

A Virtual Library for Classroom Research and Pedagogy

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ABSTRACT

At the Anderson campus of Purdue University's School of Technology, an Internet-based virtual library was recently established as a means of enhancing the technology research capabilities of students. The virtual library is a collection of links to industry periodicals, news sources, selected technology company web pages, search engines, and more.

The virtual library does much more than merely save students a walk to a traditional library. It provides the capability of searching for information beyond that found in a traditional library. This includes up-to-the-minute information, which is often very useful in a technology-oriented course, as well as case studies, white papers, and other material. The virtual library also has a huge cost and time of development advantage over traditional libraries, bringing powerful research content to any campus with Internet access.

INTRODUCTION

Changes in technology along with reduced funding for higher educational are forcing educators to re-examine how they teach.³ Sometimes this means doing without. But at other times, new technology opens new horizons for learning. A new model of education is being driven by the changing needs of society and at the same time being enabled by information technology. That new model uses individual exploration rather than classroom lectures, embraces apprenticeship rather than passive absorption of information and encounters fast-changing content rather than stable content.³

Responding to a need to bring information resources to students at a low cost, the Anderson, Indiana campus of Purdue University School of Technology created a virtual library consisting solely of Internet research resources. The results in the classroom have been encouraging.

The Anderson campus of Purdue University School of Technology consists of approximately 200 students pursuing degrees in computer technology, electrical engineering technology, technical graphics, and organizational leadership and supervision. Nearly all students have full-time jobs and pursue their degrees at night as part-time students.

A traditional library resides on the campus of our host school, Anderson University. The library is only two blocks away from our doors. But when students are driving in for a single class after a full day of work, they don't often get to the university library and, when they do, have a hard time finding information relevant to their engineering technology coursework. Yet good library resources were needed for term papers and other research assignments.

With the addition of Internet access to the Purdue Anderson computer labs, a virtual library seemed like logical step. In addition, class surveys indicated that around half of the Purdue Anderson students had Internet access from work or home, making the Internet and the virtual library more accessible than a physical library.

Figure 1 -- Virtual Library Page

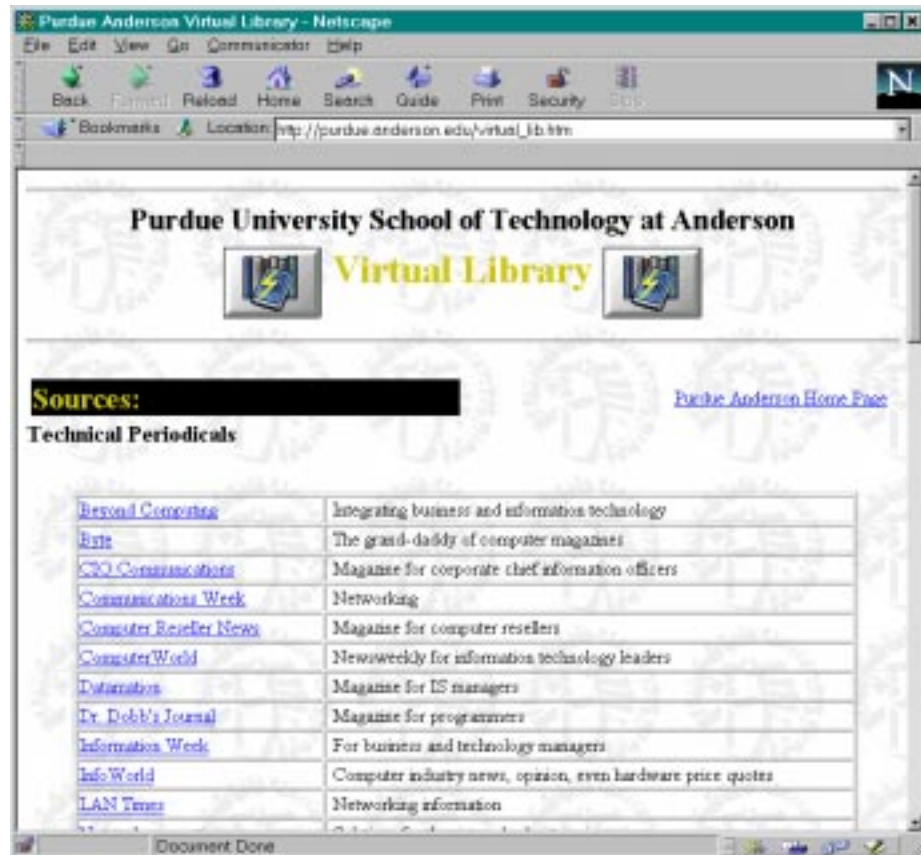
As plans were made to develop the virtual library, the following advantages were identified:

Cost – In comparison to the expense of stocking a library with books and periodicals and hiring library staff, a virtual library costs virtually nothing.

Timeliness – No physical library can be up-to-date, especially with regard to computer technology. The Internet is constantly being updated by vendors and news organizations.

Pedagogy – Research indicates that integrating technology into education increases and improves active learning, critical thinking, motivation, cooperative learning, and communication skills, among other benefits.¹

Skills – Searching and filtering information from that vast array of data on the Internet is quickly becoming a life-skill for the Information Age. As information grows, the important thing becomes not what one knows but what one can find quickly and efficiently. Assignments with the virtual library can introduce students to those techniques.



METHODOLOGY

Our site administrator has web server software installed on his computer, which is hooked to the Internet through our host campus, Anderson University. That makes all our web pages accessible anywhere in the world. Lab access to the World Wide Web makes those web pages and the rest of the Internet accessible in our labs. All lab computers start with the Purdue Anderson home page when Netscape is launched. The virtual library is just one click away.

Once the virtual library file was established on the web server, creating the content was a simple matter that involved no programming. Links to the various resources and all the rest of the page creation was done with Netscape Communicator in a menu-oriented, what-you-see-is-what-you-get environment. The updating is done conveniently on a PC other than the web server and then sent across the Internet to update the master page. Figure 1 shows what the virtual library page looks like.

The links on the virtual library web page were discovered through browsing newsstands and physical libraries plus personal web browsing. Colleagues may mention a periodical that should be included. That periodical's web page can often be located through searching on the web or by simply finding a copy and reading the periodical's web address off its masthead. It typically takes less than 5 minutes to update the virtual library when new links need to be added.

Table 1 lists the various categories of links included in the virtual library and examples of the information in those links. A complete and up-to-date listing can be found by visiting the virtual library on the World Wide Web at http://www.purdue.edu/virtual_lib.htm.

Table 1 -- Virtual Library Content

Category	Examples
Technical Periodicals	Byte, CIO Communications, InfoWorld, LAN Times, PC World, Ziff-Davis Magazines
Technology Vendors	Microsoft, 3Com, Netscape
Basic Computer Info	Computer Jargon, Net Dictionary
References	1990 US Census Lookup, Fed World, Webster's Dictionary
Physical Libraries	Anderson University, Anderson Public Library, Purdue University – West Lafayette
News	CNN Interactive, MS-NBC, USA Today
Search Engines	Alta Vista, Infoseek, Yahoo, Open Text, DejaNews, HotBot

ASSIGNMENTS USING VIRTUAL LIBRARY

The virtual library is quickly becoming an integral part of course work with several advantages to both students and faculty. It is apparent that interactive assignments with the virtual library can enhance learning. In 1956 Benjamin Bloom pointed out that effective education can be

accomplished by more than just learning and recalling knowledge. Knowledge is only one of six classifications in Bloom's taxonomy, the others being comprehension, application, analysis, synthesis and evaluation.² The following discussion of assignments will use the Bloom taxonomy to illustrate the value of learning experiences with the virtual library.

Trade Article Review – This assignment was given in a Fundamentals of Information Systems class. The assignment was to find an article in a trade publication and to write a paper. The paper was to (1) summarize the article, (2) relate it to class content, and (3) discuss the relevance of the technology or product to industry. In terms of Bloom's taxonomy, this assignment involved knowledge, comprehension, and evaluation.

Technology Oral Report/Memo – These are two assignments done in two different sections of the Fundamentals of Information Systems class, involved researching a technology through the virtual library and then explaining that technology either in an oral report to the class or in the format of a memo to a superior. This assignment used Bloom's classifications of knowledge, comprehension, and synthesis

Technology Case Study Report – This assignment in the Fundamentals of Information Systems class required students to find a case study of a business use of a technology discussed in class. They were then to write a paper analyzing the case study and the technology similar to the Trade Article Review above. Several trade periodicals excel in reporting business case studies that are up-to-date and relevant to class work. The HotBot search engine is especially good at finding those case studies by typing: "Case Study" +technology name. This assignment involved comprehension, analysis, and application.

Technology Report – This assignment was given in an Information Technology Architecture course. Students were assigned a topic relevant to technologies studied in the course. The students researched the topic and generated a written report explaining the topic, its relevance to the course and its importance and impact on the industry. This assignment incorporated the knowledge, comprehension and evaluation areas as defined in Bloom.

Network Analysis and Design Project - Students in a Data Communications course were given an actual business data communications problem. They were to analyze the business requirements and design a solution to the data communications problem. Student were to recommend specific hardware and software products to implement the solution. The final design was presented in both written and oral reports. This extensive exercise incorporated aspects from all of Bloom's categories.

Thus all the classifications of Bloom's taxonomy were used in these assignments, hopefully leading to more well-rounded learning.

RESULTS AND CONCLUSIONS

Observation of use of the virtual library for completing assignments indicates that students face the critical thinking tasks of refining searches and selecting appropriate sources from a vast array

of possibilities. Therefore, innovative class assignments that call specifically for Internet-based research using the virtual library are now being assigned as a way to increase active learning.

The virtual library is now drawing interest from other curricula taught on campus. Links needed for these other disciplines can be also added quickly and easily.

In conclusion, the virtual library is a low-cost resource for student research with a high pay-off in bringing up-to-date information and better pedagogy to students.

REFERENCES

¹ Barron, A.E., & Orwig, G. W. (1997). New Technologies for Education. A Beginner's Guide. Englewood, CO: Libraries Unlimited.

² Bloom, Benjamin S. (1956). Taxonomy of Educational Objectives: The Classification of Educational Goals by a Committee of College and University Examiners. New York, NY: McKay Co., Inc.

³ Buchal, Ralph O. (1996). Engineering education in the 21st Century. 1996 ASEE Annual Conference Proceedings [CD-ROM]. Washington, DC: American Society for Engineering Education.

BIOGRAPHICAL INFORMATION

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