

REVIEW OF THE LITERATURE

Introduction

Encouraging college students to utilize technology to complete assignments is an important objective if a goal of education is to assure that students possess the skills needed to compete for employment in an increasingly technologically driven job market. According to Thornburg (2001), 81% of employers require “technology fluency.” Integrating projects into the classroom that involve students in using technology is one way to assist students in developing the fluency they will need in the future to effectively compete for employment.

I embarked upon this action research project with the goal of determining whether a WebQuest activity I developed for my psychology students would increase their technology skills while also affecting their use of technology during the final project presentation for the class. My *Personality WebQuest* utilizes an inquiry-based learning activity within a collaborative learning environment and also incorporates training in how to create web pages and sites. The activity was conducted in my *Introductory Psychology* class during the fall semester of 2002.

The literature review is intended to provide background and rationale for this project. Therefore, this section reviews literature in the following areas: (a) Inquiry-based Learning, (b) Collaborative Learning, (c) Integrating Technology into the College Classroom, (d) Web-based Learning, and, (e) WebQuests as a Learning Tool.

Inquiry-based Learning

Inquiry-based education has its foundation in the theories of John Dewey (1859-1952), an education reformer who is credited with spearheading the progressive education movement (Inquiry Page Project, n.d. a, ¶ 1). Dewey believed that education begins with the natural curiosity of the learner. Inquiry-based learning occurs in a spiral pattern in which the learner asks questions, investigates solutions, creates new knowledge, discusses findings, and reflects on what was learned (Inquiry Page Project, n.d. b, ¶ 3).

A very broad definition of inquiry was developed by the Exploratorium Institute for Inquiry (as cited in Molebash, Dodge, Bell, Mason, & Irving, n.d.): “Inquiry is an approach to learning that involves a process of exploring the natural or material world, that leads to asking questions and making discoveries in the search for new understandings” (Defining Inquiry ¶ 1). Depending upon the academic discipline, the content of inquiry learning can be quite different and the structure can range from very open to highly structured (Molebash, et al., n.d., ¶ 4).

Inquiry-based learning is used in a variety of educational strategies. For example, problem-based learning also incorporates inquiry-based learning techniques (Jones, 1996). With problem-based learning, teachers develop activities with scenarios in which students tackle real-world problems. Rather than simply gathering data, they must construct some meaning from this information, which requires them to actively think through a problem.

Another form of inquiry-based learning is constructivism. “Constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in” (Funderstanding, n.d. a, ¶ 1). Constructivism has been described by many different theorists and disciplines (Ryder, 2003). The idea of constructivism is that learners construct knowledge as they learn; hence, learning is a personal and social process (Arts in Education, n.d.). This idea, advanced by Dewey, Piaget, Rogers, and Vygotsky to name only a few, appears in many different forms (Ryder, 2003). Although there are a variety of definitions and theories related to constructivism, the basic thrust in terms of educational practice is that teachers should design activities that involve the learner in collaboration and creation of meaning through synthesis of information rather than rote memorization of data (Funderstanding, n.d. b).

Collaborative Learning

Collaborative learning is “an instruction method in which students at various performance levels work together in small groups toward a common goal” (Gokhale, 1995, ¶ 1). According to Gokhale, “there is persuasive evidence that cooperative teams achieve at higher levels of thought and retain information longer than students who work quietly as individuals” (¶ 2). Collaborative learning also seems to enhance critical thinking abilities (Totten, Sills, Digby, & Russ, 1991).

Utilization of collaborative learning is a practice that is growing on college campuses (Ronkowski, 2002). Collaborative learning is actually an umbrella

term that covers many forms of learning from small group projects to the more specific form of cooperative learning (Matthews, Cooper, Davidson, & Hawkes, 2003; Ronkowski). With collaborative learning, students work together in groups to complete activities assigned by the teacher (National Institute for Science Education, 1997a). There are a number of potential positive results of collaborative learning such as increased self-esteem (Slaven, 1991) and increased motivation to learn (National Institute for Science Education, 1997b). In that many jobs depend upon workers being able to function in teams, it would seem that collaborative learning prepares students to succeed in the future with cooperative activities on the job.

Integrating Technology into the College Classroom

A fundamental assumption of my project is the importance of integrating technology into the classroom. My initial search for validation that technology use is important to the institution where I work, California State University, Sacramento, led me to the following stated objective from the online Catalog for the General Education (GE) Program: “Upon completion of the General Education Program requirements, students will be expected to: find and use common information resources, engage in specialized library research, use computers, and seek out appropriate expert opinion and advice” (Objectives Section, ¶ 4). In that my course is a GE class, it is reasonable to include activities in the class that implement this objective.

In fact, the objective of encouraging technology integration in the classroom is further supported at CSUS by the existence of an entire cadre of

services through the University Computing and Communications Services (UCCS) enabling professors to offer components of their courses via the Internet using Web Course Tools (WebCT). WebCT is an application that allows professors to develop and deliver web-enhanced or assisted courses to students. Specifically, WebCT is the application that I utilized to deliver the WebQuest activity to my Psychology students. In that the application provides an area for students to hold discussions via a posting format, to chat live and to present projects using web pages and sites, it seems logical to use these tools for class activities.

Having established support for technology integration at CSUS, I will now proceed to discuss more generic questions concerning technology integration in the classroom. I will begin with discussion of what is technology integration, why it is important and how to do it.

According to Dockstader (1999) "Technology integration is using computers effectively and efficiently in the general content areas to allow students to learn how to apply computer skills in meaningful ways." (p. 35) Integration of computers such that the curriculum drives the process rather than the other way around requires teachers who possess the technology skills to develop appropriate activities. Herein lies the greatest challenge to integration of technology in the classroom: many teachers have not learned how to effectively utilize technology themselves let alone how to integrate it into their curriculum. Assisting faculty to make this transition is one of the most important challenges facing American colleges (Charp, 2000). The fact that CSUS offers wonderful

support to teachers in the form of classes and individual mentoring still does not assure that teachers will take the initiative to move beyond their current skill levels and recreate lesson plans that effectively integrate technology into the classroom.

The question of why technology integration is important can be answered if we consider educational trends for the future. In an article available online from the National Clearinghouse for Educational Facilities, Stevenson (2002) discussed 10 educational trends that will shape school planning and design in the future. Trend 4 is “technology will dominate instructional delivery” (p. 2). As a means of reducing school budgets, Stevenson believes that schools will look for more economical means of reaching more students and that distance learning will be a solution to the problem. In such an environment, effective use of technology to motivate students who may no longer be physically present in the classroom will be an important consideration.

Other advantages to technology use include increased student interest and motivation as well as the potential to learn at a deeper level (Dockstader, 1999). We don't have to look far to realize how tuned in students are to technology. Whether it is cell phones, video games, or chatting online, students love to use technology for communication and entertainment. They are accustomed to a social environment rich in visual and communication potential, hence, is it any wonder that many become bored within the confines of the normal classroom which is devoid of such stimulus?

If one is to believe the visionary statements of David Thornburg (2000), integration of technology into the classroom will be even more attainable in the near future as students will utilize PDA devices such as Palm Pilots to access and store data from the Internet and the classroom. Rather than carrying around backbreaking backpacks loaded with books, their books will be stored in these devices that share information with each other and computers. In that “educational systems have generally mirrored the societies in which they were developed” (Thornburg, 2000, p. 12), the integration of technology into the classroom is an inevitable event, hence, the next question I will address is how to do this effectively.

According to Eisenberg (as cited in Dockstader, 1999), there are two requirements to effectively integrate technology skills: “1) the skills must directly relate to the content area and to the classroom assignments, and 2) the skills themselves need to be tied together in a logical and systematic model of instruction.” (p. 36) I used these requirements as guiding principles in the development of the lesson for this project. Additionally, once I developed and utilized the lesson, I evaluated how it went in order to consider changes for the next time around. This suggestion was made by Dockstader (1999, p. 36) but is also the foundation for good action research (Mills, 2000). In this context, the purpose of action research is “encouraging teachers to be continuous learners – in their classrooms and in their practice” (p. 11).

Web-based Learning

It is hard to believe that access to information via the Internet is a relatively new phenomenon. Starting in the early 1990s, what was once only a tool for researchers began to expand into the commercial and user communities at an ever-proliferating rate (Leiner, et al., 2000). In 1991, the National Science Foundation lifted its ban on commercial restrictions to using the network and shortly thereafter, Gopher was released as a means of searching the network using a text only format. The World-Wide Web, (WWW) as we know it, was released by CERN in Switzerland and was the result of the work of a British researcher, Tim Berner-Lee, who “created HyperText Markup Language (HTML), which used specifications for URLs or Uniform Resource Locators, for web addresses” (Davila, 2000, ¶ 4). Although some surveys suggest the Internet has largely become a “giant public library with a decidedly commercial tilt” (Stanford University, n.d.), many see it as a powerful educational tool that is transforming the way we teach.

Although there are a variety of challenges that educators face in utilizing the Internet for educational purposes, one primary concern is how to organize information gathering in a manner that supports effective learning. “As vast amounts of information become easily accessible through digital networks, the problem is no longer access to information, but selection of information” (Dimaraki, Black & Brown, 1998, p. 146). While some view the Web as a big encyclopedia, as Tom March (1998) pointed out, there are some important distinctions -

Whereas an encyclopedia is organized and cross-referenced, the Web is amorphous and chaotic. Whereas the content of an encyclopedia is carefully researched and striving for bias-free presentation, the Web is passionately posted and full of opinions and rarely hidden agendas. Finally, whereas an encyclopedia is written by professionals, anyone can write a Web page (¶ 3).

Clearly, there is a need to organize and effectively deliver web-based information to students. The question of how to effectively deliver information to students is partially answered by activities such as WebQuests that carefully scaffold the information gathering process so that the student is not overwhelmed with the vast amounts of data available online. By creating meaningful links within an activity, the teacher can guide the student to the appropriate resource, which is analogous to recommending a particular book in the library. Obviously this type of advance scaffolding requires effort and time on the part of the teacher who develops the web-based learning activity and selects sites that support knowledge acquisition.

The reward for all this hard work is what Dodge (1996) refers to as “active learning.” During active learning, students are placed in situations which compel them to read, speak, listen, think deeply, and write....Active learning puts the responsibility of organizing what is to be learned in the hands of the learners themselves, and ideally lends itself to a more diverse range of learning styles (¶ 1).

Using the Web forces students to engage in active learning and brings the real world into the classroom. Of course, active learning did not arrive with the Internet; it is a very old practice dating back to Socrates and more recently, John Dewey.

WebQuests as a Learning Medium

Bernie Dodge coined the name WebQuest for a web-based learning activity he described as “a technique for engaging students in active learning which uses the Web and other resources as they strive to understand a topic” (1996, ¶4). He developed this model in 1995 with Tom March at San Diego State University. Describing WebQuest as “an inquiry-oriented activity” (1995, ¶1), Dodge indicated that the structure is either of a short or long duration but should have certain components to be effective. Specifically, there should be an introduction that sets the stage, an interesting and achievable task, information sources that enable the doer to complete the task, a clearly described process, guidance on organization of the information gathered and a conclusion that provides closure on the process (1995, ¶6). Further, Dodge suggested that some other less critical attributes might include group activities, giving learners roles to play to motivate participation and using either a single discipline or multidisciplinary approach.

Other things to consider in designing a WebQuest are what March (2000) described as the 3 Rs – real, rich and relevant. From the beginning of the activity, it should be apparent that students are being asked to participate in a task that concerns people in the real world. Examples of real problems would be

saving an animal from extinction or investigating world hunger. The objective is for students to investigate an issue from many perspectives and arrive at some meaningful conclusions. This is a rich activity because it goes beyond the walls of the classroom into the larger database of the WWW where a student can connect with any number of experts and sample divergent thinking. Finally, the activity is relevant because the students are “able to find themselves, their concerns, or their interests in the scenarios we spin” (¶ 5).

The true benefit of a well-designed WebQuest with abundant online resources and scaffolds is that it promotes “higher order thinking” (March, 1995, ¶25). By engaging the student in a challenging and interesting real world problem, the student moves beyond rote memorization of details and facts into a realm where knowledge is applied. If designed by a conscientious teacher, this process can result in a transformation of the learner who becomes more than a student but potentially a concerned participant in world events. This form of active versus passive learning increases the likelihood of yielding students that Gardner (1999) described as “human beings who understand the world, who gain sustenance from such understanding, and who want – ardently, perennially- to alter it for the better” (pp. 19-20).

References

Arts in Education. (n.d.). *Constructivist learning theory*. Retrieved February 20, 2003 from <http://www.artsined.com/teachingarts/Pedag/Dewey.html>

California State University, Sacramento. (n.d.). *Online Catalogue*. Retrieved April 20, 2002 from the CSUS web site:

<http://aaweb.csus.edu/catalog/current/First%20100%20Pages/GE.asp>

Charp, S. (2000, February). Technology integration [Electronic version]. *T.H.E. Journal*. Retrieved January 16, 2003 from T.H.E. Journal web site:

<http://www.thejournal.com/magazine/vault/A2619.cfm>

Davilla, R. (2000). *History and development of the Internet: A timeline (the 1990s)*. Retrieved January 16, 2003 from

<http://www.sat.lib.tx.us/Displays/it90.htm>

Dimaraki, E., Black, J., & Brown, M. (1998). What pedagogy for the age of abundant information? Lessons from Archaeotype. In J. Hirschbuhl & D. Bishop (Eds.), *Annual Editions: Computers in education 00/01* (pp. 146-151). Guilford, CT: Dushkin/McGraw-Hill. (Reprinted from Educational Media International, September, 1998, pp. 181-185, by International Thompson Publishing Services)

Dockstader, J. (1999). Teachers of the 21st Century know the what, why and how of technology integration. In J. Hirschbuhl & D. Bishop (Eds.), *Annual Editions: Computers in education 00/01* (pp. 35-37). Guilford, Conn: Dushkin/McGraw-Hill. (Reprinted from *T.H.E. Journal*, January 1999, pp. 73-74, by the Technical Horizons in Education Journal

www.thejournal.com)

Dodge, B. (1996). *Active learning on the web* (k-12 version). Retrieved October 2001, from San Diego State University, Department of Educational

Technology Web site:

<http://edweb.sdsu.edu/people/bdodge/active/ActiveLearningk-12.html>

Dodge, B. (1995). *Some thoughts about webquests*. Retrieved January 16, 2003, from San Diego State University, Department of Educational

Technology Web site:

http://edweb.sdsu.edu/courses/edtec596/about_webquests.html

Funderstanding. (n.d. a). *Constructivism*. Retrieved February 20, 2003. from

<http://www.funderstanding.com/constructivism.cfm>

Funderstanding. (n.d. b). *Vygotsky and Social Cognition*. Retrieved February

20, 2003 from <http://www.funderstanding.com/vygotsky.cfm>

Gardner, H. (1999). *The disciplined mind: What all students should understand*.

New York: Simon & Schuster.

Gokhale, A. (1995). *Collaborative learning enhances critical thinking*. Retrieved

January 16, 2003, from <http://scholar.lib.vt.edu/ejournals/JTE/jte-v7n1/gokhale.jte-v7n1.html>

Inquiry Page Project. (n.d. a). *Inquiry page: Who was John Dewey*. Retrieved

January 16, 2003 from <http://inquiry.uiuc.edu/inquiry/johndewey.php3>

Inquiry Page Project. (n.d. b). *Inquiry page: Learning begins with questions*.

Retrieved January 16, 2003 from <http://www.inquiry.uiuc.edu/index.php3>

Jones, D. (1996). *Problem based learning*. Retrieved October 1, 2001, from San

Diego State University, Learning Tree Web site:

<http://edweb.sdsu.edu/clrit/learningtree/Ltree.html>

- Leiner, B., Cerf, V., Clark, D., Kahn, R., Kleinrock, L., Lynch, D., Postel, J., Roberts, L., & Wolff, S. (2000). *A brief history of the Internet*. Retrieved January 16, 2003, from <http://www.isoc.org/internet/history/brief.shtml>
- March, T. (2001, June). *Working the web for education. Theory and practice on integrating the web for learning*. Retrieved January 16, 2003, from <http://www.ozline.com/learning/theory.html>
- March, T. (1998). *WebQuests for learning: Why WebQuests? - An introduction*. Retrieved January 16, 2003, from <http://www.ozline.com/webquests/intro.html>
- March, T. (2000, November/December). Working the web for education: The 3 R's of WebQuests. Let's keep them real, rich, and relevant. *Multimedia Schools*. Retrieved January 16, 2003, from <http://www.infotoday.com/MMSchools/nov00/march.htm>
- Matthews, R., Cooper, J., Davidson, N., & Hawkes, P., (2003). *Building bridges between cooperative and collaborative learning*. Retrieved February 20, 2003 from http://www.csudh.edu/soe/cl_network/RTinCL.html
- Mills, G. (2000). *Action research: A guide for the teacher researcher*. Upper Saddle River, NJ: Prentice Hall.
- Molebash, P. (n.d.). *Web inquiry projects: Inquiry inquiries*. Retrieved January 16, 2003, from the Web Inquiry Projects Web site of the Educational Technology Department at San Diego State University: <http://edweb.sdsu.edu/wip/faq.htm>

Molebash, P., Dodge, B., Bell, R., Mason, C., & Irving, K. (n.d.). *Promoting student inquiry: WebQuests to Web inquiry projects*. Retrieved January 16, 2003, from the Web Inquiry Projects web site of the Educational Technology Department at San Diego State University:

http://edweb.sdsu.edu/wip/WIP_Intro.htm

National Institute for Science Education. (1997a). Doing CL. Retrieved February 20, 2003 from

<http://www.wcer.wisc.edu/nise/cl1/cl/doingcl/structr.htm>

National Institute for Science Education. (1997b). More information: Why does collaborative learning work? Retrieved on February 20, 2003 from

<http://www.wcer.wisc.edu/nise/cl1/cl/moreinfo/MI2C.htm>

Ronkowski, S. (2002, November) Collaborative Learning. Retrieved January 16, 2003, from <http://www.id.ucsb.edu/IC/Resources/Collab->

[L/CL_Index.html](http://www.id.ucsb.edu/IC/Resources/Collab-L/CL_Index.html)

Ryder, M. (2003). *Constructivism*. Retrieved January 16, 2003 from

http://carbon.cudenver.edu/~mryder/itc_data/constructivism.html

Slavin, R. (1991). *Student team learning: A practical guide to cooperative learning* (3rd ed.). Washington, DC: National Education Association.

Stanford University. (n.d.). *The Internet study: More detail*. Retrieved January 16, 2003, from

http://www.stanford.edu/group/siqss/Press_Release/press_detail.html

- Stevenson, K. (2002) *Ten educational trends shaping school planning and design*. Retrieved August 27, 2002 from the National Clearinghouse for Educational Facilities web site: <http://www.edfacilities.org/pubs/trends.html>
- Totten, S., Sills, T., Digby, A., & Russ, P. (1991). *Cooperative learning: A guide to research*. New York: Garland.
- Thornburg, D. (2000, Winter). *Renaissance 2000*. The Thornburg Center web site. Retrieved February, 20, 2002, from <http://www.tcpd.org/thornburg/handouts.html>
- Thornburg, D. (2001, October). *Pencils down: How norm-referenced testing is corrupting technology use and destroying education*. Presentation at the National Fall CUE Conference on *Using technology to support curriculum standards*, Sacramento, CA.