

# **WebQuests: A Critical Examination In Light of Selected Learning Theories**

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## **Abstract**

In 1995, Dr. Bernie Dodge developed an instructional activity that he called a webquest. This paper briefly traces the history and increasing popularity of the webquest instructional strategy. His original definition left much room for interpretation. As a result, there are many different ideas about what constitutes a webquest. Because of this variety of interpretations, a working definition of webquests is offered.

The paper examines the webquest instructional strategy in light of selected learning theories: Robert M. Gagné and his nine instructional events, cooperative learning, and Lev S. Vygotsky's theory with a special emphasis on the zone of proximal development. Sources for the review include published research, web pages and articles from practitioners' journals. The paper points out the need for research in this area of growing interest.

## Overview

There is an increasing number of computers in schools and Internet connectivity is becoming commonplace. Educators must find research-based, effective pedagogical strategies to incorporate these new tools into instruction (Brucklacher & Gimbert, 1999). This paper examines the webquest, a strategy that holds promise for instructional use of the Internet, but requires a closer examination. Research in this area is scant (Dodge, 2002c).

The webquest instructional strategy was conceived and made popular by Dr. Bernie Dodge of San Diego State University. Dodge defines a webquest as “an inquiry-oriented activity in which some or all of the information that learners interact with comes from resources on the Internet” (Dodge, 1995b). In an interview with *Education World*, Dodge further refines the definition of a webquest. “A WebQuest is built around an engaging and doable task that elicits higher order thinking of some kind. It’s about *doing* something with information. The thinking can be creative or critical, and involve problem solving, judgment, analysis, or synthesis. The task has to be more than simply answering questions or regurgitating what’s on the screen. Ideally, the task is a scaled down version of something that adults do on the job, outside school walls” (Starr, 2000, p. 3).

Since inception in 1995, webquests have gained in popularity. Tom March, a former graduate student with Bernie Dodge and co-developer of the webquest strategy, posted a handful of early webquests during his fellowship with *Pacific Bell’s Knowledge Network Explorer* (SBC Pacific Bell, 1995). Internet traffic to the main page of Dodge’s *WebQuest Page at San Diego State University* has had in excess of two million visitors since 1998, one million of them within approximately one year (Dodge, 2002b). The web

statistics generated by *The WebQuest Page* indicate an average of 4,439 “hits” during March 2002 (Nedstat, 2002). In a search conducted March 23, 2002, *Google*, a popular Internet search engine reported 207,000 hits on the term “webquest.”

Webquests are appearing at technology conferences and in staff development offerings as well. San Diego City Schools has included aggressive staff development activities promoting the webquest strategy. They’ve disseminated the professional development models and materials developed through funding by two Technology Challenge Grants (San Diego City Schools, 2000). Despite practitioners’ interest in webquests, little research has been done in this area (Dodge, 2002c).

## Definition

Defining exactly what is meant by the term “webquest” is challenging. A review of webquests available on the Internet illustrates a wide application and interpretation of the term. Dr. Dodge’s *WebQuest Page* has a *Matrix of Examples*, screened for quality and organized by subject area and grade level. As of March 23, 2002, it listed more than 1,400 webquests, representing a relatively broad interpretation of the term (Dodge, 2002a).

In Dodge’s original paper outlining webquests, he suggested they should contain at least the following parts:

- an introduction to set the stage and provide background information,
- an interesting task,
- information sources to complete the task,
- a description of the process learners should use to accomplish the task,
- guidance on how to organize the information, and

- a conclusion (Dodge, 1995b).

Since writing the original paper, Dr. Dodge has added an Evaluation section to the webquest model (Dodge, 1997).

To facilitate the discussion in this paper, it will be useful to develop a working definition of a webquest. This working definition is drawn from training materials available at *The WebQuest Page*, Tom March's *Ozline.com*, and San Diego City Schools' staff development pages (Dodge, 1995a, March, 1998, San Diego City Schools, 2000).

A *webquest* is an Internet-based activity focusing on a central question. This question is real, relevant and frequently complex, inviting examination from multiple perspectives and requiring higher-order thinking skills. A high-quality webquest usually requires learners to transform information into something else such as a recommendation synthesizing conflicting opinions, proposing a solution that works within constraints, or taking a stance and defending it. To facilitate the higher cognition that is required, webquest designers often use scaffolding to assist the learners. Scaffolding tools may take the form of resource links, templates for student products, or guidance to develop cognitive skills.

Webquests are usually completed by small groups of students, with each student researching a specific sub-task or representing a particular perspective. This requires each participant to develop expertise on some aspect of the subject under study.

After examining existing webquests, Bernie Dodge identified 21 different design patterns. These design patterns offer a basic structure and organization that can be modified to cover a variety of content. The selected design pattern is often evident in the introduction. The instructionally solid design patterns Dodge identified and defined are:

(1) Analyzing for bias, (2) Imagining an alternative history, (3) Clarification of abstract concepts, (4) Concrete design experiments, (5) Change models, (6) Collaborative designs, (7) Commemorative decisions and designs, (8) Compilation activities, (9) Developing exhibits, (10) Genre analyses, (11) Historical story dramatizations, (12) Meetings of the minds, (13) Mock trials, (14) Policy briefings, (15) Creating parallel diaries, (16) Delivering persuasive messages, (17) Making recommendations, (18) Creating simulated diaries, (19) Travel reports, (20) Designing time capsules and (21) Making travel plans (Dodge, 2001).

Webquests have the following components:

**Introduction** – The Introduction to a webquest introduces the scenario and central question. It conveys the importance of the question under consideration and briefly identifies the assigned task. Introductions are often visually appealing and engage learners by focusing on relevant past experiences or future goals.

**Task** – According to Dr. Dodge, the Task is the most important section of a webquest because it provides focus for the learners' activities. In 1999, Dodge identified and defined 12 common task formats: (1) retelling, (2) compilation, (3) mystery, (4) journalistic, (5) design, (6) creative product, (7) consensus building, (8) persuasion, (9) self-knowledge, (10) analytical, (11) judgment, and (12) scientific tasks (Dodge, 1999). Tasks are often the creation of a product, such as an exhibit, artifact or presentation. Tasks may also be of a verbal form such as a debate, play or other kind of performance.

**Process** – The Process section of a webquest outlines specific steps to assist learners in completing the assigned task. Often, the webquest designer offers advice

about how to divide responsibilities among the participants and organize information. Descriptions of various roles and perspectives are offered. Scaffolding tools such as visual organizers and advice on completing certain activities is often available in the process section. It is common for suggested resources to be embedded in the Process section.

**Resources** – The Resources section of a webquest provides a list of resources to assist learners in completing the task. Internet sites are pre-selected to allow learners to focus on the topic and avoid aimless surfing on the web. The practice of using pre-selected resources helps to maximize the use of instructional time and to minimize the likelihood of students inadvertently locating inappropriate content. Often resources are organized and divided by learner roles. Frequently, instructors identify a few Internet sites to provide background information for all learners. Additional web sites are provided to specific learners to further educate them on their role or perspective. This practice helps to assure interdependence of the learners.

**Evaluation** – The Evaluation component of webquests is the most recent addition to the format. This section describes how the task will be evaluated, often in the form of a rubric. Rubrics identify selected aspects of student performance or product, and describe indicators reflecting a variety of proficiency levels. It is not uncommon for students to be evaluated individually and as part of a group. This section should make any grading schemes clear.

**Conclusion** – The Conclusion section of a webquest provides closure for the learner. It encourages learners to reflect on the webquest experience and often asks

rhetorical questions to extend learning and thinking beyond the lesson. Frequently, the Conclusion is related in some way to the Introduction.

## **Robert M. Gagné and Webquests**

In *Conditions of Learning* Robert Gagné summarizes five types of learning outcomes: (1) Intellectual skills, (2) Verbal information, (3) Cognitive strategies, (4) Motor skills, and (5) Attitudes. He goes on to describe both the internal and external conditions necessary to achieve the various outcomes as well as offering suggestions on how to manipulate the learning environment to facilitate desired learning outcomes (Gagné, 1985).

Instructional designers using the webquest strategy may attempt to influence the learner's external environment to facilitate the desired learning outcome in much the way Gagné describes. Gagné recommends informing the learner of the learning objective, a common practice included in the Introduction section of a webquest. Gagné specifically mentions the use of an advance organizer to aid in learning verbal information. Such advance organizers are often provided in the Process section of a webquest.

Certain webquest design patterns and tasks may be more suitable to facilitate a desired learning outcome than others. For example, a self-knowledge webquest design may be used to assist learners in becoming aware of and even changing their individual attitudes.

Gagné offers a Theory of Instruction consisting of nine events. In *Conditions of Learning*, Gagné states “the province of an instructional theory is to propose a rationally based relationship between instructional events, their effects on learning processes, and

the learning outcomes that are produced as a result of these processes.” He correlates each instructional event with a specific internal process.

The webquest format may be thought of in terms of Gagné’s nine instructional events. Table 1 illustrates the correspondence of Gagné’s events with the learner’s internal processes and webquest components.

<b>Instructional Event</b>	<b>Learner’s Internal Process</b>	<b>Corresponding Webquest Component</b>
Gaining attention	Reception	Introduction
Informing learners of the objective	Expectancy	Task
Stimulating recall of prior learning	Retrieval to Working Memory	Introduction and Task
Presenting the stimulus	Selective Perception	Task
Providing “learning guidance”	Semantic Encoding	Process and scaffolding
Eliciting performance	Responding	Process
Providing feedback	Reinforcement	Process and collaboration
Assessing performance	Retrieval and Reinforcement	Evaluation
Enhancing retention and transfer	Retrieval and Generalization	Conclusion

**Table 1. Gagné’s instructional events with corresponding internal processes and webquest components.**

## Cooperative Learning

Cooperative learning is a leading approach to classroom instruction. Individual students demonstrate increased academic success and increased social skills after completing cooperative learning group tasks (Stahl, 1994). The success of cooperative groups is documented in lower and middle elementary grades (Gillies & Ashman, 1998) as well as in college students (Soja & Huerta, 2001). In their nine-month investigation, Gillies and Ashman analyzed the group effect on individuals. They found that structured tasks promote better retention and that higher-level cooperative tasks promote higher-level thinking. They identified student interactions, task structure and type of task as important variables influencing higher performance in individuals.

In a meta-analysis of cooperative versus competitive efforts and problem solving, researchers found that cooperators outperform competitors regardless of age (Qin, Johnson, & Johnson, 1995). Similarly, a study conducted by the University of California noted that students who engage in constructive activity during group activities are likely to evidence increased individual achievement. This finding held true for less capable students as well (Webb, Troper, & Fall, 1995). Cooperative learning research has been completed in the field as well as the laboratory. In their field research, Chambers and Abrami tested and supported their hypothesis that team outcome would relate positively to subsequent individual achievement. Their study focused on how the structure of team learning mediates learning (Chambers & Abrami, 1991).

Another study conducted in Mississippi, compared individual study, interactive multimedia and cooperative learning to discover which activity best supplements lecture-based distance education (Boling & Robinson, 1999). These researchers defined

interactive multimedia in such a way that might include the webquest format. They concluded that cooperative learning was most effective at increasing individual comprehension, but interactive multimedia was most effective in increasing learner satisfaction. Traditional instruction was found to be less effective than either interactive multimedia or cooperative learning. The webquest instructional strategy combines desirable characteristics of both interactive multimedia and cooperative learning. Future research in this area is needed.

### **Lev S. Vygotsky, Scaffolding and Webquests**

Lev Vygotsky's theory emphasizes the importance of social interaction to learning. His "zone of proximal development provides a conceptual basis for explaining the five basic tenets of cooperative learning: positive interdependence, face-to-face interaction, individual accountability, small-group and interpersonal skills, and group self-evaluation. (Doolittle, 1997).

Vygotsky asserted that instruction should collaboratively engage students in whole and authentic activities within a meaningful and relevant cultural context. After encountering new learning in a social context, the learning can be internalized individually (Doolittle, 1997).

The tenets of cooperative learning and Vygotsky's zone of proximal development are embodied in the webquest instructional strategy. Webquests foster positive interdependence with respect to learning goals, the learning task, assigned resources, interdependence of roles and the interdependence of the rewards. This interdependence enables students to develop based on their zone of proximal development when effective

instructional designers provide stimulating activities and necessary resources for the student to develop (Doolittle, 1997).

Face-to-face interaction is embedded in the webquest strategy as students provide each other with assistance to complete the webquest task. To succeed, students must exchange resources and offer feedback. Individual accountability is essential as learners work to complete tasks. Each is accountable for completing individual tasks and mastering relevant material. Small-group and interpersonal skills are developed as students learn to work with others. Scaffolding instructions to develop skills such as brainstorming or consensus building assist in this development and encourage learners to examine issues from multiple perspectives. Finally, group self-evaluation allows group members, along with their teachers, to monitor progress and individual achievement.

Scaffolding can take a variety of forms. Online scaffolding strategies identified by Bull et al. include visual cueing, separate pages offering instructions or describing useful processes, tutorials, help systems, advanced organizers, outlines, and flow charts (Bull et al., 1999). Each of these can be found in high-quality webquests.

## **Conclusion and Future Direction**

Though there is little research directly supporting the use of webquests to increase academic achievement, related literature seems to indicate some promise in this increasingly popular instructional strategy. For example, “there is something special about the instruction to write an argument when reading from multiple sources, which prompts readers to construct their own representation or situation model of the text contents” (Wiley & Voss, 1999, p. 308). Wiley and Voss also examined essays created from web sources and found more connections, especially causal connections.

Case studies examining a variety of webquest implementations will be useful to refine the definition of the strategy. Anecdotal evidence from practitioners attending webquest workshops should be gathered and analyzed to determine the degree of success experienced in real classrooms. Modification of previous experiments will be needed to develop a research base.

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