

MSTU 6532

Seminar in Cognitive Science

(Fall 2005)

Webquests

A Literature Review on Their Use to Foster Critical Thinking in Learners

Summary

This paper identifies an aspect of instructional design that is gaining currency in internet-supported collaborative learning - The WebQuest - and presents a literature review pertaining to its use in fostering critical thinking in K-12 as well as in adult learners. Rhetoric as to how using WebQuests for enquiry-based learning activities can greatly enhance creative and higher-order thinking skills of learners abound in the literature. Interestingly, enough empirical evidence is not available to support this as current literature mostly focuses on the design and development of WebQuests. A lot more empirical studies in this direction are therefore suggested.

Introduction

As schools are being provided with increasingly easier access to digital technologies, a greater attention is now being focused on the potential of these technologies for supporting constructivist student-centered pedagogy. Internet-based information and resources are so vast and varied that they serve as a rich repository of knowledge, ideas and activities, capable of helping us "engage in active, constructive, intentional, authentic and cooperative learning." (Jonassen, Howland, Moore, & Marra, 2003, p.44.). As the continuing goal of modern pedagogy is to help learners develop higher order thinking, critical thinking and problem solving skills through active engagement rather than passive reception (to enable them deal with the demands of the future information society), teachers are often challenged to provide learning environments that are learner-centred, authentic, problem-based and collaborative (Bradshaw, Bishop, Gens, Miller & Rogers, 2002).

Against this backdrop, Jonassen, Howland, Moore, & Marra (2003) suggest that an effective and educationally valid use of the internet should involve the development and intentional articulation of intended learning goals ... and the alignment of these goals with inquiry-based learning activities "(p.44). However, since locating quality information on the Internet presents a variety of challenges, as learners need to be able to sort through the multitude of information to locate the most relevant pieces, Bernie Dodge originated the WebQuest, a framework for teachers to structure student-centered learning using prescribed tasks and pre-selected Internet resources (Dodge, 1995). Two levels of WebQuests exist: short-term and long-term. The instructional goal of a short-term WebQuest (designed to be completed in one to three class periods) is knowledge acquisition and integration. On the other hand, a long-term WebQuest typically takes between one week and a couple of months in a classroom setting, and after completing it, a learner will be expected to have analyzed a body of knowledge deeply, transformed it in some way, and demonstrated an understanding of the material by creating something that others can respond to, both on and off-line.

As WebQuests (especially the long-term ones) challenge student intellectual and academic ability rather than their simple web searching skills, they are said to be capable of increasing student motivation and performance (March, 1998), developing students' collaborative and critical thinking skills (Perkins & McKnight, 2005), and also enhancing their ability to apply what they have learned to new learning (Pohan et al., 1998). WebQuests have thus been widely adopted and integrated into K-12 and higher education curricula (Zheng, Stucky, McAlack, Menchana, & Stoddart, 2005), and also in several staff development efforts (Dodge, 1995).

A casual look at literature however reveals that whereas most studies tend to focus on the design and development of WebQuests (Pohan et al., 1998; Gohagan, D, 1999), the bulk of the assertions being made about their pedagogical usefulness are more of predictions based on their characteristics rather than on evidence from empirical studies. For example, in one study, Vidoni and Maddux (2002) compared the characteristics of WebQuests with Weinstein's (2000) framework of critical thinking and concluded that "WebQuests meet all six of Weinstein's key elements in critical thinking and therefore are powerful tools for inspiring critical thinking in student" (p. 101). Also Gohagan (1999) intimates that "students who are actively engaged in acquiring, assessing and evaluating social work's knowledge, values and skills will use higher order or critical thinking" (p.149).

It is therefore necessary to make a thorough review of existing research literature to further explore studies made that determine the effects of WebQuests use on student learning. This brief paper shares the findings of such a literature review. The nature of WebQuests, how they are integrated into curricula and their ability to foster critical thinking especially in adult learners will be explored. Implications for teaching and learning with WebQuests will then be made along with suggestions for further research.

The WebQuest

The WebQuest model as designed by Dodge has six major components - introduction, task, processes, resources, evaluation and conclusion. The introduction serves to launch the topic of study by providing interesting background information whilst throwing up a challenging authentic problem. The task and processes sections present a general description of the assigned task which is generally doable and interesting, and the step-by-step procedures to be followed to complete the task. A set of information sources needed to complete the task is provided in the resources section. Many (though not necessarily all) of the resources are embedded in the WebQuest document itself as anchors pointing to information on the World Wide Web. Information sources might include web documents, experts available via e-mail or real-time conferencing, searchable databases on the net, and books and other documents physically available in the learner's setting. The evaluation component is usually in the form of a rubric that will be used to assess students' work, whilst the conclusion brings the quest to closure, reminds learners of what they have learned and encourages them to extend the experience into other domains.

WebQuests are often designed for group activity either within a single discipline or across disciplines, but it is possible to have solo quests especially those that are applicable in distance education settings. In addition to the basic structure, WebQuests can be enhanced by adding motivational elements such as role-playing and scenarios for learners to work within.

Learning with WebQuests

With the ongoing rhetoric about WebQuests, and the fact that they involve the use of emerging technologies, it is not surprising that they have been incorporated into various education courses worldwide. The Web is awash with thousands of WebQuests created by all manner of persons, and covering all disciplines and grade levels. However, as Dodge (2001) points out, most of these do not represent the WebQuest model well and are merely worksheets with URLs. In a survey conducted on participants in a state instructional technology conference who were primarily K-12 teachers, higher education faculty, district-level administrators, and technology vendors, Perkins & McKnight (2005) obtained very positive comments about WebQuests. Though these educators had some reservations regarding WebQuest use, 62% of the respondents said they had used them in their classrooms, and contend that when properly created and used, "WebQuests provide an interesting way for students to attack real problems in a focused way" (p. 133).

There are however no set standards as to what activities and resource use actually represent the effective use of a WebQuest in learning. Creating a high-quality WebQuest requires an understanding of the elements of a good WebQuest, and also specific technology skills, and even though most teachers do not know how to create quality WebQuests (Perkins & McKnight, 2005), Gohagan (1999) explains that those who use computer-facilitated instructional strategies for more than presenting, storing or accessing information actually are applying one or more parts of the WebQuest framework. WebQuest implementation is therefore highly inconsistent across curricula, teachers and learners. In most situations, factors such as high student-computer ratios, limited bandwidth, limited web navigational abilities of learners and the need for excessive learner supervision, tend to limit effective implementation of WebQuests in teaching and learning.

Effects of WebQuest Learning

The inconsistency of WebQuest use, coupled with unlimited constraints encountered in their implementation (some of which become evident when learning is process), are some of the factors

that have contributed to the very little empirical research on the effects of WebQuests on student learning. This lack of evidential base of measured student performance has been noted by Reynolds, Treharne, & Tripp (2003). A few articles (e.g., Lipscomb, 2003) describing classroom use of WebQuests indicate that students often found the learning activities interesting and fun. However results of a large scale study conducted in California by Trotter (as cited in MacGregor & Lou, 2004), revealed that mere exposure of Internet resources is not sufficient to improve student learning. Lipscomb (2002), after conducting a study using two classes of eighth grade students who completed a WebQuest on the Civil War, concluded that despite student appreciation of the WebQuest structure in the classroom, and a general positive attitude toward the technology used, there was a wide range of comprehension and understanding of the students' assigned roles.

Research work on the effects of WebQuest use in adult learners has typically focused on pre-service teachers, but the homogeneity of the research subjects tends to limit the generalizability of the findings (Zheng, Stucky, McAlack, Menchana, & Stoddart, 2005). This paucity of research literature therefore still leaves open the question - Does the use of learner-centered, authentic, problem-based, and collaborative environments created by WebQuests lead to the development of complex thinking skills in learners?

Conclusion and Recommendation

Available literature does not only make a strong case for the integration of WebQuests into teaching and learning activities across disciplines and curricula, it also provides evidence of the wide acceptance of WebQuests by both teachers and students. Unfortunately, whilst it is still not very certain what constitutes a standard WebQuest learning activity, the literature also fails to give very tangible evidence that lends credence to the fact that WebQuest use actually enhances creative and higher order thinking of learners.

Technology is always touted as being a panacea for all the ills in education. Research into effective uses of technology is important to justify its continued use. Since WebQuests are a new implementation of technology, a knowledge base surrounding their effectiveness needs to be developed. Schools in many states are accountability driven, based on performance testing; and some schools are seeing a backlash against technology and a desire for a back-to-basics movement to raise test scores (Perkins & McKnight, 2005). However, we are now in the Information age, and teachers who feel that technology is providing knowledge acquisition in an interesting way to

students should be encouraged to continue its use, but along more comprehensive and systematic guidelines. But as research workers continue to develop and hone these guidelines, it is also significant to recommend that future research should involve more adult learners, more diverse populations, and should shift focus to the outcome of WebQuest use in these learners.

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