Promoting Students’ Critical Thinking Skills Through Problem-Based Learning WebQuests

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Problem-Based Learning

- Problem-based learning represents the ability to identify a problem, analyze possible solutions, implement a plan, and present the solution.

- student-centered learning
- active and collaborative activities
- build on existing knowledge
- promote critical thinking & reflection
Constructivist characteristic of the WebQuest

- Kundu and Bain (2006) highlight the “collaborative learning, negotiation of authentic resources, active application of researched knowledge, and construction of a solution to an open-ended problem” (7).
Medicating ADHD Children to Promote Classroom Learning: A Problem-Based Learning WebQuest

by Barbara Blumner, Towson University

This WebQuest utilizes a problem-based learning approach to teach information literacy skills to freshman students in the Education discipline. It represents the second in the series.

Introduction

A Problem-Based Learning WebQuest Designed to Promote Information Literacy Skills for Education Majors

Background

Information literacy includes the ability to locate and use relevant resources. It remains especially important in the academic environment. Problem-based learning represents an educational strategy that presents an ill-defined problem for student groups to analyze, research, and devise solutions. Information literacy facilitates problem-based learning. This WebQuest presents a problem-based learning scenario in an attempt to guide freshman education students in developing information literacy skills.

Problem

Your five year old nephew was recently diagnosed with hyperactivity attention deficit disorder (ADHD). The elementary school and the pediatrician strongly recommend medication during school hours to promote learning and maintain stability in the classroom. However, your brother and sister-in-law are concerned about the negative effects of these drugs. A family conference is convened to discuss the matter. What will you say?
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Task

Description:
Students work in groups of four to solve the problem of how to advise your brother and sister-in-law on whether to medicate your five year old nephew with ADHD to promote classroom learning by

- analyzing the problem presented
- considering possible solutions
- summarizing the plan
- verifying and matching the solution to the problem

This strategy will encompass information literacy as well as problem-solving skills such as

- identifying major keywords
- noting synonyms
- creating a search statement
- determining known and unknown information
- developing various search strategies
- testing strategies in various databases and websites
- analyzing the results

Final Product will include

- two or more summary paragraphs advising your brother and sister-in-law on whether to medicate your nephew, who has ADHD, to promote classroom learning including optimal learning environments for these students
- evaluation of the problem-based learning exercise
- bibliography in APA format

First Things First...
Before beginning the information literacy problem-based learning WebQuest all students should do the following

1. review the webpages on information literacy and problem-based learning
2. read the online tutorials on searching scholarly literature, locating information on the web, and searching the online library catalog
3. complete the two interactive quizzes on searching scholarly literature and locating information on the web
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Process

Process 1
The group analyzes the problem of how to advise your brother and sister-in-law on whether they should medicate your five year old nephew who has ADHD to promote learning and determines the information need.

How to Determine the Information Need Presented in the Problem

1. Assign group participants roles as the leader, the secretary, the searcher, and the writer.
2. Read the problem and identify the major keywords associated with the ADHD problem.
3. Select synonyms for these major keywords such as child or student, classroom or learning, drugs or medication, ADHD or attention deficit hyperactivity disorder.
4. Determine what is known and unknown among the group on ADHD, medication used to treat it, advantages and disadvantages of the drugs, and learning environments for these children.
5. Identify the discipline.
6. Note the teacher recommended resources.

Suggested Resources

Library Databases

- Academic Search Premier
- Epic (EBSCO)
- Eric Digest
- Education Abstracts

Websites

- NIAMS
- Child Development Institute
- ADHD Help
- CHADD

Suggested Software

- Word processing software
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### Evaluation

<table>
<thead>
<tr>
<th></th>
<th>Needs Improvement</th>
<th>Average</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identification of Problem</strong></td>
<td>States some keywords in the problem.</td>
<td>identifies major keywords associated with the problem</td>
<td>Lists all keywords associated with problem, including synonyms and demonstrates some understanding of issues involved</td>
<td>Includes all keywords and synonyms and illustrates a clear understanding of the information used.</td>
</tr>
<tr>
<td><strong>Database searched and websites examined</strong></td>
<td>Locates one source for information (database or website)</td>
<td>Selects at least two sources with search materials</td>
<td>Finds several appropriate databases and websites that clearly contain relevant information</td>
<td>Provides superior evidence of appropriate and relevant material from a variety of resources</td>
</tr>
<tr>
<td><strong>Search strategy employed</strong></td>
<td>Writes a search statement</td>
<td>Crafts two or more field specific search statements</td>
<td>Develops at least three search statements which utilizes various fields and synonyms as well as different</td>
<td>Formulates a superior search strategy that encompasses field searching, boolean operators, various search options as...</td>
</tr>
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Conclusion

Problem-Based Learning Exercise & Information Literacy Skills Gained

This WebQuest employed a problem-based learning approach to promote information literacy skills for freshman education majors. The WebQuest presented a scenario that included advising a brother and sister-in-law on whether to medicate their child, recently diagnosed with ADHD, to promote classroom learning.

In the process of devising a solution to the problem, the group further increased their familiarity with search techniques in scholarly databases and locating information on the world wide web utilizing field, Boolean, and command line searches. They also gained additional experience in selecting appropriate databases and websites, identifying relevant materials and websites, and evaluating search results. In addition, students exposure to scholarly education resources in commercial databases as well as on the world wide web increased. Moreover, the exercise provided students with additional experience with problem-based learning strategies to enhance lifelong learning.

Lastly, students increased their awareness of the strategies available to teach children with attention deficit hyperactivity disorder as well as the controversies surrounding medication for this condition.

Problem-Based Learning

Problem-based learning is increasing in popularity as a learning strategy in higher education. It employs a constructivist strategy that allows students to build on existing knowledge to create new knowledge. Problem-based learning promotes lifelong learning which facilitates personal and professional success. An article by Major and Palmer (2003) in Academic Exchange Quarterly examined the effectiveness of problem-based learning in higher education. This website compiled by Central Queensland University provides an annotated list of problem-based resources on the web.

Information Literacy

Information literacy skills remain essential for academic success. Information literacy, like problem-based learning promotes lifelong learning. Recently major U.S. universities such as University of Southern California and Stanford University expanded their definition of information literacy to include Information and Communication Technology Literacy (ICT). These schools are promoting an Educational Testing Service ICT exam for incoming freshmen as well as juniors to assess student's ICT skill level, improve curricula and measure student progress.

Medicating Children with ADHD in School Environments

This topic continues to be a controversial issue among parents, doctors, and educators. Research highlights the increasing numbers of children medicated for ADHD as well as the disadvantages of ADHD drugs. Still, studies also note the learning problems ADHD children encounter as well as their role in disrupting classroom learning for other students. Check the Google directory on ADD and ADHD to learn more about treatment options.
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Teacher Introduction

Purpose of Problem-Based Learning WebQuest

This exercise is designed to promote information literacy skills through problem-based learning in an introductory class for freshman education majors. The problem, which centers on the controversy surrounding medicating ADHD children to promote classroom learning, exposes students to education databases but also includes literature from psychology as well as the medical discipline. In researching possible solutions students learn the advantages and disadvantages of medicating children with ADHD to promote classroom learning as well as optimal learning environments and teaching styles for these students. They also develop research and analytical skills as well as experience with the problem-based learning technique.

Unit Title: Promoting Information Literacy Skills for College Freshman Education Majors

Keywords: Information literacy, problem-based learning, Education databases, search techniques, ADHD, attention deficit hyperactivity disorder, medication, Ritalin, Adderall, Concerta

Time: Six hours

Content Standards: American Library Association Competency Standards for Information Literacy

Summary of Unit: This WebQuest was created as a unit for an introductory college freshman education class.

Learning Goals:

Students will obtain skills for searching scholarly databases as well as the web. They will learn how to identify major keywords, select synonyms, craft a search statement, devise a search strategy, execute a search using various fields, boolean operators, databases, web search engines as well as the invisible web. They will gain familiarity with scholarly literature in the education field.

Students will also understand obtain experience with problem-based learning such as problem analysis, crafting a solution, composing a written resolution, and assessing the solution.

In addition, students will gain knowledge of the advantages and disadvantages of medicating children with ADHD to promote classroom learning. They will also discover optimal learning environments and teaching styles for these children.

Finally, students will learn APA format for creating bibliographies.
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Learners

The intended audience for this WebQuest on promoting information literacy skills through a problem-based learning approach includes freshman college students majoring in Education in an introduction core course to the discipline.
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Standards

American Library Association Standards, Performance Indicators, and Outcomes for Information Literacy

Standard One

The information literate student determines the nature and extent of the information needed.

Performance Indicators:

1. The information literate student defines and articulates the need for information.

   Outcomes Include:

   a. Confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need.
   b. Develops a thesis statement and formulates questions based on the information need.
   c. Explores general information sources to increase familiarity with the topic.
   d. Defines or modifies the information need to achieve a manageable focus.
   e. Identifies key concepts and terms that describe the information need.
   f. Recognizes that existing information can be combined with original thought, experimentation, and/or analysis to produce new information.

2. The information literate student identifies a variety of types and formats of potential sources for information.

   Outcomes Include:

   a. Knows how information is formally and informally produced, organized, and disseminated.
   b. Recognizes that knowledge can be organized into disciplines that influence the way information is accessed.
   c. Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book).
   d. Identifies the purpose and audiences of potential resources (e.g., popular vs. scholarly, current vs. historical).
   e. Differentiates between primary and secondary sources, recognizing how their use and importance vary with each discipline.
   f. Realizes that information may need to be constructed with raw data from primary sources.

3. The information literate student considers the costs and benefits of acquiring the needed information.

   Outcomes Include:
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Teacher Process

Defining Problem-Based Learning & Information Literacy
Teachers need to clarify the problem-based learning technique as well as define information literacy to the students prior to the WebQuest. This is best accomplished through exposure to websites that define the process of problem-based learning as well as information literacy.

Providing Search Tutorials for Scholarly Databases, the Web, & Online Library Catalogs
Studies on problem-based learning document the importance of instructing students in searching electronic databases, the web, and online databases prior to the exercise. This exposure enhances the student's problem-based learning by providing experience in identifying the information need and locating relevant materials. This WebQuest provides two tutorials aimed at increasing student's search experience and knowledge of the web. In addition, the availability of quizzes allows the students to gauge their understanding of the content.

Time Commitment
This WebQuest should take at least six hours. Students will need one hour to familiarize themselves with the online search tutorials and to read the text on information literacy and problem-based learning. They will need three hours to devise the search strategy and conduct the search, and analyze the results. Two hours will be required to produce the written products.

Providing Resource Suggestions
This exercise is designed to teach students information literacy skills especially locating appropriate databases and websites. Although an important component of the WebQuest includes teacher suggested resources, these are minimized in this exercise to encourage students to locate relevant materials.
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Credits

Images taken are from Microsoft Word clip art.

The author is indebted to Dr. Layan Song, Assistant Professor, Dept. of Educational Technology and Literacy, College of Education, Towson University, for suggesting the use of a WebQuest to create a problem-based learning exercise for information literacy instruction.

Dr. Song also recommended I examine two WebQuests including Chocolate: A Multidisciplinary WebQuest by Sara Maseroff and Problem-Solving in Mathematics by Yusuke Morihara. My WebQuest borrows some formatting and organizational ideas from these examples.

In addition, Kandu and Bain’s (2006) article titled Webquests: Using Technology in Constructivist Manner to Facilitate Meaningful Preservation in Art Education provided information on the importance of collaboration and group roles in the exercise. Brun’s (2001) article, In Virtual Pursuit, outlined the use of WebQuest to teach students information literacy skills. Brun listed four questions that WebQuest should address including How does the WebQuest teach the topic or concept, does the WebQuest promote collaborative learning, does the WebQuest require students to use higher order thinking skills and does the WebQuest promote information literacy. I utilized these questions to measure the effectiveness of my WebQuest.

Merci

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This WebQuest was created in QuestGarden
Welcome!

You've arrived at the most complete and current source of information about the WebQuest Model. Whether you're an education student new to the topic or an experienced teacher educator looking for materials, you'll find something here to meet your needs.

What is a WebQuest?

A WebQuest is an inquiry-oriented lesson format in which most or all the information that learners work with comes from the web. The model was developed by Bernie Dodge at San Diego State University in February, 1995 with early input from SDSU/Pacific Bell Fellow Tom March, the Educational Technology staff at San Diego Unified School District, and waves of participants each summer at the Teach the Teachers Consortium.

Since those beginning days, tens of thousands of teachers have embraced WebQuests as a way to make good use of the internet while engaging their students in the kinds of thinking that the 21st century requires. The model has spread around the world, with special enthusiasm in Brazil, Spain, China, Australia and Holland.
Selected Bibliography

