Creating Virtual Workspaces: New Models for Developing Online Curriculum

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Since 1995 educators have recognized the need for providing structured learning environments for students when working with the resources of the World Wide Web. The WebQuest, first proposed and developed by Dr. Bernie Dodge, has become a widely used and adapted format for designing online learning environments. However, as the Web has developed as an instructional resource, very few new models of Web-based pedagogy have emerged. In this paper, I explore new models of instructional design that merge the powers of online learning with the development of critical skills such as information literacy and those skills associated with and identified as 21st Century Skills. New models of instruction, including the Project Page, the MiniQuest, the CurriculumQuest, and DecisionQuest provide educators with the capability to design highly engaging and interactive learning experiences for their students beyond the typical "WebQuest."

The Power of Online Learning and Virtual Workspaces for Learning

Various types of virtual learning environments, when supported by pedagogically sound instructional models, and when combined with the content of the Web, can provide the following:

- A structured approach to an investigation that provides direction and guidance for students in a large, complex, and dynamic system such as the Web.
- An opportunity to integrate multiple types of truly unique Web resources into the learning experience, including such media as simulations and animations that can promote the development of highly interactive and multisensory learning environments.
- An increased level of student engagement.
- An opportunity to build information literacy and 21st Century Skills in students.
- Learning experiences that are pliable and scalable, and provide opportunities for differentiation.
- Learning experiences that are inquiry-based, and focus upon the resolution of an essential question that requires the acquisition, processing and synthesis of information.

Web learning experiences are further enhanced by:

- Taking advantage of the interconnected nature of the online world, so that embedded hyperlinks provide ready access to content available from many different types of sites.
- "right now" access to current, relevant, and engaging content.
- access to resources that are interactive and manipulatable.

- The increased ability of individuals to communicate, including students with experts, and peer-to-peer interactions.

The Power of Digital Learning: Integrating Digital Content" CEO Forum. 25 Mar. 2003
<http://www.ceoforum.org/downloads/report3.pdf

Another perspective for understanding the power of online learning can be illustrated by examining the following diagram, created by the intersection of many critical components of learning. The center of the diagram (online learning or virtual learning) is created by the intersection of curriculum content standards (what is taught) with an inquiry-based pedagogy (how it is taught). Supporting this online inquiry-based learning are two other essential sets of process skills--21st Century and information literacy skills-that can be taught in conjunction with content acquisition through inquiry. In other words, online learning can be used to deliver curriculum specific content through an inquiry approach, while also promoting the development of 21st Century Skill and information literacy skills.
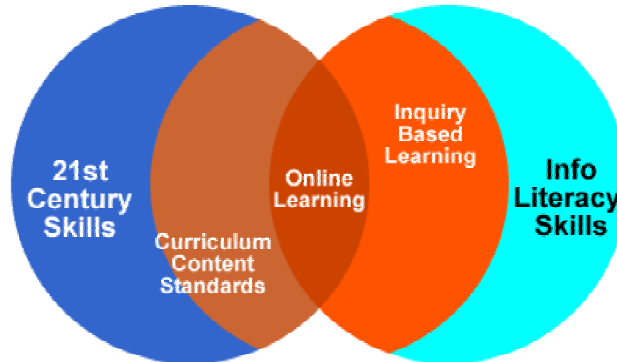
Basing Virtual Learning Experiences in Essential Questions

"It is not possible to be a good thinker and a poor questioner."

"Questions define tasks, express problems, and delineate issues. They drive thinking forward. Answers, on the other hand, often signal a full stop in thought. Only when an answer generates further questions does thought continue as inquiry. A mind with no questions is a mind that is not intellectually alive. No questions (asked) equals no understanding (achieved). Superficial questions equal superficial understanding, unclear questions equal unclear understanding. If your mind is not actively generating questions, you are not engaged in substantive learning."

Elder, Linda and Richard Paul. "The Miniature Gudie on the Art of Asking Essential Questions" Critical Thinking Consortium. 05 Feb. 2003 <http://www.criticalthinking.org/AskingQuestions.htm>

The effectiveness of any lesson design, and therefore any learning experience, including those that are virtual learning experiences, rely on the quality of the **essential question** posed to students. As all educators know, effective questioning strategy by teachers is absolutely essential if a teacher expects to promote critical and creative thinking by students. The ability to ask great questions often separates great teachers from good ones.

Getting Started:
For the purposes of this article, an essential question is any question that requires one of the following thought processes:

- a question which requires the student to develop a plan or course of action.
- a question that requires the student to make a decision.

The essential question directs the course of student learning. As such, essential questions are powerful, directive and commit students to the process of critical thought through inquiry. Ultimately, the answer to the essential question will require that students craft a response that involves knowledge construction. This new knowledge building occurs through the integration of discrete pieces of information obtained during the lesson. As a result, answers to essential questions can be considered a direct measure of student understanding.

From Point A to B: Avoiding the Simple Question.
Writing questions such as "What is cancer?" simply asks students to move information from one point (the resource, typically electronic) to another (their paper). By asking this type of question, incidents of plagiarism increase dramatically.

Instead of the above question, we may ask students the essential question: "What plan could you develop that would reduce your likelihood of developing cancer?" This is a more powerful question than "What is cancer" but the question is still not finished. At this point it is helpful to visualize the answer. In this case, a student could answer this question by developing a *list* of strategies. They are still moving information.

The Essential Nature of the Question.
A much better question is "What plan could you develop that would reduce your likelihood of developing cancer in your lifetime? Your plan can have only two strategies. Defend why you selected those two strategies." In this case, the question requires students to discriminate among the potential list of strategies, and then defend their choice. Certainly, a more thoughtful question like this increases the amount of critical thought that students engage in.

More examples:
At this point, it is appropriate to list additional examples of essential questions. My work with teachers during staff development events indicates that when building lessons, such as during the construction of online curriculum for virtual learning environments, the most difficult part of the design process is framing the essential question. Here are more examples of essential questions:

- Is it acceptable to clone human beings? Support your decision. (Decision-making)

- What invention of the 20th Century has had the greatest impact? Justify your response (decision-making).

- Who was the greatest home run hitter in baseball history? (Decision-making)

- Which credit card should is best for me? (Decision-making)

- What plan could be developed to reduce the impact of zebra mussels on the Great Lakes ecosystem? Your plan can include three strategies. (Action plan)

- What is the best plan for losing 20 pounds? Your plan can include three strategies that are most appropriate for you. (Action plan)

- What plan could I use to prepare for a 5K run? The plan can include two strategies. (Action plan)

Creating Virtual Learning Formats: Online Curriculum Pedagogy

In this section of the paper, I introduce a new instructional design that can be used in constructing virtual learning spaces. As previously mentioned, the WebQuest was the first model applied to online learning and has become the subject of countless articles, presentations, and classroom activities. But other instructional design models exist that perhaps can serve to extend the initial idea of the WebQuest, and in the process, create a more effective model of instruction. This new model of instruction has the capability to promote content knowledge acquisition as well as other critical process skills such as information literacy and those contained in the skill set cumulatively known as 21st Century skills. This new activity structure is called the Project Page.

The Project Page:

Like the WebQuest, the Project Page has inquiry as its fundamental pedagogical foundation, yet the structure of the Project Page activity is much different than the WebQuest. The complete inquiry process as it relates to the Project Page is illustrated in Figure 1; note that each part of the inquiry process is contained within the Project Page model. For example, the Task section of the Project Page clearly states the essential question and identifies the list of foundation questions students must answer. The components of the Project Page include the Scenario, Task, Resources, Product and Assessment. Each component is described below.

- **Scenario:** introduces the student to the learning activity, places the learning activity within an authentic context, places the student in an adult role, and links previous learning and understanding to this new task.

- **Task:** includes the essential question and a set of foundation questions that structure resources.

- **Resources**: links to online resources, as well as directives to other types of information media, including library databases and print materials. Authors of Project Pages should seek to include and incorporate as many unique Web resources (simulations, animations, primary source information, collections, graphics, etc.) to provide highly engaging and interactive content. For a list of Web sites that feature unique content, see the unique Web resource page at Biopoint.com (http://www.biopoint.com/ibr/unique_web_resources.htm).

- **Product:** describes what the students will build to represent their answer. The product is directly linked to the role given to the students in the scenario and is typically an authentic product associated with that job. For example, if students are asked to be newspaper columnists in the scenario, then their product should be a newspaper article. If students are asked to serve on a committee, then the product should be a set of committee recommendations.

- **Assessment:** assesses the student product using a predefined rubric. Assessment for an activity delivered through a Project Page can focus on generally three areas: product design, content acquisition, and process skills. Teachers must ask: "How well did they build the product, is knowledge about the subject obvious, and how well did they fulfill each component of the process?"

Using the Project Page to build information literacy skills:

The components of inquiry-based learning are closely linked to information literacy skills (Figure 2). Such skills include formulating questions, developing search strategies, identifying information sources, evaluating information, integrating information, and knowledge construction). Any activity, including Project Page learning activities that are based in inquiry can help build information literacy skill sets in students. Because information literacy is linked directly to inquiry, and inquiry is the pedagogical foundation of the Project Page, information literacy and the Project Page methodology are directly associated (Figure 3).

Project Pages can be used to promote the development of information literacy skills. Over time, a careful integration of Project Page activities enables teachers to require more student ownership of the skills required to complete the activities. Over multiple experiences, the responsibility for developing *"Essential Elements"* of Project Pages (foundation questions, resources, product and assessment) is shifted from teacher to student. As such, skills that involve information location, evaluation and synthesis, knowledge building, and the creation of personal solutions to authentic problems can be achieved.

A four part instructional sequence can be used to promote information literacy through Project Pages.

In the **first** use of a Project Page with a group of students, every element of the process is supplied to students. Because Web investigations incorporate many difficult skills, the goal of the first activity is to familiarize students with the model, have them research in a very structured environment, and build knowledge.

In the **second** use of a Project Page with a group of students, one essential element is removed: the set of foundation questions are eliminated. Students are required to write the foundation questions and submit their list to the teacher for evaluation. Such assessment FOR learning strategies can be used to redirect and refocus efforts (if necessary) to ultimately improve student performance. Students also begin to develop another view of assessment; that is, assessment need not always be for a grade or be punitive in nature. Creation of this document has an additional benefit; it is direct evidence of original effort, something that is very important in this age of digital copy and paste essay creation. It is important to remember that removing an element mandates

that the teacher provide instruction relative to the skill. As a side note, the Inspiration software is very useful for having students generate lists of foundation questions.

In the **third** use of a Project Page with a group of students, two essential elements of the Project Page are removed: the foundation questions and the Web resources. Students are required to develop both components and are required to submit documents for assessment. In this case, the teacher, or some other specialist such as a librarian, must supply Web searching instruction. This instruction should address search engine use, search syntax, and Web site evaluation as it relates to information quality,

In the **fourth** use of a Project Page with a group of students, every element except the essential question and the scenario are eliminated. Students, in addition to the foundation questions and Web resources, must choose a product and develop an assessment component. Developing both these two components are the most challenging part of transitioning responsibility to students. Begin by listing a set of potential products students could select from and provide example assessment rubrics. As was the case before, assessment of both product choice and assessment strategy will be critical in ensuring proper fulfillment of these components.

Conclusion:

Creating and teaching with virtual workspaces provides a highly engaging learning experience for students. Done over a period of time, virtual workspaces like Project Pages can be used to facilitate the acquisition of critical information literacy skills, something so critical in today's world of information explosion.

Resources

Resources to support this document can be found at:
http://www.biopoint.com/ibr/techforum.htm

Figure 1:

Project Page Process

Inquiry-based Learning as applied to a Web Learning Environment

Ask the Essential Question

↓

Ask Foundation Questions

↓

Develop a Search Strategy

↓

Locate Web Resources

↓

Evaluate Web Resources

↓

Distill Information (answer Foundation Questions)

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Build Answer

↓

Develop the Product

The Scenario

↓

The Task

↓

Resources

↓

Product

↓

Assessment of Learning
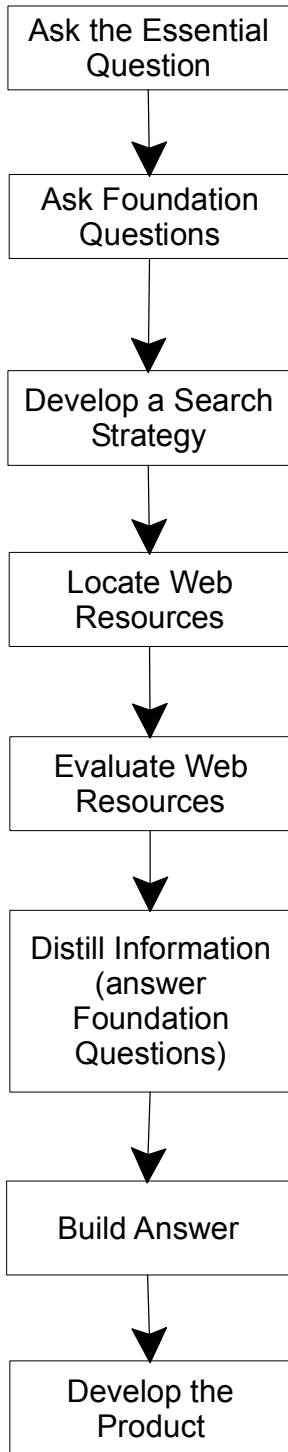
Figure 2

An information literate person is one who:

Inquiry-based Learning as applied to a Web Learning Environment

An information literate person is one who:	Inquiry-based Learning as applied to a Web Learning Environment
Formulates questions	Ask the Essential Question
	Ask Foundation Questions
Develops successful search strategies	Develop a Search Strategy
Identifies potential sources of information	Locate Web Resources
Evaluates information	Evaluate Web Resources
Organizes information	Distill Information (answer Foundation Questions)
Integrates new information into an existing body of knowledge	Build Answer
	Develop the Product

"Information Literacy in an Information Society" ERIC ERIC Clearinghouse on Information & Technology. 08 Apr. 2003 <http://www.ericfacility.net/databases/ERIC_Digests/ed372756.html>
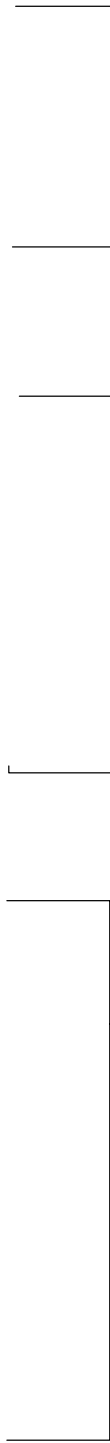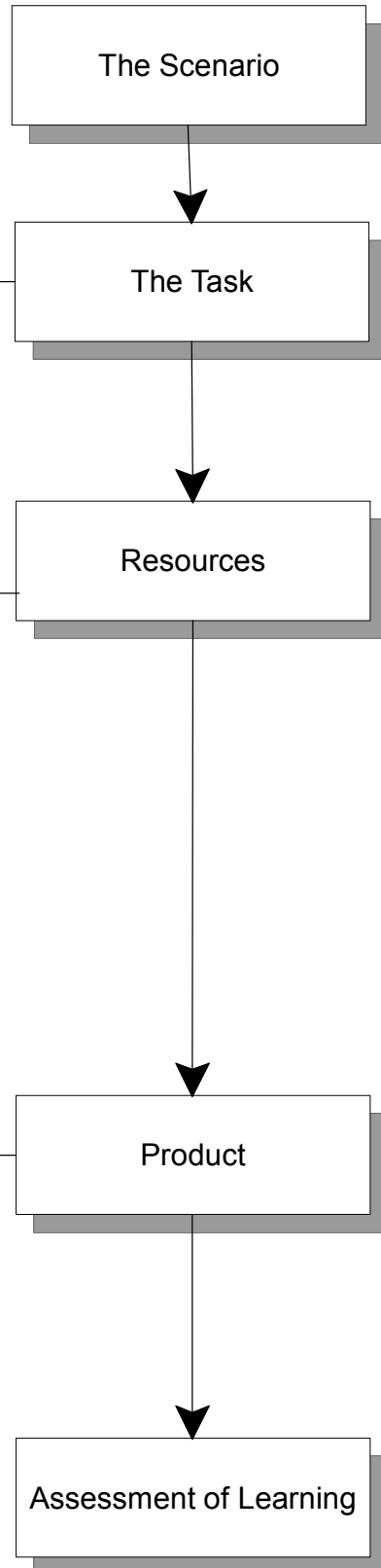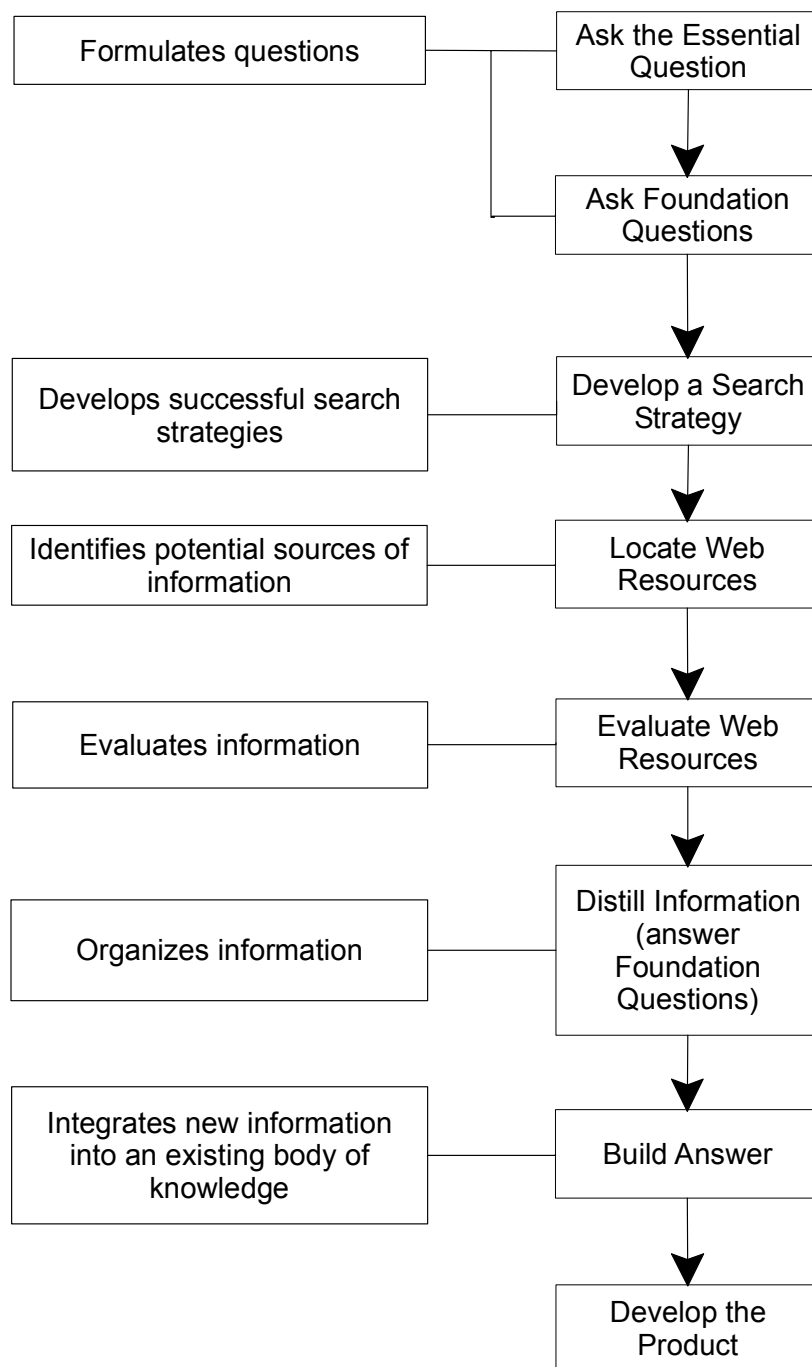
Figure 3

An information literate person is one who:	Inquiry-based Learning as applied to a Web Learning Environment	Project Page Process

The Scenario

Ask the Essential Question

Formulates questions

Ask Foundation Questions

The Task

Develop a Search Strategy

Develops successful search strategies

Resources

Locate Web Resources

Identifies potential sources of information

Evaluate Web Resources

Evaluates information

Distill Information (answer Foundation Questions)

Organizes information

Product

Build Answer

Integrates new information into an existing body of knowledge

Develop the Product

Assessment of Learning