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Researching the internet : a student tutorial

Roger S. Davis
University of Northern Iowa

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Researching the internet : a student tutorial

Abstract

This project involves the development of a series of web pages that serve as a tutorial students use for Internet searching. Students in the Computer Concepts and Applications class at Hawkeye Community College use the Internet to find information for use in an oral report or written assignment. A limited amount of general information about the mechanics of working with a web browser and a brief introduction to search engines is presented to the students in class. The tutorial will assist students by providing links to search engines, ideas in formulating a search strategy, additional more detailed information on working with directories and search engines, ideas for choosing keywords, and assistance in evaluating the sites they find.

Researching the Internet: A Student Tutorial

A Graduate Project

Submitted to the

Division of Educational Technology

Department of Curriculum and Instruction

In Partial Fulfillment

Of the Requirements for the Degree

Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

By

Roger S. Davis

June 7, 2000

This Project by: Roger S. Davis

Titled: Researching the Internet: A Student Tutorial

Has been approved as meeting the research requirement for the
Degree of Master of Arts in Education

Sharon E. Smaldino

June 9, 2000
Date Approved

Sharon E. Smaldino
Graduate Faculty Reader

Lisa Hansen

June 10, 2000
Date Approved

Lisa Hansen
Graduate Faculty Reader

Rick Traw

June 23, 2000
Date Approved

Rick Traw
Head, Department of Curriculum and Instruction

Introduction

This project involves the development of a series of web pages that serve as a tutorial students use for Internet searching. Students in the Computer Concepts and Applications class at Hawkeye Community College use the Internet to find information for use in an oral report or written assignment. A limited amount of general information about the mechanics of working with a web browser and a brief introduction to search engines is presented to the students in class. The tutorial will assist students by providing links to search engines, ideas in formulating a search strategy, additional more detailed information on working with directories and search engines, ideas for choosing keywords, and assistance in evaluating the sites they find. In addition, the tutorial will serve to reinforce the concepts taught in class.

In prior semesters, when given an assignment, students used the search button on their Netscape browser to locate search engines. As is often the case with the Internet, some of the search engines included in Netscape were no longer in operation. New search engines were not available from the browser link because it was developed earlier than they were available. In order to use these newer search engines, a small list of hyperlinks to search engines that students could use was created. The students had difficulty with the mechanics of using the search engines. They had difficulty in figuring out good keywords or ways to use directories. They also needed help in evaluating the quality of the material they located.

Textbooks are used to teach other computer applications in this class. The books have worked well to reinforce concepts taught in class and provide students with the additional practice they need to become proficient with the applications. This class does not have scheduled lab time, so it is important that students have materials they can use outside of class to help them find information they may not have retained from the class session. Several textbooks that covered the Internet were evaluated for class use; however, the books usually covered a multitude of Internet topics beyond searching. Most textbooks limited their discussion of searching to the mechanics of using a search engine. A textbook used in the past provided exercises designed to teach students to find information on the web. Practice exercises in the book were often of limited value due to changes in the web sites referenced in the book. As an example, students might be asked to locate information about a company that existed when the text was published but has since gone out of business. The textbook seemed to offer the students some value, but it was not worth what it cost to purchase.

Internet searching is a unit of study within a class that includes word processing, spreadsheets, databases, and computer terminology. Class time for this topic is somewhat limited. It is also difficult to cover every circumstance the students might encounter in attempting to do an Internet search during class. This class meets in a computer lab, so the students can have hands-on experience for the searching process in class, but they often needed guidance beyond one experience in class. The students needed a source they could use

outside of class to help them with the assignment. That need led to the development of this project.

After hearing questions from classes and observing the areas where students needed the most help, three major topics were identified to include in the tutorial. The tutorial includes a list of resources they can use. Second, it offers suggestions for doing the search, focusing on strategies such as choosing between directories and search engines, rather than mechanics of where to point and click. Third, it identifies resources the students can use to evaluate the quality of the material they locate.

Methodology

Locating Resources for Searching

The first step in this project was to locate resources for the three areas outlined in the introduction. One consideration was to use the help sections of the search engines as a primary source of information. These had some explanations of how to search, but offered little help in evaluating materials.

A variety of textbooks that had been considered in the past for this and other courses were examined. Most of them offered only limited explanations on increasing the relevance of the results to the topic. There was little information offered on evaluating materials. There were few suggestions on alternatives to search engines or directories.

A search at the library found several books, including some in the library science area, which were devoted to the topic of Internet searches. Several books had one or more chapters on some of the areas that contributed

information for the project. The publication dates of all these books were within the last three of years. Publication date was important due to the changing nature of the Internet.

Some topics are less affected by changes on the web than others. Some ideas for evaluating sources, for example, are useful for all types of sources and therefore, not affected by changes on the web. However, in the bibliography section of these books, written by professional librarians, most of the web sites checked were no longer in operation.

Search Strategies

In a review of the books, several common themes were found on how to choose between search engines and directories and how to narrow down a topic to specific categories and keywords. Bradley (1999) divides search engines into four categories. They are index or directory-based search engines, multi- or meta-search engines, resource- or site-specific search engines, and free-text search engines. Each has a different way of locating material.

The index or directory based search engine is created by a human editor, who decides what categories to use. This can be a problem due to cultural differences. For example, Yahoo! lists military, politics, law, and taxes as sub-categories of government. "However, a British reader might look slightly askance at the subheadings, since we would expect to find some of them elsewhere in the hierarchy" (Bradley, 1999, p. 21). An advantage is users can use the headings to guide them to the information they need.

Multi- or meta-search engines search several different search engines and consolidate the results. Because different search engines use different syntax, these search engines are not as flexible as free-text search engines.

Resource or site-specific search engines are very limited in that they search only a specific site. For this project, the on-line publication sites would be an example. They have search engines that look for information only on their site.

Free-text search engines, such as AltaVista, use keywords to locate material. Documents containing the requested words are returned, with those documents having the most relevance listed first. Search engines search for more than one word at a time. Craver (1997) says using Boolean operators with search words is one of the best strategies for getting useful results.

Boolean operators are such words as “and,” “not,” and “or.” The Boolean operator “and” tells the search engine to return only documents with both search words in the document. The Boolean operator “or” tells the search engine to return documents with either word in the document. The Boolean operator “not” tells the search engine to return documents that do not have the specified word in the document. Ackermann and Hartman (1997) note that most search engines will allow the use of the plus sign (+) to indicate “and,” while the minus sign (-) indicates “not.”

The search strategy adopted for the tutorial for this project is adopted from a process outlined by Morville, Rosenfeld, Janes, and DeCandido (1999), who suggest virtual libraries as a good place to begin. The Argus Clearinghouse is an

example of a virtual library. Internet directories are listed next. Because both use the same method of searching (e.g. working from a broad category down to a specific category), the links for virtual libraries and directories were combined on the same page.

After using directories, students are led to a natural language search engine. AskJeeves is frequently mentioned as a good place where a search can be done by asking a question, just as a student would ask an expert on a subject (Morville, Rosenfeld, Janes, & DeCandido, 1999). AltaVista also supports natural language searching (Morville, Rosenfeld, Janes, & DeCandido, 1999), however, when experimenting with both services, significant differences were found in the relevance of the results returned. On the basis of these trials, only AskJeeves was listed in the natural language section of the project.

The third step in the search strategy is to try on-line publications. This is not included in the Morville, Rosenfeld, Janes, & DeCandido (1999) strategy. This is a rich source of information about computer technology – the topic the students will be researching for their assignment. This section could use more entries. Those that are included are based on sources found to be useful.

In this step, students will need to use keywords to search the site. Suggestions in the tutorial are adapted from Glossbrenner's (1999) list of steps for choosing keywords. After keywords are introduced, Boolean logic is discussed, as well as phrase searching. Looking for a word in the title of the web page is introduced in this section.

The fourth step of the strategy is to use a keyword search engine to search the web. At this point the student should know how to do keyword searching from their experience with on-line publication search engines. The "links page" lists search engines that the students might find to be useful. Glossbrenner (1999) lists "the Big Six" – AltaVista, Excite, HotBot, Infoseek, Lycos, and Yahoo! – as the best places to use to search. Ackermann and Hartman (1998) list the same six except for Yahoo!, which they classify as a directory. In addition, they list Webcrawler as a major search engine. Sullivan (2000) charted search engines based on how they scored in reviews by major computer magazines. Notess (2000) lists AlltheWeb, Northern Light, AltaVista, Google, and Excite as the top five search engines in a ranking of database relative size. On the basis of the rankings of Sullivan and Notess, AlltheWeb, Google, and Northern Light were included in the list of search engines.

After the keyword search engine, other resources such as encyclopedias and dictionaries were included. Many students will not need these resources, but they are available for those who do need them. These were chosen from this author's experience.

Strategies for Evaluation

Some questions for students to consider are included in a section about evaluating resources. Tate and Alexander (1999) suggest five criteria: authority, accuracy, objectivity, currency, and coverage. Whitson and Armstutz (1997) suggest these five criteria: validity and reliability, content, currency of the source, scope of the resource, and format. The questions included are adapted from

these criteria. Links to several other sources for evaluating material are also included.

The goal of this portion of the site is to lead the student through the process of getting information from the web. The tutorial provides a logical sequence the students can follow from brainstorming about the topic through using directories and other sources to evaluating sources. For students who need help with a specific aspect of the process of searching or evaluating, the tutorial is set up in small units that can be accessed directly without viewing the entire tutorial. A web format would be the best for accomplishing this goal.

Hawkeye Community College prohibits instructors from posting web pages that contain links to sites outside of the college on the Hawkeye web server.

Therefore, the tutorial will reside on the campus network and students can use a browser to view it. Some general topics and sub-points were outlined to identify the main topics and sub-topics. This list became the basis for the design of the main web page.

Books on publication design and web page design were referenced.

Several web sites were examined making notes of things about the design that were positive and negative. Since most students will run the tutorial on campus, the screen resolution of the browser was checked. The design of the tutorial, with a common heading for consistency, was important. On the left side of the screen, a common menu panel to allowing students to move from one section of the tutorial to another at any time was added for flexibility. A next button at the bottom each page to allows students who wish to follow the tutorial sequentially

the option to do so easily. Finally, binoculars were added to the top of the page to direct attention to the section where the information would be located.

The page is designed as a table, allowing the master design to be used as a template. This offers a consistent look without having to recreate links for each page of the tutorial. Frames were not considered for aesthetic reasons. Particularly on a low-resolution screen, like 640 by 480, the space for other text can become very limited.

Text for each topic was typed using a word processor and checked for errors. Then, the text for each section was placed in the appropriate table cell. Finally, the links to move from page to page were created.

Project Description

This project is a tutorial for Internet searching. HTML web pages are used to create the tutorial because it was determined this will be an easy format for the students to use. At this time, Hawkeye Community College prohibits instructors from putting web pages containing links to off campus sites on the college web site. As a result, the tutorial will not reside on the web, but rather on the college intranet. Each student in the class will be able to access it through their network login. A benefit is that it will run much faster on the intranet than on the web. See Appendix A for sample pages from the tutorial. Initial student feedback on the effectiveness of the tutorial will be collected during the summer term.

Conclusions and Recommendations

In developing this project, the realization that traditional printed textbooks are of little use when dealing with the web was noted. The textbooks used

previously provided some guidance on search strategies and some generalities on the evaluation of materials. These things tend to be similar for books and web sites. However, the information on specific web sites was likely to be out of date. It is surprising how quickly this can happen. Most of the books were very recent. Using the web for the tutorial allows faster updating than is possible with a traditional textbook. Students who wish to have a printed copy of the material have access to printers in the classroom and the lab.

The process of finding things on the Internet was difficult for students. Using keyword search engines with wrong keywords was the primary reason they had so much difficulty. After working through this project, students no longer use a keyword search engine as a first step, but rather a last step. A new, and hopefully more effective, search strategy has been implemented for students to use because of doing the project.

The evaluation of sources had less detail in the books, although most included a chapter on the topic. Several books included bibliographies listing web sites on evaluating material. These links were considered for the project. As is often the case with print material about the web, a good number of the sites were no longer in existence. However, the few that worked led to enough other information to be able to compile a list of sources students can use.

The original intention was to do more than had been assigned with evaluation of materials. That is a possible area for future development. However, there is value in giving the students links and having them draw their own conclusions. The students will work with the tutorial in the summer term, so the

effectiveness of this project will remain unknown until near the end of the summer term.

The tutorial will need to be updated on a regular basis because of the changing nature of the web. New search engine sites will be developed and some of the current ones may become outdated or even cease to exist. New sites are added to the web constantly and some search engines may do a better job of finding new sites than others find. A possible future addition to this project is a section for practice where students would be given something specific to search for. Another section could be added for students to evaluate material and sites that they found in a search.

Overall, this project has been beneficial in helping students learn to search the web more effectively. Students who use the tutorial will be asked for feedback at the end of each semester and suggestions for future improvement will be sought. The work on this project will continue in order to improve for future semesters.

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Appendix A

The search tutorial has been posted at

<http://www.uni.edu/~davis78/research/home.html>. Sample pages from the tutorial are included in this appendix.



Searching the Internet



- This tutorial is designed to help you learn how to search the Word Wide Web. This tutorial is divided into sections. This is the home page.
- Click on the buttons on the left side of the screen to move to a particular section. Within a section, click on the arrow pointing to the right to go to the next page in the section.
- When you complete one section, you will automatically go to the next section when you click on the arrow. Use the links at the left if you want to skip a section.
- If you want to return to a previous page, click on the back button on your browser.
- The search links section contains links to search engines and other sources. The resources section contains a bibliography and a site index.

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Searching the Internet



Using a Directory

Directories are a good choice when you want to start with something general and work toward something more specific. Directories may be either commercial or academic. Because of their differing purposes, they may yield different results. See the [search links](#) section for links to directories.

- An academic directory is designed to assist researchers in finding high quality material. The editor of an academic directory is examining material for quality and usefulness in research.
- A commercial directory is designed to generate traffic to view the advertising at the site. The editor at the commercial directory is looking for something that will be popular with those who use the directory.

To use a directory you need to start with a very broad topic. In this case, your first topic would most likely be computers.

After clicking on computers, you will be given another list of topics. This list might include hardware and software. In each case, click on the topic that seems most appropriate to your needs. If you want to go back to a previous list of topics, click the back button on your browser.

After choosing several sub topics, you will find a listing of pages about your topic. Most directories list the name of the site, along with a short description of the site. They may also comment on the usefulness of the site.

Next

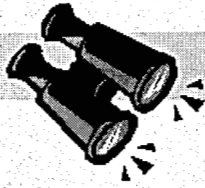


Searching the Internet



Directory Links

- AltaVista is, according to some sources, the largest search engine on the web. Includes special sections for finding images, mp3/audio, and video.
- Argus Clearinghouse is a virtual library. The content has been reviewed and rated by a cyber librarian prior to being included.
- Direct Hit claims to get more accurate results on the first try.
- Excite uses special software to find sites that have words with similar meanings to the words you've specified.
- Google is one of the newest search engines. It uses new search techniques, which it claims will result in more relevant results.
- HotBot is one of my personal favorites. It gives you easy control over your search for things such as date, language, and so forth. It also tracks what sites people visit after doing a search and lets you see a list of the top 10.
- Infoseek was reported by CNet reviewers to find the most relevant links.
- Lycos includes tools for finding photos and sound.
- WebCrawler provides a link with each summary that allows you to find pages similar to the summarized page.
- Yahoo! is another favorite of mine because I usually get good results.



Searching the Internet



Evaluating sources

Evaluating sources is important. Published materials are evaluated for accuracy before publication. Materials on the Internet may or may not be evaluated. Before relying on a web site, evaluate the site critically.

- Who is the author?
- What are the author's qualifications to write about this topic?
- Is there a hidden agenda?
- Is this page a marketing tool or an impartial research study?
- Is the material up to date?
- Are there grammar and spelling errors?
- Is the web site a personal page?

On the next page you will find links to web sites that have material about evaluating sources. Visit a few of them and make your own checklist for evaluating sources.

[Next](#)