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This study describes an evaluation of library tutorials provided by the member libraries of the Association of Research Libraries (ARL). The evaluation was conducted to determine whether or not the Web-based library instruction tutorials available on the Home pages of ARL member libraries are pedagogically sound.

Out of a sample population of 25 research libraries that were randomly chosen from the total population of 122 member ARL libraries, 19 were found to have general tutorials that were suitable for evaluation. Four of these tutorials met all six of the evaluation criteria applied, but the remaining 15 met only some of the criteria. It appears that many libraries are following sound pedagogical strategies for the instruction of their learners, but few are complete in their attempts. Further research and continued evaluation of Web-based library tutorials are suggested.

Headings:

Bibliographic instruction -- College and university students.

Bibliographic instruction -- Evaluation.

Computer-assisted instruction -- Evaluation.

Internet -- College and university libraries.

Research libraries -- Evaluation

WEB-BASED LIBRARY TUTORIALS: HOW ARE WE DOING?
AN EVALUATION OF ARL MEMBER LIBRARIES

by
Jennifer Simpson Parsons

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Approved by:

Advisor

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Introduction

Over the past five to seven years, organizations have been rushing to mount information for potential customers on Internet-linked servers, allowing people all over the world to learn about their services via the World Wide Web (WWW). Libraries have been included and, in many cases, have led the pack in this rush to get online. Students and community members are growing accustomed to the almost ubiquitous accessibility of the resources and services available on the Web and, reasonably, are beginning to expect their library (whether it be supported by their student fees or taxpayer dollars) to provide many of its services as fully as possible via the Web. Numerous libraries have produced elaborate and full gateways to information through the creation of library Web sites, but without providing high-quality, Web-based instruction in the use of these resources they have not truly served those seeking convenient and complete library services.

One of the most successful services provided by libraries over the years has been library instruction (a.k.a. "bibliographic instruction," "user instruction," and "library orientation," etc.). For over 100 years library instruction has existed primarily as a classroom-based service, offered for the most part in formal lessons conducted in the libraries' physical facilities. With the advent of the WWW, many of these lessons have been adapted for online use, but with varying degrees of success.

Web-based instruction, while similar in many respects to classroom instruction, differs in several important ways. It is imperative that library instruction tutorials that are made available via the WWW follow a sound Web-oriented pedagogy, based on the theories of those who have studied Web-based instruction over the past several years. In order to work towards this goal it is necessary to evaluate the current state of affairs with respect to the library tutorials that currently exist. For this reason, I have attempted to answer the following research question:

Question:

Are the Web-based library instruction tutorials available on the Home pages of ARL member libraries pedagogically sound?

To clarify this research question, I offer the following operational definitions:

Operational Definitions:

- Web-based--(a.k.a. online) accessible via the World Wide Web, usually written in the Hypertext Markup Language (HTML)
- Library instruction tutorials--instructional modules with the purpose of assisting learners in their understanding of effective library/research strategies
- Available--those Web pages that can be reached publicly (i.e., without a password or other certification system) by following links no more than four levels deep from the library's home page
- ARL member libraries--The 122 libraries who belong to the Association of Research Libraries (ARL), "comprising the leading research libraries in North America" (ARL, 2001).
- Pedagogically sound--meet a set of Web-based pedagogical criteria defined by those who have studied in this area.

The Association of Research Libraries (2001) includes in its priorities:

- Develop new approaches and models for measuring and improving library service effectiveness, diversity, and leadership, and
- Promote tools, policies, and programs to ensure enduring, cost-effective access to research materials in all formats to readers working both near and at a distance from those resources.

By studying the Web-based library instruction tutorials of the ARL member libraries, I hope to address both of these priorities. By evaluating the content and format of these tutorials, using sound Web-based teaching theories as a guide, the effectiveness of the instructional services of these libraries will be assessed. I hope to increase awareness about the best practice sites discovered and, as a result, increase the overall quality of Web-based tutorials at these and other libraries.

Literature Review

Over the past few years much has been written about Web-based instruction, especially its use in distance education programs and as a supplement to classroom-based education. Several researchers in the areas of library and information science have also focused on Web-based instruction, studying ways in which it can effectively enhance information services. While many in the educational community are excited about the incredible possibilities of this new medium, most who write about this topic warn against using the Web for the sake of using the latest technology. McManus (1996) states

The Internet is fast emerging as one of a teacher's most important tools, with the World Wide Web emerging as the easiest and most popular way to access the Internet. The possibilities of Web based instruction are boundless. But many educators, both teachers and designers, are at a loss for how to use this tool properly.

Librarians have been instructing patrons in the effective use of the library for over a century. In "College Libraries as Aids to Instruction" (dated 1880) Harvard Librarian Justin Winsor wrote that the college librarian should become "a teacher, not with a text book, but with a world of books" (United States Government Printing Office, 1880:7). According to Farber (1999:7), many librarians over the years have shared Mr. Winsor's position. He states that librarians at many institutions during the early 1900s were offering library instruction in some form, "But such instruction was, for the most part,

very basic and could hardly be regarded as playing a role of any significance in a student's education. The situation did not change much over the next several decades."

As Mr. Farber (1999: 171-176) has provided a synthesis of 25 years of library instruction in his summary article, I will not repeat his description of the developments that have occurred in library instruction since the turn of the 20th century. I will mention, however, that Farber emphasizes the significance of a recent book in the evolution of library instruction. Gateways to Knowledge: The Role of Academic Libraries in Teaching, Learning, and Research (Dowler, 1997) is a collection of papers given at a conference hosted by the Harvard College Library in 1997. Farber (1999:175) states,

The 'gateway' concept of the library, as seen in this volume of essays, is nothing really new; it serves as the point of access to other research resources, a very traditional role for the academic library. What is new is its emphasis on using electronic technology, and how that changes so much of what the library does and how it does it. And what is especially important is the recognition of the role of the librarian in this new environment.

What has happened, it seems to me, is that the recognition of the educational role of the librarians now is the result of the convergence of two developments: one, the widespread success of bibliographic instruction; and two, the impact of electronic resources of information.

According to Dewald (1999b), face-to-face instruction and the online environment do not always lend themselves to exact parallels. However, she agrees with many researchers, both within and outside the Library and Information Science (LIS) community, that traditional criteria can guide teachers/librarians in developing good online instruction.

Representing one of the first studies of its kind, Dewald (1999a) applied six criteria for "good library instruction practices" to Web-based tutorials selected by the Library Instruction Round Table (LIRT) of the American Library Association. In evaluating these tutorials, Dewald chose to use the following "characteristics of good library instruction": The tutorial: (1) is course related, (2) includes active learning, (3) includes collaborative learning, (4) includes graphics (that have the positive characteristics of loading easily and enhancing instruction), (5) contains clear educational objectives, (6) teaches concepts, not merely mechanics, and (7) includes the option of asking the librarian for help. While her study is of great importance in understanding how well a select group of Web-based library tutorials met these criteria, the broader sampling methods and slightly different evaluation criteria to be described here could yield results that are equally as informative and, perhaps, more global in scope.

For this study, I have chosen to use a random sample of libraries chosen from the population of ARL member libraries. By doing this, I hope to get a more general view of general library tutorials. While these libraries do represent the leading research libraries in North America, their tutorials were not necessarily hand picked by ALA's LIRT and, for this reason, would better represent the average quality of tutorials that exist at these types of institutions.

For the most part, the criteria used for this study are quite similar to those that Dewald (1999a) used in her study. The two exceptions are her examination of whether or not the tutorial is, "(1) course related" and "(4) includes graphics." The reasoning behind the first criterion exclusion is that my aim was to evaluate "freely available" tutorials,

those that were accessible to not only students, but community members as well.

Determining whether or not the tutorials were used in conjunction with coursework at the institution would not only be difficult without extensive further research, but also, not especially useful for the goals of this study. My logic in not assessing the graphics content of the tutorials was that I wanted to focus most directly on the instructional design issues of Web-based instruction, rather than the general design issues of Web-based materials. I assert that the inclusion of effective graphics can be an element of successful Web and instructional design, but that it is not a necessity. Hall's opinion (1997) concurs with mine when he states, "Good instructional design can make up for poor quality of media, but it doesn't work the other way around."

Combining the theories of Dewald (1999b) and some of her colleagues (Dixon [1995], Dupuis [1998], and Nipp [1998]), the Teaching Methods Committee of the Instruction Section of the Association of College and Research Libraries (2000) has created some informal guidelines ("tips") on the pedagogy of Web-based tutorials. They are:

- (1) Outline the objectives and outcomes clearly to establish purpose and realistic expectations.
- (2) Provide a clearly defined structure that:
 - a.) Reflects the objectives of the tutorial and
 - b.) Allows for both linear and nonlinear learning, so students can review sections and/or select the pathways that best meet their needs.
- (3) Include interactive exercises (active learning) such as with simulations, manipulation of objects, interactive quizzes, or the direct application of

principles. These will encourage problem solving by students and allow them to:

- a.) Practice/respond to what is taught
- b.) Self-assess their learning
- c.) Engage in "deep learning" (understanding the meaning) rather than "surface learning" (memorization and regurgitation)
- d.) Receive feedback

(4) Give attention to the concepts behind the mechanics so that information skills are applicable to other search interfaces.

(5) Incorporate contemporary language and topics, be as succinct as possible, and don't be afraid to entertain.

This will:

- a.) Establish relevance to students' lives
- b.) Not overwhelm them with verbiage and
- c.) Help to keep their interest

(6) Provide a way to contact a librarian.

(7) When the tutorial is used, try to make it course-related by encouraging faculty to link Web-based instruction to a course assignment. This will provide additional hands-on experiences using information resources in various formats within the context of an actual assignment, further reinforcing the tutorial's teachings and relevance.

All but one of the ACRL guidelines was used in part or whole as an evaluation criteria item for this study. The one that was not used is number seven (7): "When the tutorial is

used, try to make it course-related, " for the same reason as mentioned above, with respect to Dewald's criteria (1999a).

From the disciplines of professional communications, educational technology, and educational development, Wulff, Hanor, and Bulik (2000) write about the "strategic cues" for effective Web-based teaching and learning. Their constructivist-oriented approach to Web-based pedagogy can be summarized as an emphasis on the integration of presence, reflection, and self-directed learning. Without these elements, they assert, the Web is not being used effectively to promote learning. The authors state,

There is a considerable doubt that the availability of information is always an advantage. Simply accessing or acquiring data must only be the first step... In other words, the WWW, through Web-based resources and courses only has the *potential* to support and motivate effective pedagogy.

One of the central guidelines upon which effective Web pedagogy relies, according to Wulff, et. al. (2000), is the development and maintenance of a "nonlinear, interactive learning environment that features reflection and self-directed learning." By this, we can assume that the authors would support the following approach to Web-based learning environments: Learners should be given options as to how they would like to work through the material presented. They should have opportunities to interact with the information they encounter, reflecting on what they have learned and letting their new understandings guide their next steps.

Also coming from an educational technology perspective, Ritchie and Hoffman (1997) talk about the importance of incorporating the seven common elements of traditional instructional sequences into Web-based lessons. These are: motivating the

learner, specifying what is to be learned, prompting the learner to recall and apply previous knowledge, providing new information, offering guidance and feedback, testing comprehension, and supplying enrichment or remediation. Ritchie and Hoffman continue by describing the various ways that all seven of these elements can be included in Web-based learning activities. I will recount their suggestions here, along with the evaluation criteria from my study that assess, in parallel, how well the sample Web-based library tutorials address these important instructional elements.

1. "Motivating the learner--" This can be done via external stimuli (graphics, color, sound, etc.) or, more effectively, by "inquiry arousal." Inquiry arousal can be achieved in a few ways. The learner can face a problem, contradictory information, or a mystery to be solved. Or, value and relevance can be established for what the users will learn. Or, the user's confidence level for the given task can be increased. For my study, the 4th and 5th evaluation criteria, focusing on "concepts behind the mechanics" and "contemporary language topics and succinct language" are good measures of attempts to motivate the learner.

2. "Identifying what is to be learned--" Listing expectations or outcomes at the access points for lesson pages does this. Learners can easily spend a lot of time free-associating or surfing through Web sites when learning in an online environment. The inclusion of instructional expectations helps learners to focus on that information which is most important for them to understand. The 1st evaluation item for my study, "...objectives and outcomes outlined clearly..." directly assesses whether or not the tutorial identifies what is to be learned for the user.

3. "Reminding learners of past knowledge--" Learners need to have multiple options for accessing the information contained within the lesson, so that they can create their own associations by visiting and revisiting areas of interest or where they find themselves experiencing difficulties in understanding. By providing flexibility in how learners proceed through the material, more opportunities for reminders of previously gained knowledge are possible. Evaluation criteria number 2, "clearly defined structure provided," and, especially, its sub-criteria items, "reflects the objectives of the tutorial" and "allows for linear and non-linear learning" assess this element fairly well. Criteria item 3, "interactive exercises included, " and its sub-criteria items, "practice/respond" and "self-assess" effectively assess attempts to remind learners of their past knowledge.

4. "Requesting active involvement--" The learner must actively make sense of and process the information that is presented in order for learning to take place. As with the previous instructional element, success in requesting active involvement is assessed by criteria item number 3: "interactive exercises included."

5. "Providing guidance and feedback--" Learners benefit from being encouraged to make an "informed choice" among alternatives after they complete an instructional segment. They learn by reading resulting links to answers/rationale or by seeing their answers compared to preset correct answers. The "receive feedback" sub-criteria item of criteria number 3 measures this instructional element.

6. "Testing--" Learners who are encouraged to create artifacts or complete a quiz/test to assess what they have learned gain greater understanding of the subject matter through this process. While this element is somewhat related to the sub-criteria items from criteria number 3, "practice/respond," "self-assess," and "receive feedback," it is an

item that will be difficult to assess given that the tutorials being evaluated, for the most part, have been created for a general user population that may not voluntarily complete a test on the subject.

7. "Providing enrichment/remediation--" Allowing students to recycle back through material or providing extra help can be extremely helpful for those learners who are experiencing difficulties with the lessons. In my study, criteria item 2, "clearly defined structure," and 6, "librarian contact information provided," assesses attempts to provide enrichment/remediation quite well.

The goal of this study was to use the selected research-based ACRL guidelines to evaluate the pedagogical soundness of the Web tutorials available on the home pages of ARL member libraries. It is hoped that an evaluation of this type will help to describe the current state of Web-based library instruction at the leading research libraries, and will guide future efforts for improvement in this area of library services.

Methodology

A random sample population of 25 research libraries was chosen from the total population of 122 member ARL libraries (ARL, 2001) (See Appendix A). A random pilot group of 5 was chosen from the sample population of 25 in order to perform preliminary evaluations (See Appendix A). Data from these pilot evaluations was used to decide whether or not the evaluation criteria would need to be altered in any way. Only one change was made to the evaluation criteria as a result of this pilot study. The maximum tutorial depth (from the library's Home page) of three was removed due to the fact that some of the pilot tutorials were easily located with the use of a site map.

In order to reach the Home page of the sample libraries, I tried, first, to use the direct links provided by the ARL Home page <<http://www.arl.org/members.html>>. If a link did not work, or there was no link listed, then I searched for the library's Home page by entering the full name of the library's parent organization into the search form of the Google search engine <<http://www.google.com>>, and clicking on the link on the first page that seemed to best represent the possible URL for the library (i.e., [http://www.\[name of organization\].edu](http://www.[name of organization].edu) or .org or .gov) (See Appendix A).

Once I reached the library's Home page, I visually scanned the page for an instruction-oriented link. These links were in the form of "Library Instruction," "How-To," "About the Library," etc. If a link to library instruction tutorials was not provided on the library's Home page, then I attempted to locate tutorials through a site map. If I

was unable to locate a site map, or if there were no tutorials listed on the site map, I used a site search engine when one was available (See Appendix B).

Once I reached an area within the library's Website where tutorials were available, I chose what appeared to be the most general tutorial (e.g., "General Research Guide," "Using the Library," "How to Do Research," etc.) (See Appendix C) and evaluated it according to the criteria outlined below (See Appendix D for complete evaluation tool). I followed the steps of these tutorials to completion, evaluating their content/format as I progressed (See Appendix E). I was unable to locate a library instruction tutorial using the method above for four of the sample libraries. One of the libraries linked directly to the tutorial created by another library in this sample population and one library included a link to a library tutorial, but access was limited (and password accessible only) to first-year students enrolled at the institution. The criteria outlined below were used to evaluate 19 tutorials for this study:

1. Are the objectives and outcomes outlined clearly?
2. Is a clearly defined structure provided?
 - a. Does the structure reflect the objectives and outcomes of the tutorial?
 - b. Does the structure allow for linear and non-linear learning?
3. Are interactive exercises included?
 - a. Do the exercises encourage learners to practice/respond?
 - b. Do the exercises encourage the learners to self-assess their understanding?
 - c. Do the exercises encourage "deep" rather than "surface" learning?
 - d. Are learners able to receive feedback?
4. Are the concepts behind the mechanics given attention to?

5. Are contemporary language and topics used?
 - a. Is succinct language used?
6. Is librarian contact information provided?

Results

Objectives and Outcomes

Objectives and outcomes are well-defined goals for the learners that are included at the beginning of the tutorial or at the beginning of each lesson. These goals are usually presented as a numbered or bulleted list, prefaced by "By completing this tutorial, you should learn to," or a similar message. Less than half of the tutorials clearly outlined the objectives and outcomes of the tutorial (See Table 1). Eight out of the 19 sites (42%) included a clear list of objectives and outcomes. Eleven tutorials (58%) did not outline objectives/outcomes clearly, or, in some cases, at all.

Table 1

Objectives and Outcomes Outlined Clearly

N=19	Outlined Clearly	Not Outlined Clearly
Number	8	11
Percentage	42	58

Clearly Defined Structure

A great majority of the tutorials provided a clearly defined structure for learners (See Table 2). Fifteen out of 19 sites (83%) presented a clearly defined structure. Four

of the tutorials (17%) presented an unclear structure or no structure at all. All eight of the tutorials that had outlined their objectives and outcomes clearly presented a structure that reflected those objectives. All but one of the tutorials (95%) provided a structure that allowed for linear and non-linear learning.

Table 2

Clearly Defined Structure Is Provided, Allows for Linear and Non-Linear Learning

N=19	Clearly Defined Structure Provided		Structure Allows for Linear and Non-Linear Learning	
	Yes	No	Yes	No
Number	15	4	18	1
Percentage	83	17	95	5

Interactive Exercises

Interactive exercises in an online tutorial may be defined in much the same way as Dewald (1999a) defines active learning for her study, "exercises conducted by the student online, whether this involves using online forms to review material and receive instantaneous feedback from the computer, or sending online worksheets or quizzes to the librarian for later email feedback." About half of the tutorials included interactive exercises (See Table 3). Examples of interactive activities included in these tutorials include games, polls, search simulations, and quizzes. Many tutorials used a similar technique for self-assessment with the inclusion of "Click 'n Learns," "Check Your

Knowledge," or "Points to Ponder" informational pop-up windows. Nine out of 19 tutorials (47%) did include interactive exercises, while 10 tutorials (53%) did not.

Table 3

Interactive Exercises Are Included

N=19	Yes	No
Number	9	10
Percentage	47	53

The interactive exercises that were included in these nine tutorials exhibited strongly the four sub-criteria evaluation items (See Table 4). With the use of interactive exercises, 8 out of 9 tutorials (89%) encouraged learners to practice and respond and eight 8 out of nine 9 tutorials (89%) encouraged deep rather than surface learning. Encouraging deep learning may be described as requiring learners to participate in activities that force them to think about the concepts behind the procedures used in that aspect of library research. All nine of the tutorials (100%) that included interactive exercises encouraged learners to self-assess their understanding and provided methods for learners to receive feedback.

Table 4

Characteristics of Interactive Exercises

N=9	Practice/Respond	Self-Assess	Deep Rather Than Surface	Receive Feedback
Number	8	9	8	9
Percentage	89	100	89	100

Concepts Behind the Mechanics

About half of the tutorials gave attention to the concepts behind the mechanics. Similar to the "deep rather than surface" sub-criteria item described above, this is a measure of whether or not the tutorial attempts to teach the concepts that support the procedural processes involved in library research. About half of the tutorials focused on these conceptual understandings (See Table 5). Ten out of 19 tutorials (53%) gave attention to these conceptual understandings, while 9 of the tutorials (47%) did not.

Table 5

Concepts Behind the Mechanics Given Attention to

N=19	Yes	No
Number	10	9
Percentage	53	47

Language and Topics

By using contemporary language and topics and using succinct language, tutorials can be more effective learning tools. These attributes help to establish relevance to learners' lives, avoid overwhelming them with specialized verbiage, and help to keep their interest. More than half of the tutorials used contemporary language and topics and succinct language (See Table 6). Sixteen out of 19 tutorials (84%) used contemporary language and topics and all but one of the tutorials (95%) used succinct language.

 Table 6
Language and Topics Used

N=19	Contemporary Language and Topics Used		Succinct Language Used	
	Yes	No	Yes	No
Number	16	3	18	1
Percentage	84	16	95	5

Librarian Contact Information

Offers to provide follow-up help to learners have long been appreciated for their use as access to enrichment/remediation and, often, for their provision of feedback for those responsible for the creation of lessons. All 19 of the tutorials (100%) included librarian contact information either within the tutorial or from the main library Home page from which the tutorial was reached. A common method for providing contact with

a librarian was an "Ask A Librarian" link to a question/comment form that could be submitted online.

Only 4 library tutorial sites out of 19 (21%) met all six criteria. These "best practice" sites are: University of Arizona's RIO: Research Instruction Online (1999), University of Illinois--Urbana-Champaign's Step-by-step research process: Focus on effective information seeking skills (1998), New York University's How to use Bobst library (n.d.), and University of Texas--Austin's Texas Information Literacy Tutorial (TILT) (2001).

Discussion

Objectives and Outcomes

The presentation of clear objectives and outcomes is an essential element of effective face-to-face and Web-based instruction. In the Web-based environment, objectives and outcomes can be integrated into a table of contents or as part of the introduction of the entire tutorial or even each lesson. Including these expectations helps the learner to focus on the significant ideas contained in the lessons and results in a higher rate of success in achieving educational goals.

With less than half (42%) of the sample tutorials clearly outlining objectives and outcomes, it seems that many tutorials could be improved by the inclusion of this important instructional design element. Many of the tutorials seemed to be created as Web versions of library informational handouts, rather than pedagogically sound instructional materials. By mounting purely informational content, without regard for the instructional implications, these libraries missed some opportunities to teach, rather than just inform.

The University of Illinois--Urbana Champaign's Step by Step Research Process tutorial (1998) presents an entry page that describes the six steps of the research process that will be taught in the tutorial. Below each heading for the research steps is a description of the learning objectives for that portion of the tutorial. Common in these outlines is the phrase, "This module shows you how to..." followed by a bulleted list of learning outcomes. Further, once a learner has entered the portion of the tutorial that addresses a certain step, he/she sees a list of activity titles, followed by descriptions that more specifically describe the learning outcomes for that portion of the tutorial.

Clearly Defined Structure

A clearly defined structure is necessary to make the general plan and context of each lesson apparent to the user. He/she can see how the material will be presented and, in turn, how it will fit within his/her existing knowledge framework. Also, a clearly defined structure is helpful in providing remediation opportunities. The more clearly the individual lessons are defined, the easier it will be for learners to revisit those areas in which they are experiencing difficulty.

This structure can be provided through the use of a basic table of contents and is most useful when at least the general topic areas are visible and linked to all lesson pages. This can be done with the use of HTML frames or with the inclusion of a general table of contents at the top or bottom of each lesson page. With an overwhelming majority of the tutorials (83%) providing a clearly defined structure and almost all (95%) presenting a lesson arrangement that allowed for both linear and non-linear learning, ARL member libraries seem to have focused fairly well on providing clearly defined structures for their lessons.

Howard University's Strategies for Doing Library Research tutorial (2001) includes linked table of contents items at the bottom of every tutorial page. This makes it easy for learners to jump from one area of the tutorial to another, without hitting the "back" button or going back to the entry page for the tutorial.

Interactive Exercises

Interactive exercises are online tasks that require decisions and input from the learner to complete. Without this type of active learning it is easy for users to go through a tutorial without really applying themselves. Engagement through exercises of this type

compels the learner to fully process the information that has been presented. Those who follow a constructivist viewpoint with respect to education believe that learning does not occur until this type of engagement occurs. For Web-based library tutorials, interactive exercises can include quiz- or test-type questions included at the end of each lesson or interspersed throughout the tutorial. These can be answered with the use of an online form, requiring the learner to choose from various options or filling in a text field. Ideally, the learner will receive immediate feedback about his/her responses. Other examples of interactive exercises are library search simulations and game-type activities.

Less than half of the tutorials (47%) included any type of interactive exercise. Those that did, though, almost universally provided opportunities to practice/respond (89%), self-assess (100%), and receive feedback (100%). Eight out of nine tutorials (89%) provided exercises that engaged students in deep rather than surface learning activities. Those libraries that have focused on including active learning activities in their tutorials have done an excellent job of utilizing some of the best possible characteristics of these exercises, but it's clear that most libraries still need to make an attempt at including activities of this type.

The Library of Congress' [Introduction to Searching American Memory](#) tutorial (2000) includes activities that allow the learner to open an active search window in which he/she can begin to practice the searching skills about which he/she is reading. At the end of each lesson is a "Points to Ponder" section that poses open-ended questions to the learner about the material he/she has just covered or, more specifically, what knowledge he/she gained from performing the actual search. On a limited basis, the Library of

Congress (LC) also offers moderated discussions about certain tutorial topics in which learners and LC staff members can participate.

Concepts Behind the Mechanics

There is a tendency when constructing lessons to emphasize the mechanics involved in specific situations rather than the universal concepts that support those actions. By limiting tutorial discussions to the particular techniques used when interacting with a specific database or resource and not the reasoning behind the use of those techniques, learners are ill prepared to use interfaces with which they are not familiar. Examples of the "concepts behind the mechanics" that can be addressed in library tutorials are Boolean operators; keyword, subject, or controlled vocabulary searching; and evaluation of information that is retrieved.

A little more than half (53%) of the tutorials gave attention to the concepts behind the mechanics they were attempting to teach. Due to the fact that library users will probably interact with dozens of different search interfaces and hundreds of print and Web resources over the years, libraries must pay more attention to teaching the skills that will help users to cope with the changes that occur in the future. It is not enough to train users to use current technology that may become outdated within a few years. Libraries need to help them to become information literate and successful at searching, obtaining, and evaluating resources that will assist them in making decisions in the future.

The Texas Information Literacy Tutorial (TILT) created at the University of Texas--Austin (2001) uses terminology that is universally applicable to a variety of research interfaces. Throughout the tutorial, concepts, rather than procedures, are

emphasized. For example, Module 1 in TILT lists as its key goals that students, at the end of the module, should be able to:

- Identify a variety of information sources
- Recognize that appropriate sources of information will change depending on your needs
- Identify the characteristics of information on the Web
- Identify characteristics of library resources
- Recognize that library collections are in buildings and on the Web
- Recall what you would find in a periodical index and list reasons to use one
- Distinguish between popular and scholarly periodicals

Conceptual goal lists such as this are available at all times through a "Concepts" menu item placed at the bottom of the screen for each module. [TILT](#) provides an excellent example of how to give attention to the concepts behind the mechanics.

Language and Topics

Using contemporary language and topics is necessary to effectively meet the user on a common ground. Contrary to popular belief, library users do not spend all of their time thinking about the library--how to use it, how it is changing, what issues the library is facing in today's ever-changing society. In other words, their world is different than that of the world of those who spend most of their day in the library. Most users reach the library or its Home page because they have an impending need, project, or deadline that requires they do some research.

By minimizing librarian jargon and using the language and topics learners are familiar with, tutorials can more effectively help learners to make immediate connections between the new information they're being introduced to and their existing knowledge structure. Utilizing contemporary language and topics can also serve to help the learner feel more comfortable with using the tutorial which, in turn, will positively effect his/her

confidence in achieving tutorial objects and will probably motivate him/her to work through the tutorial to completion.

Using succinct language is universally accepted as good practice for most types of instruction. Lengthy descriptions can quickly decrease learners' motivation levels and small chunks of information are much easier for learners to digest.

As far as contemporary language and topics were concerned, the University of Texas-Austin [TILT](#) site (2001) is the most current. The tutorial includes a "Current Internet Issues" summary list from which the learner can choose according to his/her interest. The examples that are provided for illustrations throughout the tutorial are generated according to the learner's selection. Current (popular and movie/TV theme) music is also used effectively in the [TILT](#) site to connect with learners and keep interest.

The University of Delaware's [English 110 Student Guide to the Library](#) tutorial (2001) provides a good example of how best to use succinct language. The text in this tutorial is broken up into small amounts and links to separate windows containing glossary and further details are included.

Most of the tutorials (84%) used contemporary language and topics and almost all (95%) used succinct language. This seems to be an area that most of the institutions concentrated on when creating tutorials, but will require frequent updates nevertheless. Many topics and language elements that are considered contemporary now will become outdated in a matter of months or years. It will be necessary for libraries to revise tutorials on an ongoing basis to reflect these changes.

A supplemental finding discovered in this evaluation is that the inclusion of dates of creation and most recent update are irregular and, for some, non-existent. Some sites

included a creation date. A few included date of "last update." Even fewer included both. Many just listed a date, with no explanation of what the date represented, and a few others included no date at all. It is difficult for learners to assess how recently most tutorials were created or updated.

Librarian Contact Information

People like to know that help is available when they are learning new concepts. Examples of how librarian contact information can be made available in library tutorials include online forms, email links, and phone numbers that connect to a live reference librarian.

All of the tutorials (100%) included librarian contact information, but some integrated this information more effectively within the tutorial. I did not break down my evaluation to include the form of contact available, but I did notice that many used the "Ask-A-Librarian" link to an online form that would probably be quite effective (as long as it was functional and a timely and effective response system was put in place). Anecdotally, I noticed that the "Ask-A-Librarian" links in Ohio University's tutorial (n.d.) even include the symbol for Superman/woman!

For some of the tutorials, the learner had to return to the library Home page to contact a librarian. Integrating the contact information directly into the tutorial pages would be a more effective way to assist those who need librarian assistance while completing the tutorial.

Conclusion

The purpose of this study was to evaluate and describe the existing Web-based library instruction tutorials at the leading research libraries in North America. In analyzing the results, I've found that many libraries are following sound pedagogical strategies for instruction of their learners, but few are complete in their attempts. Areas that sample libraries seem to already address fairly effectively include creating a structure that's clearly defined and allows for both linear and non-linear learning, using contemporary language/topics and succinct language, and providing librarian contact information. Areas that require further improvements include outlining objectives and outcomes clearly, including interactive exercises, and giving attention to the concepts behind the mechanics.

Further research in the area of Web-based pedagogy with respect to library tutorials would benefit greatly those who work towards improved library services within their organization. Web-based instruction has proved successful when proven teaching and learning techniques from traditional, face-to-face instruction have been implemented. It is important that researchers continue to refine the definition of Web-based pedagogy with this foundation in mind. We are still learning how to best harness the potential of the Web as a learning tool, but we must remember that it will always remain just a tool and, for this reason, it cannot make up for a lack of strong teaching content and learning objectives.

It would be useful to replicate this study on an annual basis to determine how well these types of library institutions are progressing with respect to their Web-based tutorials. Also useful would be similar studies that evaluate a single criterion in a more in-depth fashion (possibly, with the use of a larger sample population). Another area of research that would be useful would be to incorporate user surveys and/or assessments along with pedagogical evaluations of the tutorials that they are using. This would help in determining if those elements that we believe are most helpful for student learning really are.

I hope that by presenting this snapshot of Web-based library instruction at leading research libraries, peer libraries and other information organizations will understand what makes an effective library tutorial. Results from the study will help libraries to comprehend good pedagogy with respect to Web-based tutorials, but also to begin to determine what tools, programs, and policies will need to be put in place in order to make tutorials effective and available at their institutions.

References

Association of Research Libraries. (2001). ARL fact sheet. [On-line]. Available: <http://www.arl.org/arl/arlfacts.html> (Accessed May 26, 2001).

Association of College and Research Libraries, Instruction Section, Teaching Methods Committee. (2000). Tips for developing effective Web-based library instruction. Available: <http://www.lib.vt.edu/istm/WebTutorialsTips.html> (Accessed May 27, 2001).

Dewald, N. H. (1999a). Transporting good library instruction practices into the Web environment: An analysis of online tutorials. The Journal of Academic Librarianship, 25(1), 26-32.

Dewald, N. H. (1999b). Web-based library instruction: What is good pedagogy? Information Technology in Libraries, 18(1), 26-31.

Dixon, L., Garrett, M., Smith, R., & Wallace, A. (1995). Building library skills: computer-assisted instruction for undergraduates. Research Strategies, 13(4), 196-208.

Dowler, L. (Ed.). (1997). Gateways to knowledge: The role of academic libraries in teaching, learning, and research. Cambridge, MA: The MIT Press.

Dupuis, E. A. (1998). The times they are a'changin: Students, technology, and instructional services. Reference Services Review, 26 (Fall/Winter), 11-16.

Farber, E. (1999). College libraries and the teaching/learning process: A 25-year reflection. The Journal of Academic Librarianship, 25(3), 171-177.

Hall, B. (1997). Web-based training cookbook. New York, NY: John Wiley & Sons.

Howard University. (2001). Strategies for doing library research. [On-line]. Available: <http://www.founders.howard.edu/reference/strategies/default.htm> (Accessed 6/23/2001).

Library of Congress. (2000). Introduction to searching American Memory. [On-line]. Available: <http://lcweb2.loc.gov/ammem/ndlpedu/educators/workshop/search/index.html> (Accessed 6/24/2001).

McManus, T. F. (1996). Delivering instruction on the World Wide Web. Available: <http://www.svsu.edu/~mcmanus/papers/wbi.html> (Accessed May 27, 2001).

New York University. (n.d.) How to use Bobst library. [On-line]. Available: <http://www.nyu.edu/library/bobst/howto.htm> (Accessed 6/20/2001).

Nipp, D. (1998). Innovative use of the Home page for library instruction. Research Strategies, 16(2), 93-102.

Ohio University. (2001). How do I...? [On-line]. Available: <http://www.library.ohiou.edu/libinfo/howto/index.htm> (Accessed 6/24/2001).

Ritchie, D. C. & Hoffman, B. (1997). Incorporating the instructional design principles with the World Wide Web. In B. Khan (Ed.), Web-based instruction. Englewood Cliffs, NJ: Educational Technology Publications.

U.S. Government Printing Office. (1880). Circulars of Information of the Bureau of Education: No. 1-880, 7.

University of Arizona. (1999) RIO: Research Instruction Online. [On-line]. Available: <http://dizzy.library.arizona.edu/rio/> (Accessed 6/20/2001).

University of Delaware. (2001). English 110 student guide to the library. [On-line]. Available: <http://www2.lib.udel.edu/e110/> (Accessed 6/22/2001).

University of Illinois--Urbana-Champaign. (1998). Step by step research process: Focus on effective information seeking skills. [On-line]. Available: http://www.library.uiuc.edu/ugl/bi/research_skills/1_home/default.asp (Accessed 6/23/2001).

University of Texas--Austin. (2001). Texas Information Literacy Tutorial (TILT). [On-line]. Available: <http://tilt.lib.utsystem.edu/> (Accessed 6/13/2001).

Wulff, S., Hanor, J., & Bulik, R. (2000). The roles and interrelationships of presence, reflection, and self-directed learning in effective World Wide Web-based pedagogy. In R. A. Cole (Ed.), Issues in Web-based pedagogy: A critical primer. Westport, CN: Greenwood Press.

Appendix A

Sample Library Home Page URLs

ARL Member Sample Libraries	Library Home Page URL
1. University of Arizona	http://dizzy.library.arizona.edu
2. University of California - San Diego	http://libraries.ucsd.edu
3. Dartmouth College	http://www.dartmouth.edu/~library
4. University of Delaware	http://www.lib.udel.edu
5. Duke University (P)	http://www.lib.duke.edu
6. Emory University	http://www.emory.edu/libraries
7. George Washington University	http://www.gwu.edu/gelman
8. Howard University Libraries	http://wwwFOUNDERS.howard.edu
9. Univ. of Illinois - Urbana-Champaign	http://www.library.uiuc.edu
10. Johns Hopkins University (P)	http://www.jhu.edu/www/library
11. Library of Congress	http://www.loc.gov
12. Massachusetts Institute of Tech.	http://libraries.mit.edu
13. University of Miami	http://www.library.miami.edu
14. University of Missouri - Columbia	http://web.missouri.edu/~elliswww/instruction.html
15. University of Nebraska - Lincoln (P)	http://iris.unl.edu/screens/iris.html
16. New York University	http://www.nyu.edu/library/bobst
17. Ohio University	http://www.library.ohiou.edu
18. Queen's University	http://stauffer.queensu.ca
19. State Univ. of NY - Stony Brook	http://www.sunysb.edu/library
20. University of Texas - Austin (P)	http://www.lib.utexas.edu
21. Texas Tech University Libraries	http://www.lib.ttu.edu
22. Tulane University	http://www.tulane.edu/~html/index.html
23. University of Washington	http://www.lib.washington.edu
24. University of Waterloo	http://www.lib.uwaterloo.ca
25. University of Western Ontario (P)	http://www.lib.uwo.ca

KEY TO ABBREVIATIONS

(P) = Member of Pilot study

Appendix B

Sample Web-Based Library Tutorial URLs

ARL Member Sample Libraries	Tutorial URL
1. University of Arizona	http://dizzy.library.arizona.edu/rio/
2. University of California - San Diego	n/a
3. Dartmouth College	http://www.dartmouth.edu/~library/online.html
4. University of Delaware	http://www2.lib.udel.edu/e110/
5. Duke University (P)	http://www.lib.duke.edu/libguide/home.htm
6. Emory University	n/a
7. George Washington University	http://www.library.american.edu/aladin/tutorial/start.html
8. Howard University Libraries	http://wwwFOUNDERS.howard.edu/reference/strategies/default.htm
9. Univ. of Illinois - Urbana-Champaign	http://www.library.uiuc.edu/ugl/bi/research_skills/1_home/default.asp
10. Johns Hopkins University (P)	http://milton.mse.jhu.edu/research/papers/process.html
11. Library of Congress	http://lcweb2.loc.gov/ammem/ndlpedu/educators/workshop/search/index.html
12. Massachusetts Institute of Tech.	http://libraries.mit.edu/orientation/
13. University of Miami	http://www.library.miami.edu/guides/guides_user.html
14. University of Missouri - Columbia	n/a
15. University of Nebraska - Lincoln (P)	n/a
16. New York University	http://www.nyu.edu/library/bobst/howto.htm
17. Ohio University	http://www.library.ohiou.edu/libinfo/howto/index.htm
18. Queen's University	http://library.queensu.ca/webisi/survivalguide/
19. State Univ. of NY - Stony Brook	http://www.sunysb.edu/library/tutor.htm
20. University of Texas - Austin (P)	http://tilt.lib.utsystem.edu/
21. Texas Tech University Libraries	http://tilt.lib.utsystem.edu/
22. Tulane University	http://www.tulane.edu/~html/instruction.htm
23. University of Washington	http://www.lib.washington.edu/uwill/info/
24. University of Waterloo	http://tug.lib.uwaterloo.ca/trellis/help/contents.html
25. University of Western Ontario (P)	unk

KEY TO ABBREVIATIONS
(P) = Member of Pilot study
n/a = not applicable
unk = unknown

Appendix C

Sample Web-Based Library Tutorial Titles, Depths and Average Depth

ARL Member Sample Libraries	Tutorial Title	Depth
1. University of Arizona	RIO: Research Instruction Online	2
2. University of California - San Diego	n/a	n/a
3. Dartmouth College	Online information overview	2
4. University of Delaware	Engl 110 student guide to the library	3
5. Duke University (P)	Guide to library research	1
6. Emory University	n/a	n/a
7. George Washington University	Aladin catalog tutorial	3
8. Howard University Libraries	Strategies for doing library research	2
9. Univ. of Illinois - Urbana-Champaign	Step-by-step research process: Focus on effective information seeking skills	4
10. Johns Hopkins University (P)	Using library resources for scholarly writing	3
11. Library of Congress	Introduction to searching American memory	unk
12. Massachusetts Institute of Tech.	General orientation	2
13. University of Miami	Using Richter library	2
14. University of Missouri - Columbia	n/a	n/a
15. University of Nebraska - Lincoln (P)	n/a	n/a
16. New York University	How to use Bobst library	4
17. Ohio University	How do I...?	1
18. Queen's University	Library survival guide	2
19. State Univ. of NY - Stony Brook	Library tutor	2
20. University of Texas - Austin (P)	Texas Information Literacy Tutorial (TILT)	2
21. Texas Tech University Libraries	(Link to TILT from Student Sections)	4
22. Tulane University	Center for library Internet user education	1
23. University of Washington	Information-based research: An introduction	2
24. University of Waterloo	TRELLIS help	1
25. University of Western Ontario (P)	unk	unk
	Average depth of library tutorials	2.26316

KEY TO ABBREVIATIONS

(P) = Member of Pilot study

n/a = not applicable

unk = unknown

Appendix D

Web-Based Library Instruction Tutorial Evaluation Tool

Institution Name: _____ Library Home URL: _____

Does the library have a "general" tutorial? (Circle one) YES / NO

What other tutorials are offered? _____

Tutorial URL: _____ Creation date/Last update: _____

Date accessed: _____ Site search engine used? (Circle one) YES / NO

Tutorial "depth" (number of levels "deep" from the Library Home URL) _____

Comments:

Pedagogical Evaluation Criteria:

1. Are the **objectives** and **outcomes** outlined clearly (to establish purpose and realistic expectations)? YES / NO

Comments:

2. Is a **clearly defined structure** provided? YES / NO

(*reflects the objectives of the tutorial *allows for linear and non-linear learning)

Comments:

3. Are **interactive exercises** included? YES / NO

(*practice/respond *self-assess *"deep" rather than "surface" *receive feedback)

Comments:

4. Are the **concepts behind the mechanics** given attention to (so that info. skills are applicable to other search interfaces)? Y / N

Comments:

5. Are **contemporary language and topics** used (*to establish relevance)? YES / NO

Is **succinct language** used (*not overwhelm *keep interest)? YES / NO

Comments:

6. Is **librarian contact information** provided? YES / NO

Comments:

Appendix E

Results of Web Tutorial Evaluation for ARL Libraries

ARL Member Sample Libraries	O/O	Structure		Interactive				Cpts	Cntp	Succ	Cont		
		rf o/o	lin/non	p/r	s-a	dp	fbk						
1. University of Arizona	1	1	1	1	1	1	1	1	1	1	1	1	
2. University of California - San Diego	x	x	x	x	x	x	x	x	x	x	x	x	
3. Dartmouth College	0	0	n/a	n/a	0	0	0	0	0	0	1	0	1
4. University of Delaware	0	1	n/a	1	1	0	1	0	1	1	1	1	1
5. Duke University (P)	0	1	n/a	1	0	0	0	0	0	1	1	1	1
6. Emory University	x	x	x	x	x	x	x	x	x	x	x	x	x
7. George Washington University	1	0	1	1	0	0	0	0	0	0	1	1	1
8. Howard University Libraries	0	1	n/a	1	0	0	0	0	0	0	0	1	1
9. University of Illinois - Urbana-Champaign	1	1	1	1	1	1	1	1	1	1	1	1	1
10. Johns Hopkins University (P)	1	1	1	1	0	0	0	0	0	1	1	1	1
11. Library of Congress	1	1	1	1	1	1	1	1	1	1	0	1	1
12. Massachusetts Institute of Technology	0	0	n/a	1	0	0	0	0	0	0	1	1	1
13. University of Miami	0	0	n/a	1	0	0	0	0	0	0	0	1	1
14. University of Missouri - Columbia	x	x	x	x	x	x	x	x	x	x	x	x	x
15. University of Nebraska - Lincoln (P)	x	x	x	x	x	x	x	x	x	x	x	x	x
16. New York University	1	1	1	1	1	1	1	1	1	1	1	1	1
17. Ohio University	0	1	n/a	1	0	0	0	0	0	0	1	1	1
18. Queen's University	0	1	n/a	1	1	1	1	1	1	0	1	1	1
19. State Univ. of New York - Stony Brook	0	1	n/a	1	1	1	1	1	1	0	1	1	1
20. University of Texas - Austin (P)	1	1	1	1	1	1	1	1	1	1	1	1	1
21. Texas Tech University Libraries	y	y	y	y	y	y	y	y	y	y	y	y	y
22. Tulane University	1	1	1	1	0	0	0	0	0	1	1	1	1
23. University of Washington	0	1	n/a	1	1	1	1	1	1	1	1	1	1
24. University of Waterloo	0	1	n/a	1	0	0	0	0	0	0	1	1	1
25. University of Western Ontario (P)	z	z	z	z	z	z	z	z	z	z	z	z	z
Total that met this criteria item:	8	15	8	18	9	8	9	8	9	10	16	18	19
Total possible (bold=sub-criteria):	19	19	8	19	19	9	9	9	9	19	19	19	19
% that met this criteria item:	42	79	100	95	47	89	100	89	100	53	84	95	100

KEY TO ABBREVIATIONS	
1 = Yes	Interactive = interactive exercises are included
0 = No	p/r = ... that allow the learner to practice/respond
x = No tutorial available	s-a = ...that allows the learner to self-assess
y = Tutorial provided is a direct link to the tutorial produced at library #20 (UT-Austin)	dp = ...that promotes deep rather than surface learning
z = Tutorial only available to students w/ password	fbk = ...that provides feedback for the learner
O/O = Objectives and outcomes outlined clearly	Cpts = Gives att'n to concepts behind mechanics
Structure = A clearly defined structure is provided	Cntp = Contemporary language/topics are used
rf o/o = ...that reflects the objectives/outcomes	Succ = Succinct language is used
lin/non = ...that allows for linear and non-linear learning	Cont = Librarian contact information is provided