us and others, reveal significant challenges for us for how best to use them. Each provides a new opportunity to foster deeper online student engagement, to support new forms of learning communities and to develop new teaching and learning environments when compared with more traditional tools. In many web-based instructional systems, it is difficult—and sometimes impossible—to offer kinds of rich engagement of small peer group research, discussions and communication that serve as the very essence of constructivist learning environments. Web 2.0 tools, embedded within three-dimensional (3D) immersive virtual worlds, enhance online student engagement in new and profound ways. In this chapter, we will discuss lessons learned from eight years of use of these
tools in an instructional environment, with particular focus on the ways in which Web 2.0 tools enhance instruction within the framework of Presence Pedagogy (P2).

Figure 1

Pedagogy and Tools Enable Communities of Practice

Background

AET Zone at Appalachian State University

The faculty within Appalachian State University's Reich College of Education have developed a Conceptual Framework (Reich College of Education - Appalachian State University, 2005), based upon social constructivism (Vygotsky, 1978), that guides teaching and learning. The following concepts serve as the foundation for this framework:

- Learning occurs through participation in a Community of Practice;
- Knowledge is socially constructed and learning is social in nature in a Community of Practice;
• Learners proceed through stages of development from Novice to Expert under the guidance of more experienced and knowledgeable mentors and among like-minded peers in the Community of Practice;
• An identifiable knowledge base that is both general in nature and also specific to specialties emerges from focused activity within the Community of Practice;
• All professional educators develop a set of Dispositions reflecting attitudes, beliefs, and values common to the Community of Practice.

These social constructivist principles guided faculty in the Instructional Technology program as they began investigating web-based alternatives for our program. A number of systems which had widespread acceptance in higher education, including WebCT and Blackboard, were considered but rejected, primarily because such platforms did not provide for the types of communication and interaction thought to be necessary for meaningful learning environments. These learning systems seemed to take the traditional lecture-oriented, one-way movement of information and move it into a web environment. In order to provide a different experience for participants, it was decided to develop a 3D immersive virtual world system with ActiveWorlds, (www.activeworlds.com), one of the leading 3D platforms available at the time. To this kernel many additional tools were added and continue to be added to enhance the environment for education, including Web 2.0 tools such as VoIP, threaded discussions, wikis, blogs, and podcasting, and other recent technologies. The result has been the development of a patent-pending 3D world named the AET Zone, a teaching and learning environment with embedded Web 2.0 tools that enhance online learning in deep and profound ways. This platform provides a means to build virtual worlds for students, instructors, and other invited guests to meet and work together in ways not found in other learning environments that are currently
available. Teaching and learning in AET Zone is a unique experience. Concepts of space, movement, physical presence and co-presence combine with conversational, collaborative, production and presentation tools in ways that create effective small and large group shared workspaces.

Participants within AET Zone are represented by avatars: human-like graphical representations of themselves. Each avatar moves through the 3D world interacting with each other and objects or with embedded artifacts. These artifacts may be linked to different resources, web pages or tools necessary to provide content and support for various kinds of synchronous and asynchronous interactions. Small and large group shared workspace tools enable interactive conversations in text chats, threaded discussion boards, audio chats and group production and sharing of documents, web pages, and other types of application software, as well as other resources.

*Figure 2*

*Students interacting in a course in AET Zone*

Our online learning environment is designed to meet the needs of learners engaged in meaningful self-directed and instructor-led activities within a community of practice of novices as well as experts. During the time in which graduate level programs at Appalachian State University have been working in the AET Zone, the environment has been uniquely developed to
include students and faculty from multiple discipline areas and currently includes programs in instructional technology, library science, school administration, and educational leadership working together to form a rich and complex educational community of practice. Detailed descriptions of this 3D virtual immersive learning environment have been noted in other research (Bronack, Riedl, Tashner, 2006; Riedl, R., Bronack, S., & Tashner, J., 2006; and Tashner, J., Bronack, S., & Riedl, R.; 2005).

Our work with AET Zone has left us acutely aware of the important design issues surrounding the effective instructional use of virtual immersive worlds and other Web 2.0 tools. Likewise, our commitment to social constructivism, suggests that simply upgrading to the latest technologies is not enough. Instead, pedagogical changes and adaptations must occur for Web 2.0 tools to enhance learning, provide access to resources, and enable communication, production, sharing and collaboration in small and large groups across distance and time. It is not just the tools per se, but how the tools are used within the structured pedagogy and the learning environment created that develops a deep learning experience.

Social Constructivism, Pedagogy and Design

Development of a Community of Practice

Brown and Adler (2008) discuss the notion of 'social learning', which is based on the premise that understanding is socially constructed through conversations about content and grounded in interactions around problems or actions -- that the focus is not on what is being learned but how it is being learned. They note that Web 2.0 tools in particular:

...are examples of a new user-centric infrastructure that emphasizes participation (e.g., creating, re-mixing) over presentation, that encourages focused conversation and short briefs (often written in a less technical, public vernacular) rather than
traditional publication, and that facilitates innovative explorations, experimentations, and purposeful tinkerings that often form the basis of a situated understanding emerging from action, not passivity.

Our experience and understanding of this point, based on feedback, observation, interview and survey results, suggests that 3D virtual worlds developed for education support deep learning in these ways. As AET Zone has grown to a community of over 1700 citizens, including faculty, current students, alumni, guests, and content experts, we have seen the development of the types of community fundamental to the social constructivist ideal. Interactions and activities that are both formal and informal, and both planned and serendipitous, have allowed students and faculty to interact in a continuous, collaborative fashion in this 3D immersive environment.

Our efforts have been guided by some key questions. For example, what elements are necessary to support social learning in a community of practice in a virtual world setting? How do Web 2.0 tools facilitate this process? As might be expected, each difficult question leads not only to important lessons, but also other, equally important questions. Of all lessons learned during the implementation of a 3D virtual immersive learning environment, perhaps the most important is this: while the tools provide devices for communication and collaboration, the truly important considerations are the changes in pedagogy and facilitation of student engagement enabled by these new opportunities for interaction. As we grow in our understanding of Web 2.0 tools and our ongoing design and development of the AET Zone, we continue to explore the goal of supporting a community of learners as a fundamental tenet to the pedagogical strategies we develop for teaching in this environment. What do we do to help facilitate and encourage this
type of community? What do we model? How do activities, both planned and
unplanned, contribute to the development of a social constructivist 3D virtual world?

Presence Pedagogy

Traditional face-to-face classrooms characteristically have a sense of presence in working
with and among students, experts and other guests during scheduled class meetings. This
includes a sense of physical presence; that is, the feeling of being someplace. This sense is
heightened when combined with the sense of being someplace with others, whether it be with
large or small groups or other individuals. The classroom is a learning space in which people
interact with one another in meaningful and significant ways.

Typical web-based learning management systems support anywhere, anytime learning,
but do not foster the feeling of being someplace else with someone else in a realistic way.
Synchronous and asynchronous Web 2.0 tools can be used within appropriate pedagogical
frameworks to regain this sense of presence and co-presence lost in these more traditional online
learning environments. As the tools and the pedagogies continue to mature, powerful and new
learning communities are forming to provide anywhere, any time online learning opportunities
through which novices and experts are working together to understand complex issues and to
share new knowledge. Thoughtfully combining Web 2.0 tools with 3D immersive environments
offers students and instructors a real sense of space, context and the active presence of others.
When participants are able to immerse themselves in an online environment in such a way, often
each experiences a psychological a shift from “Click Here” to “You ARE Here.” Effectively
combining the contextual richness of 3D with the social basis of Web 2.0 tools creates a dynamic
rarely seen in online learning; that is, one in which members of the learning community rarely
feel alone and are both encouraged and required to capitalize on the presence of others in meeting their personal and course learning objectives.

Presence Pedagogy (P2), as it has evolved within the AET Zone, is described in detail in the literature (Bronack, et al, in press). While presence is a necessary element of the P2 model, neither presence and its corollary co-presence, nor the tools used to create this attribute, are sufficient to explain the uniqueness of P2. Rather it is the use and applications of the tools along with the presence phenomena that makes a substantive difference. Social constructivism (Vygotsky, 1978) and Situated Learning (Lave and Wenger, 1991) guide this new pedagogical model. The P2 model offers educators a substantial shift in how we can best approach teaching and deep learning using Web 2.0 tools embedded in 3D immersive virtual worlds.

The P2 model is similar to teaching in a face-to-face (F2F) environment in terms of the presence of faculty and students in the same space and at the same time. However, this F2F sense of presence is fundamentally different when discussed in P2 terms. Unlike F2F presence, P2 can provide continuous access to instructors, colleagues and other students. No longer do students attend class for a set number of hours on a set day of the week. Rather, students and faculty may be present in a virtual space at most times of the day, week, and semester. Interactions that occur when students are present may be planned and pre-arranged. However, they may also happen serendipitously. Members of the virtual community engaged in P2 interact with those who are present together at the same time, regardless of “assigned” course, program, department, or role. P2 expects and anticipates these unplanned interactions and subsequently integrates these chance meetings into the very fabric of what is being learned and the activity that takes place as part of the living curriculum it creates.
P2 emerges as a unique pedagogical approach out of the praxis of the philosophical frameworks of social constructivism and situated learning. It is not simply a model of best practice in teaching or for the most effective use of a particular set of tools. Rather, P2 is a model for best practice in teaching when using these new tools. It suggests ways of thinking about engaging students and taking advantage of the opportunities these emerging tools offer. In practice, it is a fundamental shift in how we approach teaching and learning in environments that support online education.

The changing nature of the ways in which individuals access and use knowledge is central to a consideration of P2. Presence Pedagogy (P2), characterized by a substantive change in what constitutes teaching and learning, focuses on the ways in which educators and learners interact in online environments:

- ask questions and correct misperceptions;
- stimulate background knowledge and expertise;
- share tools and resources;
- facilitate interactions and encourage community;
- provide and delineate context and goals to act upon;
- encourage exploration and discovery;
- facilitate distributed cognition;
- encourage reflective practice;
- capitalize on the sense of presence and co-presence;
- utilize technologies to achieve and disseminate results. (Bronack, et al, 2008)

We see all of these factors as essential to an effective approach to teaching in a Web 2.0 environment, and will describe how our implementation of what we consider Presence Pedagogy
Informs our decisions regarding each of these factors. This P2 model serves as the catalyst for social constructivist learning in an immersive virtual world. The P2 pedagogy causes a “churn” that encourages purposeful interactions, goal oriented projects, increased productivity and collaborative processes which result from an intentional learning environment.

Constructivist Attributes of Web 2.0

Hargadon (2008) suggests a paradigm shift attributable to Web 2.0 tools that is of particular importance to education. The author identifies eleven key factors of this shift:

<table>
<thead>
<tr>
<th>From:</th>
<th>To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consuming</td>
<td>Producing</td>
</tr>
<tr>
<td>Authority</td>
<td>Transparency</td>
</tr>
<tr>
<td>Expert</td>
<td>Facilitator</td>
</tr>
<tr>
<td>Lecture</td>
<td>Hallway</td>
</tr>
<tr>
<td>Access to information</td>
<td>Access to people</td>
</tr>
<tr>
<td>Learning about</td>
<td>Learning to be</td>
</tr>
<tr>
<td>Passive learning</td>
<td>Passionate learning</td>
</tr>
<tr>
<td>Presentation</td>
<td>Participation</td>
</tr>
<tr>
<td>Publication</td>
<td>Conversation</td>
</tr>
<tr>
<td>Formal schooling</td>
<td>Lifelong learning</td>
</tr>
<tr>
<td>Supply-push</td>
<td>Demand-pull</td>
</tr>
</tbody>
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Brown (2005) asserts that this move from supply-push to demand-pull causes a revisiting of constructivist practice, in which learning occurs in (virtual) communities of practice, and is characterized by tinkering, designing, creating, remixing, and re-searching. This reconsideration
of constructivist principles leads to a discussion of the ways in which Web 2.0 enables the shift described above.

A framework for Web 2.0 tools from TechSoup (n.d.) provides a valuable organizational tool when considering the ways in which P2 is enabled and supported. The site categorizes these tools into: 1) tools to collaborate with others, 2) tools to network and build community, 3) tools to publish and disseminate information, 4) tools to share stories, and 5) tools for creating new tools. Table 1 below outlines the P2 Principles, Web 2.0 Categories, examples of applicable Web 2.0 tools, and examples of ways in which these tools are used within AET Zone. The table is followed by a more in-depth discussion.