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The Panhellenic Project: assessing learning engagement using Web 2.0 technologies

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THE PANHELLENIC PROJECT:

ASSESSING LEARNING ENGAGEMENT USING WEB 2.0 TECHNOLOGIES

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DEDICATION

Perhaps they are not stars, but rather openings in heaven where the love of our lost ones pours through and shines down upon us to let us know they are happy.

---Eskimo Legend

This study is dedicated to my mother Joyce M. Woolridge Carter who has always given me unconditional love, support and encouragement for whatever endeavor I have chosen to embark on throughout my life. As I complete this chapter of my life and prepare to begin another, I am certain that my mother's warm spirit is shining brightly from above.

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VITA

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ABSTRACT

High attrition rates have been a consistent occurrence among online learners, creating the challenge of how to design online instruction for the type of learning that encourages student engagement. With new technologies constantly evolving, the question becomes how educators can use these new web-based applications to engage students and possibly resolve the problem of high attrition among online learners?

The purpose of this study was to assess the level of learning engagement through student participation in *The Panhellenic Project*, an instructional design model that integrated constructivist learning principles with Web 2.0 technologies. Additionally, the usefulness of structured orientations to the Web 2.0 technologies and the effectiveness of these technologies was also investigated.

Using a mixed-methods case study design, *The Panhellenic Project* was framed around a collaborative group activity where undergraduate students worked in teams with the task of creating a three-dimensional virtual ancient Greek Parthenon and one ancient Olympic game event within the *Second Life* virtual world. A project wiki was established for student-participants to research sports history as well as share knowledge, information and resources. An informational blog with project resource information was developed as a *Second Life* learning reference.

Multiple sources were used to capture data including the *Survey of Student Engagement,* pre- and post-project questionnaires, and electronic discourse analysis of wiki posts and *Second Life* chat transcripts.

Research finding showed that the majority of the student-participants were engaged in *The Panhellenic Project* and that learning had occurred over the length of

project implementation. The structured orientation and training sessions were perceived as effective in connecting theoretical and practical knowledge, though not effective for teaching students to use the *Second Life* virtual world.

Overall, the level of difficulty experienced in learning the application influenced student-participant perceptions about the effectiveness of the Web 2.0 technologies used in this study. Further, analysis of the data revealed that the participants consistently demonstrated constructivist learning activities through interaction with other learners, collaborative teamwork and the sharing of multiple perspectives as they completed *The Panhellenic Project.*

Chapter I: Introduction

Background of the Study

Access to education from a distance has captivated educators ever since Sir Isaac Pitman first introduced the notion of mail-enabled correspondence courses to British society in 1840 (Matthews, 1999). The idea that prospective students in outlying regions could be reached by colleges and universities through distance education programs was appealing for a variety of reasons. Course work offered through a distance education platform meant that institutions could increase enrollment without having to construct new buildings or hire more staff. Moreover, distance education provided opportunities to pursue higher education for populations living well beyond the university's geographical borders (Matthews).

The popularity of distance learning was evident by the growing number of countries choosing to integrate distance education courses as options within university curriculum. Beginning in the late 1960s, countries such as the United Kingdom, Germany, Japan, Australia and the United States were among the first to develop distance education into a well-defined mode of instruction (Matthews, 1999; Roberts, 1996; Sherry, 1996).

Over the years, distance education has moved progressively through a number of generational phases. The first generation of distance education used print as the standard form of instructional media, while the second generation was the first phase to introduce technology as a conduit for learning (Roberts, 1996; Sherry, 1996). Radio and television broadcasts, followed by videotapes and multimedia options characterized the typical

distance learning format used during this second generation of distance education (Matthews, 1999; Roberts, 1996; Sherry, 1996).

With the introduction of the Internet and the World Wide Web, distance education entered into a whole new phase of interactivity, largely due to the new, sophisticated technologies available to the general public. This third generation of distance education saw extended opportunities for two-way communication between both student and teacher. Timely communication between all participants was now possible via electronic mail (e-mail), bulletin boards, discussion boards, facsimile, audio-conferencing as well as video-conferencing (Matthews, 1999; Sherry, 1996).

As distance education courses and programs grew world wide, the very definition of what is considered "distance education" has become even more refined. Typically, distance education is described as having four key components: (a) separation between the teacher and student throughout the majority of the term or instructional period; (b) the influence of an educational organization; (c) course content made available through technological media; and (d) the provision of two-way communication so that dialogue can take place between the teacher and student (Bryant, Kahle, & Schafer, 2005; Roberts, 1996; Sampson, 2003; Sherry, 1996).

As the 21st century approached, higher education experienced not only a significant increase in the number of distance education courses and programs in general, but also saw an increase in the application of technology within distance education. For example, in the *2000-2001 Distance Education Study* conducted by the U.S. National Center for Education Statistics (NCES), distance education was defined as "education or training courses delivered to remote (off-campus) sites via audio, video (live or

prerecorded), or computer technologies including both synchronous (i.e. simultaneous) and asynchronous (i.e. not simultaneous) instruction" (NCES, 2002). Key findings of the report indicated that:

> 56 percent of all two-year and four-year degree granting institutions offered distance education courses. Ninety percent of public two-year and 89 percent of public four-year institutions offered distance education courses. (And) among the 56 percent of the institutions that offered distance education courses, 34 percent had degree or certificate programs designed to be completed totally through distance education. (NCES, 2002)

Overall, the NCES (2002) study estimated approximately 3,077,000 students enrolled in distance education courses in two-year and four-year institutions across the United States.

In less than a decade, advances in technology have radically altered the way American society communicates, obtains information and has access to education. More and more colleges and universities are using online resources as a part or whole of the educational process. The impact of these new technologies can be felt throughout educational institutions as new student markets are emerging in both two-year and four-year colleges and universities across the United States. For example, the U.S. Department of Education compared the profile of the undergraduate student population in 1970 to the same population in 1999 and observed the following:

> Today's undergraduate population is different than it was a generation ago. In addition to being 72 percent larger in 1999 than in 1970 (with fall enrollment growing from 7.4 to 12.7 million), proportionally more students are enrolled part-time (39 versus 28 percent) and at 2-year colleges (44 versus 31 percent), and women have replaced men as the majority (representing 56 percent of the total instead of 42 percent). There are proportionally more older students on campus as well: 39 percent of all post-secondary students were age 25 or older in 1999, as compared with 28 percent in 1970. (NCES, 2002)

Additionally, Miller and Lu (2003) described the role of technology as an important tool in reaching out to a demographically and geographically diverse student population.

Their study suggests that the "anytime, anywhere" course format offered by many institutions provides the flexibility needed by working adults whose goal may be to pursue a degree but find the traditional course format in direct conflict with job hours (Miller & Lu, 2003).

In an effort to identify the key characteristics of students most likely to participate in distance education, the U.S. Department of Education published a report entitled *A Profile of Participation in Distance Education 1999-2000: Post-Secondary Education Descriptive Analysis Report* (NCES, 2003). In general, distance learners were described as older students, age 24 years or older with familial and/or work responsibilities. Most worked full-time and were enrolled in school part-time. More females than males were distance learners and the preferred mode of instruction was by use of the Internet rather than through television or audio broadcast (NCES, 2003). Given this profile of the distance learner, an increase in the number of distance education courses could be a solution to the decline in enrollment currently being experienced by many community colleges.

Dutton, Dutton and Perry (2002) found a similar profile in their comparison between online students and lecture students. Not only were online students older and had "job and/or childcare responsibilities" (¶ 50) but they also were described as lifelong learners with longer commutes to campus and more experience using computers.

In recent years, there has been a shift in the type of student choosing to enroll in distance education courses. While the non-traditional, older, working student continues to pursue distance education, more and more traditional students are electing to "mix and match" distance education courses with traditional courses as part of their full-time

academic load. For many of today's college students, part-time employment along with juggling a full academic schedule is the standard operating procedure. Enrollment in distance education courses not only offers the flexibility necessary for students to maintain part-time jobs, but can also help reduce the cost of travel expenses to and from campus (Miller & Lu, 2003). Furthermore, distance education provides these traditional and non-traditional students a chance to broaden their educational experiences through enrollment in multiple institutions (Calvert, 2005). No longer are students bound to one higher education institution because of geographical location, the Internet has made the pursuit of a global education possible without ever having to leave one's own neighborhood. The Internet has also made an impact on the traditional lecture course allowing for new technologies to support the learning of course content and resulting in online learning woven into the traditional course curriculum.

Statement of the Problem

Though the Internet inspired third generation of distance education has expanded educational opportunities for the post-secondary student population, several issues have consistently plagued distance education programs throughout at least a few of the technology-based generations. One such issue is the high student dropout rate common among distance learners (Bryant et al., 2005; Leung & Li, 2006; Schlosser & Anderson, 1994). While the reported attrition rate shifts slightly depending on the study, most estimate a 10% to 25% higher attrition rate for students enrolled in online courses as compared to those students enrolled in face-to-face courses (Bryant et al., 2005; Tyler-Smith, 2006).

Student retention in online courses is a critical concern to educators for a number of reasons. First, institutional funding is often based upon student enrollment figures regardless of course format. For online courses to consistently show a higher attrition rate than their face-to-face counterparts, means that the cost effectiveness of the program becomes questionable. Typically, the high technological costs of implementing and maintaining a distance education program as well as the extensive preparation time needed to develop and teach the course are among the often-cited drawbacks in sponsoring online courses (Bryant et al., 2005; Matthews, 1999).

Other factors that have contributed to the high attrition rate are the frustrations that online participants have expressed regarding course-related technical issues. In their discussion of common e-learning platforms, Gibbs and Gosper (2006) revealed that the drawback to using some of the more prevalent course management systems is that students have difficulties with navigation, downloading course materials and having to use and remember multiple passwords for access to the online classroom. Comparable studies have identified problems with the technology itself with "slow to respond" technical support complaints commonly cited by students enrolled in distance education courses (Bryant et al., 2005; Chernish, DeFranco, Lindner & Dooley, 2005; Tyler-Smith, 2006).

A crucial factor that can lead to high attrition rates and is a consistent criticism of the online course delivery method, is the lack of engagement and the feelings of isolation frequently expressed by online learners. Research has shown that when online students are limited in their opportunities to interact with their peers, when instructors provide little or delayed feedback concerning course assignments and student progress, and when

little is offered to students in the way of support services, the online student is much more likely to withdraw from the course than are face-to-face students enrolled in similar courses (Chin & Williams, 2006; Sampson, 2003; Schlosser & Anderson, 1994).

Unlike the traditional classroom that has dynamic visual and auditory cues and the chance for impromptu exchanges between all participants, the online course environment is often an asynchronous, text-based platform designed for independent learning and remote contact with classmates and the instructor. Recent research suggests that persistence in online courses is related to how well the course has been designed to emphasize and support student engagement among its learners. When students are consistently interacting with their instructor, and when they are given opportunities to collaborate and construct knowledge with their peers, it is then that they can be engaged in authentic learning (Bryant et al., 2005; Chin & Williams, 2006; Tyler-Smith, 2006). The challenge, however, becomes in how to design online instruction for the type of interaction that encourages student engagement.

The interest in online interaction is a trend that extends beyond the world of distance education courses. As the Internet matures as both an informational and educational resource, it has begun to transition into a more dynamic forum, one that promotes social interaction and collaboration among its users. This new evolutionary phase in the use of the Internet is commonly called Web 2.0 (Cardus, 2006; Churchill, 2007; O'Reilly, 2005) and incorporates a range of technologies that "wrap interactive capabilities around digital information" (Milne, 2007, p.14). Often termed "social networking," "social software" or "sociable media" these new technologies allow individuals and teams of people to communicate, collaborate, create and share

information in real-time and often over great distances (Cardus, 2006; Churchill, 2007; Milne, 2007).

Today's social networking service is the 21st century platform for "virtual communities," groups of people who use the Internet to communicate and stay connected with one another. Community members use voice, chat, instant message, videoconference, blog (web log or journal) and other emerging Web 2.0 technologies in order to stay in contact with others for personal or professional reasons. Public interest in social networking services is demonstrated by the widespread popularity of platforms such as *MySpace*, *Facebook* or *Friendster.*

Gaining prominence among the general public is the emergence of the various immersive, three-dimensional virtual worlds. These are multi-user online virtual environments where participants, represented by character personas called *avatars*, have the ability to communicate, create and integrate other Web 2.0 technologies into a user designed real-time virtual habitat or community.

Some have dubbed this explosion of social software technologies as the dawning of the "Interaction Age" (Milne, 2007) but the question educators need to consider is whether or not this growing social phenomenon signals the next phase of distance education and if so, how can these new technologies be used to solve not only the problems commonly associated with online learning, but how can we use these new technologies to make online learning more engaging?

Purpose of the Study

It is well documented that a number of the underlying reasons for high attrition rates among online learners can be attributed to students not engaged with online course

work, course work that uses static instructional design features that limit interactivity between peers and the instructor (Bryant et al., 2005; Calvert, 2005; Leung & Li, 2006; Schlosser & Anderson, 1994; Sherry, 1996). With the availability of social software, and the potential to create an intellectually and socially dynamic online learning environment, the question that educators need to ask is how can these new technologies be used to engage online learners within the world of virtual education? Additionally, educators need to determine the important instructional design principles that should be put in place when using these new technologies in order to support student engagement. Principles that incorporate sound pedagogical practices and rest on a foundation of solid educational theory.

Using a case study design, this study used a holistic approach to studying student engagement within an online learning environment through the implementation of a collaborative group project entitled *The Panhellenic Project*. This holistic approach explored the effectiveness of an instructional design model that may be able to create a conceptual bridge between educational theory and pedagogical practice.

This instructional design model for engaged online learning used educational theory as the foundation or theoretical framework, and then integrated established pedagogical practices into the design model. Structured orientations or training sessions were developed as contextual scaffolding activities to assist in learning how to use the new technologies.

Moreover, specific Web 2.0 technologies are identified and selected as part of the instructional design and used as a conduit to support both theory and practice as well as enhance student engagement in the learning process.

Figure 1 presents a visual representation of the project instructional design model.

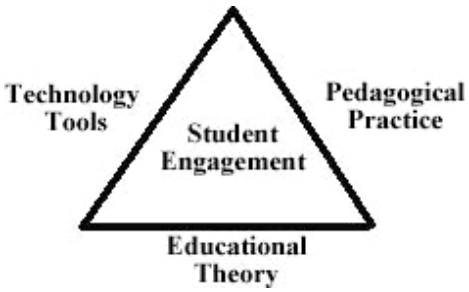


Figure 1. Instructional design model for engaged online learning

The purpose of this study was to assess the level of learning engagement using an instructional design model that integrated: (a) the constructivist learning approach; (b) a pedagogical framework for online learning environments; and (c) a blog, a wiki and the *Second Life* virtual world as the Web 2.0 technologies used in this study. In addition, student-participant perceptions of the scaffolding activities and usability issues associated with these Web 2.0 technologies was also investigated.

Research Questions

The research questions for this study are:

1. What is the level of engagement demonstrated by students participating in *The Panhellenic Project*?
2. Do student-participants perceive structured introduction sessions to Web 2.0 technologies as helpful in the implementation of *The Panhellenic Project*?
3. What are student-participants perceptions concerning the effectiveness of using blogs, wikis and *Second Life* virtual world in the implementation of *The Panhellenic Project*?

Significance of the Study

The instructional design of online course work is a crucial element in the retention of not only non-traditional students, but the general student population as well. Chernish et al. (2005) in their exploration of different learning delivery methods noted that many distance education students were frustrated with inaccessible course materials, technical problems, time required to complete course work and feelings of isolation. They suggest that the integration of synchronous and asynchronous learning is an important component that supports student engagement with faculty and with other class members (Chernish et al.).

Further, Richardson and Newby (2005) propose that distance education should be less concerned with comparisons between traditional, face-to-face classroom environments versus distance learning environments and focus instead on "how learners learn in online learning environments" and "how students engage with their online courses" (p. 2). After all, whether the course is taught in a physical classroom or in a virtual classroom, the goal of all programs is to cognitively engage students so that they have the ability to "learn to learn" (Richardson & Newby, p. 3). According to the *Community College Survey of Student Engagement*

> …research shows that the more actively engaged students are----with college faculty and staff, with other students and with the subject matter they study---the more likely they are to learn and to stay in college until they achieve their academic goals." (CCSSE, 2005, p. 2)

Therefore, student retention is contingent upon the degree to which the student feels actively engaged with not only the instructor but with the campus community as a whole.

The problem of attrition among online learners may be resolved if researchers can determine effective approaches that enhance student engagement and with "improvements in technology, more effective course design, (a) better understanding of online pedagogy and more learner-centered design" (Tyler-Smith, 2006, p. 81), educators may be able to design more engaging learning environments.

While the existing course management systems have been valuable especially during the initial Internet-driven phase of distance education, they are designed to deliver course content, exams and mostly asynchronous communication between instructor and student rather than designed to enhance learning (Maloney, 2007). Given this scenario, it is not surprising that online learners often disengage from online courses and feel disconnected from the instructor and other students enrolled in the course (Baab, 2004).

As the Internet continues to transition into the next Web 2.0 generation of interaction and collaboration, now is an opportune time for higher education to explore the possibilities of using these emerging technologies within the curriculum. In an article published in the *Chronicle of Higher Education*, Maloney (2007) offers:

> What we can see in the Web's evolution is a new focus on innovation, creation and collaboration, and an emphasis on collective knowledge over static information delivery, knowledge management over content management and social interaction over isolated surfing…The challenge that we now face is figuring out how to incorporate the paradigm altering technologies of Web 2.0 into teaching and learning. (p. B26)

Perhaps the integration of these emerging Web 2.0 technologies into the instructional design of online courses is the answer to the ongoing concerns about high attrition rates, poor student engagement and feelings of isolation reported by online learners. The possible benefits of using these new technologies within distance and traditional education is exciting, yet research in terms of the educational uses of Web 2.0

technologies is limited at best (Beldarrain, 2006). This study will use *The Panhellenic Project* case study to present preliminary findings about the usage of Web 2.0 technologies as a vehicle to encourage learning engagement and the essential instructional design principles that should be considered in the development of online courses and online course projects. The information obtained in the research has the potential to serve as a model for the design of online learning courses within distance and traditional education programs.

Summary

Higher education is poised to enter into the next phase of online learning, one that may use the next generation of Internet capabilities to address the long-standing attrition issues that have consistently plagued web-based courses. While the new emerging Web 2.0 technologies emphasize communication, collaboration and knowledge-sharing, little research exist regarding their applicability to the online learning environment.

This study used a case study design to collect and analyze data to identify the key instructional design principles necessary in the development of online course work that supports student learning engagement and to determine the educational effectiveness of specific Web 2.0 technologies. Chapter two reviews the literature related to issues with student engagement, online instruction, theoretical foundations of learning, pedagogical practices, learning from game-based research, instructional design factors, emerging Internet technologies and provides existing research in order to establish a need for the study. Chapter three specifies the research questions and outlines the research methodology utilized in conducting this study. Chapter four presents the results associated with each of the study's data sources. Chapter five discusses the study's

findings and implications as a result of those findings. It also suggests future research that can be conducted with respect to instructional design for online learning using Web 2.0 technologies to support student engagement within the virtual environment.

Definition of Terms

Avatar. An Internet user's representation of himself or herself in the form of a three-dimensional character model used in computer games and in virtual worlds; dynamic character personas.

Blogs. Online journals or website on which articles are posted and displayed in chronological order.

Distance education (Learning). Education or training courses delivered to remote (off-campus) sites via audio, video or computer technologies including both synchronous (i.e. simultaneous) and asynchronous (i.e. not simultaneous) instruction (NCES, 2002).

Engaged learning. Student strategies that demonstrate curiosity, course involvement, social exchange, self-efficacy, analysis and synthesis of information, mastery of procedures (Richardson & Newby, 2005).

Immersive virtual world. Web-based, desktop virtual reality that gives the illusion of three-dimensional space; avatars serve as visual representations of users and an interactive chat environment is used for communication. Avatars are able to move, interact with one another, move objects within the virtual world (Dickey, 2003).

Instant messaging. Text-based communication that involves communicating with another user over the Internet in real-time through the use of client software.

Interaction. The act of exchanging information that occurs between learners or between the instructor and learners.

Interactivity. The back and forth actions or dialogue that occurs between learners or between learners and technology in the process of active learning.

In-world. Refers to users logged in to *Second Life* virtual world and participating in the virtual environment.

Online classroom. Web-based learning environment that features text-based chat and private messaging, conversation transcripts and threaded discussion boards.

Second life. An online, three-dimensional, immersive virtual world created by Linden Lab®; a metaverse inhabited by avatars that interact and communicate with one another in real-time.

Social networking. A virtual community for people who use the Internet to communicate, collaborate and share information with one another.

Web 2.0. Perceived second generation of web-based services that emphasize online collaboration and sharing among users (O'Reilly, 2005).

Wikis. A collaborative online space in which many users can work together on a shared project.

Chapter II: Review of the Literature

In order to better understand the role of instructional design in the development of online courses that promote student engagement, relevant literature was reviewed. Discussed is the importance of engaging students in the process of learning, an overview of the constructivist learning theory and a description of sound pedagogical practices applicable to both the online and on-campus educational environment.

In addition, issues that are unique to learning in a virtual classroom are presented as well as an examination of the design principles that support engaged learning found within the computer game and Massively Multiplayer Online Game (MMOG) environment. Also presented is an investigation into the emergent Web 2.0 technologies and a discussion regarding the potential usage of these technologies within curriculum design. Concluding this chapter is a review of instructional design models and design principles developed specifically for application within the online course environment.

Engaging Students in Learning

Student engagement. Engaging students in the process of learning is a challenge all professors, teachers and instructors must face whenever they attempt to employ any aspect of instruction. Understanding the dynamics that facilitate a connection between learner and content, one that encourages "deep learning" rather than "surface learning" (Weigel, 2002) is of interest not only to the educator teaching the course, but also to the educational institution as a whole. Weigel describes some of the attributes of "deep learning" as

> "learners relate ideas to previous knowledge and experience; look for patterns and underlying principles; check evidence and relate it to conclusions; examine logic and or argument cautiously and critically." (p. 6)

Conversely, Weigel (2002) describes the attributes of "surface learning" as

> "learners treat the course as unrelated bits of knowledge; memorize facts and carry out procedures routinely; find difficulty in making sense of new ideas presented; see little value or meaning in either courses or tasks." (p. 6)

Student engagement is an important issue on many college campuses because research has shown that the more actively engaged the student is with course content, college faculty, campus resources and other students, the more likely that student will remain in college and complete their educational goal (Kuh, 2001; Kuh, Kinzie, Buckley, Bridges & Hayek, 2006; NSSE, 2007).

In the United States, over 600 colleges and universities participated in the *National Survey on Student Engagement* (NSSE) and over 200 community colleges participated in the *Community College Survey on Student Engagement* (CCSSE) in an effort to determine the level of student engagement at their institution. The significance of this research is that it implies that an important factor in retaining students in courses is to engage students in the process of learning as well as with the campus community.

While understanding the importance of engaging students can be crucial for educational institutions, defining what constitutes engagement can be a matter subject to interpretation. In their study investigating student engagement and online learning, Richardson and Newby (2005) used the term "cognitive engagement" and defined it as "…the integration and utilization of students' motivations and strategies in the course of their learning" (p. 3). Kuh et al. (2006) in their review of the literature on student engagement provided critical features indicative of the engaged student. The first feature is "the amount of time and effort students put into their studies and other educationally purposeful activities" (p. 31). The second critical feature includes "how institutions

deploys its resources, organizes its curriculum, provides support services and induce students to participate in activities…that lead to persistence, satisfaction, learning and graduation" (Kuh et al., 2006, p. 31).

Further, in order to promote engagement among learners, a number of research studies suggest educators take a deep approach to learning when designing or developing courses, one that encourages students to have meaningful, active involvement with content and allows for interaction with and among other learners (Ahlfeldt, Mehta & Sellnow, 2005; Hughes & Hewson, 1998; Kearsley & Shneiderman, 1998; Richardson & Newby, 2005). These approaches to engaged learning are consistent with the characteristics commonly found in constructivist pedagogy, a learning theory or educational philosophy that contends that learners construct their own knowledge and take responsibility for their own learning (Tenenbaum, Neider, Jegede & Austin, 2001; Wiegel, 2002).

The constructivist model. In general, the constructivist learning approach contends that learning is an active process where the individual constructs their own knowledge based on previous experiences, multiple perspectives and collaborative interaction with other learners. Additionally, learners gain knowledge through participation in contextual, authentic activities or tasks (Almala, 2005; Cooperstein & Kocevar-Weidinger, 2004; Gagnon & Collay, 2006; Marlowe & Page, 1998; Petraglia, 1998).

Learners are expected to take an active role in their pursuit of knowledge where information flows not only from teacher to student, but to and from all individuals involved in the course. According to Marlowe and Page (1998),

> The main proposition of constructivism is that learning means constructing, creating, inventing and developing our own knowledge. Others can give us information…receiving it, getting it and hearing it does not necessarily equal learning. Constructivism focuses on in-depth understanding, not regurgitating and repeating back. (p. 10-11)

Interestingly, Barr and Tagg (1995) suggested a developing trend within higher education, a paradigm shift from "teaching to learning" (¶ 5) within undergraduate education. The authors define the traditional, predominant lecture-discussion mode of teaching as the "Instruction Paradigm" where "the chief agent in the (learning) process is the teacher who delivers knowledge, students are viewed as passive vessels, ingesting knowledge for recall on tests" (¶ 56). The new paradigm termed the "Learning Paradigm" shifts the process of learning from a more or less passive endeavor to an active one where the learner discovers and constructs their own knowledge (Barr & Tagg).

Similar in nature to the constructivist learning philosophy, the "Learning Paradigm" encourages a holistic approach to acquiring knowledge, one where information is provided in a meaningful context as a whole rather than fractionalized into smaller pieces, disconnected from the overarching purpose of the content or concept (Barr & Tagg, 1995).

In an effort to define active learning and to determine its effectiveness, Prince (2004) examined the educational research and found "the core elements of active learning are student activity and engagement in the learning process" (p. 8). Conclusions drawn from Prince's investigation of the literature provided considerable support from the research that demonstrated the benefits of incorporating active learning within the curriculum.

Another key component of the constructivist philosophy is that learning is a social endeavor, one that relies on social interaction and collaboration as a conduit to construct meaningful knowledge (Almala, 2005; Bruckman, 2004; Cooperstein & Kocevar-Weidinger, 2004; Dickey, 2003; Gagnon & Collay, 2006; Petraglia, 1998; Tynjälä, 1999). The concept of social learning can be traced back to a number of sources including Lev Vygotsky and his socio-cultural theory of learning (Rogoff, 2003).

The central premise to Vygotsky's theory is that learning occurs within the zone of proximal development, meaning that the learner enhances their cognitive development through social interactions with others, more specifically, with peers that have a higher level of skill development (Rogoff, 2003; Vygotsky, 1978). Vygotsky argued that cognitive skills such as problem solving and reasoning were strongly influenced by the social, cultural and historical environment in which the learner resided, that "higher mental functions were socially formed and culturally transmitted" (p. 126). Constructivism draws many of its tenets from Vygotsky's socio-cultural theory including the contention that learners not only benefit from the knowledge of more experienced and skilled peers, but also from the differing perspectives and viewpoints they bring to the learning environment.

It is important, however, to understand that while the major tenets of constructivist learning encompass learner knowledge construction through active learning practices and through social interaction, Bransford, Brown and Cocking (2000) warn not to confuse "theories of knowledge" with "theories of pedagogy" (p. 11). They offer that a common misconception regarding constructivism is that the learner is simply "let loose" to construct knowledge with little intervention from the teacher (knowledge theory)

(Bransford, Brown & Cocking, 2000). In terms of pedagogical considerations, it is crucial for the teacher to provide structure and scaffolding in order to support student learning (Bransford, Brown & Cocking).

While the constructivist learning approach may well serve as the underlying foundation in curriculum development, it is equally important to focus attention on the applied instructional strategies and effective teaching practices that comprise the main support for the learning structure.

Seven Principles for Good Practice in Undergraduate Education. Chickering and Gamson (1991) identified from their research about "the way teachers teach and students learn" (p. 13), *Seven Principles for Good Practice in Undergraduate Education*. The seven principles describe key characteristics that make up good teaching practice. The following provides a brief summary of each of the seven practices recommended by Chickering and Gamson:

1) Student-Faculty Contact: Faculty need to be accessible and approachable, providing consistent contact between the faculty member and the students;

2) Cooperation Among Students: Collaboration among students supports active participation and increases the involvement of students in the learning process;

3) Active Learning: Active rather than passive learning whether developed for individualized or collaborative work enhances student learning;

4) Prompt Feedback: Students need prompt and consistent feedback about assignments, exams, performance and student progress. According to Chickering and Gamson (1991), "the most significant conclusion to be reached from research on innovative teaching methods, then, is that immediate, corrective and supportive feedback is central to learning" (p. 19);

5) Time On Task: The amount of time spent involved in the subject (time allotment), how the information and activities are planned, organized and facilitated (time management) as well as the amount of time actively engaged in the subject matter (time on task) are all essential elements that influence student learning;

6) Communicates High Expectations: Teachers who set high expectations using attainable goals are more likely to see increased levels of achievement from their students (Chickering & Gamson, 1991, p. 21).

7) Respects Diverse Talents and Ways of Learning: Students bring to the classroom not only differing perspectives, but also diverse approaches to learning. Enhancement of the learning process can be encouraged by teachers who acknowledge these different learning styles, incorporate compatible instructional methods and who teach learning strategies that help students develop alternative modes of learning (Chickering & Gamson, 1991).

In general, engaging students in their own learning is related to persistence and success in reaching their educational goals. The constructivist learning approach with its emphasis on knowledge construction, active learning and social interaction between and among peers is a theoretical framework that supports student engagement in the learning process. While constructivism provides the foundation for engaged learning, the *Seven Principles for Good Practice in Undergraduate Education* offers instructional methods or strategies that can be applied in both the traditional and the virtual classroom.

Learning in Virtual Environments

Issues with online courses. When reviewing the effectiveness of online courses through the lens of the Seven Principles for Good Practice… it becomes apparent that the most persistent criticism regarding online learning stems from the non-application or misapplication of a number of these principles. For example, a concern often voiced by students enrolled in online courses is the lack of opportunities for deliberation and discourse, as well as a lack of intellectual and social interaction among peers and the instructor (Calvert, 2005; Matthews, 1999; Middleton, 1997; Sampson, 2003; Sherry, 1996; Wilkes, Simon & Brooks, 2006). Additionally, online learners frequently express dissatisfaction with the lack of prompt and consistent instructor feedback, a concern that seems to be experienced less within a traditional classroom format (Larreamendy-Joerns

& Leinhardt, 2006; Sampson, 2003; Schlosser & Anderson, 1994; Tallent-Runnels et al., 2006).

In their investigation into the eLearning experiences of graduate students, Gilbert, Morton and Rowley (2007) found that students were generally satisfied with the "synergy between theory and practice, discussion forums and learning support" (p. 570), however, the students reported dissatisfaction about "the robustness and usability of (the) platform" (p. 560). Some of the overall conclusions drawn from the Gilbert et al. (2007) research included the realization that each online student engages with the curriculum differently, just like students within traditional, face-to-face classrooms. Moreover, while the discussion threads posted by the professor were appreciated, most of the students were unsure about how to actually contribute to the online discussion.

Similar research conducted by Wilkes, Simon and Brooks (2006) compared faculty perceptions of online courses and degree programs with those of undergraduate students and found significant differences in perception between the subject populations. Generally, faculty members were more likely to view online courses as a "highly structured presentation of material" (p. 136) when compared to on-campus courses, while the students surveyed had a strongly opposing view (Wilkes, Simon & Brooks).

The problem of high attrition among online learners and the factors that can lead to early dropout in online courses has been the subject of numerous research studies (Bryant et al., 2005; Chernish et al., 2005; Gibbs & Gosper, 2006; Leung & Li, 2006; Matthews, 1999). Tyler-Smith (2006) in his review of the factors that contribute to the early withdrawal of adult learners from online courses identified common challenges that online learners must face when enrolling in an online course for the first time.

He suggested that "challenges with technical access, organization, social challenges, information overload, isolation, asynchronicity, text-based discussions and multiple conversations" (p. 78) result in online learners experiencing a cognitive overload that in turn is the catalyst to early withdrawal from online courses (Tyler-Smith, 2006).

For many online students, the learning curve needing to be successfully negotiated within a virtual environment can be daunting. Tyler-Smith (2006) proposes a conceptual eLearning model that outlines the "multidimensional learning tasks" (p. 80) that each online student must negotiate if they are to successfully complete the course, a model that addresses the "anxiety of learning" (p. 78) often experienced by the online learner. Below are the learning tasks Tyler-Smith discusses in his eLearning model:

> 1) Negotiating Technology: learner has to be competent in using the technology especially when there is little technical support;
>
> 2) Negotiating the Learner Management System (LMS) Interface: learner has to learn how to navigate websites and engage in web-based research;
>
> 3) Negotiating the Learning Content: developing the skills necessary to engage in course content including the materials, readings, activities, assignments and exams;
>
> 4) Becoming an E-learner: learner has to learn to shift their style of learning from the traditional classroom-based model to a model that is geared toward individual and independent learning, self-direction and self-motivation;
>
> 5) Negotiating Computer Mediated Communication (CMC) Interaction: learner has to interact with peers via asynchronous and synchronous modes of communication. (p. 79-80)

A suggested strategy that may prove useful in reducing cognitive overload is to develop and integrate a virtual orientation or face-to-face "induction workshop" (p. 80) into the curriculum. These virtual orientations can be developed to weave throughout the length of the course, opportunities for students to master the learning tasks

that have been outlined in this conceptual model. Other strategies to be considered include the distribution of printed instructions, complete with course screenshots so as to reduce the steep learning curve experienced by many online learners (Tyler-Smith, 2006).

The cognitive overload proposition is an interesting concept because if online learners, particularly those enrolling in online courses for the first time are intimidated, overwhelmed and overloaded by the skills, tasks and problems associated with negotiating the virtual classroom, then engaging students in the process of learning can be a significant challenge for anyone teaching an online course.

There are, however, educators that have observed a venue where multiple individuals are involved in engaged learning. This collective endeavor includes involvement in complex online tasks where experts assist novices in enhancing knowledge as well as skill development. Active learning takes place in the form of community involvement where participants frequently interact and cooperate with one another, where respect is shown for the diversity of talents and where community members offer prompt feedback regarding challenges and performance. Such are the common characteristics found in the multiplayer online game environment.

What education can learn from computer games. In recent years, the educational community has begun to explore the educational potential of computer games. The popularity of both console and online computer games is growing rapidly with 53 percent of all Americans participating in some type of game format (Tobias & Fletcher, 2007). Often educators view the typical "gamer" as children or teenagers, but in reality the average age is 33 years old and among online gamers, 48 percent are male and 42 percent female (Carstens & Beck, 2005; Tobias & Fletcher, 2007). Additionally, one of the

fastest growing segments of the gamer population is the retired worker, especially women who use games as a way to maintain their alertness (Tobias & Fletcher).

Given the fact that 70 percent of all gamers are age 18 or older, it is understandable why many educators are interested in understanding what it is about computer games that make them so appealing to users and what type of learning takes place within that context that can be translated to the academic environment (DeKanter, 2005; Ducheneaut, Yee, Nickell & Moore, 2006; Gee, 2003; Halverson, 2005; Naish, 2005; Squire, 2006; Steinkuehler, 2004; Tobias & Fletcher, 2007).

For example, Dickey (2005) conducted research to investigate how specific attributes of game design that lead to player engagement could be incorporated into instructional design. Critical game design strategies such as "role playing, challenges, interactive choices and interaction with other players" (p. 67) and how these methods could be integrated within an active learning framework within an educational context (Dickey, 2005).

Similarly, Rice (2007) was interested in identifying the key characteristics of computer video games that support higher order thinking in order to develop an assessment tool (rubric) that could be used by teachers to evaluate the cognitive potential of educational computer games. Blumberg and Sokol (2004) examined gender differences among second-grade and fifth-grade children in terms of the types of cognitive strategies that were used when they were in the process of learning how to play video games. And Ko (2002) explored the different methods that could be used in the analysis of cognitive skills used by seven to ten year old children engaged in playing computer games.

In his book entitled *What Video Games Have to Teach Us About Learning and Literacy*, James Paul Gee (2003) contends:

> Video games are what they are, an immensely entertaining and attractive interactive technology built around identities…they build into their designs and encourage---good principles of learning, principles that are better than those in many of our skill-and-drill, back-to-basics, test-them-until-they-drop schools." (p. 205)

According to Gee (2003), there are 36 learning principles commonly found within the design of good video/computer games that can be applied or adapted to the educational learning environment (Appendix A). Upon closer evaluation of these 36 learning principles, one can identify at least six of the *Seven Principles for Good Practice*… (Chickering & Gamson, 1991). Good Practice number two, Cooperation Among Students is supported by the Dispersed Principle (#34) and Affinity Group Principle (#35) where gamers share their knowledge, expertise and collaboration on tasks with one another inside and outside of the game domain (Chickering & Gamson, 1991; Gee, 2003).

Next, Good Practice number three, Active Learning is supported by the Active, Critical Learning Principle (#1) which describes the game environment as one that involves experiential learning where gamers interact with the software and other gamers experimenting with new approaches to problem-solving and develop resources that can be applied to future endeavors (Chickering & Gamson, 1991; Gee, 2003).

Good Practice number four, Prompt Feedback can be found within the Explicit Information On-Demand and Just-In-Time Principle (#27) and explains that built into the design of the game is critical information made available to the gamer at just the point where the "…information can best be understood and used in practice." (p. 211)

(Chickering & Gamson, 1991; Gee, 2003). Continuing the comparison, Good Practice number five emerges from both the Practice Principle (#12) as well as the Bottom-Up Basic Skills Principle (#26) where the game design promotes the evolution of the gamer from novice to master by giving them multiple opportunities to practice and hone their skills using a variety of increasingly challenging tasks used to engage players (Chickering & Gamson; Gee).

Good Practice number six, Communicates High Expectations is present in the Achievement Principle (#11) where games are designed to ensure varying levels of play with incentives programmed in to encourage the mastering of each skill level (Chickering & Gamson, 1991; Gee, 2003). Additionally, "basic skills are not learned in isolation or out of context" (p. 210), gamers learn from their successes and failures and use that knowledge to advance to the next level of play (Gee).

Finally, the last Practice, number seven, can be viewed within the Multiple Routes Principle (#16) and the Multimodal Principle (#20) (Chickering & Gamson, 1991; Gee, 2003). Games are designed so that there are multiple approaches to achieving goals. Gamers often become aware of their own style of learning and are exposed to a diversity of approaches through their collaborative work and through strategizing with other players (Gee).

MMOGs-massively multiplayer online games. Gee's (2003) observations provide powerful "food for thought" when considering how to best design course work for engaged online learning, observations that have sparked much interest into the educational potential of computer games. In recent years, researchers have begun to

investigate a relatively new form of computer gaming called the Massively Multiplayer Online Game (MMOG) as a platform for learning.

MMOGs are immensely popular games where a large number of players can play and interact with one another online simultaneously and in real-time. Unlike previous generations of computer games where players purchased software that allowed only one or two gamers to play from a single computer, MMOGs are subscription-based commercial websites that allow sometimes millions of players to download the software that will give them access to a designated virtual world.

MMOGs are graphical, three-dimensional, persistent worlds that typically center on a fantasy inspired storyline involving quests, challenges and collaborative tasks among its players. They frequently require activities that when completed successfully, will permit players to advance to the next level within the game. Players are represented within the MMOG by individual, personalized, visual character models called *avatars* that are dynamic in nature, allowing players to move, dialog (chat) and perform tasks within this virtual world. MMOG developers or game designers, offer players an ever-changing landscape of challenging activities in an effort to keep the gamers engaged and thus ensure longevity in game participation.

Of interest to a number of educators, is the type of socially generated, engaged learning that appears to take place within MMOGs. Squire (2006) suggests that "participation in online gaming…demands a range of (primarily written) social practices, eliciting an enormous amount of reading, writing, research, analysis and argumentation" (p. 23). For MMOGamers to move ahead in the game, it is usually to their advantage to

"share what they know" as completion of most level-advancing activities require expertise from varying skill-sets, therefore, collaboration is often advantageous.

This exchange of knowledge is mostly situational where experts share with newcomers mutually benefiting information, resources and skills. Consistent with the participation framework of situated learning as proposed by Lave and Wenger (1991), the learning that occurs between and among MMOGamers is highly interactive, one involving legitimate peripheral participation where newcomers can accelerate more smoothly through the challenging game levels by apprenticing with game experts. Steinkuehler (2004) in her study that focused on learning within Massively Multiplayer Online Games states "what is at first confined to the game alone, soon spills over beyond the virtual world (websites, chatrooms, email, face-to-face meetings, telephone calls)" (p. 522).

It appears that the most effective approach to learning within the MMOG environment is not through isolated information retrieval, but through interactive social practice where the individual learns by doing and by engaging in dialog with more experienced and knowledgeable participants. Steinkuehler (2004) compared the active learning commonly found within the MMOG environment to that of cognitive learning, she states "from a learning sciences perspective, cognition is (inter) action in the social and material world" (p. 522).

Other studies have evaluated game-based learning using the constructivist learning approach. For example, DeKanter (2005) proposes that the characteristics commonly found in multi-player games such as interactivity, knowledge construction, contextualized knowledge, collaboration and reflection among players as well as the

opportunity to test ideas using alternative views and perspectives are aligned with the "theoretical principles of constructivism" (p. 27).

Begg, Dewhurst and Macleod (2005) explored the effectiveness of using an immersive, social game environment developed using constructivist and problem-based learning approaches to teach medical curriculum to undergraduate students and found that "principles of successful digital gameplay can contribute towards learning applications without embedding curricular content in actual games" (¶ 25).

Given the high level of participation by MMOGamers, a number of studies have been interested in determining the game design factors that contribute to high levels of engagement often observed in players. Factors such as the pedagogical effectiveness of MMOGs as learning environments (Delwiche, 2006; Gros, 2007; Halverson, 2005; Tobias & Fletcher, 2007; Young, Schrader, & Zheng, 2006) the methods, strategies and techniques used by game designers to engage players (Dickey, 2005; Dickey, 2007; Salen & Zimmerman, 2004) and the social aspects of the online gaming world (Ducheneaut et al., 2006; Squire, 2006).

However, all of this interest in game-based learning has not been without its critics. Some researchers have argued that the empirical evidence supporting the effectiveness of computer games for the purpose of learning is slim at best. O'Neil, Wainess and Baker (2005) examined thousands of published articles that addressed the educational benefits of computer games, yet they could find only 19 articles from peer reviewed journals with solid empirical research design. Using Kirkpatrick's four levels for evaluating training and the CRE 557 model of learning as their evaluation framework for reviewing these 19 journal articles, O'Neil et al. concluded that results were mixed

regarding the effectiveness of games for learning. In general, they concluded that the instructional design and the instructional strategies used in courses were the critical factors in learning rather than the games themselves (Clark, 2007; O'Neil et al., 2005).

Clark (2007) echoes this position and argues "none of the peer reviewed studies reported compelling evidence that games produced significantly more learning or motivation than other instructional platforms" (p. 57). While their review of the empirical research about the pedagogical effectiveness of computer games supported the findings of O'Neil et al. (2005) and Clark (2007), Tobias and Fletcher (2007) suggested that given the popularity of computer game use by students, game-based learning may still be the way to reach this audience. They offered research-based recommendations directed toward game designers that would strengthen the instructional elements of game design and resolve some of the concerns posed by "games in education" critics. More specifically, Tobias and Fletcher's game design recommendations ranged from the inclusion of cognitive analysis of game tasks to pedagogical considerations such as minimizing discovery-based learning and providing more user guidance. Overall, these researchers made 13 recommendations for game designers.

Part of the problem in evaluating the effectiveness of game-based learning is that narrative or story-based games, simulations and multi-user virtual environments (MUVE) are often lumped together as if they would all be applied to the instructional curriculum in the same way. In story-based games such as *Civilization III* or *Rise of Nations*, game developers structure the story lines and offer differing scenarios, though players do have some influence over the final outcome of game play. Simulations tend to be used for the purposes of training especially for military, aviation or medical education (Begg et al.,

2005; Tobias & Fletcher, 2007). Multi-user virtual environments (MUVE), however, are not pre-determined stories driven by game developers, nor are they necessarily simulations of reality, though they could be. MUVEs are persistent, computerized virtual spaces that have evolved out of MUDs and MOOs, textual virtual environments popularized in the 1980s and 1990s (Che & Zhang, 2005; Dieberger, 1996).

MUDs, MOOs & MUVEs. Multi-User DUNGE(o)N or Dimension (MUD) was first developed by Roy Trubshaw and Richard Bartle as a persistent, computer-moderated, text-based virtual environment that allowed users to interact with one another in a shared virtual space (Bartle, 2004; Che & Zhang, 2005). MOO is the acronym for MUD Object-Oriented and represents one of the later versions or stages of the MUD by extending its social capabilities (Bartle). Both MUDs and MOOs became attractive to the educational community because they supported not only interaction among its users in real-time, but also gave the user the ability to create objects and things within that virtual space (Che & Zhang, 2005; Turkle, 1998).

For educators looking for a new and innovative way to reach students, the technology driven MUDs and MOOs provided a teaching platform that could accommodate a large number of students and give access to course materials using a virtual framework. With the introduction of the Internet and World Wide Web, these multi-user virtual environments became much more sophisticated evolving into virtual classrooms and social spaces. During this time, the MUD/MOO user, visually represented by an avatar, was able to attend online seminars and events, participate in class discussions, read course materials, submit papers and form social communities (Barab,

Thomas, Dodge, Carteaux & Tuzun, 2005; Che & Zhang, 2005; Dieberger, 1996; Haynes, 1998; Turkle, 1998).

Over the course of web-based education, the consistent criticism directed at online classroom learning has been that distance learners often feel disengaged from the learning process and can feel isolated from the instructor and peers (Arbaugh & Benbunan-Fich, 2006; Chin & Williams, 2006; Sampson, 2003; Sherry, 1996). Additionally, cognitive overload generated from the amount of information needing to be assimilated along with technical difficulties common in navigating the technology contributed to high attrition rates in online courses (Tyler-Smith, 2006).

Recently, a number of researchers have looked into the positive attributes found in computer gaming as a possible solution to these issues in online learning (Gee, 2003; Squire, 2006; Steinkuehler, 2004; Young, Schrader & Zheng, 2006). Of interest to these educators has been the strategies, the methods and the techniques Massively Multiplayer Online Game (MMOG) developers have used to enhance learning in a highly complex technical environment through the design of the game. Many MMOG developers have been successful in engaging users with their knowledge base, challenging the status quo by integrating ever-increasing levels of difficulty within the game. The social nature inherent in MMOGs supports the sharing of knowledge between expert and novice and encourages collaborative endeavors among its users.

While little empirical research exists demonstrating the effectiveness of commercial computer games for the purposes of learning in an educational context, the majority of the *Seven Principles for Good Practice…* can be identified within the online gaming environment (Chickering & Gamson, 1991; Clark, 2007; O'Neil et al., 2005).

Similar in structure to the MMOG is the multi-user virtual environment (MUVE), a virtual platform that has continued along the evolutionary trajectory of MUDs and MOOs developing into a three-dimensional (3D), immersive virtual world that is not quite a game and not quite a virtual classroom. Best described as hybridization between MUDs/MOOs and MMOGs, these 3D virtual worlds seem to combine the best of both environments. The 3D virtual world is a growing segment of the emergent Web 2.0 technologies, the next phase of the Internet, one that emphasizes social interaction and collaboration among its users.

Emergent Technologies: The Educational Potential of Web 2.0 Tools

Commonly viewed as the next progression of the Internet, many of the current and emergent Web 2.0 technologies were developed to support interaction and sharing between users (Beldarrain, 2006; Cardus, 2006; Milne, 2007). If the first phase of the Internet can be regarded as the era of global information, albeit in a read-only format, this new phase of the Internet can best be described by its capabilities to foster a global exchange and creation of knowledge, global collaboration and global communication both professionally and socially. Most Web 2.0 technologies encourage dynamic interaction among its users either synchronously or asynchronously and have integrated into the platform a wider range of audio and/or visual modalities. Collaborative workspace or social software as it is sometimes called allows multiple users to contribute and edit content and is among the most popular of the available Web 2.0 tools (Alexander, 2006).

Blogs and wikis. A blog or "web log" is a web-based application that allows the author to publish content that may be accessed via the Internet (Beldarrain, 2006; Cardus,

2006; Churchill, 2007). Blog content is listed in reverse chronological order listing the most recent entries first and can take the form of a personal diary, expression of opinion and personal interest or a sharing of knowledge and resources. Unlike standard web pages, comments concerning blog content can be posted on the blog by any Internet user or restricted by the blog publisher or blogger to a select group of people (Alexander, 2006; Churchill, 2007). Basic blogs usually contain text, graphics and links to other websites, however, in recent years the blog has expanded to accommodate other formats. Content posted from mobile devices such as cell phones are called moblogs, visual postings from video are called vlogs and the audio version of the blog with audio recordings is termed audilog or audioblog (Beldarrain, 2006; Churchill, 2006).

A wiki, also a web-based application, differs from the blog in how it is used by the author. Beldarrain (2006) explains "a wiki is a collection of web pages that are linked to each other, and reflect the collaborative work of many authors" (p. 142). Unlike the blog, wikis allow multiple authors to post, delete and edit content (Alexander, 2006; Ferris & Wilder, 2006). Inherently collaborative, wikis support knowledge creation and knowledge sharing activities by giving the authors the ability to continually update content while archiving previous versions of the content (Churchill, 2007). Because of the organizational structure of the wiki pages, wikis are useful repositories of knowledge that similar to the blog, supports text, graphics, web links and other audio and video media (Beldarrain, 2006; Cardus, 2006).

Due to the "emerging" nature of these new Web 2.0 technologies, little empirical data exist concerning the effectiveness of their use within the educational environment. There are, however, a number of research articles that discuss the educational potential of

these Web 2.0 tools. For example, Churchill (2007) proposes that student blogs may serve as an effective vehicle for digital portfolios where students can share digital stories and use "interactive and visual representations and other multimedia artifacts that demonstrate their learning" (p. 27).

Maloney (2007) suggests that higher education take a closer look at these Web 2.0 technologies as their emphasis on active participation by the user is conducive to student-centered learning and encourage individual responsibility in the learning process. Beldarrain (2006) provides applied examples of these new technologies within the educational setting such as Columbia University Teacher College's (USA) instructor-blog used to publish course information with links to student-created blogs and Bowdoin College's (USA) student generated wiki devoted to sharing resources about romantic literature and poetry. Further, when viewing the pedagogical possibilities of these emergent technologies, Alexander (2006) offers,

> "one could imagine faculty and students across the United States following, for example,… the outcome of a genomic patent and discussing the issue through these and other Web 2.0 tools. Such a collaboration could, in turn, be discovered, followed and perhaps joined by students and faculty (from) around the world." (p. 40)

In an article entitled *Is Education 1.0 Ready for Web 2.0 Students?* Thompson (2007) gives the results of an *EDUCAUSE* student survey that revealed 68% of the students surveyed preferred faculty make moderate or extensive use of technology to communicate knowledge. These survey results are important given the growing diversity of the students entering educational institutions.

An example of this demographic shift is Cardus'(2006) discussion on the convergence of the different generations that make up the adult population within the

United States. The article describes the Silent Generation (born after the great depression), the Baby Boomers, Generation X and the Millennial Generation as distinctive groups of people all impacting the workforce as well as schools, colleges and universities in order to enhance their employment skills. Cardus suggests that these new technologies particularly those involving collaborative workspaces including blogs and wikis can be used as a great equalizer among these generations, encouraging an exchange of knowledge among and between the groups.

Virtual worlds. As discussed previously, immersive virtual worlds are not new to education though with advances in new technologies and more sophistication in its capabilities, what has occurred is resurgence in the exploration of virtual worlds as a platform to enhance learning.

Over the years, virtual worlds have gone through several changes, each with a different purpose. The best description of a virtual world is provided by Bartle (2004) one of the initial developers of virtual worlds, who states,

> Virtual worlds are places. Virtual worlds are not simulations, because they don't simulate anything. They approximate aspects of reality—enough for the purposes of immersion… They may simulate abstractions of reality; they may be operated as a service; creating them may be an art; people may visit them to play games. Ultimately, though, they're just a set of locations. Places. Most certainly of all, virtual worlds are not games. (pp. 474-475)

Book (2006) adds depth to the description of virtual worlds by offering six features commonly found in multi-user virtual worlds. First, the user interface is graphical, giving the illusion of 3D space and using visual and spatial representations of the world. Secondly, a virtual world is shared space, allowing multiple users to participate at the same time. Thirdly, there is immediacy to virtual worlds, all actions and interactions occur in real-time. Fourthly, interactivity is a key feature of virtual worlds.

Users not only interact with one another, but they also have the ability to interact with the virtual environment as well as create and alter objects. Fifthly, virtual worlds are persistent. They continue to exist even when a user is not logged in. And finally, virtual worlds encourage a sense of community. Users with common interests whether socially or professionally often develop into community groups that can transcend beyond virtual world borders into real life.

Virtual worlds have become an appealing learning platform to many educators for various reasons. The realism provided by the 3D images, the high degree of immersion experienced by the participants and the ability to interact with others and the virtual environment itself gives students the opportunity to engage in activities that are difficult, dangerous or impossible to do in real life (Dalgarno, Hedberg, & Harper, 2002). For example, students can visit 3D virtual re-creations of historical sites, taking on the societal roles of people living centuries earlier. Visually realistic and interactive, explorations of outer space, the ocean floor or objects at the molecular level can all occur within virtual worlds.

Using an immersive virtual environment for children, Roussos, Johnson, Moher, Leigh, Vasilakis & Barnes (1999) implemented the NICE project (Narrative-based, Immersive, Constructionist/Collaborative, Environment) where second-grade children "collaboratively construct, cultivate and tend a healthy virtual garden" (p. 248). The students had the ability to "shrink" their avatars, walking below the surface of the virtual soil to investigate root systems and interact with soil inhabitants.

Dede (2003) developed the multi-user virtual environment (MUVE) *River City* to middle-school children where students were immersed in a 19th century city. The students

worked collaboratively using virtual laboratory tools to investigate problematic water samples and the potential ramifications of the samples to the virtual populace living in *River City*.

The *Quest Atlantis* project is another MUVE for children ages 9-12 where students immersed as avatars in the virtual world engage in a series of individual or collaborative quests with the goal being to save virtual Atlantis from disaster. According to Barab et al. (2005) the creators of *Quest Atlantis* designed the game to incorporate sound pedagogical practices within the storyline,

> Completing quests requires that students participate in real-world, socially and academically meaningful activities, such as conducting environmental field studies, interviewing families and friends, researching community problems, examining current events from multiple perspectives, writing autobiographical anecdotes, producing advocacy media or developing real-world action plans. Each quest is also connected to local standards…(p. 95)

Undergraduate college students used *Second Life*, a non-narrative virtual world as a platform to learn the elements of videogame design and criticism (Delwiche, 2006). The *Second Life* environment served a dual function by providing both virtual classroom space for class discussion and interaction, as well as the "sandbox" or workspace for the game prototype.

Educators are frequently drawn to virtual worlds because of their compatibility with constructivist learning. The construction of knowledge, active participation, emphasis on collaboration and the social nature of virtual worlds are all conducive to the constructivist educational philosophy (Dede, 1995; Dickey, 2003). Additionally, virtual worlds support situated learning through the creation of authentic context and the encouragement of the expert-novice exchange of knowledge (Chittaro & Ranon, 2007; Dalgarno et al., 2002; Delwiche, 2006). Virtual worlds can easily accommodate

"*The Seven Principles for Good Practice*…" through the real-time communication tools that allow avatar contact between students and faculty and therefore, provide the opportunity for prompt feedback from the instructor. Virtual worlds also support active and cooperative learning and can accommodate a diversity of learning styles and perspectives since it is a global platform (Beldarrain, 2006; Chickering & Gamson, 1991).

Second life. Second Life is an online three-dimensional (3D), immersive virtual world created by Linden Lab®. Graphically similar to real world environments, *Second Life* regions re-create land terrain, water and sky along with simulated weather conditions that range from sunrise to sunset and from foggy to snowy to tropical conditions (Figure. 2).

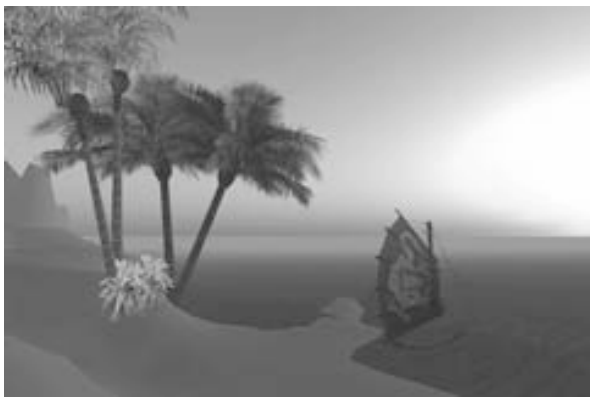


Figure 2. Snapshot of Second Life virtual world

The *Second Life* virtual world is a non-narrative virtual environment inhabited and shaped by its "residents," dynamic avatars that are representative of each of the users participating in the virtual world (Delwiche, 2006).

Avatar appearance can be customized in a variety of ways; for example, residents can choose different clothing styles, add attachments such as glasses and jewelry or adopt an animal persona. Resident avatars are given the ability to walk, run, fly, dance, chat,

and perform other animated functions along with the ability to send instant messages or notes while in *Second Life*.

All *Second Life* residents have access to 3D modeling tools that allow one to create, edit and build objects in the virtual environment (Graetz, 2006). These tools form the basic building blocks of all objects called "primitives or prim" and can be used to create everything from virtual butterflies to houses to spaceships. Residents are also able to upload images, sound, stream video and use voice communication (VoIP). Animations that control avatar or object behavior can be programmed using a powerful scripting language called Linden Scripting Language (LSL) developed by Linden Lab® (Rymaszewski et al., 2007).

Further, *Second Life* has its own economy and its own currency called Linden Dollars where residents can purchase virtual items such as land (grid space), houses, avatar clothing, scripting code (scripts), images, etc. At the time of this writing, the basic *Second Life* account is free though users pay a tiered-structured subscription fee if they wish to obtain a premium account that allows the user to purchase a greater amount of virtual land (reserved grid space).

Over 120 colleges, universities and non-profit organizations from around the world have used *Second Life* as virtual classrooms, meeting space, exhibits, conferences, presentations and virtual experimentation. Many educators purchase virtual islands in *Second Life* because it gives the owner of the island control over who has access to the island and what type of activities can take place. In other words, instructors can restrict visitation to the island to only the students enrolled in the course so that other residents

cannot have access to it. This is an important component of *Second Life* given that it is a global virtual world that is made available to anyone in the real world.

Non-profit organizations use *Second Life* for a variety of reasons including community building, real-life support groups or for promoting a specific cause. Commercial businesses use *Second Life* for virtual meetings or to showcase products. Artists and musicians use *Second Life* for artistic experimentation and to promote their talent while game developers use it to create prototypes of online games. Finally, a large segment of *Second Life* residents use this virtual world for purely social reasons and leisure activities, forming full functioning virtual communities that truly create a "second life."

In summary, Web 2.0 technologies are changing the way our society communicates, collaborates and form connections with one another. Emergent technologies such as virtual worlds, blogs and wikis may be useful tools that encourage student engagement in the learning process as well as supports learning theory and pedagogy for both the on-campus student and the distant learner.

Design for Learning

Instructional design models. All of these new technologies may hold exciting possibilities for the future of online learning, yet it is easy to forget that it is not the technology that does the actual teaching any more than instruction occurs from a pencil or whiteboard. Too often, educators and instructional designers become enamored with the technology, taken in by the "wow factor" of the latest innovation without enough analysis given to how the technology should be integrated into the curriculum and

whether or not it actually supports learning (Garland & Martin, 2005; Martens, Bastiaens & Kirschner, 2007; Sherry, 1996).

Rather than let the technology become the driving force behind the teaching, online content development needs to be based upon the fundamental principles of effective instructional design, principles that are aligned with sound pedagogical practices and built from solid educational learning theory. Recent studies remind us that when using new technologies as a part of the curriculum such as computer games, the most critical factor needed to enhance learning is in the instructional design and the instructional strategies used in the course (Clark, 2007; O'Neil et al., 2005).

Historically, one of the most widely used Instructional System Designs (ISD) is the ADDIE model, initially developed as a systems engineering problem-solving process (Allen, 2006). The ADDIE model is a five-phased, systems-based approach that incorporates (A)nalysis, (D)esign, (D)evelopment, (I)mplementation and (E)valuation as the key components of its instructional design methodology.

When initiating the ADDIE model, instructional designers first perform an analysis of the problem, clarifying and defining it along with possible solutions. The design phase involves the creation of instructional strategies that support learning goals and objectives, while the development phase assimilates content and supportive materials and resources. Implementation refers to the actual launching of the course and finally, formative evaluation is used throughout the process to determine the effectiveness of the instruction, culminating in an overall summative evaluation at the end (Allen, 2006; Braxton, Bronico & Looms, 2000; Strickland, 2006).

Although the ADDIE process is still used as a foundation model for many instructional designers, over the years it has been modified to meet the changing needs of the educational environment including the virtual classroom. Fresen (2007) expanded the ADDIE model in an attempt to provide a more holistic approach to instructional design, one that addressed the unique factors commonly associated with web-based learning.

The taxonomy of factors identified as important features necessary to support quality online learning were organized around six factor-related categories: institutional, technology, lecturer, student, instructional design and pedagogical (Fresen, 2007). Within these six categories, Fresen recommended that factors such as a learner-centered environment (pedagogical), currency of learning resources and content (pedagogical), layout and presentation (instructional design), appropriate bandwidth and download demands (technology), usability (instructional design) and multiple learning paths (pedagogical) be integrated into the ADDIE instructional design model (p. 353-354).

Further expansion of the ADDIE design is recommended by Irlbeck (2006) who proposes that online education needs more of a contemporary design framework and presents a case for using emergent theory as the design foundation. Rather than apply a traditional systemic approach to course design where the instructional designer controls content, objectives, activities and outcome, emergent theory encourages high level interaction and contributions from the learners themselves resulting in a dynamic, flexible and adaptable design model though scaffolding is provided by the instructor (Irlbeck, 2006).

Irlbeck (2006) cites examples of emergent systems being applied in mainstream society by observing the interaction and contributions of individuals participating in

video games, blogs and virtual communities. Additionally, she suggests that instructional designers can generate the same dynamism found in mainstream social networking technologies by using 3D chat rooms, blogs, MOOs and MUDs to foster faculty-student, student-student, student-content and student-interface interactions (Irlbeck, 2006).

Online learning appears to be moving out of the experimental phase, instead being replaced by a refinement of the pedagogical and instructional design principles that address the unique conditions found within the virtual environment. For instance, a marked departure from the five-step ADDIE model is Boettcher's LeMKE framework for designing effective learning environments; a framework developed from cognitive learning research studies.

The LeMKE framework is comprised of a number of core principles with the first learning principle, #1 Every Structured Learning Experience Has Four Elements With the Learner at the Center, setting the base for the framework by defining four central elements that make up the LeMKE model—the Learner, the Mentor/Faculty, the Knowledge and the Environment (Boettcher, 2007, ¶ 3).

The Learner segment encompasses individual learners as well as a classroom full of students, but the main idea behind this LeMKE element is the recognition that each learner experiences learning in a slightly different way. The Mentor/Faculty segment is the element that provides the instruction, guidance and support to the learner through a physical presence, virtual presence or through programmed agents such as text postings or video components. The Knowledge element refers to the course content and the resources made available to the learner that would be useful in the acquisition of content knowledge. And the final element, Environment is determined by the actual design of the

course. It is in this phase that the designer structures the activities, assignments and setting for the course. For example, content exploration may take place within a virtual environment, via a hand-held mobile device or through the use of other social networking technologies (Boettcher, 2007).

She also points out in the remaining core principles, instructional design considerations that are particularly pertinent to online learning. A consideration such as the role of the faculty member or instructional designer is to design and structure a contextual learning experience since "learning occurs only within a context" (Boettcher, 2007, ¶ 10). Consistent with the pedagogical practices as outlined in the *Seven Principles for Good Practice...*, Boettcher discusses how to structure effective student learning experiences,

> …a well-planned course provides a variety of interaction choices for students. For example, a well-planned course balances three levels of interaction: faculty-to-student, student-to-student, and student-to-resources. Additionally, a well-planned course balances three types of activities: individual activities, small group activities and large group activities. By ensuring multiple channels of communication, engagement and collaboration within the design of a course, faculty members provide a richly textured environment that can accommodate a full range of student needs and learning styles. (¶ 9)

Further, the LeMKE framework underscores individual differences in how people learn by reminding us that each person's brain is unique and so is the learner's zone of proximal development (Boettcher, 2007; Vygotsky, 1978). Boettcher suggests that student disengagement may occur when a student is outside of their learning comfort zone and that perhaps, they cannot see the conceptual relationship between one idea and another resulting in a withdrawal from course participation.

To address this zone discomfort, other core principles advise using successive approximations that lead to conceptual learning and concept acquisition. Here blogs,

wikis and discussion forums are recommended as online tools useful in facilitating concept clarification, establishing meaning to concepts and assisting in making the student's thinking process visible.

Finally, the usefulness of technology tools for both the online and on-campus classroom is included in the design principles. Instructional designers are reminded that our students have already discovered communication and collaboration tools such as instant messages, blogs, wikis, online forums and discussion boards for activities outside of the classroom, so why not integrate these technologies into the curriculum to enhance communication with the instructor and between students as well as encourage conceptual and peer-to-peer learning.

Similar in some respects to the LeMKE framework, Sims, Dobbs & Hand (2002) proposed the Proactive Evaluation framework to improve the quality of online learning. Unlike many instructional design models, the Proactive Evaluation framework takes into account the influence of interface design as a part of the learning process. They outline the influences and major components in the design of the online interface and advocate that instructional designers consider the information and interface design, continuity of the delivery of content (navigation) and the "look and feel" of the platform (aesthetics) when creating web-based courses.

Additionally, Sims, Dobbs and Hand (2002) recommend that designers employ usability testing, construct designs that accommodate individualized and individual learning so that learners will be able to successfully navigate the learning environment. Interactivity is an important component of the Proactive Evaluation framework because it is through active participation that the learner becomes immersed in the learning

environment and engaged in the learning process. In general, Proactive Evaluation assumes the scaffolding role in the design of the online learning environment by providing a framework that integrates all facets of the design process from planning to development to implementation to evaluation of an effective online delivery model.

Scaffolding: Structured learner guidance. Other research studies support the effectiveness of structured learner guidance or scaffolding as a design strategy because it can lift the learner's knowledge and skill acquisition beyond their unassisted capabilities (Arbaugh &Benbunan-Fich, 2006; Cooperstein & Kocevar-Weidinger, 2004; Garland & Martin, 2005; Marks, Sibley & Arbaugh, 2005; Merrill, 2007). Consistent with Vygotsky's (1978) concept of the learner's zone of proximal development and the tenets of constructivism, scaffolding can be accomplished by: (a) providing a context for the learning experience; (b) including peer-to-peer interaction and collaboration; and (c) designing structured activities that encourage analysis, synthesis and reflection of course content (Cooperstein & Kocevar-Weidinger; Merrill).

For example, using the constructivist learning theory as a core foundation, McLoughlin (2002) reviewed the literature in order to identify effective scaffolding designs applicable to a variety of online and distance education learning environments. The review resulted in ten key dimensions necessary in the creation of effective instructional scaffolds:

(1) Goal Orientation: planned and designed to achieve independent learning and task performance;

(2) Adaptability: flexibility of the scaffold to meet the needs of a diverse range of students;

(3) Accessibility: needs to be in the form of "just in time" support;

(4) Alignment: tasks and assignment design ensures consistency and structure in course design;

(5) Experiential Value: make sure learners are not just exposed to inert facts and information but that they are afforded experiences that enable them to plan, act and reflect;

(6) Collaboration: learning through social dialogue and collaboration;

(7) Constructivism: designed to support knowledge construction, not memorization or rote learning;

(8) Learning Orientation: designed to ensure that the learner progresses from teacher regulation to self-regulation and learner self-direction;

(9) Multiplicity: scaffolds can range from one-dimensional to multi-dimensional aspects of learning;

(10) Granularity: enables learners to select and reconstruct the parts that are meaningful to them within a task and are therefore, more efficient. (McLoughlin, 2002, p 156-159)

What is promising about these contemporary instructional design models is that they may offer the solution to problems that have consistently plagued web-based courses throughout its inception. Perhaps the attrition rates of online courses will decrease if in the design of the course, a combination of sound educational theory (constructivism) and sound pedagogical practices (*Seven Principles for Good Practice…*) serve as the foundation from which to build the courses (Ferdig, 2006). In a supporting role, one that strengthens the foundation could be the integration of Web 2.0 technologies that enhance communication, collaboration and active learning. Technologies such as blogs, wikis and non-narrative virtual worlds that have the potential to diminish feelings of isolation and increase student-instructor, student-student and student-content interactions, issues common in online learning.

According to Ferdig (2006) using innovations like blogs and wikis in education produces artifacts that augment conceptual learning and supports a diversity of representative knowledge. He states "publishing makes the material accessible to subsequent reflection and analysis, allowing students to revisit and revise artifacts, thus enriching the learning experience" (p. 751).

Additionally, the steep learning curve often experienced by students trying to learn new technologies is likely to be reduced due to the popularity of the social networking platforms found in contemporary society. Even still, designers should incorporate into the design an introduction or orientation to the technologies to be used in the course along with contextual scaffolding activities that not only serve to increase the confidence of students in the application of new technologies, but maintains constructivist learning principles and may reduce cognitive overload (Tyler-Smith, 2006).

No matter how meticulous the design, if the online course does not engage students, the end result may be a decrease in the amount of learning that takes place and ultimately, withdrawal from the course. How to engage virtual populations in the complexities of learning has become the expertise of computer game and MMOG designers and many in the educational arena are taking notes regarding the factors necessary for effective engagement design.

In her analysis of the design of Massively Multiplayer Online Role-Playing Games (MMORPGs) Dickey (2006) discovered that game designers engage players by creating activities and scaffolds that "foster intrinsic motivation" (p. 254) and knowledge construction via interactions with information, resources and objects, and also through collaboration and strategizing with other participants.

Similarly, Begg, Dewhurst & Macleod (2005) observed that game developers seem to be able to engage players by providing them with an immersive, contextualized learning environment that gives the player a sense of identity as well as some control over the game's outcome. Gros (2007) argues that the whole underlying framework in game design is to solve a problem and in doing so, effectively "promotes conceptual learning, problem-solving skills, cooperation and practical participation" (p. 30). Further, she points out that virtual worlds make it possible to form virtual communities with shared values, a sense of identity and a platform for situated learning experiences (Gros).

To better understand the cognitive and learning processes that take place through participation in MMOGs and to get a better grasp concerning the educational potential of MMOGs, Young, Schrader and Zheng (2006) proposed using the tenets of ecological psychology as a theoretical framework in the analysis of engagement, knowledge acquisition and the social practices of MMOG participants.

Table 1 shows the primary ecological psychology principles and how they can be applied to MMOG design within an educational context:

Table 1

Design Implications From Psychological Principles Described by Young (2004)

Principles from Ecological Psychology	Principle as Applied to MMOG Design
1. *Perception-action cycle:* Learning arises from a cyclical relationship between perception and action (e.g. Dewey's "learning by doing").	1. The game designer should allow for rapid user-interface interaction.
2. *Embodied cognition:* Learning arises from situated action as an extension of the person's skills and abilities to move and act.	2. The game designer should allow the avatar and operator opportunities to communicate and explore.
3. *Social attributes of situated learning:* Learning arises from collaborative activity.	3. The game designer should allow for team and group identities to emerge.
4. *Boundary constraints on behavioral trajectories:* Learning arises from clearly established contextual limits for potential action.	4. The game designer should make visible all skills, characteristics and tokens that can become goals.
5. *Affordance-effectivity duals:* Learning arises from a continuous dialectic between one's goals and the opportunities to act on them provided by the changing environment.	5. The game designer should construct parameters with an understanding of them as duals, co-determined by user effectivities.
6. *Goal-directed action:* Learning arises from clearly established intentions and objectives.	6. The game designer should construct the game with multiple goals in mind and allow new uses to emerge.
7. *Contextualized learning:* Learning arises from clearly defined situations or hypothetical scenarios.	7. The game designer should allow the back story of the game to evolve with play and be influenced by player input.
8. *Repetition:* Learning arises from multiple opportunities to "show what you know."	8. The game designer should allow game skills to be applied at all levels.
9. *Detection of the raison d'être:* Learning arises from the opportunity to transfer knowledge to new situations.	9. The game designer should provide the game with a back story or anchor to provide continuity and shared communal knowledge.

Summary

In summary, engaging students in the process of learning requires forging a connection between student and content, student and instructor, student and peers. By establishing student engagement as one of the main goals in the development of web-based instruction, the problem of high attrition rates in online classes may soon be a thing of the past. Accomplishing this goal means careful planning in the instructional design for online learning. Design principles that begin with educational learning theory as its foundation from which the curriculum is built. The constructivist learning philosophy

with its emphasis on active and social learning, construction of knowledge based on past and present experiences and the sharing of information, knowledge and resources between and among peers is consistent with the conditions known to support student engagement.

Current Web 2.0 tools such as blogs, wikis and virtual worlds are technologies that promote communication and collaboration and may offer educators the opportunity to take online learning to another level of effectiveness by having the capability to make learning active, social and dynamic, often in real-time. Ultimately, these capabilities may result in a reduction in disengagement and feelings of isolation, common problems often expressed by online learners.

Applications such as *Second Life* have the potential to become an appealing learning platform because of the high degree of immersion experienced by the participants. With the ability to interact with others and the virtual community, students have the opportunity to engage in activities that are difficult, dangerous or impossible to do in real life (Dalgarno et al., 2002). Opportunities such as the re-creation of historical sites or events and taking on the societal roles of people living centuries earlier.

It is not, however, the technologies that do the actual teaching, therefore, it is important that sound pedagogical practices be integrated into the instructional design of the online course. Through the application of sound pedagogy along with contextual, structured scaffolding, the constructivist learning foundation may improve the efficacy of Web 2.0 technology usage.

In conclusion, educators can learn a great deal from Massively Multiplayer Online Game (MMOG) developers who by listening closely to their online communities have

successfully learned how to engage millions of people in the process of learning new knowledge and new skills. By recognizing and incorporating the critical design principles used in online gaming, educators too may be able to expand the knowledge base of millions of virtual learners.

Chapter III: Methodology

Introduction

The focus of this research was to assess the level of learning engagement using an instructional design model that integrated: (a) constructivist learning tenets; (b) a pedagogical framework for online learning environments; and (c) a blog, a wiki and *Second Life* virtual world as the Web 2.0 technologies used in this study. Additionally, student-participant perceptions of the scaffolding activities and usability issues associated with these Web 2.0 technologies was also investigated. This chapter is organized into five sections: (a) design of the study, (b) participants in the study, (c) data collection tools, (d) data collection process, and (e) a description of the data analysis.

Design of the Study

This study employed a case study design using a mixed-methods approach where both quantitative and qualitative data were collected and analyzed. The researcher elected to use a case study framework because it allowed for in-depth exploration of student engagement within the online learning environment as well as the related issues of instructional design and technology usability. The case study consisted of a core group of student-participants working collaboratively on a group project entitled *The Panhellenic Project* over a sustained period of time (Creswell, 2003).

This study was designed to answer the following research questions:

1. What is the level of engagement demonstrated by students participating in *The Panhellenic Project*?

2. Do student-participants perceive structured introduction sessions to Web 2.0 technologies as helpful in the implementation of *The Panhellenic Project*?
3. What are student-participants perceptions concerning the effectiveness of using blogs, wikis and *Second Life* virtual world in the implementation of *The Panhellenic Project*?

Context. The goal of *The Panhellenic Project* was for student-participants to create a three-dimensional simulation of the ancient Greek Parthenon and one virtual Olympic event such as a foot race, pentathlon, chariot race or wrestling match from the time period of 776 B.C.E. within the *Second Life* virtual world.

The underlying theoretical framework in the instructional design of *The Panhellenic Project* was the guiding principles associated with constructivist learning theory. The basic tenets of the constructivist approach argue that the learner constructs knowledge and that the learner plays an active role in the learning process. It proposes that learning is a social endeavor, one that integrates multiple perspectives through dialog, knowledge sharing, collaboration and social negotiation. Further, the constructivist theory contends that authentic learning occurs when the learner is actively engaged in the learning process with opportunities to reflect and synthesize information rather than to simply reproduce it (Almala, 2005; Chin & Williams, 2006; Cooperstein & Kocevar-Weidinger, 2004; Dickey, 2003; Petraglia, 1998).

For the purposes of this study, instructional strategies were developed to scaffold learning through experiential activities designed to promote participation and interaction

between and among the student-participants, strategies consistent with the active learning principles outlined by constructivist learning theory.

The pedagogical framework used in the design of *The Panhellenic Project* were drawn from some of the principles outlined in the *Seven Principles for Good Practice in Undergraduate Education*, a set of sound teaching practices based on the teaching and learning research of Chickering and Gamsom (1991). The principles used in the project framework were: (a) Cooperation Among Students; (b) Active Learning; (c) Prompt Feedback; (d) Communicate High Expectations; and (e) Respects Diverse Talents and Ways of Learning (Chickering & Gamson, 1991).

Second Life. Second Life is an online, immersive, three-dimensional virtual environment developed by Linden Lab® where the users called "residents" can design and construct their own virtual world. *Second Life* users are represented in the virtual world as dynamic character personas called avatars that have the ability to interact and communicate with one another in real-time. Avatar appearance can be customized and each avatar has the capability of walking, running, flying, chatting and performing other animated functions as well as send instant messages and notes while in the virtual world. The instant messaging function also supports an email communication to users outside of the *Second Life* environment while maintaining resident anonymity, as users cannot identify avatars to the real-life identity of the *Second Life* user.

All *Second Life* users have access to three-dimensional modeling tools that allow residents to move, edit and create virtual objects or simulations such as houses, waterfalls, musical instruments, space ships and butterflies. These tools help to form the basic building blocks of all objects called primitives or "prims". Users are able to

download sound, images and stream in video into *Second Life*. Actions or animations that control avatar or object behavior such as running water is created by a programming language called Linden Scripting Language (LSL) developed by Linden Lab®.

In addition*, Second Life* has its own economy and its own currency called Linden dollars where residents can purchase virtual world items including land (grid space) and services though many virtual objects are available to residents free of charge. The *Second Life* user account is free, however, to purchase land (grid space) residents must pay a subscription fee that is based on the size or amount of the virtual land.

Along with using *Second Life* to create *The Panhellenic Project*, a web-based blog and wiki were established for project information and for knowledge sharing between student-participants and as a platform to share project resource information such as reference articles, book titles, informational websites, images, etc.

Blog. The blog used for this study was obtained from *Blogger* ™, a division of *Google* ™, which offers free blog templates and web space. *The Panhellenic Project* blog was used as a *Second Life* informational resource for the student-participants. The blog provided links to *Second Life* tutorials, instructional YouTube™ videos, in-world practice stations, in-world shops for ancient artifacts, and exotic *Second Life* locations for inspiration. The project blog listed *Second Life* in-world links called "slurls" where an individual can be directed (teleported) to a specific in-world location as long as they are logged into *Second Life* simultaneously when the slurl posted on the blog is "clicked."

Blogger has a "comments" component that serves as a vehicle for users to offer feedback on previous blog posts and comments can be submitted on a post-by-post basis, as well as deleted by the authors of the blog.

Additionally, *Blogger* provides access control which allows users to decide who can read and who can write to the blog. It has easy to use editing tools and a collection of blog templates that get the site online right away without users having to learn any hypertext mark-up language (HTML) though *Blogger* does support editing in HTML code. Blogs can be customized and images or photos can be uploaded to the blog.

Wiki – Wetpaint.™ Wikis are collaborative online workspaces where multiple users can collaborate and edit a shared project, document or exchange information and resources. *Wetpaint* offers free wiki websites that are easy to start and can easily add text, photos, links, and other content to the wiki website. To add or edit content, users click the EasyEdit button to activate an editing toolbar similar to programs like *Microsoft Word*™. The creator of the *Wetpaint* wiki can customize it for content and design and can limit user access only to those individuals that have been "invited" to contribute to the wiki and *Wetpaint* wikis can be read regardless of the web browser.

The Panhellenic Project wiki was developed as a collaborative workspace for student-participants, only individuals who were invited had access to wiki content. The project wiki gave an overview of the study, provided sports history and Greek history resources and posted 18 ancient Greek sports history questions divided between the nine groups.

Participants in the Study

This study focused on adult learners over the age of 18 enrolled as undergraduate students in a *History of Sports and Physical Education* course at a state university. The course was offered through the Kinesiology Department, an academic discipline that

studies the art and science of human movement or physical activity in work, play, games, sports, aquatics, dance, combatives, adventure and fitness activities.

The state university is a public four-year university comprised of seven colleges, Applied Sciences and Arts, Business, Education, Engineering, Humanities and the Arts, Science, Social Sciences as well as the School of Journalism and Mass Communications, School of Library and Information Science, School of Music and Dance, School of Nursing and the School of Social Work.

As of Fall 2007, the university's enrollment figures for full-time (minimum 12 semester units) undergraduate students were 18,687. The number of part-time undergraduate students, enrolled in fewer than 12 semester units was 5,703. The total number of full-time and part-time undergraduate, graduate and teaching credential students enrolled at the university for Fall 2007 was 31,906.

Role of the researcher. The researcher assumed the role of observer/participant conducting formal *Second Life* orientations and training sessions that introduced student-participants to the navigational strategies, tools and resources within the *Second Life* virtual world. Additionally, the researcher demonstrated how to use the blog, and wiki as well as clarified any project-related questions from student-participants.

Human subject considerations. In order to protect the welfare and dignity of the human subjects participating in this research, all federal guidelines were complied with over the course of the dissertation study. The following safeguards were employed:

1. Research objectives and the goal and implementation procedures for *The Panhellenic Project* was articulated in writing and distributed to student-participants (Appendix B).

2. Student-participants were informed about all data collection activities and devices used in the research process.
3. Student-participants were informed that confidentiality is ensured for their real-life identity and their avatar identity and that participation in the project was voluntary.
4. Student-participants signed a consent form agreeing to the use of their *Survey of Student Engagement* responses, pre- and post-project questionnaire responses, blog postings, wiki postings, and chat transcripts for research purposes (Appendix C).
5. The *Survey of Student Engagement, Pre-Project Questionnaire* and the *Post-Project Questionnaire* was distributed to student-participants in paper format and collected during project implementation. Survey and questionnaire instructions were printed on the documents.
6. Student-participants were informed that the survey and questionnaire responses, blog postings, wiki postings and chat transcripts are confidential and only a tabulation of responses would be summarized and reported.
7. There were no risks anticipated through participation in this study. An anticipated benefit to participation in this study was the opportunity for student-participants to be introduced to new web-based technologies.

This study and its procedures were reviewed and approved by the Institutional Review Boards from both the researcher's institution and from the institution participating in the research.

Data Collection and Instrumentation

Quantitative data. Descriptive statistics were used to generate demographic information and to summarize student-participant responses through frequency distribution and percentage calculations of the *Pre-Project Questionnaire* (Appendix D) and the *Post-Project Questionnaire* (Appendix E). Measures of central tendency were also used to analyze data. In addition to providing participant demographics, the questionnaires were developed to gather information about participant technology experience, participant engagement levels, perceptions about project instructional design and the effectiveness of the Web 2.0 technologies used in this study.

The *Survey of Student Engagement* was used in this research to measure engagement at the classroom level (Appendix F). The survey is comprised of three subscales, resulting in an overall engagement score.

Qualitative data. The *Post-Project Questionnaire* posed several open-ended questions that were summarized and used to gather participant perceptions of the Web 2.0 technologies used in the study. All data obtained from the project wiki posts and the *Second Life* chat transcripts were thematically coded and analyzed using a coding scheme framed around the study's definition of engaged learning and constructivist learning principles. Further description regarding analysis of the data is discussed in a later section.

Instrumentation. Student-participant data determining levels of engagement were gathered from a survey tool. The *Survey of Student Engagement* is a 14-item instrument developed by Ahlfeldt, Mehta, & Sellnow (2005) as a modification of the *National Survey for Student Engagement (NSSE)*. The *National Survey of Student Engagement*

(NSSE) is a national survey used by over 600 colleges and universities to provide them with information about how their undergraduate students spend their time and what they gain from attending college.

The researcher of this study elected not to use the NSSE survey for a number of reasons, first of all the data collected by NSSE is directed toward student perception of engagement to the campus community as a whole rather than a specific course or project. Additionally, the NSSE survey is an instrument designed to measure levels of student engagement at the institutional level, while the *Survey of Student Engagement* is designed to measure levels of engagement at the classroom level.

The *Survey of Student Engagement* contains ordinal ranking questions grouped into three subscales, questions 1-4 measure Cooperative Learning, questions 5-9 measure levels of Cognitive Level and questions 10-14 measure the development of Personal Skills. In addition to the three subscales, the survey provides an overall engagement score with a range of 17-53. The alpha reliability for the *Survey of Student Engagement* is 0.84. Comparison between NSSE national scores and the *Survey of Student Engagement* classroom scores produced comparable means (NSSE $\mu = 38$; *Survey of Student Engagement* $\mu = 37$).

Data were also collected via pre- and post-project questionnaires designed by the researcher. The *Pre-Project Questionnaire* was developed to obtain demographic information from the student-participant regarding gender, age, educational background and current work environment. Using a Likert scale, the *Pre-Project Questionnaire* gathered information about the student-participant's knowledge of ancient Greek

history as well as their technology experience and how often they used these technology applications.

The *Post-Project Questionnaire* is a 26-item survey designed to give the researcher insight into the student-participants perceptions of *The Panhellenic Project*. Five-point Likert attitudinal scales were developed to acquire information about student engagement, content knowledge, instructional design and the usability of the Web 2.0 applications used in this research.

Since most of the Web 2.0 technologies are emergent technologies that have only recently been available for public use, there is very little evaluative research available or instruments developed to measure their effectiveness.

Moreover, this study seeks to explore the three core issues of student engagement, instructional design and technology usability collectively, therefore, the researcher elected to design an instrument that would capture data reflective of all three of these core components. An expert in the field of testing and measurement reviewed and evaluated both the pre-project and post-project questionnaires (Appendix G).

Electronic discourse analysis. Data was extracted from wiki posts and from *Second Life* chat transcripts to gather evidence of constructivist learning and project engagement through participant online interaction. Table 2 shows the coding scheme used to determine evidence of constructivist learning and project engagement.

Table 2

Coding Scheme for Wiki Posts and Second Life Chat Transcripts

Framework Categories	Code	Description
Engagement	E	Engaged Learning: strategies that demonstrate curiosity, course involvement, analysis and synthesis of information
Constructivism	GS	Group Skills: group activity and cohesiveness
	OW	Organizing Work: planning, assignment of tasks
	GFB	Giving Feedback: providing feedback to others
	ERI	Exchanging Resources & Information: posting or exchanging resources/information useful for project completion
	SK	Sharing Knowledge: sharing existing knowledge/information with others
	SA	Seeking Assistance: asking for help from others
	SFB	Seeking Feedback: asking for input from others
	CG	Comments: social interaction and dialog from participants

In addition to the researcher serving as the primary coder for the discourse analysis, a second coder was used to review the content of the wiki posts and *Second Life* transcripts. An evaluation worksheet was used by both coders in the analysis of the electronic discourse displayed by the student-participants (Appendix H).

Data Collection Process

The goal of *The Panhellenic Project* was for student-participants to create the ancient Greek Parthenon and one ancient Olympic game event as a simulation within *Second Life.* In addition to using *Second Life* as a part of the project, student-participants used a blog and a wiki for project information and to share and exchange their resources as they investigated ancient Greek society.

The project consisted of nine collaborative teams, each composed of four team members. The study involved participants meeting for six, 1 hour and 15 minute sessions with two optional *Second Life* practice sessions.

Data collection was completed in four main phases: (a) Pre-project preparation; (b) Implementation of *The Panhellenic Project*; (c) Review and scoring of survey and

questionnaires*;* and (d) Coding and analysis of wiki posts and *Second Life* chat transcripts.

Overview of The Panhellenic Project.

- Phase One: Pre-Project Preparation

  Wiki Preparation:

  - The project wiki was established and invitations were sent to participants to join the wiki in order to have access to it;
  - A separate wiki page was created for project overview, wiki instructions, and Greek history resources;
  - Each team was assigned a separate wiki page with two ancient Greek sports history question to research and answer collectively (Appendix I);

  Blog Preparation:

  - The project blog was established for participants as a *Second Life* informational resource (Appendix J);
  - The blog was divided into several sections with links to *Second Life* tutorials, places inside *Second Life* to practice skills, SL shops with ancient artifacts, and historical places to visit inside SL;

  Second Life Preparation:

  - *Second Life* virtual land (grid space) was donated by the participating university, so that participants had a location in the virtual world to work on *The Panhellenic Project;*

- *Second Life* tutorials and practice stations were built and programmed with instructions, then placed on the virtual land;

- Phase Two: Implementing The Panhellenic Project

  Session One: Introduction to the Study/Project

  - Overview of *The Panhellenic Project*; Purpose of the Study, and Timeline;
  - Participants given the option to participate or complete alternate assignment per professor;
  - Review consent form, collect forms from participating students;
  - Students complete the *Pre-Project Questionnaire*;
  - Overview & Demonstration of blog, wiki and *Second Life* (Appendix K)*;*
  - Explain that each group works on separate questions posted on the wiki. Responses must be thorough and involve a group effort using resources such as class notes, articles, books, etc;
  - Participants divided into 9 groups of 4;
  - Teams 1-5 worked on constructing the Parthenon in *Second Life* and can include virtual artifacts that are reflective of the Classical period;
  - Teams 6-9 worked on construction of an Olympic event in *Second Life* and can include artifacts;
  - Each team member received 500 linden dollars, but needed to negotiate with team members, how the currency was to be spent;

- Participants were polled for best days for optional practice times in *Second Life*;
- Homework Assignment: log into *Second Life* and create an avatar, go through SL Orientation Island, email researcher participant avatar name and participant email (Appendix L);

Session Two: Introduction to Second Life (SL)

- Reviewed purpose of the wiki;
- Reviewed purpose of the blog;
- Purpose of session is to earn Basic Navigation in *Second Life* (Appendix M)*;*
- Participants worked in pairs so as not to experience "lag" when working in *Second Life*;

Session Three: Building Tutorial & Practice Session

- Teams worked in pairs through self-paced practice modules;
- Modules covered: movement controls, camera controls, pie controls, editing objects, using SL inventory and teleporting to SL shops;

Sessions Four & Five: Working Groups

- Wiki workers begin work on one of their sports history questions;
- Research answers and begin posting on project wiki;
- SL Workers, use the research from your wiki questions to get an idea of what ancient Greece was like during the Classical period, around the time of the first recorded Olympic Games;

- As a team, use your linden dollars to purchase items within Second Life that are consistent with the Classical time period. For example, you can find Greek vases for purchase in SL and may opt to place them on our project land;
- Teams 1-5 are working together on a single Parthenon for the project;
- Teams 6-9 are working together to create one Olympic event for the project (Appendix N);

Session Six: Completion of The Panhellenic Project

- Working on wiki team questions;
- Ancient Greece representations in *Second Life*: Teams 1 – 5 work on Parthenon & Teams 6 – 9 work on Olympic event of Classical era;
- Administration of the *Survey of Student Engagement* and the *Post-Project Questionnaire;*
- *Second Life* "de-briefing," information about how to keep *Second Life* account, how to discontinue SL account and uninstall software;
- Informed participants that project wiki will "locked" so no more contributions to content, but was still available for viewing if they needed it for future reference. Blog was also available for future viewing if needed;

Note: Two (2) optional *Second Life* practice sessions were scheduled, one in the evening and one on a weekend.

- Phase Three: Review and Scoring of the *Survey of Student Engagement* and pre- and post-project questionnaires;
- Phase Four: Coding and Analysis of Wiki Posts and *Second Life* Chat Transcripts;
    - Electronic discourse analysis performed by second coder, coded data submitted to researcher;

Table 3 provides an overview of the data collection process and project timeline.

Table 3

Data Collection Process and Timeline

<table>
<tr><th>Date</th><th>Process Component</th></tr>
<tr><td></td><td></td></tr>
<tr><td>Phase One</td><td>Pre-Project Preparation
▪ Blog content
▪ Wiki content
▪ Prep Second Life virtual land and create practice stations
▪ Written materials for participants</td></tr>
<tr><td>Phase Two</td><td>Project Overview:

Session 1 — Intro to Research Study/Project
▪ Overview of The Panhellenic Project (Appendix)
▪ Information about Web 2.0 technologies (Appendix D)
▪ Completion of consent forms
▪ Division of students into groups (G1, G2, G3, G4, G5, G6, G7, G8, G9)
▪ Administration of the Pre-Project Questionnaire
▪ Homework assignment

Session 2 — Intro to Second Life (SL)
▪ Basic navigation and practice activities (in-world)
▪ Second Life Skill Building Tutorial (in-world)

Session 3 — Second Life Building Tutorial & Practice Session
▪ Review of resource wiki and project blog
▪ Second Life practice session, learning about resources/field trips (in-world)

Session 4 — Working Groups
▪ Begin preparing SL region for project (in-world)
▪ All groups working on project (wiki workers & SL workers)

Session 5 — Working Groups
▪ All groups working on project (wiki workers & SL workers)

Session 6 — Completion of Panhellenic Project
▪ All groups finishing final project
▪ Administration of the Survey of Student Engagement and the Post-Project Questionnaire

Note: Two (2) optional practices sessions were scheduled for project student-participants;

Students used the blog as the project scaffolding artifact and resource center for their Second Life work.</td></tr>
<tr><td>Phase Three</td><td>Review and scoring of survey and questionnaires</td></tr>
<tr><td>Phase Four</td><td>Coding and analysis of blog/wiki postings and Second Life/online classroom transcripts

Coding data submitted to reviewer</td></tr>
</table>

Analysis of the Data

The results from the *Survey of Student Engagement* and the multiple choice questions from the pre- and post-project questionnaires were tabulated and summarized using descriptive statistical analysis. Comparison between student-participant self-rated knowledge of sports history at the start of *The Panhellenic Project* and at the end of the project was analyzed using data from the pre- and post-project questionnaires.

Data were entered into Microsoft Excel spreadsheet program and SPSS Graduate Pack 11.0 for Mac® OSX statistical software in order to calculate frequency distributions, percentages and measures of central tendency.

Engagement scores were obtained from the *Survey of Student Engagement* by summing total responses from the survey. Subscale scores were obtained through summation of questions 1 through 4 for the Cooperative Learning variable, 5 through 9 for Cognitive Level variable and 10 through 14 for Personal Skills variable. Student-participant engagement scores were plotted using a scatter chart so as to provide a visible representation of project engagement levels.

The open-ended questions from the *Post-Project Questionnaires* were imported into a spreadsheet using Microsoft Excel software. The researcher examined the responses for evidence of engaged learning and to give a sampling of student-participant perceptions regarding the effectiveness and usability of the Web 2.0 technologies used in this study. Additionally, responses to the open-ended questions that addressed what student-participants liked best about using the Web 2.0 technologies to implement the project were also summarized and presented.

All data obtained from the Web 2.0 technologies, specifically; project wiki posts and *Second Life* chat transcripts were thematically coded and analyzed by the researcher and the second coder. The themes used to code and interpret the data were adapted from the coding schemes used in previous online learning research (Curtis & Lawson, 2001; Roussos, et al., 1999).

Design validity. To ensure internal validity, several strategies were employed. First, multiple sources of data were collected so as to cross-validate the information obtained from the research. Data were collected from the *Survey of Student Engagement, Pre- and Post-Project Questionnaires*, wiki posts, and *Second Life* chat transcripts. To make certain that an accurate interpretation of the electronic communication and discourse analysis used in the thematic coding was objective, a second examiner was used to review all student-participant posts and transcripts collected as part of the data.

Summary

This chapter described the research design and methodology that was used in this study. A descriptive overview of all Web 2.0 technologies used in this research was presented as well as participants in the study, data collection tools, the data collection process and data analysis.

Chapter IV: Results

Introduction

The purpose of this study was to assess level of learning engagement through participation in *The Panhellenic Project*, an instructional design model that integrated constructivist learning strategies with Web 2.0 technologies within an online learning environment. The Web 2.0 technologies used in this study were a blog, a wiki and the *Second Life* virtual world. In this chapter, the findings of the study are reported based on data gathered from the *Survey of Student Engagement,* pre- and post-project questionnaires and discourse analysis of wiki posts and *Second Life* chat transcripts.

Demographic Information

The participants in this study were 38 undergraduate students enrolled in an introductory sports history course at a state university. Sixty-three percent of the participants were male and 37% were female, 90% were age 25 or younger. The majority of the participants were upper division level students, 53% were juniors and 42% were seniors, no freshman level students were enrolled in the course. Seventy-seven percent of the participants identified their major course of study as Kinesiology, Athletic Training or Sports Management. Kinesiology as an academic discipline typically includes sports history as an area of study.

Technical expertise. In order to determine technological experience and familiarity with specific technology applications, participants were asked to complete the Pre-Project Questionnaire. Thirty-eight percent responded that they had been using a computer between 5 and 10 years, while 48% indicated computer usage for 10 or more

years. The majority of the participants used the Internet on a regular basis with 51% spending 10.5 or more hours per week online.

Using a Likert scale with a rank of 1 equated to "No Experience" and a rank of 5 equated to "Very Experienced," participants were asked to rate their level of experience with blogs, wikis, virtual worlds and computer/video games. Table 4 shows that 52.5% of the participants rated their experience with blogs at a level 1 or level 2 and 55% reported a level 1 or 2 regarding their experience with wikis. Virtual world experience was limited with 77.5% of the participants indicating level 1 experience though 70% gave their experience with computer/video games between level 3 through level 5 rating.

Table 4

Overview of Participant Technology Experience (n =38)

Experience Rating	Blog	Wiki	Virtual World	Computer Games
Level 5	12.5%	5.0%	2.5%	25.0%
Level 4	10.0%	7.5%	2.5%	20.0%
Level 3	22.5%	22.5%	2.5%	25.0%
Level 2	10.0%	10.0%	12.5%	12.5%
Level 1	42.5%	52.5%	77.5%	15.0%
No Data	2.5%	2.5%	2.5%	2.5%
Total	100%	100%	100%	100%

Quantitative Data Analysis

Research question 1. The first research question in this study examined the level of engagement demonstrated by the students that participated in *The Panhellenic Project*. The *Survey of Student Engagement*, an instrument adapted from the *National Survey of Student Engagement* (NSSE) and developed to measure engagement at the classroom level was one of the surveys used to answer research question one (Ahlfeldt, Mehta & Sellnow, 2005).

Results from the *Survey of Student Engagement* are based on 37 surveys; one participant did not complete the survey. The *Survey of Student Engagement* consists of three subscales that measure: (a) level of collaborative learning; (b) level of cognitive complexity: and (c) gains in personal skills to determine an overall engagement score. A summary of participant engagement scores and subscale scores is presented in Table 5.

Table 5

Summary of Survey of Student Engagement Score and Subscales (n = 37)

Subscales	Mean	Standard Deviation	Range
Cooperative Learning	9.19	1.47	7, 13
Cognitive Level	10.76	2.63	5, 16
Personal Skills	11.70	3.06	5, 18
Engagement Scores	31.57	5.93	20, 43

Participant engagement levels as measured by the *Survey of Student Engagement* showed a mean score of 31.57 with a standard deviation of 5.93. The mid-point or median score was 20 and the most frequent score was 29 (mode). The difference between the highest and lowest engagement score was 23 with a 7.5 point spread separating the middle 50% of the participants. Survey findings reflected a positively skewed distribution (Figure 3).

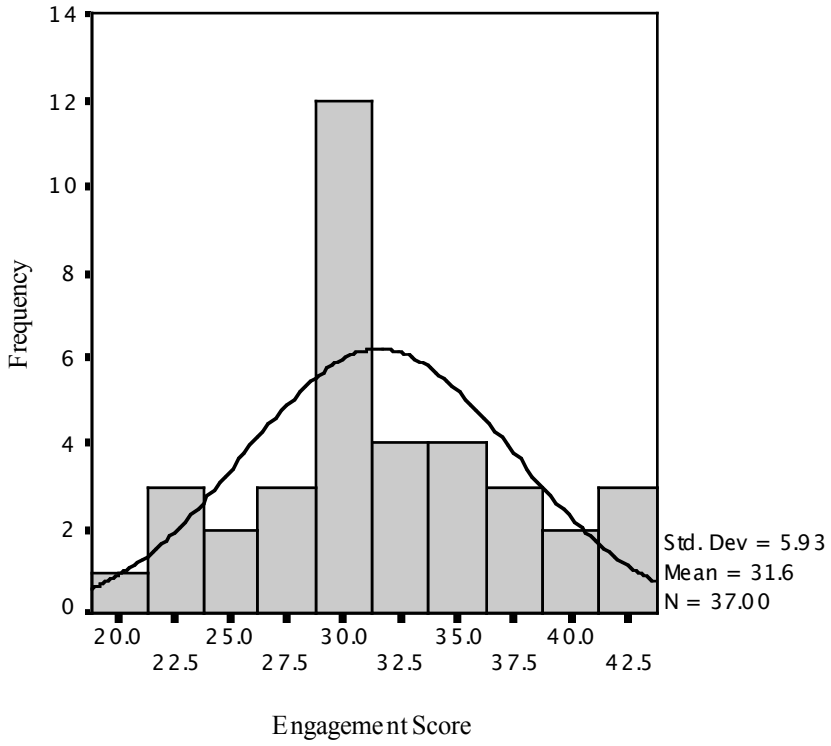


Figure 3. The Panhellenic Project engagement scores

Project engagement averages were below the averages of the *Survey of Student Engagement* and the *National Survey of Student Engagement* (NSSE). The mean engagement score for "The Panhellenic Project" is 31.57, while the mean score for the *Survey of Student Engagement* is 37 and 38 for the *National Survey of Student Engagement* (NSSE). Figure 4 represents the distribution of individual participant engagement scores with 27% identified as actively engaged in the project, 33% moderately engaged, 16% somewhat engaged and 24% not engaged in the project. The mid-point for the *Survey of Student Engagement* is 26.5, represented by the dashed line.

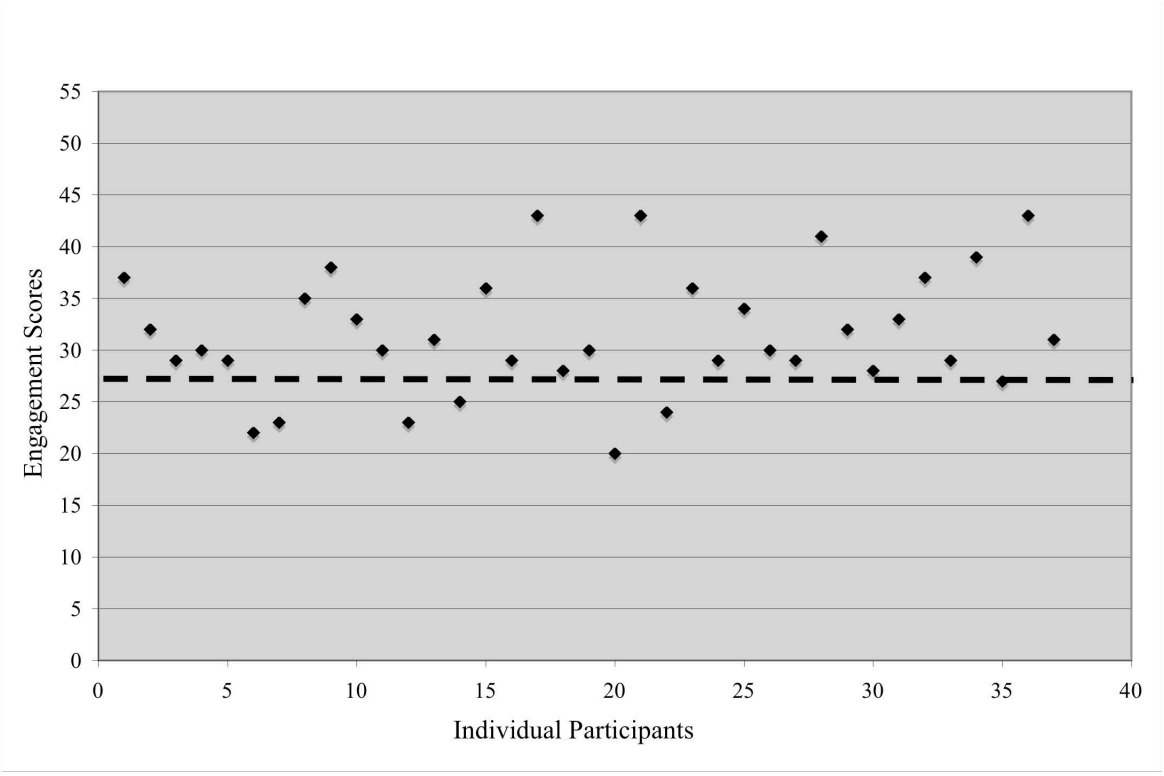


Figure 4. Distribution of participant engagement scores (n = 37)

Engagement data were also collected from the *Post-Project Questionnaire* where participants evaluated their experience and shared their perception of *The Panhellenic Project* (n = 38). Using a Likert scale, questionnaire statements for the Engagement section were assigned either a Strongly Agree, Agree, Disagree, Strongly Disagree or No Opinion rating.

When participants were asked, "Through the use of Web 2.0 technologies, students and faculty present new ways of understanding knowledge and practice in the field," 66% Agree or Strongly Agree, 18% Disagree and 11% Strongly Disagree.

Results from the questionnaire statement, "Through the use of Web 2.0 technologies, I found the course materials and information more engaging than if I were to participate in the same project using traditional, face-to-face format," showed that 42% of the participants Agree or Strongly Agree, 45% Disagree or Strongly Disagree and 11% had No Opinion.

When asked, “During group activities, students actively seek to learn from one another to enrich their understanding of knowledge and practice in the field,” participant responses were 55% Agree, 37% Disagree and 5% Strongly Disagree.

The questionnaire statement, “My interest in the subject-matter was stimulated through the usage of Web 2.0 technologies,” resulted in 32% of the participants Agree or Strongly Agree, 47% Disagree, 18% Strongly Disagree.

Responses to the question, “Do you feel that the project learning materials were relevant and useful?” shows that 55% of the participants Agree or Strongly Agree, 26% Disagree, 13% Strongly Disagree and 5% had No Opinion.

When participants were asked the question, “Do you feel your contributions and wiki postings added to the enrichment of the learning experience of other learners?” 66% Agree or Strongly Agree, 26% Disagree, 8% Strongly Disagree. Figure 5 represents participant responses to the question, “Out of the four group members, how many participated actively most of the time?” 74% All Four Team Members, 11% Three Members, 11% Two Members and 5% completed the project by themselves.

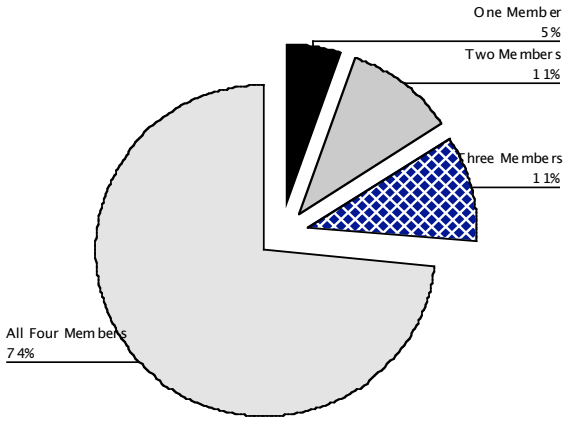


Figure 5. Perceptions of active participation by team members

Participant perceptions regarding team member participation in the project are consistent with the results from the *Survey of Student Engagement* that show that 24% of the student-participants were not engaged in the project.

Research question 2. The second research question examined participant perceptions regarding the structured introduction sessions to the Web 2.0 technologies used in this study and whether or not the sessions were helpful in the implementation of *The Panhellenic Project*. The *Post-Project Questionnaire* collected data concerning the instructional design of the project using a Likert scale ranging from Strongly Agree to Strongly Disagree and an option of No Opinion.

Participants were asked to respond to the statement, "Students received hands-on instructional activities aimed at connecting theoretical and practical knowledge to tangible issues," 50% Agree or Strongly Agree, 26% Disagree and 8% Strongly Disagree.

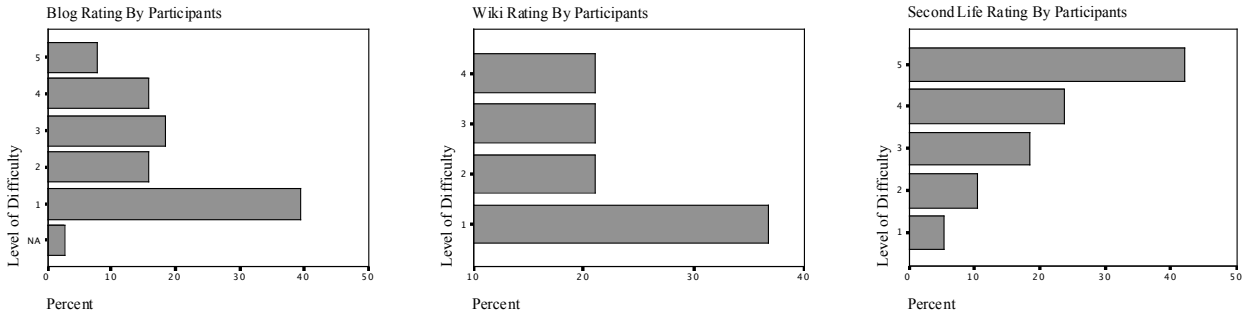
Results from the questionnaire statement, "I found the introduction to the uses of the blog, wiki and online *Second Life* sessions useful in completing this project," showed that 37% of the participants Agree or Strongly Agree, 37% Disagree and 16% Strongly Disagree.

When asked to evaluate *Second Life* orientations, participants responded to the question, "I found the in-world orientation to *Second Life* sessions useful in completing this project," 24% Agree or Strongly Agree, 39% Disagree, 26% Strongly Disagree and 11% had No Opinion.

Research question 3. The third research question investigated participant perceptions concerning the effectiveness of using blogs, wikis and *Second Life* virtual world in the implementation of *The Panhellenic Project*. Participants were asked to rate

the level of difficulty experienced with each of the Web 2.0 technologies used in the study. Rating range of the Likert scale began with 1 equivalent to Very Easy through 5 equivalent to Very Difficult.

Fifty-eight percent of the participants rated the project wiki a level 1 or level 2 rating with no one assigning a level 5 rating. The project blog was given a level 1 or level 2 rating by 55% of the participants with 8% rating blog use a level 5. The *Second Life* virtual world was rated the most difficult Web 2.0 technology used in *The Panhellenic Project* with only 15% of the participants giving it a level 1 or level 2 rating and 42% assigning a level 5 rating. Figure 6 shows a side-by-side comparison of participant ratings of the three Web 2.0 technologies used in this study.



Project Blog *Project Wiki* *Second Life*

Figure 6. Participant ratings of level of difficulty

Qualitative Data Analysis

Research question 3. To obtain more insight into the participants' perceptions of the effectiveness of the Web 2.0 technologies used in *The Panhellenic Project*, the *Post-Project Questionnaire* posed several open-ended questions. When participants were asked what made the Web 2.0 technologies very difficult or difficult to use, the majority of the comments expressed were about *Second Life*, particularly with regard to the

technical difficulties experienced during project implementation. Selections of participant comments are as follows:

- The actual *Second Life* program wouldn't download;
- The lag time during *Second Life* made it hard;
- There is limited access per group;
- Hard to get accustom to if you're not computer savvy;
- Trying to understand the concept and all the different aspects of *Second Life* is hard;
- Little time to become acclimated with the program;
- Difficulties with logging on;
- Had trouble getting started in *Second Life* but once I got started it was easy;

Participants were also asked what was the best part about using the blog, wiki and *Second Life* for *The Panhellenic Project* and to explain their answers. A sampling of the responses are listed:

- Using the blog & wiki was the best part;
- Reading other people's answers to questions that would help students understand the subject more;
- Wiki…because it was the only place where we collaborated with teammates;
- Making my avatar was fun! The wiki was easy and helpful;
- I like that everyone can post on the wiki, it allows you to view other people's opinions and views;
- 2nd life was fun, the wiki informational;

- *Second Life* = new and intuitive, blog = good references, wiki = also new and intuitive;
- Ability to share information;
- Other team members can contribute to the class, so everyone gets involved;
- Building things and buying things while interacting with other classmates;
- Being able to interact with other people and learn new ideas;
- I really liked the wiki, it helped me learn so much about ancient Greece;
- The best part of the wiki was being able to work as a whole class;
- Group members can communicate and stay connected easily by using the wiki;

In general, the wiki was viewed as the best Web 2.0 technology for *The Panhellenic Project*, with participants citing the ability to collaborate and share knowledge with one another as the most positive aspect of the modality.

Analysis of Content Knowledge

To determine if learning engagement occurred through participation in *The Panhellenic Project*, participants were asked if using *Second Life*, the blog or the wiki was effective in learning about ancient Greek sports history. Out of the 38 responses to the survey question, 21 indicated that they found the Web 2.0 technologies effective in learning about ancient Greek sports history. A selection from the open-ended questions is listed below:

- Yes, I did, it was more engaging and was a different way of learning;
- Yes, reading other posts and blogs helped;

- Yes, because we were able to create something cool and learn at the same time;
- Yes, technology is the way to grab our attention these days;
- Yes, because without this project, I would not have looked for the information;

While there were four participants that did not answer the question, 13 of the survey responses indicated that the Web 2.0 technologies used in this study was not effective and preferred the traditional classroom lecture format. Their comments included the following:

- No, anything I learned mainly through lecture and then searching the Internet;
- No, I only learned anything through my own research in trying to answer the wiki questions;
- These resources didn't affect my learning about Greek history, I could have done the equivalent without having to use them;
- I probably would have learned more and not have been so confused in a traditional classroom setting;
- Not really, I feel I learned the same as traditional ways. I still had to research the material myself. It didn't add to the learning experience;

Comparison between participant's pre-project and post-project content knowledge about ancient Greek history showed that learning had occurred over the length of the project. Participants were asked three subject-matter questions at the start of the project and at the end. Using a Likert scale, participants were asked to rate their content

knowledge level between level 1 and level 5 with level 1 equivalent to No Knowledge and level 5 equivalent to Very Knowledgeable.

Overall, 23% of the pre-project responses to the question about Greek history rated themselves between a 3 and 5 level of knowledge, while 63% gave the same rating range post-project. Thirty percent of the pre-project responses to the question about the ancient Olympic games gave a knowledge rating between level 3 and level 5, compared to 68% that gave the same rating range post-project. The subject-matter question regarding knowledge about the Parthenon showed a 15% pre-project rating between level 3 and level 5, and 34% post-project using the same range.

Figure 7 compares pre- and post-project responses to the question posed about ancient Greek history.

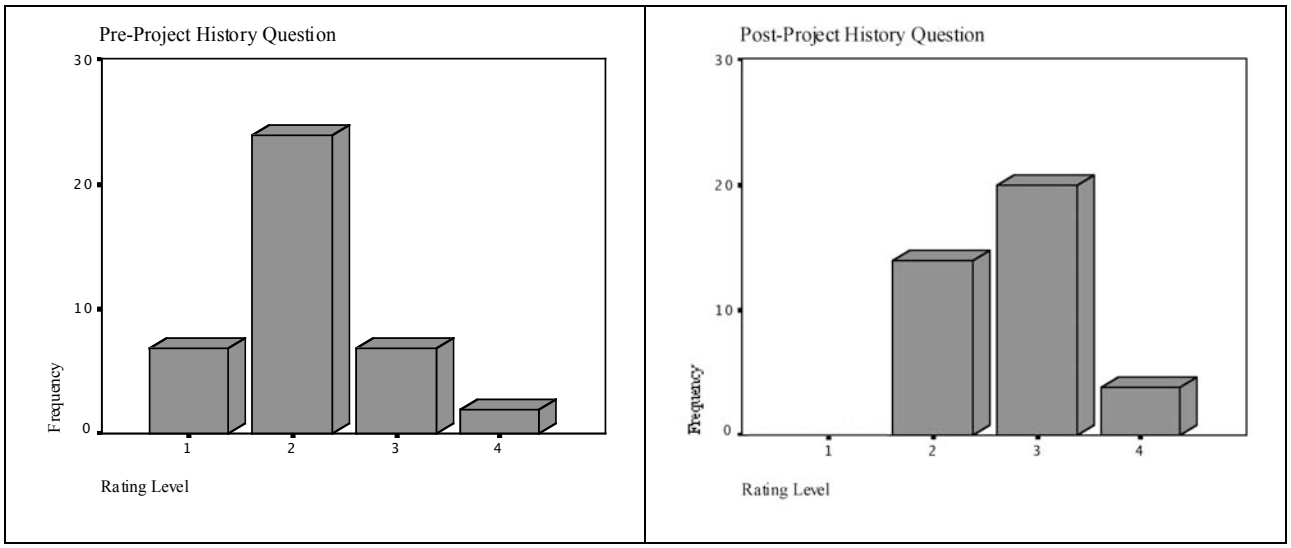


Figure 7. Pre- and post-project ratings of participant knowledge of ancient Greek history

Figure 8 compares pre- and post-project responses to the question related to knowledge of ancient Olympic games.

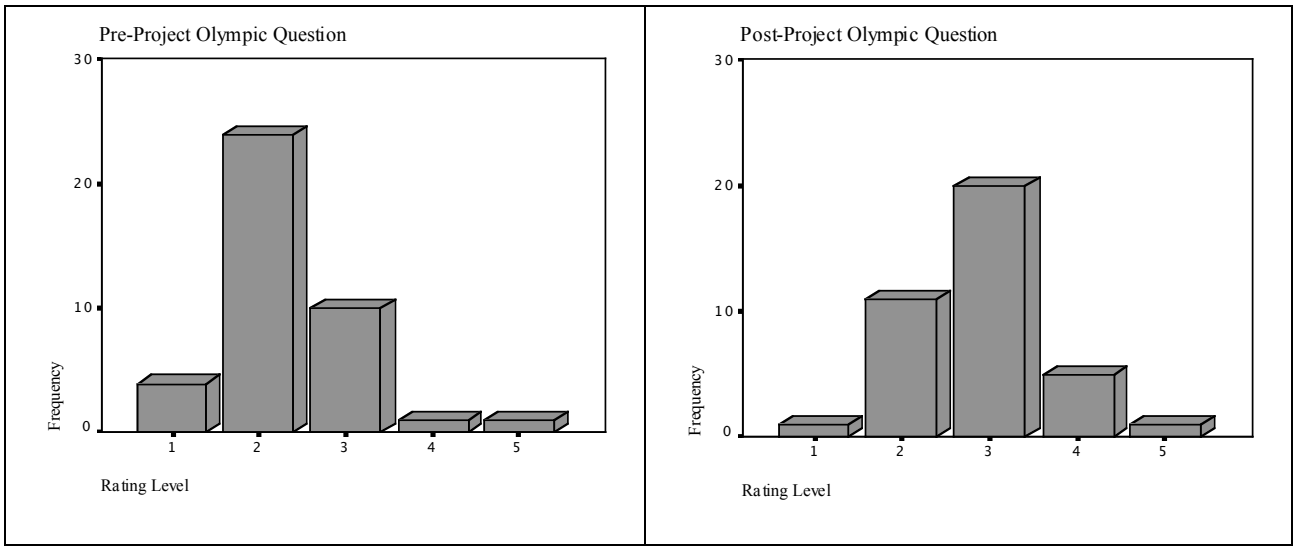


Figure 8. Pre- and post-project ratings of participant knowledge of ancient Olympic games history

Figure 9 compares pre- and post-project responses to question about participant knowledge regarding the Parthenon of ancient Greece.

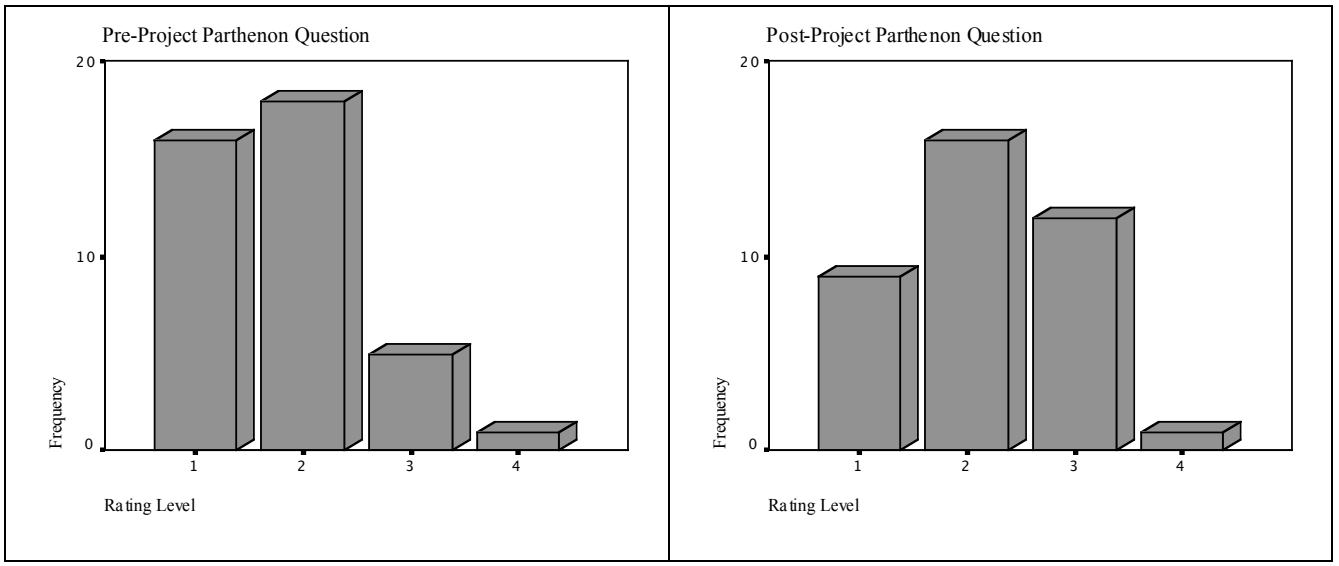


Figure 9. Pre- and post-project ratings of participant knowledge of the Parthenon

Evidence of Constructivist Learning

Electronic discourse analysis. Wiki postings and *Second Life* chat transcripts were analyzed for evidence of constructivist learning. To ensure internal validity of electronic discourse content, a second coder was used for the analysis of the wiki posts and *Second Life* chat transcripts. The project blog was established for informational purposes as a *Second Life* resource site; therefore, no blog postings were expected or observed.

The Panhellenic Project, consisted of nine teams each composed of four team members. Teams were given two ancient Greek sports history questions to research and answer collectively using the project wiki. Each team was assigned a different set of questions and given a specific page on the project wiki to post their answers. Table 6 shows the coding scheme used for wiki posts and *Second Life* chat transcripts.

Table 6

Evaluation Framework for Electronic Discourse

Framework Categories	Code	Description
Engagement	E	Engaged Learning: strategies that demonstrate curiosity, course involvement, analysis and synthesis of information
Constructivism	GS	Group Skills: group activity and cohesiveness
	AO	Assisting Others: responding to questions, requests from others
	GFB	Giving Feedback: providing feedback to others
	ERI	Exchanging Resources & Information: posting or exchanging resources/information useful for project completion
	SK	Sharing Knowledge: sharing existing knowledge/information with others
	SA	Seeking Assistance: asking for help from others
	SFB	Seeking Feedback: asking for input from others
	CG	Comments: social interaction and dialog from participants

A summary of the wiki team interactions is presented in Table 7. The predominant exchange between team members was in Sharing Knowledge (SK) with 40% engaging in that activity, 25% Exchanged Resources and Information (ERI), 16%

demonstrated Engaged Learning (E) and 14% of the posting reflected Group Skills (GS). One team (Team 3) was particularly active, accounting for 23.24% of the wiki postings.

Table 7

Analysis of Team Wiki Postings

Behavior Categories	Code	Participants										
		Team 1	Team 2	Team 3	Team 4	Team 5	Team 6	Team 7	Team 8	Team 9	Code Totals	Code %
Engagement	E	1	2	8	4	2	2	7	1	2	29	16%
Constructivism	GS	2	4	4	4	2	1	3	2	4	26	14%
	AO	0	0	1	0	0	0	2	0	0	3	2%
	GFB	0	0	1	0	0	0	0	0	0	1	.5%
	ERI	1	6	12	5	2	3	4	5	9	47	25%
	SK	9	8	11	5	3	3	12	7	10	74	40%
	SA	2	0	0	0	0	0	0	0	0	2	1%
	SFB	0	0	0	0	0	0	0	0	2	2	1%
	CG	1	0	0	0	0	0	0	0	1	1	.5%
Participant Posting Totals		16	20	43	18	9	9	28	15	27	185	100%

Chat transcripts for the *Second Life* practice sessions were limited due to inconsistent Internet connections, issues with the *Second Life* platform (i.e. log in problems) and face-to-face dialog that occurred between participants. A summary of the *Second Life* participant interactions is presented in Table 8. The two most dominant behaviors were Engaged Learning (E) 58.33% and Seeking Feedback (SFB) 12.50%.

Table 8

Analysis of Second Life Chat Transcripts

Framework Categories	Code	Second Life Interactions
Engagement	E	58.33%
Constructivism	IA	4.17%
	AO	4.17%
	GFB	4.17%
	ERI	8.32%
	SA	4.17%
	SFB	12.50%
	CG	4.17%
Totals		100%

Summary

Both quantitative and qualitative data were collected to determine if learning engagement had occurred through participation in *The Panhellenic Project*, an instructional design model that integrated Web 2.0 technologies with constructivist learning strategies.

An examination of levels of engagement showed that a majority of the participants were identified as *engaged* to *actively engaged* in the project. This finding was supported by a significant number of participants indicating that all four team members participated in the project. While most participants felt that the use of Web 2.0 technologies made course materials and information more engaging than the face-to-face classroom format, a selection of participants preferred the traditional lecture mode of instruction.

Participant perceptions of the structured orientation sessions to the Web 2.0 technologies used in this study resulted in half of the participants viewing the hands-on activities as useful in forming a connection between theoretical and practical knowledge. However, factors such as problems with Internet access and navigation issues when using the *Second Life* platform, in addition to its steep learning curve, posed a significant challenge for participants.

The Web 2.0 technologies that were perceived by the participants as most effective in the implementation of *The Panhellenic Project* were also rated the easiest technologies to learn. The project wiki and blog were regarded as useful and supportive of collaboration, knowledge exchange and sharing of resources. The most difficult

technology to learn as perceived by the participants was *Second Life*; this was largely due to problems with connectivity and technical issues.

Through an analysis of participant responses to open-ended questions, wiki posts and *Second Life* chat transcripts; evidence of constructivist learning was observed as one of the outcomes of *The Panhellenic Project*. A comparison of pre- and post-project questionnaire responses to subject matter content, demonstrated that engaged learning had occurred through collaboration and active participation in the project.

The next chapter presents a brief overview of the study, summarizes and discusses the findings of *The Panhellenic Project*, and identifies the limitations of the study. Finally, conclusions are drawn from the data analysis and recommendations are offered for further research.

Chapter V: Discussion and Conclusions

Introduction

This chapter presents a brief summary of the study and summarizes the findings from the data analysis presented in the previous chapter. It discusses the limitations of the study, implications for action and provides recommendations for further research.

Overview of the Study

The Internet has begun to transition into a more dynamic forum, one that promotes social interaction and collaboration among its users. This new evolutionary phase of the Internet is commonly called Web 2.0 (O'Reilly, 2005) and incorporates a range of new technologies that allow users to communicate, collaborate as well as create and share information. For the educational community, there are important questions to ask about the capabilities of these new technologies. For example, how can these Web 2.0 applications be used to address problems connected with online learning? Moreover, can these new technologies be used to make online learning more engaging?

It is well documented that among the difficulties associated with online learning is the problem of students not engaged in the course content (Bryant et al., 2005; Calvert, 2005; Leung & Li, 2006; Schlosser & Anderson, 1996; Sherry, 1996). For course work held within a virtual environment, one that uses a "read only" instructional design with minimal interactivity a common end result is high attrition among the online learners (Bryant et al., 2005; Calvert, 2005; Leung & Li, 2006). This high attrition rate has been a consistent trend in distance education, creating the challenge of how to design online instruction for the type of learning that encourages student engagement.

The purpose of this study was to assess the level of learning engagement through student participation in *The Panhellenic Project,* an instructional design model that integrated constructivist learning principles with Web 2.0 technologies within an online learning environment. The Web 2.0 technologies that were used in this study are a blog, a wiki and the *Second Life* virtual world. In addition, student-participant perceptions of the scaffolding activities and usability issues associated with these Web 2.0 technologies was also investigated.

While the study was not conducted within an online course format, the project was implemented using online instruction, online resources and online activities that are easily adaptable to the online course format.

The research questions examined in this study were as follows: (a) What is the level of engagement demonstrated by students participating in *The Panhellenic Project*; (b) Do student-participants perceive structured introduction sessions to the Web 2.0 technologies helpful in the implementation of *The Panhellenic Project*; and (c) What are student-participant perceptions concerning the effectiveness of using blogs, wikis and *Second Life* virtual world in the implementation of *The Panhellenic Project*.

Review of methodology. This study employed a case study design using a mixed-methods approach where both quantitative and qualitative data were collected and analyzed. The case study framework allowed for an in-depth exploration of student engagement using Web 2.0 technologies, as well as the related issues of instructional design and technology usability.

The study was framed around a collaborative group project entitled *The Panhellenic Project*, where undergraduate students enrolled in a university sports history

course worked in teams with the task of creating a three-dimensional simulation of the ancient Greek Parthenon and one virtual Olympic game event within the *Second Life* virtual world. Six instructional sessions and two optional *Second Life* practice sessions were scheduled for *The Panhellenic Project*.

The project blog was developed as an *Second Life* informational resource site giving student-participants a web-based reference for learning how to use the technology. Blog resource information included links to *Second Life* tutorials, YouTube™ videos, in-world practice stations and shops along with direct teleports (slurls) to exotic *Second Life* locations for inspiration.

The wiki was established as the base for student-participant sports history research by providing a collaborative workspace for project information, knowledge exchange and resource sharing.

Constructivist learning principles were used as the guiding theoretical framework in the instructional design of *The Panhellenic Project*. Additionally, many of the teaching principles outlined in Chickering and Gamson's (1991) *Seven Principles for Good Practice…* served as the pedagogical framework for the project. Scaffolding exercises and activities were developed as an instructional strategy in order to teach student-participants how to utilize the Web 2.0 technologies introduced in this study.

Multiple sources were used to capture data including the *Survey of Student Engagement, Pre-Project Questionnaire, Post-Project Questionnaire* and electronic discourse analysis of the wiki posts and *Second Life* chat transcripts. The *Survey of Student Engagement* was developed to measure levels of engagement at the classroom level using the combined total of three subscales: Cooperative Learning, Cognitive Level

and Personal Skills for an overall engagement score. The *Pre-Project Questionnaire* provided participant data regarding knowledge about ancient Greek sports history as well as their level of technological experience. The *Post-Project Questionnaire* posed identical content knowledge questions as the *Pre-Project Questionnaire*, and then captured participant perceptions about *The Panhellenic Project* using Likert scale and open-ended questions.

The project wiki posts and *Second Life* chat transcripts were analyzed and coded for evidence of engaged learning and evidence of learning within a constructivist framework. The project blog was used as a *Second Life* resource page providing only information, therefore, no participant blog posts were expected or observed.

Statistical analysis of quantitative data was performed using SPSS Graduate Pack 11.0 for Mac® OSX. Qualitative data was analyzed using a summation of open-ended questions and thematic coding of the electronic discourse. To ensure consistency in data coding of project wiki posts and *Second Life* chat transcripts, a second coder was used to minimize the threat to internal validity.

Research Findings

Evidence of engaged learning. The first research question investigated the level of learning engagement demonstrated by the students that participated in *The Panhellenic Project*. Several strategies were used to measure the engagement level of student-participants in order to obtain a holistic perspective concerning project engagement. Engagement results from the *Survey of Student Engagement* showed that 27% of the participants were actively engaged in the project, 33% moderately engaged, 16% somewhat and 24% not engaged in the project. The percentage of student-participants not

engaged in *The Panhellenic Project* is consistent with the 10% to 25% attrition rate of online learners represented in the literature (Bryant et al., 2005; Leung & Li, 2006; Schlosser & Anderson, 1994; Tyler-Smith, 2006).

Although the analysis of project wiki posts demonstrated little evidence of engaged learning (16%), data collected from the *Post-Project Questionnaire* reported otherwise. Using a Likert scale, participants were asked if during group activities, students actively sought to learn from one another in order to enrich their understanding of knowledge and practice in the field, 55% of the participants agreed.

Similarly, the *Post-Project Questionnaire* surveyed participants to determine if they felt their contributions and wiki posts added to the enrichment of the learning experience of the other learners, 66% agreed or strongly agreed. In addition, the majority of the project participants indicated that their team members were actively involved with the project. In fact, 74% reported that "All Four Team Members" participated actively in the project most of the time.

Data collected from the open-ended questions provided further insight into engagement levels of project participants. Participants commented on how they enjoyed using the project wiki because it supported collaborative learning and an exchange of differing levels of knowledge. The wiki was also viewed as a platform that encouraged full inclusion where everyone could contribute to the project, share alternative views and provide easily accessible communication between teammates.

This discrepancy between evidence of engagement from the wiki posts versus the *Post-Project Questionnaire* is likely due to participants unfamiliar with using the wiki as a virtual space to exchange dialog and engage in discussion. Furthermore, the constraints

of the project timeline did not allow for an in-depth tutorial exhibiting all aspects of the wiki's capabilities. Figure 10 shows a screenshot of *The Panhellenic Project* wiki.

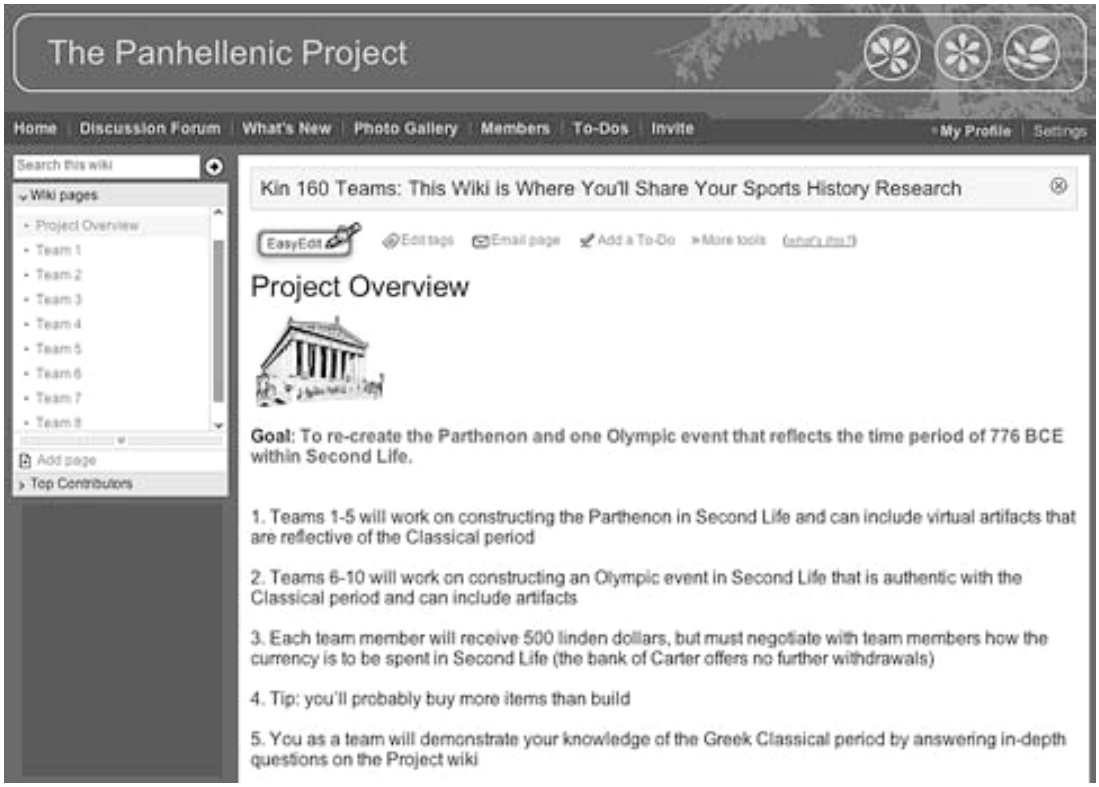


Figure 10. Screenshot of project wiki instructions

Comparison between pre-project and post-project questionnaires regarding participant subject matter knowledge about ancient Greek history showed that learning had occurred over the length of the project. A significant increase in the level of knowledge relating to ancient Greek sports history and ancient Olympic games was self-reported by the participants. However, although an increase in the level of knowledge about the Parthenon was reflected in the results, that increase did not demonstrate extensive knowledge in the subject matter.

Structured introductions to the technologies. The second research question explored participant perceptions of the structured introductions to the Web 2.0

technologies. These orientations or training sessions were developed as part of the instructional design of the project in order to determine if the sessions were useful in developing the skill-set necessary to effectively use the Web 2.0 technologies selected for this study. Figure 11 shows a *Second Life* screenshot of one of the "in-world" training sessions.

Figure 11. Second Life screenshot of team practice session

While 50% of the participants indicated that the applied instructional activities designed to connect theoretical and practical knowledge was effective, 53% did not find the specific introductions to the uses of the blog, wiki or online *Second Life* sessions useful in completing *The Panhellenic Project.* This statistic is likely more representative of participant feelings toward *Second Life* training sessions rather than wiki or blog orientations. This impression is supported by the fact that 65% of the participants did not find the "in-world" *Second Life* orientation sessions useful in completing the project. Problems with Internet connectivity, *Second Life* technical issues and the limitations of

the virtual environment caused significant interference in the initial orientation sessions resulting in a frustrating experience for many student-participants.

Effectiveness of web 2.0 technologies. The final research question examined the effectiveness of the Web 2.0 technologies used in this study as viewed from the perspective of the student-participants. When the participants were asked to rate the level of difficulty or usability of each of the platforms used for the project, 58% rated the project wiki a level 1 or level 2. Level of difficulty was determined by a Likert scale with 1 equivalent to Very Easy and 5 equivalent to Very Difficult. Similarly, 55% of the participants rated the project blog a level 1 or level 2 with 8% rating it a level 5.

Of the three Web 2.0 technologies used for this study, the *Second Life* virtual world was viewed by participants as the most difficult to use in completing the project. Only 15% of the participants rated *Second Life* a level 1 or level 2, while 42% rated the platform a level 5.

The *Post-Project Questionnaire* collected additional data regarding perceptions about the effectiveness of the Web 2.0 technologies through a series of open-ended questions. Overall, the main objections expressed by student-participants about *Second Life* were the technical issues experienced during implementation of the project.

Problems with software download, log in failure and firewall issues were common. Several participants indicated that more time was needed to acclimate to the immersive virtual environment and to better understand the various tools and applications used in *Second Life*. Even though many of the student-participants experienced a certain level of frustration in using *Second Life* as part of the project, several wrote that they enjoyed creating their custom avatar as well as building and buying virtual items. Some

saw the potential of *Second Life* as an emerging educational platform, describing it as "new and intuitive."

The *Second Life* portion of *The Panhellenic Project* instructed half of the student teams to establish the ancient Greek Parthenon on project virtual land and the other half to create an ancient Olympic game event. Given that the student-participants had only six, one-hour and 15 minute sessions to complete the project and with all of the technical difficulties experienced with *Second Life* throughout the course of the project timeline, participants were able to complete the majority of *The Panhellenic Project.* Figure 12 shows a screenshot of the final project in *Second Life.* Teams working on the ancient Olympic game event felt that the task was beyond their abilities particularly with respect to the project timeline, though their work is represented by an Olympic torch and flame resting next to the Parthenon.

Figure 12. Screenshot of completed Second Life portion of the project

Viewed as an easy platform to learn in comparison to *Second Life*, the project wiki was identified most favorably by the majority of the student-participants. The open-ended questions from the *Post-Project Questionnaire* revealed a strong theme running through participant's perceptions of the project wiki. They found the wiki effective for

teamwork and in working collaboratively together to engage in research about ancient sports history. Most of the sports history research submitted by the nine teams showed high quality work and depth in their answers. All teams completed the wiki portion of The Panhellenic Project successfully.

For those participants that used the project blog in order to learn more about how to use *Second Life*, the blog was viewed as informational and easy to use. Figure 13 provides a screenshot of *The Panhellenic Project* blog. A few of the student-participants seemed to confuse the project blog with the project wiki and some participants never accessed the blog during project implementation.

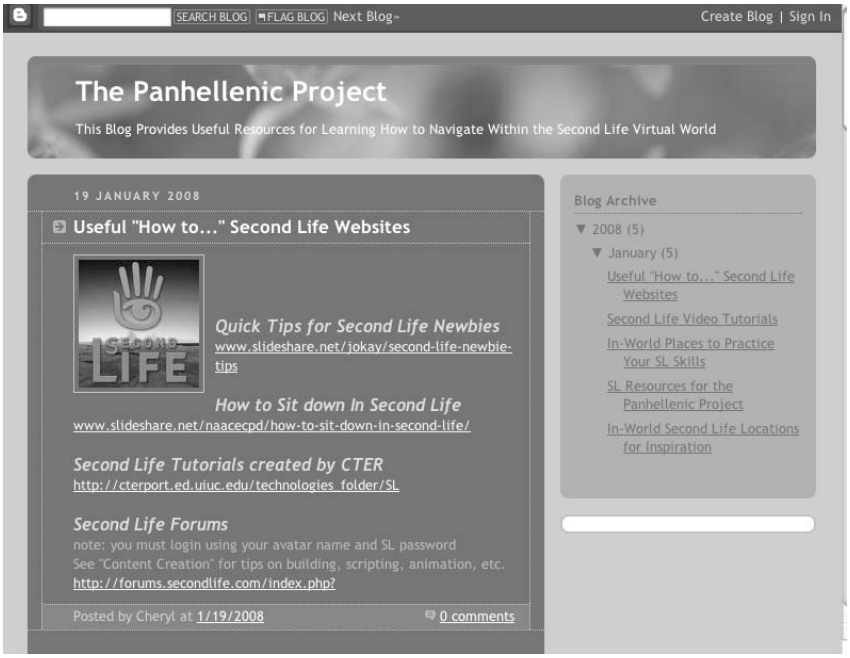


Figure 13. Screenshot of The Panhellenic Project blog

While a good number of the students participating in the study seem to find the Web 2.0 technologies effective in the implementation of *The Panhellenic Project,* 13 out of the 34 participants that answered the *Post-Project Questionnaire* indicated that they did not find the new technologies effective and preferred the traditional lecture format.

Constructivist learning. The constructivist learning approach proposes that learning is an active process where the activities assist in the development of concepts and where experience is gained through active participation (Cooperstein & Kocevar-Weidinger, 2004). In general, constructivist learning involves learners constructing their own knowledge, incorporating their previous experiences, applying multiple perspectives to the task at hand and engaging in collaborative interaction with other learners (Almala, 2005; Cooperstein & Kocevar-Weidinger, 2004; Gagnon & Collay, 2006).

An analysis of the *Post-Project Questionnaire* revealed that collaborative learning was taking place throughout implementation of *The Panhellenic Project.* Team members were perceived by their teammates as active contributors to the project, sharing differing views, resources, information and knowledge with one another particularly through use of the project wiki. Discourse analysis of wiki posts showed that 40% of the participants Shared Knowledge (SK) meaning that they were sharing existing knowledge and information with other participants. Twenty-five percent Exchanged Resources and Information (ERI), which meant that the participants were posting or exchanging resources or information useful for completion of the project.

Though there was limited conversation recorded as *Second Life* chat, what was captured showed predominately Engaged Learning (E) by project team members. Engaged Learning was defined as strategies that demonstrate curiosity, course involvement, analysis and synthesis of information.

When participants were asked what they liked best about the Web 2.0 technologies used in this study, what was cited most often were the basic tenets of constructivist learning: interaction with other learners, collaborative team work and the

sharing of multiple perspectives. Moreover, completion of *The Panhellenic Project* reflected many of the characteristics observed in multiplayer online games. Characteristics such as interactivity, knowledge construction, contextualized knowledge creation and collaboration among peers (DeKanter, 2005).

Limitations of the Study

The Panhellenic Project used a case study approach in order to better understand the factors, influences and instructional design elements that support learning engagement through the use of Web 2.0 technologies. There are, nonetheless, limitations to this study that need to be recognized.

First, this research study was designed to be exploratory in nature; it was not designed to produce results for large-scale application. Second, the study was limited to one university level sports history course and cannot be generalized to all approaches of online learning. What is within the scope of this study is a contribution to the broad instructional knowledge base, one that includes course design strategies that use new technologies to support student engagement in the learning process.

Conclusions and Recommendations

Over the last decade, online courses have experienced high drop-out across disciplines from its online student population. Many of the common factors often expressed by online learners that have lead to high attrition rates are lack of engagement with course content, limited opportunities for deliberation and discourse as well as a lack of social interaction among peers (Chin & Williams, 2006; Matthews, 1999; Middleton, 1997; Sampson, 2003). Additionally, feelings of isolation, frustration with course-related technical issues and slow to respond technical support have also been cited as underlying

reasons for high attrition in online courses (Bryant et al., 2005; Chernish, DeFranco, Linder & Dooley, 2005; Gibbs & Gosper, 2006).

While *The Panhellenic Project* was not conducted within the framework of an online course, the project's design was developed so that the majority of the instructional activities were conducted online or easily adaptable to the virtual environment. Project sessions were held mostly on-campus within the college library though the student-participants were spread out throughout the building, engaging in activities using their own laptops.

There were several reasons why this study was implemented using this format: (a) the course instructor did not want sessions conducted completely within a virtual environment since the course was not designated as a "hybrid" section; (b) there were problems with intermittent Internet connectivity within the course classroom since it was housed in an older building on campus; and (c) campus protocols and policies restricted software and hardware usage resulting in the project design structure adjusted to comply with campus policy.

Learning in virtual environments. As discussed previously, one of the guiding principles of the constructivist learning approach is that learning is an active process. Prince (2004) in his examination of the research concerning the effectiveness of active learning, defined active learning as "…any instructional method that engages students in the learning process; …active learning requires students to do meaningful activities and think about what they are doing" (p. 1). Findings from *The Panhellenic Project* showed that most of the student-participants were actively engaged in learning, working together,

collaborating, and exchanging knowledge and resources as they endeavored to complete the project.

What is strikingly apparent, is that the easier the technology is to use, the more it enhances and supports engagement in course content and in the learning process. This is evident by the enthusiastic responses to the project wiki by the participants. Boettcher (2007) in her discussion about the core principles needed for designing effective learning environments, advocates "making student's thinking visible" (¶ 28) and the wiki is clearly a modality that allows for collective activity and visibility among learners. Both the wiki and the blog can easily be incorporated into the curriculum of online courses and perhaps offers a solution to a number of the issues known to contribute to the high attrition among online learners.

On the other end of the spectrum, if the technology used in the course design has a steep learning curve, it can create a barrier to learning. Rather than enhance the opportunity to learn, what is formed instead is a disconnection between the student and course content causing a disruption in the learning process. This disruption can take the student out of their zone of proximal development resulting in withdrawal and disengagement from the instructional activities and failure to see the purpose of the lesson as was the case for several participants involved in the project (Boettcher, 2007; Vygotsky, 1978).

Technical issues can add another layer of distraction to the process of learning, leading to the "cognitive overload" described by Tyler-Smith (2006) in his analysis of factors leading to attrition among first-time online learners. Many of the participants in

The Panhellenic Project experienced this "cognitive overload" when using *Second Life* especially during the first, two training sessions.

Specifically, if the learner experiences multiple complex learning tasks, they become overwhelmed or "overloaded" cognitively which results in a shutting down in the learning process (Tyler-Smith, 2006). The expression "you can never take back a first impression," holds true for many of the participants in the project who could not overcome their initial and continued frustrations with *Second Life*.

For those students that were able to navigate within *Second Life* with minimal technical issues, the experience was positive and the educational potential of the platform was acknowledged. For example, participants suggested that rather than have students create the Parthenon and an Olympic event themselves, what would have been more effective would be to participate in a scavenger hunt within an virtual ancient Greek city-state located in *Second Life.* Some suggested that *Second Life* would be most effective for courses held online.

The key for *Second Life* is that its navigation and technical issues need to be resolved. If this can be accomplished, then it has the potential of solving one of the main problems with online asynchronous learning, which is the feeling of being isolated within a virtual environment.

Second Life is a highly interactive platform whose strength is in its ability to support and encourage social interaction among its users. This aspect is apparent by *Second Life's* wide-spread popularity as a social virtual space for its recreational users. If Linden Lab® can maintain the social presence and appealing attributes of *Second Life*,

lessen the learning curve and create a stable platform, then the educational possibilities are potentially far reaching.

Emergent technologies and education. As new technologies become integrated into curriculum design both for online and face-to-face course work, educational institutions should consider reassessing their current technology practices. Intermittent wireless Internet connectivity is not an uncommon occurrence on college campuses particularly with older academic buildings, but it became a significant problem for the introduction to *Second Life* orientation sessions executed in this study. Weak connections and dropped connections made it difficult to use the technologies that require a high level of bandwidth such as *Second Life*. At times, connectivity problems interfered when multiple teammates tried to access the project wiki all at the same time. At one point, the researcher wondered why it is easier to make a wireless connection at the local coffee house than it is on some college campuses.

Moreover, educational institutions must consider reviewing their current network security protocols because some policies can be so restrictive that experimentation with new technologies is a difficult endeavor to negotiate. For example, a number of campuses have the policy that software cannot be uploaded in labs during the academic term. This policy makes it hard for faculty to engage in experimental or spontaneous lesson planning. Adjustment to such a policy would provide educators the opportunity to build curriculum that is dynamic and evolutionary so as to keep the course content fresh and vibrant. Curriculum innovation isn't always a planned process.

With network security breaches common in today's headlines it is understandable why colleges and universities are cautious about technology usage, but for innovation to

occur within curriculum design there needs to be a "middle ground" that supports creative exploration to new approaches to learning.

Virtual worlds are just beginning to emerge as an instructional arena for educators. Given the general disinterest in the education market by traditional computer game companies, virtual worlds such as *Second Life, Activeworlds* and *There* may eventually lead to a solution to some of the persistent problems associated with online learning and develop into an effective platform for constructivist learning.

What is appealing about *Second Life* is that it can accommodate different operating systems (Mac, Windows, Linux), while most of the current crop of virtual worlds can only accommodate PC systems. Linden Lab®, developers of *Second Life* have actively marketed to the education community and have dedicated personnel assigned to support the educators who use *Second Life.* Still, there are a number of issues that could significantly affect the longevity of *Second Life* as an educational platform:

- Currently, there is a restriction in the number of avatars that can be created from one Internet Service Provider (ISP) location. This Linden Lab® policy was initiated due to past abuses by users that caused major problems (griefing) within the virtual world. This policy is not likely a problem for online courses where students log in from multiple locations; however, it is a problem for educators who use computer lab facilities to conduct class in *Second Life* or for those students who use the campus network for Internet access. As the researcher discovered at the final session, it can also be a problem for housemates or dorm residents who share the same ISP.

- Timely tech support can become an issue and is highlighted as a critical factor in withdrawal from online courses. Unlike many of the *Second Life* residents who are in-world for social reasons, classes held in *Second Life* are bound by the academic calendar. Delays in addressing technical issues can undermine lesson plans and the time necessary to cover crucial course content. Student and campus firewall issues can result in persistent log in problems, therefore, timely tech support is necessary to keep levels of student frustrations to a minimum and in order for *Second Life* to integrate well with course content and design.
- *Second Life* is a global platform with a diversity of users. For many of the "high end" residents who desire high resolution graphics, advanced capabilities and expert tools, the bi-monthly *Second Life* upgrades and fixes (current at the time of this writing) help to keep the platform interesting and challenging. For academic institutions with budget restrictions and for students struggling to keep up with the increasing costs of higher education, the constant upgrades will ultimately out pace the hardware constraints of the academic user. This could then lead to consistent "crashes" and frustrating lag that make it difficult to navigate within the virtual environment.

Because "technology time" seems to move so much faster than "real time," it is easy to forget that *Second Life* has only been around for a few years, since 2003. In his book, *Diffusion of Innovations,* Everett M. Rogers (2003) discusses how innovation is assimilated into a community or culture. Figure 14 provides an overview of the innovation adoption categories outlined in Rogers' (2003) book.

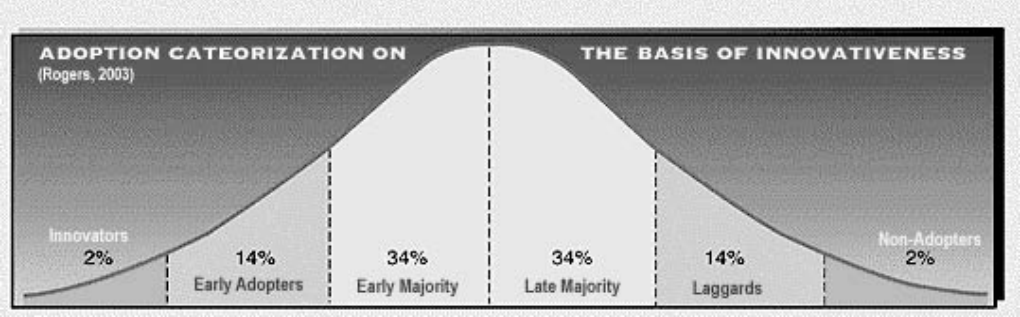


Figure 14. Diffusion of innovations adoption categories

For *Second Life* to shift from the Early Adoption to the Early Majority category within the education community, the developers as well as the developers of other virtual worlds might consider these recommendations.

Consider creating a separate virtual world grid that requires lower bandwidth, uses simplistic tools and defaults the graphical interface at a lower setting, basically a "*Second Life* Light." This could meet the needs of many members of the academic community as well as for the virtual world resident that enters the virtual environment purely for social reasons rather than for the creation of elaborate artifacts. The main grid would still be available for those disciplines such as Computer Science, Engineering, and Multi-Media as well as for the "high end" resident needing a more sophisticated platform.

Further, consider establishing a designated registration period several times a year to assist educators and their students with initial multiple avatar creation and to assist with trouble-shooting any start up problems. In its current state, *Second Life* may be more effective for smaller class sizes, more independent academic work or for disciplines that require their students to use sophisticated, state-of-the-art hardware.

It is important for educators to understand that *Second Life* is not a virtual classroom or an academic institution but a blank canvas where educators can experiment

with new ways of learning. It is a virtual world that reaches out to a global population and to many different communities engaged in many different activities.

> Richard Bartle's (2004) description of virtual worlds is worth repeating here: Virtual worlds are places. Virtual worlds are not simulations because they don't simulate anything. They approximate aspects of reality---enough for the purposes of immersion. (p. 474)

Design for learning. In designing the instructional components of *The Panhellenic Project*, the initial introduction session to *Second Life* called for a group introduction. The group approach was not effective for a variety of reasons. For one, the researcher's attention was diverted to those students experiencing technical problems leaving those participants with no tech issues without any direction. What was effective and used for successive sessions was a self-paced approach where participants received written instructions and worked through the in-world training sessions at their own pace. Students worked in pairs so that they could share knowledge and computer experience, but also because 38 avatars in one location in *Second Life* would result in excessive lag meaning a slowdown of movement in the virtual environment.

Upon reflection, *The Panhellenic Project* was designed as an ambitious project where participants were introduced to three new technologies in just six, approximately one-hour sessions. What was not anticipated or integrated into the design of the project design was how to accommodate students who were absent during one or more of the training sessions. It is likely that the participants who had indicated, "feeling lost" or unclear about the purpose of the project on the *Post-Project Questionnaire* were absent during the initial start-up sessions. This project was designed for active learning;

therefore, instructional emails with accompanying handouts (passive learning) were not enough for absentee students to fully understand the overriding purpose of *The Panhellenic Project.*

Moreover, the project was designed to be a companion piece and support to the lecture that focused on ancient Greek sports history. It was discovered late during the implementation of the project that the lecture component was out of sync with the activities and not introduced until *The Panhellenic Project* was almost complete.

As discussed earlier, the role of technology should be to enhance the lecture, not replace it so this discovery may account for some of the content knowledge confusion expressed by student-participants. Despite this development, participants seemed to have learned a great deal in terms of content knowledge and technology application within a relatively short period of time. The researcher believes that learning occurred largely due to the application of many of the principles found in the *Seven Principles for Good Practice.* These principles served as a foundation that supported constructivist learning strategies in the instructional design of the project and were as follows:
(a) Develop cooperation among students; (b) Use active learning techniques; (c) Provide prompt feedback; (d) Communicate high expectations; and (e) Respect diverse talents and ways of learning (Beldarrain, 2006: Chickering & Gamson, 1991).

Finally, other considerations that would be useful in designing for instruction using Web 2.0 technologies is to incorporate the instructional design factors for quality online learning suggested by Fresen (2007) and Hosie, Schibeci & Backhaus (2005). These studies recommend adding to the traditional instructional design model factors

such as assessing appropriate bandwidth, download demands, accessibility, usability and reliability of the interface (Fresen, 2007; Hosie et al., 2005).

Implications for Further Research

The Panhellenic Project offered important insight into the effectiveness of using a selection of Web 2.0 technologies to engage students in the process of learning. Yet, there is more to be learned from this project and it would be interesting to compare findings if *The Panhellenic Project* were implemented under less restrictive research protocols.

For further research, it is recommended that *The Panhellenic Project* be initiated using an action research study design one that allows a more participatory approach to research where relationships can develop between the researcher and the participants (Stringer, 2004).

An action research design may be more effective in determining the project's instructional design because the researcher needs to also teach the course content to ensure that it runs parallel to the technological strategies used in the study. This design would allow for instructional adjustments that could accommodate the natural "ebb and flow" of teaching. Additionally, the project should be implemented over a longer period of time, perhaps for a full academic term in order to ease the steep learning curve associated with *Second Life* and with a smaller class size.

The Panhellenic Project could also be implemented using an interdisciplinary approach where students from several disciplines (majors) such as Classics, Architecture and Multimedia work in collaborative teams to create a virtual ancient Greek city-state,

learning from each other different types of content knowledge and multiple perspectives generated from the unique lens of each discipline.

Both the blog and the wiki are Web 2.0 technologies that are easily adaptable to small and large class sizes and can be effective for learning in the online and traditional classroom. The wiki, so popular with the *Panhellenic* participants, supports active learning in that students can interact with wiki content and each other as well as exchange knowledge, information and resources.

There are other Web 2.0 technologies that have the potential for effective active learning, such as Voice over Internet Protocol (VoIP) or social bookmarking, technologies that can easily be integrated as a part of a collaborative project design.

In conclusion, Richardson and Newby (2005) propose that distance education should be less concerned with comparisons between traditional classroom environments versus distance learning environments and focus instead on "how learners learn in online environments," and "how students engage with their online course work" (p. 2). Therefore, in order to gain a complete view of the effectiveness of the instructional design of *The Panhellenic Project,* it is important to take it to the next step and implement it using students enrolled within an online course format. A crucial factor in analyzing the outcome of *The Panhellenic Project* in a completely virtual environment will be to monitor the rate of attrition among the learners who participate in the project.

A final thought about using new technologies for educational purposes. The professor who agreed to participate in this project did so not so much because he was interested in the technologies per se, but because he was looking for new ways to teach subject matter content that is environmentally friendly. With 38 participants in this study,

the project wiki alone saved large amounts of paper from being used to demonstrate knowledge. Perhaps these Web 2.0 technologies may be useful for not only engaging students in learning, but also as a way to leave fewer "footprints" on our environment.

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APPENDIX A

Gee's (2003) The 36 Learning Principles

1. Active, Critical Learning Principle
2. Design Principle
3. Semiotic Principle
4. Semiotic Domains Principle
5. Metalevel Thinking about Semiotic Domains Principle
6. "Psychosocial Moratorium" Principle
7. Committed Learning Principle
8. Identity Principle
9. Self-Knowledge Principle
10. Amplification Principle
11. Achievement Principle
12. Practice Principle
13. Ongoing Learning Principle
14. "Regime of Competence" Principle
15. Probing Principle
16. Multiple Routes Principle
17. Situated Meaning Principle
18. Text Principle
19. Intertextual Principle
20. Multimodal Principle
21. "Material Intelligence" Principle
22. Intuitive Knowledge Principle
23. Subset Principle
24. Incremental Principle
25. Concentrated Sample Principle
26. Bottom-up Basic Skills Principle
27. Explicit Information On-Demand and Just-in-Time Principle
28. Discovery Principle
29. Transfer Principle
30. Cultural Models about the World Principle
31. Cultural Models about Learning Principle
32. Cultural Models about Semiotic Domains Principle
33. Distributed Principle
34. Dispersed Principle
35. Affinity Group Principle
36. Insider Principle

APPENDIX B

Overview of Study: Agreement to Participate in Research

You have been asked to participate in a research study entitled "The Panhellenic Project: Assessing Learning Engagement Using Web 2.0 Technologies."

The purpose of this study is to determine if students will become more engaged in the learning process by using an instructional design model that integrates: (1) the constructivist learning approach; (2) *The Seven Principles for Good Practice in Undergraduate Education*; and (3) a blog, a wiki and the *Second Life* virtual world as the Web 2.0 technologies to be used in this study. In addition, student-participant perceptions of the usability issues associated with these Web 2.0 technologies will also be investigated.

There are no risks anticipated through participation in this study. An anticipated benefit to participation in the study is the opportunity to be introduced to new web-based technologies.

The research study is called "the Pan-Hellenic Project" and the goal is to re-create the ancient Greek Parthenon and one Olympic venue (776 B.C.E.) as a simulation within *Second Life*. Along with the use of *Second Life*, students will use Web 2.0 social software technologies (wiki and blog) to share and exchange their resources as they investigate ancient Greek society. Working in collaborative teams, the students would immersive themselves in the *Second Life* virtual world and build a simulation of this Greek venue.

The study would involve student-participants meeting for five (5) one hour and 15 minute sessions with two (2) optional practice sessions. Student-participants will be given the *Survey of Student Engagement* in addition to pre- and post-project questionnaires developed to collect their feedback about the experience regarding their level of engagement, views regarding the instructional design and usability of the technologies used in this project. Survey and questionnaire responses, blog and wiki postings and chat transcripts will be confidential and only a tabulation of responses will be summarized and reported.

Project Overview:

Session 1: *Intro to Research Study/Project*
- Information about Web 2.0 technologies (blogs, wikis, *Second Life*)
- Suggested task list, timeline, division of tasks
- Division of students into groups (G1, G2, G3, G4, G5, G6, G7, G8)
- Administration of the Pre-Project Questionnaire

Session 2: *Intro to Second Life (SL)*
- Basic navigation and practice activities (in-world)
- Second Life Skill Building Tutorial (in-world*)*

Session 3: *Second Life Building Tutorial & Practice Session*
- Review of resource wiki and project blog
- Second Life practice session, learning about resources/field trips (in-world)

Session 4: *Working Groups*
- Begin preparing SL region for project (in-world)
- All groups working on project

Session 5: *Completion of Panhellenic Project*
- All groups in-world building project, finishing final project
- Administration of the Survey of Student Engagement and Post-Project Questionnaire

Note: Two (2) optional practices sessions will be scheduled for project student-participants
Students will be working on the project wiki outside of class and using the blog as the project scaffolding artifact and *Second Life* resource center.

APPENDIX C

Consent Form

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES

Participant: _____

Principal Investigator: Cheryl A. Carter

Title of Project: The Panhellenic Project: Assessing Learning Engagement Using Web 2.0 Technologies

1. *I _____, agree to participate in the research study being conducted by Cheryl Carter _____ under the direction of Dr. Ray Gen, Pepperdine University, Educational Technology Program.*

2. *The overall purpose of this research is to assess the level of learning engagement using an instructional design model that integrates: (1) constructivist learning tenets; the Seven Principles for Good Practice in Undergraduate Education; and (3) a blog, a wiki and Second Life virtual world as the Web 2.0 technologies to be used in this study.*

3. My participation will involve the following:
   Researching ancient Greek sports history and posting information, resources, book titles, research articles, photos etc. to wiki website; Working in teams with classmates to create a 3D simulation of the ancient Greek Parthenon and one ancient Olympic game venue in Second Life virtual world; Completion of the Survey of Student Engagement and a Pre-Project Questionnaire and Post-Project Questionnaire.

4. My participation in the study will consist of five (5) class sessions within the Kin 160 – History of Sports and PE course scheduled for Spring 2008 semester. The study shall be conducted at San José State within an on-campus computer lab or within the classroom setting.

5. I understand that the possible benefits to myself from this research are:
   The opportunity to learn how to use and apply new Web 2.0 technologies.

6. I understand that there are no anticipated risks involved in this study. The probability and magnitude of harm or discomfort are no greater than what I would likely encounter in daily life.

7. I understand that I may choose not to participate in this research.

8. I understand that my participation is voluntary and that I may refuse to participate and/or withdraw my consent and discontinue participation in the project or activity at any time without penalty or loss of benefits to which I am otherwise entitled.

9. I understand that the investigator will take all reasonable measures to protect the confidentiality of my records and my identity will not be revealed in any publication that may result from this project. The confidentiality of my records will be maintained in accordance with applicable state and federal laws.

10. I understand that the investigator is willing to answer any inquiries I may have concerning the research herein described. I understand that I may contact Cheryl A. Carter or Dr. Ray Gen if I have other questions or concerns about this research. If I have questions about my rights as a research participant, I understand that I can contact Dr. Stephanie Woo, Chairperson of the Graduate and Professional Schools *IRB*, Pepperdine University, 310-258-2845.

11. I will be informed of any significant new findings developed during the course of my participation in this research which may have a bearing on my willingness to continue in the study.

12. I understand to my satisfaction the information regarding participation in the research project. All my questions have been answered to my satisfaction. I have received a copy of this informed consent form which I have read and understand. I hereby consent to participate in the research described above.

Participant's Signature Date

I have explained and defined in detail the research procedure in which the subject has consented to participate. Having explained this and answered any questions, I am cosigning this form and accepting this person's consent.

Principal Investigator Date

If any further information is required, please contact: Cheryl A. Carter (510) 410-XXXX cacarter@pepperdine.edu	Pepperdine University Graduate School of Education and Psychology – Educational Technology Dr. Ray Gen, Dissertation Chairperson (310) 908-XXXX rmgen@pepperdine.edu or raygen@gmail.com

APPENDIX D

Panhellenic Project
Pre-Project Questionnaire

Instructions: Thank you for participating in this study, "The Panhellenic Project: Assessing Learning Engagement Using Web 2.0 Technologies." Please take a few minutes to respond to the following questions, your responses will help me to better understand your background and technology experience. The questionnaire should take approximately 10 minutes to complete and your responses will remain confidential as only a tabulation of responses will be summarized and reported.

Background Information

1. Please identify your gender:

____ Male ____ Female

2. Please select your age group:

____ 25 or younger ____ 26 – 29 ____ 30 – 39

____ 40 – 49 ____ 50 – 59 ____ 60 or older

3. Please circle year of study: freshman sophomore junior senior

4. Please list your undergraduate major or program of study: _____

5. Please indicate the industry that best describes your current work environment:

____ K-12 Education ____ Higher Education ____ Corporate/Government

____ Not Working ____ Other, please specify _____

Content Knowledge

On a scale of 1 – 5 with 1 = No Knowledge and 5 = Very Knowledgeable, please rate your level of knowledge regarding the following content areas.

6. How well do you know ancient Greek history between the late Dark Age (1900 – 700) through the Hellenistic Period (323 – 30)?

1 2 3 4 5

7. How well do you know ancient Olympic games history beginning in 776 B.C.E. through the Hellenistic Period (323 – 30)?

1 2 3 4 5

Panhellenic Project
Pre-Project Questionnaire

8. The Parthenon, a Greek temple built during 447 – 438 B.C.E. comprised a blending of two distinct architectural styles. How knowledgeable are you regarding ancient Greek architecture?

1 2 3 4 5

Technology Experience
Please describe your experiences with technology.

9. How long have you used a computer?

____ Less than 6 months
____ 6 months to 1 year
____ 1 to 2 years
____ 2 to 5 years
____ 5 to 10 years
____ Over 10 years

10. If you have access to the Internet, how many hours per week are you online?

____ Less than 1 hour
____ 1 to 2 hours
____ 2.5 to 5 hours
____ 5.5 to 10 hours
____ 10.5 to 15 hours
____ Over 15.5 hours

11. This section has two parts. Please rate your experience and the frequency of use for each of the computer applications listed by placing an "X" in the appropriate box.

What is your experience and frequency of use with:	**Experience 1 = No Experience 5 = Very Experienced**						**Frequency 1 = Never 5 = Very Often**					
Computer Application	**1**	**2**	**3**	**4**	**5**	**N/A**	**1**	**2**	**3**	**4**	**5**	**N/A**
Email												
Online Classroom (i.e. Blackboard, Web CT)												
Blog												
Wiki												
Social Networking Software (i.e. MySpace)												
Virtual World (i.e. Second Life, There)												
Video/Computer/Online Games												
Discussion Board												
Chat Room												
Web Conferencing (i.e. Elluminate)												
Skype or other VoIP												
Video Conferencing												

APPENDIX E

Panhellenic Project
Post-Project Questionnaire

Instructions: Thank you for participating in this study, "The Panhellenic Project: Assessing Learning Engagement Using Web 2.0 Technologies." Please respond to the following questions regarding your experience as a participant in the Panhellenic Project. The questionnaire should take approximately 15 minutes to complete and your responses will remain confidential as only a tabulation of responses will be summarized and reported. Web 2.0 technologies are defined as blogs, wikis, virtual worlds and online classrooms.

Background Information

1. Please identify your gender:

____ Male ____ Female

2. Please select your age group:

____ 25 or younger ____ 26 – 29 ____ 30 – 39

____ 40 – 49 ____ 50 – 59 ____ 60 or older

3. Please circle year of study: freshman sophomore junior senior

4. Please list your undergraduate major or program of study: _____

Content Knowledge

On a scale of 1 – 5 with 1 = No Knowledge and 5 = Very Knowledgeable, please rate your level of knowledge regarding the following content areas.

5. How well do you know ancient Greek history between the late Dark Age (1900 – 700) through the Hellenistic Period (323 – 30)?

1 2 3 4 5

6. How well do you know ancient Olympic games history beginning in 776 B.C.E. through the Hellenistic Period (323 – 30)?

1 2 3 4 5

7. The Parthenon, a Greek temple built during 447 – 438 B.C.E. comprised a blending of two distinct architectural styles. How knowledgeable are you regarding ancient Greek architecture?

1 2 3 4 5

Panhellenic Project
Post-Project Questionnaire

Engagement

Please read each statement and indicate your degree of agreement that the statement represents your experience and perception of the Panhellenic Project.

8. Through the use of Web 2.0 technologies, students and faculty present new ways of understanding knowledge and practice in the field:

___Strongly Agree ____ Agree ____ Disagree ____ Strongly Disagree ____ No Opinion

9. Through the use of Web 2.0 technologies, I found the course materials and information more engaging than if I were to participate in the same project using a traditional, face-to-face format:

___Strongly Agree ____ Agree ____ Disagree ____ Strongly Disagree ____ No Opinion

10. During the group activities, students actively seek to learn from one another to enrich their understanding of knowledge and practice in the field:

___Strongly Agree ____ Agree ____ Disagree ____ Strongly Disagree ____ No Opinion

11. My interest in the subject matter was stimulated through the usage of Web 2.0 technologies:

____ Strongly Agree ____ Agree ____ Disagree ____ Strongly Disagree ____ No Opinion

12. Do you feel that the project learning materials were relevant and useful?

____ Strongly Agree ____ Agree ____ Disagree ____ Strongly Disagree ____ No Opinion

Instructional Design

Please read each statement and indicate your degree of agreement that the statement represents your experience and perception of the Panhellenic Project.

13. Do you feel your contributions and wiki postings added to the enrichment of the learning experience of other learners?

____ Strongly Agree ____ Agree ____ Disagree ____ Strongly Disagree ____ No Opinion

14. Students received hands-on instructional activities aimed at connecting theoretical and practical knowledge to tangible issues:

____ Strongly Agree ____ Agree ____ Disagree ____ Strongly Disagree ____ No Opinion

Panhellenic Project
Post-Project Questionnaire

15. I found the introduction to the uses of the blog, wiki and online *Second Life* session useful in completing this project:

____ Strongly Agree ____ Agree ____ Disagree ____ Strongly Disagree ____ No Opinion

16. I found the in-world orientation to *Second Life* sessions useful in completing this project:

____ Strongly Agree ____ Agree ____ Disagree ____ Strongly Disagree ____ No Opinion

The Panhellenic Project Experience

Please read each statement and indicate your degree of agreement that the statement represents your experience and perception of the Panhellenic Project.

17. Overall, how effectively did your group work together on this project?

____ Poorly ____ Adequately ____ Well ____ Extremely Well ____ No Opinion

18. Out of the four group members, how many participated actively most of the time?

____ None ____ One ____ Two ____ Three ____ All Four

19. Some people like individualized learning while others prefer learning with other people. What is your preferred style of learning, please select one of the following:

____ Strongly Prefer Learning With Other People

____ Usually, I Prefer Learning With Other People

____ Depends—I Like Both Equally

____ Prefer Learning Alone Most of the Time

____ Strongly Prefer Learning Alone

Usability of Web 2.0 Technologies

On a scale of 1 – 5 with 1 = Very Easy and 5 = Very Difficult, please rate the level of difficulty your experienced in using the following Web 2.0 technologies:

20. How difficult was it to use the wiki?

1 2 3 4 5 Comments:

21. How difficult was it to access the blog?

1 2 3 4 5 Comments:

Panhellenic Project
Post-Project Questionnaire

22. How difficult was it to use Second Life?

1 2 3 4 5 Comments:

23. If you indicated that the online classroom, wiki, blog or Second Life was very difficult or difficult to use, please indicate what made it so below:

Participant Perceptions

24. Did you find using Second Life, the blog and the wiki effective in learning about ancient Greek sports history? (please explain)

25. What was the best part about using Second Life, the blog and the wiki for The Panhellenic Project? (please explain)

26. What recommendations or suggestions do you have for using these Web 2.0 technologies to learn about sports history?

APPENDIX F

A Survey of Student Engagement

Please cross (X) your answers.

A. During your class, about how often have you done each of the following?

Scale: 4: very often; 3: often; 2: occasionally; 1: never

1. Asked questions during class or contributed to class discussions	**4**	**3**	**2**	**1**
2. Worked with other students on projects during class time	**4**	**3**	**2**	**1**
3. Worked with classmates outside of class to complete class assignments	**4**	**3**	**2**	**1**
4. Tutored or taught the class materials to other students in the class	**4**	**3**	**2**	**1**

B. To what extent has this project emphasized the mental activities listed below?

Scale: 4: very much; 3: quite a bit; 2: some; 1: very little

5. Memorizing facts, ideas or methods from your project readings so you can repeat them in almost the same form	**1**	**2**	**3**	**4**
6. Analyzing the basic elements of an idea, experience or theory such as examining a specific situation in depth and considering its components	**4**	**3**	**2**	**1**
7. Synthesizing and organizing ideas, information, or experiences into new, more complicated interpretations and relationships	**4**	**3**	**2**	**1**
8. Evaluating the value of information, arguments, or methods such as examining how others gathered and interpreted data and assessing the accuracy of their conclusions	**4**	**3**	**2**	**1**
9. Applying theories and/or concepts to practical problems or in new situations	**4**	**3**	**2**	**1**

C. To what extent has this project contributed to your knowledge, skills, and personal development in the following ways?

Scale: 4: very much; 3: quite a bit; 2: some; 1: very little

10. Acquiring major related or career related knowledge and skills	**4**	**3**	**2**	**1**
11. Writing clearly, accurately, and effectively	**4**	**3**	**2**	**1**
12. Thinking critically and/or analytically	**4**	**3**	**2**	**1**
13. Learning effectively on your own, so you can identify, research, and complete a given task	**4**	**3**	**2**	**1**
14. Working effectively with other individuals	**4**	**3**	**2**	**1**

Note: Survey developed by Ahlfeldt, Mehta, & Sellnow (2005)

APPENDIX G

Review and Evaluation of Pre- and Post-Project Questionnaire

December 1, 2007

Clayton J. Bell, Professor Emeritus of Counseling
Ohlone College
Fremont, California

Background:

- Bachelor of Arts in Psychology, University of California – Berkeley
- Master of Arts in Psychology with credential in School Counseling, emphasis in psychometrics
- Director of Testing & Research for 20 years
- Research studies conducted on attrition of community college students
- Extensive experience in test design and construction of surveys and questions
- Standardized and validated English and Math placement exams
- Participant-developer of the statewide ASSET placement test
- Chairperson for the Northern California branch of the ASSIST Implementation Group. ASSIST is an Inter-segmental Articulation website for community college transfers to University of California and California State University campuses

Comments regarding the review and evaluation of Cheryl Carter's Pre-Project Questionnaire and Post-Project Questionnaire:

I have read over your Questionnaires and design. First off, let's clarify some things. There is no way to validate a questionnaire or survey. It is your opinion that the Questionnaire is measuring what you say it is. Validity is an opinion! What can be assayed is the reliability of the instrument.

Reliability is repeatability. Ultimately, reliability puts a limit on the validity of what you are surveying. So, you do want reliability. It would be the convention of the institution as to whether or not some statement of reliability is needed. If I understand your design, the same Subjects will be taking the pre and post-test, so you will have built-in a test -retest measure of reliability. The problems with this are Subjects may have changed over time and the rest may induce Subject to change. The fact that your survey is measuring factual knowledge gives great strength to your design. I'm not convinced that this design calls for a measure of internal consistency as the Cronbach's alpha.

Now, I must say my method of judging how good a survey is, is to ask someone like me. Is it clear, can I understand a 5-point scale-is it laid out graphically correct? The answer here is that you have done a great job. Ran it by a sample of educated elite and they had no problems with the language-with the following corrections that I made.
1. Your use of modern dating CE and BCE may throw many people. I presume the instructional content may cover this, but what about the pre-test people? My group had never heard of it. Maybe use both (AD) and CE in the date, cumbersome-yes, but clear. On this topic, Question 5 has no BCE date for consistency.

Your category "Technology Experience." Seems to me you are equating technology with computer literacy. Why not just call it that or computer experience?

APPENDIX H

Electronic Discourse Analysis Worksheet

Framework Categories	**Code**	**Description**
Engagement	E	Engaged Learning: strategies that demonstrate curiosity, course involvement, analysis and synthesis of information
Constructivism	GS	Group Skills: group activity and cohesiveness
	AO	Assisting Others: responding to questions, requests from others
	GFB	Giving Feedback: providing feedback to others
	ERI	Exchanging Resources & Information: posting or exchanging resources/information useful for project completion
	SK	Sharing Knowledge: sharing existing knowledge/information with others
	SA	Seeking Assistance: asking for help from others
	SFB	Seeking Feedback: asking for input from others
	CG	Comments: social interaction and dialog from participants

Behavior Categories	**Code**	**Participants**										
		Team 1	**Team 2**	**Team 3**	**Team 4**	**Team 5**	**Team 6**	**Team 7**	**Team 8**	**Team 9**	**Code Totals**	**Code %**
Engagement	E											
Constructivism	GS											
	AO											
	GFB											
	ERI											
	SK											
	SA											
	SFB											
	CG											
Participant Posting Totals												

APPENDIX I

Wiki Sports History Questions

Team 1

Question #1 ~ Amateurism:

- Were ancient Greek athletes really amateurs?
- Discuss the view of amateurism during the Classical period.

Question #2 ~ Nature of the Games: Athletic Attire

- Describe typically what athletes wore for their competitive events.

Team 2

Question #1 ~ Culture:

- Describe and discuss the conditions that led to the development of ancient Greek culture during the Classical period.

Question #2 ~ Nature of the Games: Events/Competition

- Provide a listing of the events/competitions held during the Olympics in 776 B.C.E., along with a description of each event.

Team 3

Question #1 ~ Education:

- Describe and discuss the Greek educational system during the classical period and how it compares to today's society.

Question #2 ~ Nature of the Games: Game Participants

- Describe the participants typically found to compete during the 776 B.C.E. Olympic Games, who were they, where did they come from and how were they selected to compete?

Team 4

Question #1 ~ Gender - Women's Roles:

- Overall, describe women's roles during the Classical period in Greek society. Discuss their role (if any) involving the 776 B.C.E. Olympic Games.

Question #2 ~ Nature of the Games: General Rules of the Games

- In general, what were the established rules for conducting Olympic Games during the Classical period?

Team 5

Question #1 ~ Philosophy:

- Discuss the role that honor held in Greek society during the Classical period. What was meant by "Arete" and why was it important?

Question #2 ~ Nature of the Games: Location of Events

- Where were the Olympic Games of 776 B.C.E. held (city-state) and how was the location selected?

Team 6

Question #1 ~ Religion:

- What role did religion play in Greek sports during the Classical period? What significance did it have in the establishment of the 776 B.C.E. Olympic Games?

Question #2 ~ Nature of the Games: Myths & Misconceptions About the Games

- What are some of the common myths and misconceptions associated with the ancient Olympic Games?

Team 7

Question #1 ~ Social:

- Explain the rise of city-states within ancient Greek society during the Classical period. What were the causes and influences that lead to the establishment of permanent cities?

Question #2 ~ Nature of the Games: Purpose of the Ancient Games

- Why were the ancient Olympic Games established and what was their purpose?

Team 8

Question #1 ~ Economic:

- Many of today's Olympians have fame, endorse products and earn large sums of money, are they much different than the Olympians of ancient Greece? Describe what life was like for the winners of Olympic events during 776 B.C.E.

Question #2 ~ Nature of the Games: Typical Training Regimen

- Describe the typical training regimen used by ancient Olympic athletes to prepare for the Olympic Games.

Team 9

Question #1 ~ Warfare:

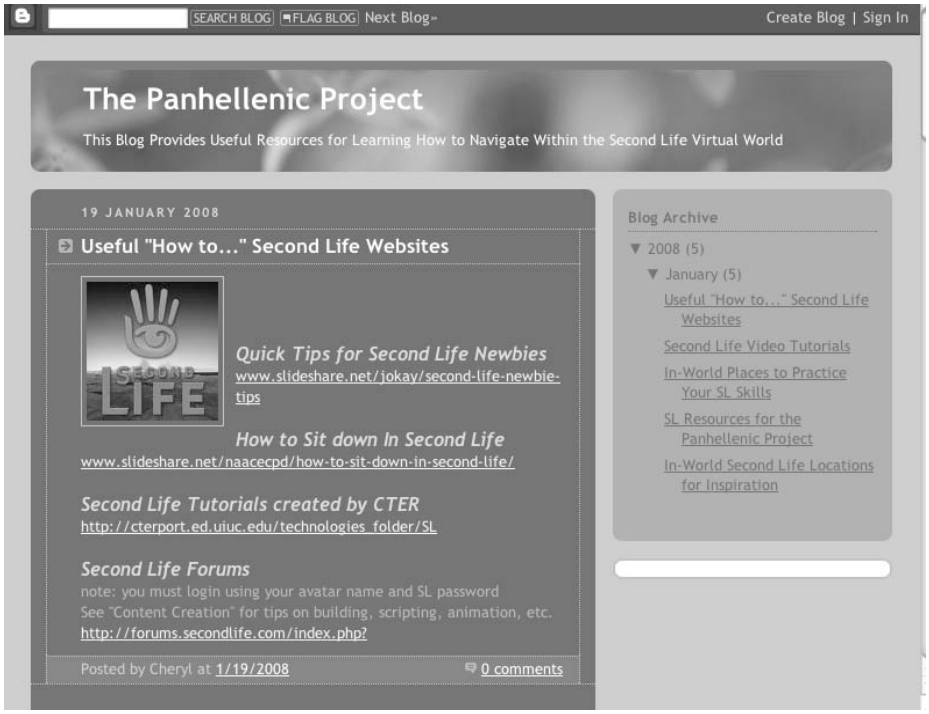
- Discuss the relationship between warfare and ancient Greek athletics. What influence (if any) did the nature of warfare have on the development of the ancient Olympic Games?

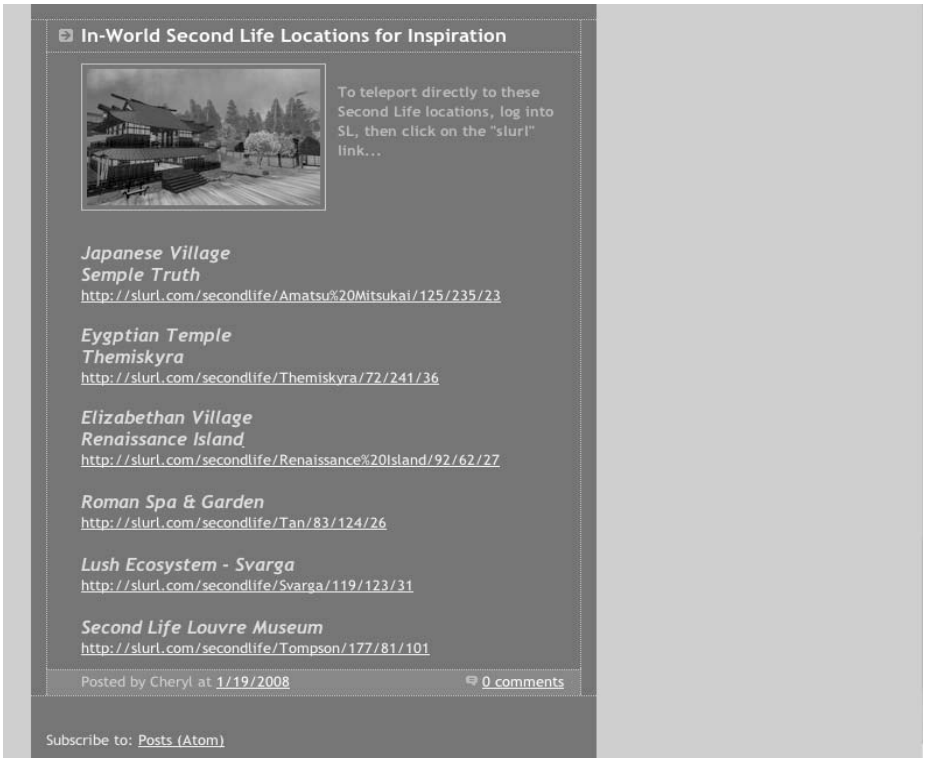
Question #2 ~ Nature of the Games: Types of Awards

- In today's modern Olympic Games, medals are given as awards. What type of awards were generally given to the ancient Olympians and what was the long term outcome of winning an Olympic event?

APPENDIX J

Project Blog Screenshot





APPENDIX K

The Panhellenic Project
Introduction to Web 2.0 Technologies

Second Life – Virtual World - http://www.secondlife.com

Second Life is an online three-dimensional (3D), immersive virtual world created by Linden Lab®. It is a non-narrative virtual environment inhabited and shaped by its "residents," dynamic avatars that represent each of the users participating in the virtual world.
Resident avatars are given the ability to walk, run, fly, dance, chat, and perform other animated functions along with the ability to send instant messages or notes while in Second Life.
All Second Life residents have access to 3D modeling tools that allow one to create, edit and build objects in the virtual environment.

- Please register at the Second Life website, registration is free though you need to supply an active email address;
- https://secure-web10.secondlife.com/join/
- Follow the on-screen instructions;
- You can choose your own avatar name and password;
- Please submit to the researcher your avatar name so that a Panhellenic Project group can be created within Second Life;
- Do not share your password with anyone, the researcher will not have access to your password so you will need to remember it;
- Linden Lab® does not share this information with anyone without your explicit permission;

Project Blog: The Panhellenic Project - http://panhellenic2.blogspot.com

The project blog has project resource information that will help you to navigate within the Second Life virtual environment and access resources for The Panhellenic project. The information posted on the blog includes:

- Website links to Second Life tutorials;
- In-world resources that may be useful in completing the project;
- In-world tutorial locations;
- Places to visit in Second Life;

Project Wiki - http://panhellenic2.wetpaint.com/

The project wiki will be used for your group work. It is here that you will post your sport history information, resources, links, book titles, research articles, photos etc. that will demonstrate your knowledge of ancient Greek history.

What is a wiki?
A wiki is a type of website with pages that anyone can edit and contribute to, including text, photos, videos, polls, and more. Wiki websites are relatively easy to change by using a web browser like Internet Explorer or Firefox. Because many people can contribute to a wiki website, the content tends to grow quickly as a result of frequent collaboration: Users can easily and quickly build on the work of others by adding new information--and even new pages--to the wiki website.

As with any group project having multiple contributors, accountability is important. Therefore, every change made to a wiki page is tracked and recorded. As easily as content can be added, content can be removed and the wiki page is reverted to a previous version.

APPENDIX L

Introduction to Second Life

Tips for Getting Started in Second Life…

1. This is the Second Life Homepage where you set up your account;

2. To check if you're registered, click on "resident login" (upper right corner) and type in your Second Life first and last name plus your password; if your account information comes up you're in!

3. To download the software, at the bottom of the Second Life Homepage is a link called "download second life" click on it, then choose the platform (PC-Windows or Mac or Linux)

4. The software is downloaded to your desktop; Look for this icon 

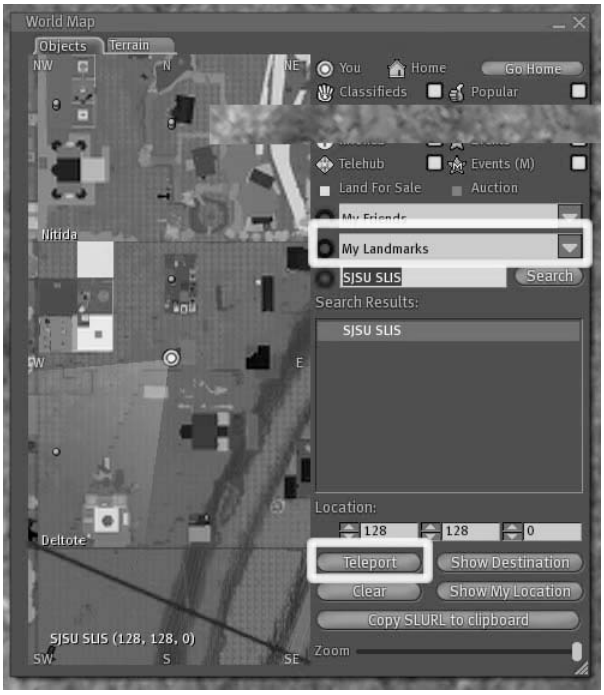
Otherwise…

For PC-Windows: click "start" -→ click "all programs" -→ then look for Second Life on the list of programs;

For Mac: at the top of the "finder" menu bar, click "go" -→ click "applications" -→ then look for second life in your folder

	5. This is the Second Life login screen, when you click on the  icon, this screen comes up and this is how you enter Second Life. You log in using your Second Life first and last name, along with your password, then click "connect"

Tips for Getting Started in Second Life…

	6. Once logged in, at the bottom of your screen is a toolbar
	7. Use the toolbar at the bottom, click on "Map" and what comes up should look like this; Next to the "red circle" type in "SJSU SLIS" Further down on that page you'll see "Location" type in the numbers 166, 189, 63 Click "teleport" You should be transported to our project site.

Note: When you log into Second Life, you'll receive a "notecard" from me, on this notecard is the location of our project site. If the map doesn't work for you, click on the link listed on the notecard.

APPENDIX M

SL Basic Navigation

The Panhellenic Project Session 2: *Intro to Second Life (SL)*

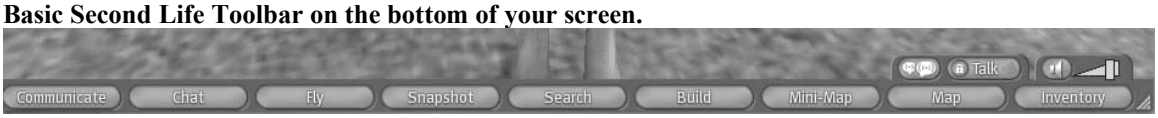
- Basic navigation and practice activities (in-world)
- Second Life Skill Building Tutorial (in-world*)*

The purpose of this session is to teach you how to use Second Life, so when you begin work on the Parthenon and the Olympic event, you will have a working knowledge of how to use Second Life.

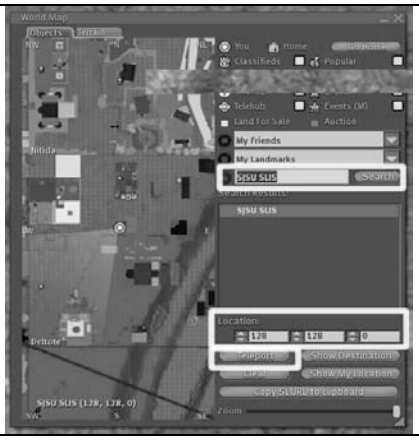
Today, we will learn how to complete each of the steps listed in the chart. After this session is finished, remember you can log onto the Panhellenic Project blog for more tips on how to use Second life: http://panhellenic2.blogspot.com.

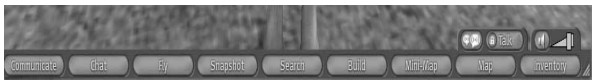
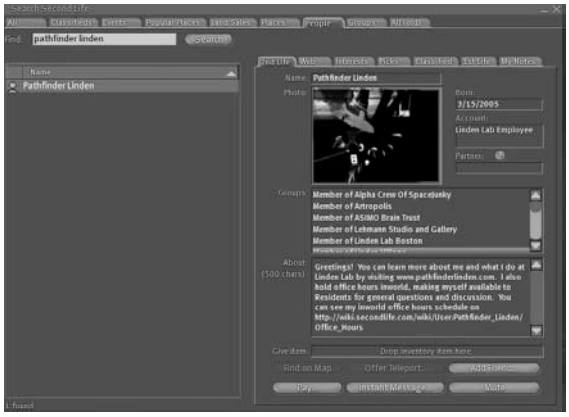
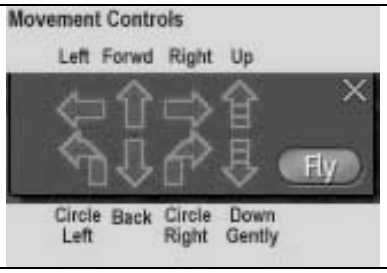
Reminder: While the class is in Second Life, please use the chat function for all conversation including questions you may have. I will be conducting this tutorial session in Second Life using chat.
The chat conversations are being recorded for research purposes of the Panhellenic Project.

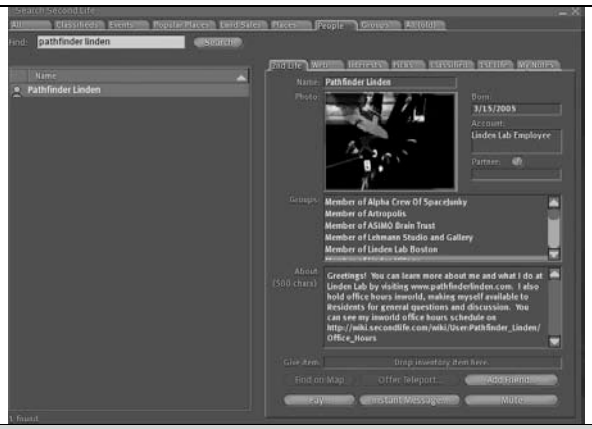
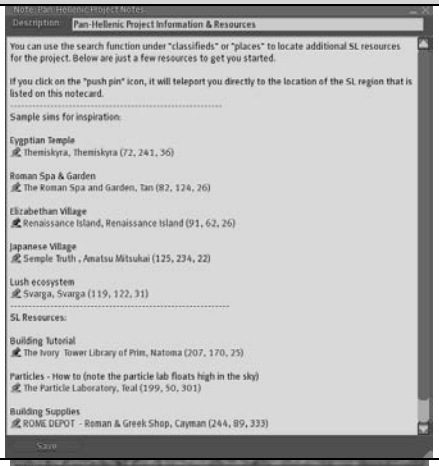
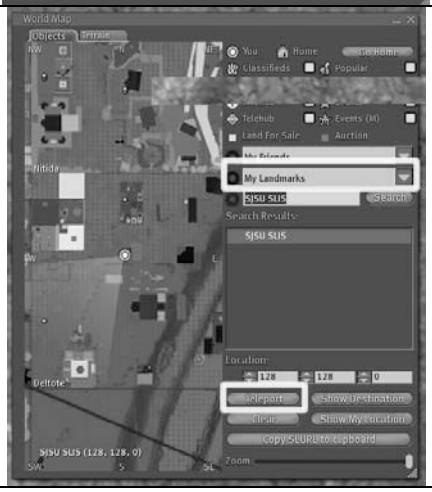
Basic Second Life Toolbar on the bottom of your screen.

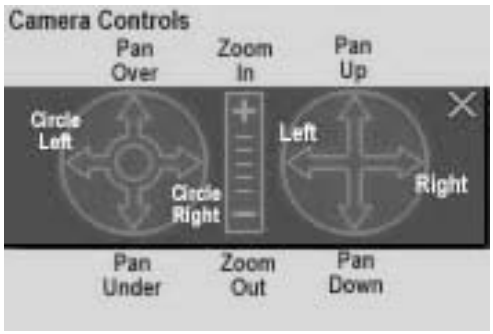


After logging into Second Life, follow step one listed below:

Purpose	***Instructions***	***Image***
1. How to Get to Panhellenic Project Site **Project Location:** **SJSU SLIS** **166, 189, 63**	▪ Use the Map function to locate places in SL ▪ At the bottom of your screen, click: Map => type "SJSU" under "Search"; when it comes up on the map, click "Teleport"	

2. Set SJSU Island as "Home"	▪ Once at our SJSU Island, you will want to set our project site as "home" in SL so you can always locate it; ▪ At the top of your screen, click: "World" => "Set Home to Here"; to teleport home, you'll go to "World" => "Teleport Home"	
3. How to Chat-IM-Shout (levels of conversation) ▪ **Chat is non-private conversation, everyone in close range can see the text on screen (approx 30m);** ▪ **IM is private conversation, only the person you have IM can see the text on screen;** ▪ **Shout is non-private conversation, anyone within 100m will be able to see the text on screen.**	▪ For Chat or Shout, at the bottom of your screen, click: "Chat" => type your message into the chat window and hit "return" or click "shout" if you want your message to go greater distance; ▪ For IM, if the avatar is close, "right click" on the avatar, then click "IM" if they are not in the area, at the bottom of your screen click "Communicate" then locate the avatar in your friends list; or under "Search" function, click "People" type avatar's name, click on the name, then click "IM" when their profile comes up	 
4. Flying & Landing (movement control)	▪ Use Movement Controls for walking, running, flying, landing ▪ At the top of your screen, click: View => Movement Controls	

5. SL Friendships (to locate your teammates in-world)	▪ For "Friendship", if the avatar is close, "right click" on the avatar, then click "Add Friend" if they are not in the area, click "Search" function, click "People" type avatar's name, click on the name, then click "Add Friend" when their profile comes up	
6. Touching Objects	▪ Left click the object to "touch" it	
7. Notecards in Your Inventory	▪ To locate notecards filed in your inventory, at the bottom of your screen, click: "Inventory" => locate "Notecards" folder and double click to open; double click on the notecard you wish to open	
8. Teleporting (how to get around in Second Life)	▪ To teleport to locations in SL, you can either use the "Search" function (at the bottom of your screen) or if you have created a landmark, go to "Map" (bottom of screen)- use the pulldown menu to locate "My landmarks," then click "Teleport"	

9. Camera Control	▪ Use Camera Control for viewing objects up close or far away ▪ At the top of your screen, click: View => Camera Controls ▪ You will use it for things like reading signs, looking at merchandise, building, taking snapshots.	
10. SL Practice Activity	▪ To help you practice your camera controls; ▪ Find the cube that corresponds to your team number; Use your camera controls to follow the instructions on the cube!	

APPENDIX N

Working Groups Session

INSTRUCTIONS

- Each team will divide up;
- 2 people will work on the team wiki question;
- 2 people will work in Second Life;
- Below are today's activities:

Wiki Workers:

1. Go to the project wiki and log in: http://panhellenic2.wetpaint.com;
2. Click on your team link;
3. Choose 1 team question to work on for today's class;
4. Click on "resources," review the books & websites listed;
5. Locate at least 1 of the reference books in the library and bring it back to class;
6. Begin posting complete answers to the questions;
7. Be sure to cite your sources on the wiki thread;
8. You can surf the web or use other library books as references;
9. Images can be uploaded and links to websites added, if you feel it supports your answers;
10. If you find resources you wish to share with the other teams, post the info in the "discussion forum" section of the wiki;

Second Life (SL) Workers: (you can use 1 or both avatars for this activity)

1. Log into Second Life;
2. Notice the linden dollars in the upper right corner of your SL screen;
3. **Teams 1-5 are working together to locate a single Parthenon for the project:**
    - Parthenon teams need to teleport to 3 SL locations to shop: Solution Island 182, 24, 320; Barbados 12, 42, 21; and Kumarajiva 228, 167, 79;
    - After reviewing items from your collective budget, come to consensus on which one building to purchase for the project (be sure it is Greek);
    - Use camera controls to zoom in on pictures;
    - ***Note: If you need assistance, IM CW or teleport her to your SL location:***
    - Purchase by "right click" (mac use ctrl-apple) on item or image; pie control will display, click "buy" (note: be sure it is the item you wish to purchase)
    - Once purchased, all teams teleport to project SL location;

- To place item on land, open inventory; drag the "box icon" of the item to the ground; If a box appears, "right click" the box for pie control, click "open" and save to inventory; Drag item from inventory to the ground;
- Use "edit controls" to position building on project land;
- If you have extra linden dollars available, you can embellish the project site with items reflective of ancient Greece.

4. **Teams 6-9 are working together to create one Olympic event for the project:**
    - Olympic teams need to decide which event to showcase;
    - Olympic team members need to teleport to 3 SL locations to shop: Aeos 222, 98,27; Hauwai 96, 171, 87; Silverglade 112, 105, 24;
    - Other items to consider for purchase or from "freebie" locations are walkways or roadways, artifacts reflective of the time period, clothing, etc. Use the "search" function to locate other SL shops;
    - After reviewing items from your collective budget, come to consensus on which items you wish to purchase for the project (be sure it is Greek);
    - Use camera controls to zoom in on pictures;
    - ***Note: If you need assistance, IM CW or teleport her to your SL location:***
    - Purchase by "right click" (mac use ctrl-apple) on item or image; pie control will display, click "buy" (note: be sure it is the item you wish to purchase)
    - Once purchased, all teams teleport to project SL location;
    - To place item on land, open inventory; drag the "box icon" of the item to the ground; If a box appears, "right click" the box for pie control, click "open" and save to inventory; Drag item from inventory to the ground;
    - Use "edit controls" to position items on project land;
    - If you have extra linden dollars available, you can embellish the project site with items reflective of ancient Greece.

Note: the project blog provides "how to" information about Second Life, http://panhellenic2.blogspot.com

APPENDIX O

Permission to Use Survey

From: ahlfeldt@cord.edu
Date: Friday, September 28, 2007 8:03 AM
To: Cheryl Carter cacarter@pepperdine.edu
Subject: Re: Seeking Permission to Use Your Survey

Cheryl,
Yes, you may use the survey as long as you properly cite it. I am sorry I do not have a contact person for NSSE, but they have a webpage you could check out. There should be contact information there.
Stephanie Ahlfeldt, Ph.D.

----- Original Message -----
From: Cheryl Carter <cacarter@pepperdine.edu>
Date: Wednesday, September 26, 2007 3:08 pm
Subject: Seeking Permission to Use Your Survey
To: ahlfeldt@cord.edu

September 26, 2007

Hello Ms. Ahlfeldt,
My name is Cheryl Carter and I am a doctoral candidate in Educational Technology at Pepperdine University. I am writing to ask permission to use the survey you and your colleagues developed, "A Survey of Student Engagement" as discussed in the article entitled Measurement and Analysis of Student Engagement in University Classes Where Varying Levels Of PBL Methods of Instruction Are In Use, published in Higher Education Research & Development Vol. 24, No. 1, February 2005, pp. 5-20.

I would use a slightly modified version of your survey as an instrument to collect data for my dissertation research on student engagement and the use of Web 2.0 technologies for online learning. The modifications would simply include adding questions to the survey that would collect student feedback about their views on the effectiveness of the Web 2.0 technologies used in my study. I can provide you with more information regarding my study if you
would like, please just let me know.

Additionally, in your article, you mentioned that your survey was adapted from the National Survey of Student Engagement (NSSE) and I wondered if you had a contact person with email that you could share so that I may seek permission from that organization.
Thank you for your time and your consideration, I look forward to hearing from you.

Sincerely,
Cheryl Carter

Cheryl Carter, Doctoral Candidate
Educational Technology
Pepperdine University
cacarter@pepperdine.edu

Stephanie L. Ahlfeldt, Ph.D.
Assistant Professor/Director of the Oral Communication Center
Communication Studies and Theatre Art Dept.
Concordia College
Olin 328
Moorhead, MN 56562
ahlfeldt@cord.edu
www4.cord.edu/csta/ahlfeldt

APPENDIX P

Permission to Use Chart

From: Michael Young michael.f.young@uconn.edu
Date: Wednesday, September 26, 2007 2:10 PM
To: Cheryl Carter cacarter@pepperdine.edu
Re: Seeking Permission to Use Your Chart in My Dissertation Study

Ms Carter,
You are welcome to use and reproduce Exhibit 2 as needed for your dissertation. Good luck with your review of the literature and please keep me posted on your progress. Your topic is important, and regular teachers should see the power of some online environments to engage students with activities and information... And we need to get creative about how to adapt these environments in service to an scholarly curriculum.

Regards.

Michael Young, Ph.D.
Coordinator, Learning Technology Program
Neag School of Education, UConn
249 Glenbrook Rd, Unit 2064
Storrs, CT 06029-2064
http://web.uconn.edu/myoung
myoung@uconn.edu

On 9/26/07 4:10 PM, "Cheryl Carter" <cacarter@pepperdine.edu> wrote:

September 26, 2007

Hello Professor Young,
My name is Cheryl Carter and I am a doctoral candidate in Educational Technology at Pepperdine University. I am writing to ask permission to use the chart you developed, "Exhibit 2: Design implications from psychological principles described by Young (2004)" as discussed in the article entitled *MMOGs as Learning Environments: An Ecological Journey into Quest Atlantis and The Sims Online*, published online at Innovate: Journal of Online Education, 2006, 2(4),
http://www.innovateonline.info/index.php?view=article&id=66
<http://www.innovateonline.info/index.php?view=article&id=66> as part of my dissertation.

My dissertation is entitled *Exploring Student Engagement in the Age of Web 2.0: Using Second Life, Blogs and Wikis for Online Learning* and I would use your chart as part of my dissertation literature review in support of using MMOGs for online learning. I can provide you with more information regarding my study if you would like, please just let me know.

Thank you for your time and your consideration, I look forward to hearing from you.

Sincerely,
Cheryl Carter
Cheryl Carter, Doctoral Candidate
Educational Technology
Pepperdine University
cacarter@pepperdine.edu

APPENDIX Q

Institutional Review Board Approval Letter

PEPPERDINE UNIVERSITY

Graduate School of Education and Psychology

February 19th, 2008

Cheryl Carter

Protocol #: E0108D02
Project Title: *The Panhellenic Project: Assessing Learning Engagement Using Web 2.0 Technologies*

Dear Ms. Carter:

Thank you for submitting your revised IRB application, *The Panhellenic Project: Assessing Learning Engagement Using Web 2.0 Technologies*, to Pepperdine's Graduate and Professional Schools Institutional Review Board (GPS IRB). The IRB has reviewed your revised submitted IRB application and all ancillary materials. As the nature of the research met the requirements for expedited review under provision Title 45 CFR 46.110 (research category 7) of the federal Protection of Human Subjects Act, the IRB conducted a formal, but expedited, review of your application materials.

I am pleased to inform you that your study has been granted **Full Approval.** The IRB approval begins today, **February 19th, 2008**, and terminates on **February 19th, 2009**.

Your final consent form has been stamped indicating the expiration date of GPS IRB study approval. One copy of the stamped consent form will be retained for our records. You may only use copies of the consent that have been stamped with the GPS IRB expiration date to consent your participants.

Please note that your research must be conducted according to the proposal that was submitted to the GPS IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For ***any*** proposed changes in your research protocol, please submit a **Request for Modification Form** to the GPS IRB. Please be aware that changes to your protocol may prevent the research from qualifying for expedited review and require submission of a new IRB application or other materials to the GPS IRB. If contact with subjects will extend beyond **February 19th, 2009**, a **Continuation or Completion of Review Form** must be submitted at least one month prior to the expiration date of study approval to avoid a lapse in approval.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the GPS IRB as soon as possible. If notified, we will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event.

Please refer to the protocol number denoted above in all further communication or correspondence related to this approval. Should you have additional questions, please contact me. Thank you for submitting such complete and thorough application. On behalf of the GPS IRB, I wish you success in this scholarly pursuit.

Sincerely,

6100 Center Drive, Los Angeles, California 90045 ▪ 310-568-5600