
Due to increased Internet access and the prevalence of distance education, online instruction is increasing, and libraries generate a great deal of online library instruction content to meet the needs of users. This study investigates the UNC University Libraries’ Introduction to Library Research tutorial in an effort to evaluate the tutorial and gather evidence to guide future updates. Twenty-four undergraduate students filled out a pre-test questionnaire, completed the tutorial, and answered a post-test questionnaire and an engagement questionnaire. While the average number of correct answers slightly increased in the post-test, the result was not statistically significant. The engagement questionnaire revealed that a recent design update was well-received and that while students do not necessarily consider the tutorial ‘fun,’ they would recommend it to others. This experimental approach provides evidence of student engagement with the online tutorial, serves as a possible model for evaluating the tutorial in the future, and provides benchmark data on which to compare future findings.

Headings:

- Library orientation for college students
- Web-based instruction -- Evaluation
- Questionnaires – Library user satisfaction
TOWARD A MORE EFFECTIVE ONLINE LIBRARY TUTORIAL: AN EXPERIMENTAL STUDY OF UNC LIBRARIES’ INTRODUCTION TO LIBRARY RESEARCH TUTORIAL

by
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A Master’s paper submitted to the faculty of the School of Information and Library Science of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Science in Library Science.

Chapel Hill, North Carolina
April, 2012

Approved by:

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Diane Kelly
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Introduction

With the widespread availability of computers and Internet access, academic libraries in particular are moving library instruction content online. As a result of this, Bowles-Terry, Hensley, and Hinchliffe (2010) point out “the line blurs between students who approach the Internet as distance learners and students who prefer online learning” (p. 19). In an effort to meet the needs of their users at their point of need, or “just in time,” many librarians create online tutorials that offer guidance on everything from constructing keyword searches to an overview of the research process to plagiarism. As interfaces change, librarians find that their once state-of-the-art tutorials quickly become dated, and these online learning objects can become quite a drain on work time. Martin, Birks, and Hunt (2010) and Veldof and Beavers (2001) all note this problem as an impetus for their own studies. Given this, I am interested in studying how students use these tutorials, specifically the Introduction to Library Research tutorial created by the librarians at the University of North Carolina at Chapel Hill.

Online library instruction content is delivered in many different ways: commercial products such as LibGuides, home-grown subject guides and course pages, videos created with software such as Camtasia and Captivate, and even simple HTML pages. Library instruction content here encompasses a variety of types of instruction: learning about library services, such as how to request interlibrary loan materials and how to check out books; learning about the library website, such as using the OPAC; and learning about the research process and scholarly communication, such as introduction to library
research and how to avoid plagiarism. The focus of this experimental study will be a tutorial that falls into this last category, more specifically, UNC Libraries’ *Introduction to Library Research* tutorial (http://www.lib.unc.edu/instruct/tutorial). This tutorial is often used as an introduction to concepts that will be covered in face-to-face library instruction session. While this study will investigate a research process-oriented tutorial, it will be informed by studies of similar tutorials as well as studies conducted on tutorials that address using library websites and services.

Many people within the library are involved in the creation of tutorials, from librarians to graduate students to staff members, and the production of this content can potentially span several departments. From inception to delivery, these tutorials are time-consuming and the final product often is not ‘final’ since the continual update of platforms and interfaces requires updating and maintenance lest the tutorial file formats become obsolete or the content contained within appears dated. Given this, tutorials, though only one aspect of a librarian’s work duties, can quickly dominate the majority of librarian’s schedule. The librarians at R.B. House Undergraduate Library (UL), a part of UNC Libraries, where I work as the Undergraduate Library Carolina Academic Library Associate (CALA), maintain the library’s online tutorials and the graduate students are often tasked with updating content.

The *Introduction to Library Research* tutorial underwent a design update and content refresh in 2011. The updates to the design of this tutorial grew out of research conducted by a School of Information and Library Science graduate student on the needs of students studying abroad. This research led to a consolidation of the many study abroad tutorials UNC Libraries had created to a single *Studying Abroad* tutorial. At the
same time the content was consolidated, the design of the *Studying Abroad* tutorial was also updated (see Figure 1 and Figure 2), inspired by the Department of State’s Students Abroad website (http://studentsabroad.state.gov/). Once the *Studying Abroad* tutorial was updated, the other online tutorials, including the *Introduction to Library Research* tutorial, were updated to have the same design. The updates to the content of the *Introduction to Library Research* tutorial were mostly guided by anecdotal evidence provided over the years by Teaching Fellows (graduate students and lecturers who teach English 100, 101, and 102 at UNC) regarding what they believed their students needed (K. Vassiliadis, personal communication, March 18, 2012).

Figure 1 - Previous Design of the Tutorial
The library has no recent empirical evidence to guide the editing and updating process for tutorials. It occurs to me that while we as librarians know what students need to know to successfully conduct research based on the knowledge of the library’s resources and conversations with faculty members, we do not have empirical evidence for how the students are actually interacting with and learning through online library instruction. Since these tutorials are time-consuming for librarians and staff, and since the current budget situation often leads to the need to do more with less, it is important that we optimize librarian and staff labor by investigating how students are actually using the tutorials, discovering what is retained, and basing our future efforts on empirical evidence.

The primary purpose of this study will be to find out what students are learning from the online tutorials and to determine student engagement with the tutorial. The
ultimate goal of this is to inform the library of student practices and attitudes in order to optimize time spent in the creation and maintenance of tutorials and in order to deliver better online library instruction content to our users. Among the questions I seek to answer are:

1. How engaged are students with this tutorial?
2. Does student learning about the library increase as a result of this tutorial?

The problem of usability of online library instruction content is important because students want to access as much as possible online and they attempt to do most of their work online. To stay vital and relevant, the library needs to meet students where they are already doing work. Also, while librarians may find it ideal for users to enter the library, the increase of distance education programs means that realistically many of our users are not local and may find it impossible to enter the physical library. In order to serve all of our users, we need to make sure that the online learning components created by the library are useful and usable.

My study will help improve UNC Libraries’ existing tutorial by providing empirical evidence concerning students’ engagement with the tutorial and student learning as a result of the tutorial. Although there have been similar studies done by other universities, there have not been any recent studies conducted on the UNC Libraries tutorials, so a need exists to get local user feedback in order to identify strengths and weaknesses. By conducting research, the library can provide evidence-based answers to these questions instead of going on hunches and anecdotal evidence.
Literature Review

The following literature review summarizes studies that have been conducted on online library tutorials, including student surveys. Of particular interest are the methods involved in these studies, the types of online tutorials studied, the debate concerning interactivity, the benefits of these tutorials, and the question of whether they should replace or supplement face-to-face instruction.

There have been several approaches to assessing online library tutorials, from large-scale analyses of tutorials created by libraries across the United States and Canada to assessments of individual tutorials at universities. Dewald’s (1999) analysis of tutorials from across the United States and Canada is often cited because of its contributions toward developing “best practices” for tutorial creation. Recognizing that libraries increasingly need to meet the needs of students in online environments, Dewald (1999) applied criteria for good in-person bibliographic instruction to web-based instruction tutorials. In doing so, she examined whether these in-person instruction criteria were used in online environments and the ways in which they were applied. Originally identifying 20 online tutorials recognized by the Library Instruction Round Table (LIRT), Dewald examined 19 tutorials, 18 of which were geared toward a post-secondary education audience. She found that online library tutorials are best used as a supplement to in-person instruction, and especially stressed that these tutorials should allow for active and collaborative learning, include graphics, and point users toward librarians for further assistance (p. 30 – 31). Though not a large-scale analysis, Bowles-Terry, Hensley,
and Hinchliffe (2010) also offer “best practices” for tutorial creation based on the results of their usability study.

Somoza-Fernández and Abadal (2009) followed this model of large-scale analysis and applied pre-identified criteria to online tutorials. While Dewald (1999) selected tutorials highlighted by LIRT, Somoza-Fernández and Abadal (2009) examined 180 online tutorials specifically created by academic libraries worldwide in terms of “general characteristics, content, teaching methodology, usability and technology” (p. 127). Somoza-Fernández and Abadal (2009) noted that tutorials addressing information literacy account for almost 43% (n=77) of the tutorials studied with the next largest subject area being “searching in information sources” at almost 13% (n=23) (p. 129). Perhaps as a result of Dewald’s (1999) study, three-fourths of the tutorials they examined had an interactive component. In their discussion, Somoza-Fernández and Abadal (2009) asserted that “web-based tutorials offered by academic libraries are at an early stage of development” and identify the inclusion of “explicit indication of the educational objectives,” “information on the time that students will need in order to follow the tutorial,” and “some form of evaluation of students’ previous knowledge” as the areas needing the greatest improvement (p. 130). These sorts of large-scale analyses of web-based tutorials are helpful to get an overall perspective on the state of online tutorials and give librarians creating tutorials useful guidance for “best practices;” however, in order to meet the needs of their particular users, it is important for librarians to also conduct user-centered research on the tutorials created by their library. The rest of the articles selected for this review address these sorts of local studies, and I have focused on the methods used to collect data, the types of online tutorials studied, the debate surrounding
interactivity, the benefits of these tutorials, and the question of whether online tutorials should replace or supplement face to face instruction.

The three methods of data collection used in the individual studies were surveys, focus groups, and usability studies. A popular strategy for the surveys was to administer a questionnaire as a pre-test and post-test (Armstrong & Georgas, 2006; Churkovich & Oughtred, 2002; Friehs & Craig, 2008; Martin, Birks, & Hunt, 2010; Petit, 2006; Van Scoyoc, 2003). The other frequently used data collection method was usability studies (Bowles-Terry, Hensley, & Hinchliffe, 2010; Bury & Oud, 2005; Mestre, 2010; Veldof & Beavers, 2001). Mestre (2010), in her study of the use of learning styles to develop online learning objects, took a two-pronged approach to data collection: she surveyed librarians about their considerations when creating tutorials and she conducted a usability study with 10 students. Martin, Birks and Hunt (2010) utilized focus groups to formulate their surveys. Veldof and Beavers (2001) also employed a focus group, but as a means toward understanding students’ mental models rather than redesigning the tutorial. Bury and Oud (2005) used a survey to assess the redesign that occurred as a result of their usability testing. The pre-test and post-test survey design will be important to answering my research questions, and the examples here provide a model for structuring my questionnaires.

The format of tutorials investigated varied widely. The majority were videos created using Captivate or Camtasia (Bowles-Terry, Hensley, & Hinchliffe, 2010; Friehs & Craig, 2008). Others used static HTML pages (Bury & Oud, 2005; Martin, Birks, & Hunt, 2010; Veldof & Beavers, 2001). Still others were Flash based animations (Armstrong & Georgas, 2006; Petit, 2006). Some of the tutorials formats were not
explicitly mentioned, except for the use of a phrase like “computer-assisted instruction” or “computer-based tutorials” (Van Scoyoc, 2003). In one case a commercial tutorial was used (Churkovich and Oughtred, 2002). Mestre’s (2010) study is notable because it was the only one that I identified that investigated and conducted usability testing on three technologies used to create tutorials: a Camtasia tutorial, static HTML pages, and an animated Flash tutorial. Mestre (2010) found that “those who used the static Web pages with screen shots and a directive to open a new Web browser and do the search along with the steps on the Web page were all able to go back and recreate the search” whereas 8 out of the 10 were unable to do so using the Camtasia tutorial (p. 821). Her findings are of interest to my study since the Introduction to Library Research was created using static HTML pages and a natural question is whether this is the most appropriate format for the content.

Van Scoyoc (2003) found, in her comparison of in-person bibliographic instruction and online tutorial instruction, that students who attended in-person instruction exhibited significantly less anxiety about using the library than those taking online tutorials. However, she noted that “those students who completed the computer-based tutorial experienced significantly less library anxiety compared to those students who did not participate in either” in-person or online instruction (p. 337). Of interest to librarians, “analysis of the first subscale [of library anxiety], barriers with staff…revealed that students who participated in library staff-led bibliographic instruction experienced significantly less library anxiety compared to those students” who did not have an in-person or online session as well as “compared to those students who completed the computer-based tutorial” (Van Scoyoc, 2003, p. 337). Indeed, Churkovich and
Oughtred’s (2002) study support this finding, showing that students who had face-to-face instruction had “higher confidence levels” (p. 33). These two studies are fascinating because although it is not an explicit research question for my own study, library anxiety and student comfort levels are implicit in my desire to learn more about students’ opinion and use of tutorials.

Dewald (1999) maintained that interactivity (quizzes, media, etc.) plays a role in successful online tutorials. Armstrong and Georgas (2006) found that “students are receptive to and often enthusiastic about learning through interactive tutorials” (p. 496). During their usability study, Bury and Oud (2004) stated that “students responded very favorably” to interactive portions of the tutorial and that “there was a consensus that this approach helped hold student attention” and more importantly, “students requested that more modules use this interactive approach” (p. 61). Martin, Birks, and Hunt (2010) also found “that students liked and used the images and movies created” in their online tutorials, and “62 percent of…students stated that the images helped them to understand the information” (p. 61). They do state that “50 percent…of students claimed not to have used the movies” included in the tutorials despite the fact that “limited research…done in relation to learning styles among Arab students indicates a preference for auditory and visual perceptual styles” (p. 61). Mestre (2010) found in her testing that “students did better on the post tests when they had something active to do in the tutorial” (p. 827).

Despite all the evidence for interactivity, Friehs and Craig (2008) found in their study that the interactivity did not have to be very involved; the responses of the students in their two-part survey “support the value of streaming media tutorials,” especially noting the audio aspect but that “no students asked for more interactivity” (p. 505). Friehs
and Craig’s (2008) findings somewhat contradicted the widely held belief in the importance of interactivity to online tutorials, but they did acknowledge that “more studies need to be done to test the value of non-interactive, streaming media tutorials” (p. 505). Bowles-Terry, Hensley, and Hinchliffe (2010) found that the students who participated in their usability study did not think that the tutorials needed to have any more entertainment value and noted that “students view library tutorials in a utilitarian light and want to get the necessary information and move forward with the information-seeking process” (p. 24).

The role of online tutorials is also debated: while some studies have shown that in-person instruction cannot be replaced by online tutorials, others have shown that there is no significant difference between the two approaches. For example, Friehs and Craig (2008) reported that the students they surveyed liked the online tutorial but preferred face-to-face instruction (p. 505). On the other hand, Armstrong and Georgas (2006) reported that the students they studied said they prefer online learning to face-to-face instruction (p. 495). They go on to discuss the ways in which the tutorial is being shown at the beginning of face-to-face instruction as a ‘jumping off’ point to supplement instruction (p. 496). Those who argued that in-person instruction cannot be replaced with online tutorials make the point that the usefulness of such web-based tutorials is as supplement material to support classroom instruction (Churkovich and Oughtred, 2002). Others, such as Bowles-Terry, Hensley, and Hinchliffe (2010), argued that web-based tutorials are well-suited to ‘just-in-time’ instruction, addressing the point-of-need issues that users face (p. 19). Interestingly, the students in their study also responded that they would prefer to learn about library resources from a librarian in-person rather than via
online tutorials (Bowles-Terry, Hensley, & Hinchliffe, 2010, p. 19). While not necessarily preferring tutorials over in-person instruction, the students in Mestre’s (2010) study did prefer “learning objects…[be] available at point-of-need” (p. 827).

While not explicitly arguing the role of online tutorials, Veldof and Beavers (2001) examined mental models of students and librarians and ultimately made the argument that for these online tutorials to be successful, librarians need to situate them in the mental models of students rather than designing from the point of view of librarian mental models of research. This concept of mental models is of interest since my study seeks student opinion through a questionnaire such opinion is based on existing mental models. Blummer (2007), too, took into account “learning from the student’s perspective” when she discussed individual assessment of tutorials (p. 126). Her article is important to this study because it offers three views of assessment of tutorial: general, individual, and program assessment. Her discussion of program assessment regarding the tutorial, focusing on things like learning outcomes, is especially informative for my study since the Introduction to Library Research tutorial is underpinned by information literacy standards. Also, Blummer (2007) noted that “program assessment considers the attitude of the students and their professor’s toward the tutorials value” (p. 129). The engagement questionnaire in my study will be completed by students and will elicit their opinions of the tutorial’s value.
Method

In order to gather data to provide evidence of student learning as a result of the tutorial, as well as student opinion, an experimental study was devised. The study consisted of a pre-test skills test, a treatment (the *Introduction to Library Research* tutorial), and a post-test skills test to measure student learning. This was accompanied by an engagement questionnaire, which explored student opinion of the tutorial.

The experimental design was a pre-experimental design because it investigated “a single group and provide[d] intervention during the experiment” and there was no “control group to compare with the experimental group” (Creswell, 2009, p. 158). In order to explore student opinion of the tutorial, an engagement questionnaire was administered after the post-test. Churkovich and Oughtred (2002) made good use of pre-tests and post-tests in their study. They were evaluating student learning in the context of in-library versus web-based so the pre-test/post-test set up was useful.

These methods are appropriate to this study since I am seeking not only to evaluate student learning as a result of this tutorial but also student opinion of and engagement with the tutorial. Previously I had considered conducting a traditional usability study, which, after reviewing the literature and reconsidering my research questions, would not meet my needs since they tend to examine design and usability of a site rather than content.

The sample consists of undergraduate students in UNC who had not yet taken the *Introduction to Library Research* tutorial. The students were recruited via an email sent
to the UNC Mass Email system and a flyer that was placed at the reference desk in the R.B. House Undergraduate Library. Both the email and the flyer indicated that students who participated would be given $15 cash for their time. When students emailed expressing interest in the study, a follow-up email was sent confirming that they were 1) undergraduate students, and 2) had never before taken the *Introduction to Library Research* tutorial. This follow-up email contained two screenshots of the first page of tutorial: one of the previous version and one of the current version. Since the study was open to all undergraduate students, it was necessary to include the screenshot of the old tutorial. Once students confirmed that they meet both criteria, they were scheduled for the study.

The study was conducted in the Undergraduate Library in the computer classroom with multiple students participating at one time. When students arrived, they were seated at a computer station and given a consent form to read. After they each read the consent form, I opened a browser on their computer and navigated to a website which had the links to each of the questionnaires and the tutorial (see Figure 3). I oriented students to the webpage by verbally instructing them to click on each link and fill out the questionnaires in order. I pointed out that the third link was for the tutorial itself and told them that when they got to that link they were to take the tutorial. Students were told to not complete the quiz associated with the tutorial but instead return to the webpage with the questionnaires and complete the remaining questionnaires. The webpage also included these instructions. Each student drew a number to enter at the beginning of each questionnaire before beginning the study. After each student completed the last questionnaire they were given $15 cash for their participation. The estimated time to
complete the study was 45 minutes, though most students finished within 30 minutes. The questions in the pre-test and post-test helped evaluate prior knowledge as well as what learning took place as a result of the tutorial while the questions in the engagement questionnaire addressed student attitudes and opinions about the tutorial.

Figure 3 - Webpage with Links to the Questionnaires and the Tutorial

The four questionnaires were created in Qualtrics, and the first question of each questionnaire prompted the student to input the number they drew. This was done so that comparisons could be made across questionnaires without having to collect identifying information from the students. The first questionnaire was a demographic questionnaire, which asked students about their age, sex, year in school, and major. The pre-test and post-test skills test questionnaires each consisted of twelve multiple choice questions that addressed information literacy skills or library system information that was taught in the *Introduction to Library Research* tutorial. To create the questions, I reviewed the tutorial and identified categories of skills to test, such as library services, elements of the research
process, finding sources, evaluating sources, and ethical use of information. The structure of the pre-test and post-test were similar so that like skills could be compared. For example, the second question in the pre-test asked about a particular library service so the second question in the post-test also asked about a particular library service.

The engagement questionnaire administered after the post-test was adapted from a User Engagement Scale that was originally developed for measuring e-commerce experiences (O’Brien and Tom, 2010). It has been adapted for studying interactive information retrieval, and was adapted here for studying engagement with online tutorials. The engagement questionnaire consisted of 31 questions divided into 6 categories, or factors: Focused Attention, Perceived Usability, Aesthetics, Endurability, Novelty, and Felt Involvement. A 5-point Likert scale was employed with the response choices being Strongly Agree, Agree, Neither Agree Nor Disagree, Disagree, and Strongly Disagree.

In order to avoid any possible ethical conflict that might have existed because the study was administered within the Undergraduate Library, I included a statement in the recruitment email and in the consent form that said that participants would receive no special consideration for their participation in the study. The consent form also indicated that students could withdraw from participation at any time.

The quantitative data obtained through the multiple-choice pre-test and post-test and through the Likert scale engagement questionnaire was generated by and analyzed in Qualtrics. Excel and SPSS were also used to help analyze the data.
Results

Demographics

A total of 24 students participated in this study, of which 15 were female and 9 were male. The average age of the participants was 21.17 years old. The median age was 19.5. The standard deviation was 5.15 years, and two of the participants were nontraditional undergraduate students with ages more than 2.5 standard deviations and 3.5 standard deviations from the mean. All of the participants were undergraduate students, 33% of whom were freshmen, 35% were sophomores, 17% were juniors, and 25% were seniors. Of the 24 participants, only 23 responded when asked their major. Five of the participants indicated a double-major. Table 1 shows the breakdown of disciplines represented in this study and reflects double-majors when the majors fall in two different disciplines.

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Humanities</td>
<td>10</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>7</td>
</tr>
<tr>
<td>Sciences</td>
<td>4</td>
</tr>
<tr>
<td>Professional Schools</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 1 – Majors by Discipline

Pre-test and Post-test

Pre-test

Results of the pre-test are shown in Table 2. Among the twenty-four participants, only two answered every question correctly on the pre-test. Overall, the participants correctly answered an average of 9.29 questions for an average score of 77.46%. Freshmen correctly answered an average of 9.63 questions (80.25%), sophomores
correctly answered an average of 10.17 questions (84.83%), juniors correctly answered an average of 9 questions (75%), and seniors correctly answered an average of 8.17 questions (68%). Seventy-one percent of the students scored 75% or higher on the pre-test. No one scored below 50% on the pre-test.

Of the twelve questions asked, only 2 questions had a response rate of 100% correct answers. Five of the questions had correct answer responses above 90%. Three of the questions had response rates of correct answers below 70%. One of those questions dealt with evaluating websites while the other two, which had much lower scores, dealt with UNC Libraries’ physical and online library spaces.

<table>
<thead>
<tr>
<th>Pre-test Questions</th>
<th>All (n=24)</th>
<th>Freshmen (n=8)</th>
<th>Sophomores (n=6)</th>
<th>Juniors (n=4)</th>
<th>Seniors (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>Which library maintains the print and electronic reserves collection?</td>
<td>8</td>
<td>33%</td>
<td>3</td>
<td>38%</td>
<td>4</td>
</tr>
<tr>
<td>Which library service allows you to borrow materials not available at UNC-Chapel Hill?</td>
<td>17</td>
<td>71%</td>
<td>6</td>
<td>75%</td>
<td>5</td>
</tr>
<tr>
<td>The library has movies that I can check out or watch in the library.</td>
<td>24</td>
<td>100%</td>
<td>8</td>
<td>100%</td>
<td>6</td>
</tr>
<tr>
<td>Why should you gather background information before you begin your research?</td>
<td>20</td>
<td>83%</td>
<td>8</td>
<td>100%</td>
<td>5</td>
</tr>
<tr>
<td>If your topic is too broad, what is NOT a way to narrow it?</td>
<td>22</td>
<td>92%</td>
<td>8</td>
<td>100%</td>
<td>6</td>
</tr>
<tr>
<td>Where is the best place to go for up-to-the-minute information about an event that just happened?</td>
<td>21</td>
<td>88%</td>
<td>8</td>
<td>100%</td>
<td>6</td>
</tr>
<tr>
<td>The library has information that can’t be found through a Google search.</td>
<td>22</td>
<td>92%</td>
<td>7</td>
<td>88%</td>
<td>6</td>
</tr>
<tr>
<td>Which search would result in the narrowest set of results?</td>
<td>18</td>
<td>75%</td>
<td>6</td>
<td>75%</td>
<td>5</td>
</tr>
<tr>
<td>What is the difference between scholarly journal articles and magazine articles?</td>
<td>23</td>
<td>96%</td>
<td>7</td>
<td>88%</td>
<td>6</td>
</tr>
<tr>
<td>If you want to find the library databases, which link should you click on?</td>
<td>8</td>
<td>33%</td>
<td>1</td>
<td>13%</td>
<td>2</td>
</tr>
<tr>
<td>Which is an example of a question to ask yourself when evaluating a website’s currency?</td>
<td>16</td>
<td>67%</td>
<td>7</td>
<td>88%</td>
<td>4</td>
</tr>
<tr>
<td>In which case is citing a source unnecessary?</td>
<td>24</td>
<td>100%</td>
<td>8</td>
<td>100%</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 2 - Pre-test Questions and Number and Percentage of Correct Answers

**Post-test**

Post-test results are shown in Table 3. Among the twenty-four participants, only two answered every question correctly on the post-test. Overall, the participants correctly answered an average of 9.38 questions for an average score of 78.17%. Freshmen correctly answered an average of 9.63 questions (80.25%), sophomores correctly
answered an average of 9.83 questions (82%), juniors correctly answered an average of 9.25 questions (77.25%), and seniors correctly answered an average of 8.67 questions (72.17%). Seventy-nine percent of the students scored 75% or higher on the post-test. No one scored below 50% on the pre-test.

Of the twelve questions asked, only 1 question had a response rate of 100% correct answers. Six of the questions had correct answer responses above 90%. Four of the questions had response rates of correct answers below 70%. One of those questions dealt with the uses for a reference book, one dealt with whether peer-reviewed articles could be found using Google, and the other two dealt with UNC Libraries’ physical spaces and services.

<table>
<thead>
<tr>
<th>Question</th>
<th>All (n=24)</th>
<th>Freshmen (n=8)</th>
<th>Sophomores (n=6)</th>
<th>Juniors (n=4)</th>
<th>Seniors (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following can be found in Davis Library?</td>
<td>12 50%</td>
<td>5 63%</td>
<td>2 33%</td>
<td>2 50%</td>
<td>3 50%</td>
</tr>
<tr>
<td>Which library service allows you to recall books that are already checked out or reserve a group study room?</td>
<td>12 50%</td>
<td>5 63%</td>
<td>2 33%</td>
<td>2 50%</td>
<td>3 50%</td>
</tr>
<tr>
<td>The library has a lab where I can work on multimedia projects.</td>
<td>23 96%</td>
<td>7 88%</td>
<td>6 100%</td>
<td>4 100%</td>
<td>6 100%</td>
</tr>
<tr>
<td>Which is NOT a reason to use a specialized dictionary or encyclopedia?</td>
<td>12 50%</td>
<td>6 75%</td>
<td>3 50%</td>
<td>2 50%</td>
<td>1 17%</td>
</tr>
<tr>
<td>Which of the following is an example of a topic for which it may be hard to find published information because of limited available research?</td>
<td>22 92%</td>
<td>7 88%</td>
<td>6 100%</td>
<td>4 100%</td>
<td>5 83%</td>
</tr>
<tr>
<td>Where is the best place to go for peer-reviewed analysis of an event that took place a year ago?</td>
<td>23 96%</td>
<td>8 100%</td>
<td>6 100%</td>
<td>3 75%</td>
<td>6 100%</td>
</tr>
<tr>
<td>Regular Google searches can find scholarly, peer-reviewed articles.</td>
<td>13 54%</td>
<td>4 50%</td>
<td>6 100%</td>
<td>1 25%</td>
<td>2 33%</td>
</tr>
<tr>
<td>Which search would result in the broadest set of results?</td>
<td>20 83%</td>
<td>6 75%</td>
<td>5 83%</td>
<td>4 100%</td>
<td>5 83%</td>
</tr>
<tr>
<td>Which of the following would indicate that an article is from a magazine rather than a scholarly journal?</td>
<td>22 92%</td>
<td>7 88%</td>
<td>6 100%</td>
<td>4 100%</td>
<td>5 83%</td>
</tr>
<tr>
<td>If you want to find out if the library has a particular book, which link should you click on?</td>
<td>24 100%</td>
<td>8 100%</td>
<td>6 100%</td>
<td>4 100%</td>
<td>6 100%</td>
</tr>
<tr>
<td>Which of the following indicates a website may NOT be a good source for your research?</td>
<td>20 83%</td>
<td>7 88%</td>
<td>5 83%</td>
<td>3 75%</td>
<td>5 83%</td>
</tr>
<tr>
<td>Which of the following is NOT true of plagiarism?</td>
<td>22 92%</td>
<td>7 88%</td>
<td>6 100%</td>
<td>4 100%</td>
<td>5 83%</td>
</tr>
</tbody>
</table>

Table 3 - Post-test Questions and Number and Percentage of Correct Answers

**Comparison of Pre-test and Post-test**

Only one student, a sophomore, answered every question correctly on both the pre-test and the post-test. In addition to this, only one other student, a junior, answered
every question correctly on the pre-test, and only one other student, another sophomore, answered every question correctly on the post-test.

In comparing the pre-test and post-test, of the 12 questions asked, the number correctly answered either stayed the same or improved for six of the questions. On the pre-test, the average number of correct questions was 9.29, or 77.46%. On the post-test, the average number of correct questions increased to 9.38, or 78.17%. A paired samples t-test conducted in SPSS revealed a t statistic of -.249 and a p-value of .806, confirming that the slight increase in the average number of correctly answered questions was not statistically significant.

**Engagement Questionnaire**

The engagement questionnaire was comprised of 31 questions divided into 6 factors: Focused Attention, Perceived Usability, Aesthetics, Endurability, Novelty, and Felt Involvement. For the purposes of analysis, the 5-point Likert scale responses were assigned numerical values as follows: Strongly Agree=5, Agree=4, Neither Agree Nor Disagree=3, Disagree=2, and Strongly Disagree=1. When the questions were negatively worded, the responses were reverse-coded to reflect this. For example, several questions within the Perceived Usability factor addressed confusion and frustration, and were worded in such a way that the desirable result would be a “Strongly Disagree” or “Disagree” response. For questions like these, the numerical values assigned were Strongly Agree=1, Agree=2, Neither Agree Nor Disagree=3, Disagree=4, and Strongly Disagree=5. Results are shown in Table 4.

Five questions received less than 24 responses. “I was absorbed in the online tutorial,” “This online tutorial was aesthetically appealing,” “The screen layout of this
online tutorial was visually pleasing,” and “I consider my experience with this online tutorial a success” all received 23 responses. “The content of the online tutorial incited my curiosity” only received 22 responses.

Figure 4 depicts the factor means for each engagement factor. The three factors that had the highest mean responses were Perceived Usability, Aesthetics, and Endurability. Perceived Usability had a mean response of 3.80. Aesthetics had a mean response of 3.65. Endurability had a mean response of 3.60.

Focused Attention and Felt Involvement had mean responses of 2.76 and 2.81, respectively. Novelty had a mean response of 3.02.

<table>
<thead>
<tr>
<th>Engagement Questionnaire Items</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focused Attention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I lost myself while taking the online tutorial.</td>
<td>2.25</td>
<td>0.90</td>
</tr>
<tr>
<td>I was so involved while taking the online tutorial that I lost track of time.</td>
<td>2.58</td>
<td>0.93</td>
</tr>
<tr>
<td>I blocked out things around me when I was taking the online tutorial.</td>
<td>3.17</td>
<td>0.92</td>
</tr>
<tr>
<td>When I was taking the online tutorial, I lost track of the world around me.</td>
<td>2.63</td>
<td>0.97</td>
</tr>
<tr>
<td>The time I spent taking the online tutorial just slipped away.</td>
<td>3.08</td>
<td>1.06</td>
</tr>
<tr>
<td>I was absorbed in online tutorial.</td>
<td>2.96</td>
<td>0.93</td>
</tr>
<tr>
<td>During the online tutorial I let myself go.</td>
<td>2.67</td>
<td>0.82</td>
</tr>
<tr>
<td><strong>Perceived Usability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I felt frustrated while using this online tutorial.</td>
<td>3.67</td>
<td>0.70</td>
</tr>
<tr>
<td>I found this online tutorial confusing to use.</td>
<td>4.08</td>
<td>0.58</td>
</tr>
<tr>
<td>I felt annoyed while using this online tutorial.</td>
<td>3.79</td>
<td>0.88</td>
</tr>
<tr>
<td>I felt discouraged while using this online tutorial.</td>
<td>4.08</td>
<td>0.58</td>
</tr>
<tr>
<td>Using this online tutorial was mentally taxing.</td>
<td>3.54</td>
<td>0.88</td>
</tr>
<tr>
<td>The online tutorial experience was demanding.</td>
<td>3.71</td>
<td>0.62</td>
</tr>
<tr>
<td>I felt in control of my online tutorial experience.</td>
<td>3.75</td>
<td>0.94</td>
</tr>
<tr>
<td>I could not do some of the things I needed to do with this online tutorial.</td>
<td>3.79</td>
<td>1.02</td>
</tr>
<tr>
<td><strong>Aesthetics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This online tutorial is attractive.</td>
<td>3.46</td>
<td>0.88</td>
</tr>
<tr>
<td>This online tutorial was aesthetically appealing.</td>
<td>3.61</td>
<td>0.94</td>
</tr>
<tr>
<td>I liked the graphics and images used on this online tutorial.</td>
<td>3.75</td>
<td>0.74</td>
</tr>
<tr>
<td>This online tutorial appealed to my visual senses.</td>
<td>3.58</td>
<td>0.88</td>
</tr>
<tr>
<td>The screen layout of this online tutorial was visually pleasing.</td>
<td>3.83</td>
<td>0.72</td>
</tr>
<tr>
<td><strong>Endurability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taking this online tutorial was worthwhile.</td>
<td>3.71</td>
<td>0.95</td>
</tr>
<tr>
<td>I consider my experience with this online tutorial a success.</td>
<td>3.61</td>
<td>0.99</td>
</tr>
<tr>
<td>The online tutorial experience did not work out as I had planned.</td>
<td>3.75</td>
<td>0.79</td>
</tr>
<tr>
<td>My online tutorial experience was rewarding.</td>
<td>3.46</td>
<td>0.83</td>
</tr>
<tr>
<td>I would recommend taking this online tutorial to my friends and family if they had to learn about library research.</td>
<td>3.46</td>
<td>1.02</td>
</tr>
<tr>
<td><strong>Novelty</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I continued to explore the online tutorial out of curiosity.</td>
<td>2.63</td>
<td>1.06</td>
</tr>
<tr>
<td>The content of the online tutorial incited my curiosity.</td>
<td>3.14</td>
<td>1.08</td>
</tr>
<tr>
<td>I felt interested in the online tutorial information.</td>
<td>3.29</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Felt Involvement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was really drawn into the online tutorial.</td>
<td>2.75</td>
<td>0.90</td>
</tr>
<tr>
<td>I felt involved in the online tutorial.</td>
<td>2.96</td>
<td>0.91</td>
</tr>
<tr>
<td>The online tutorial experience was fun.</td>
<td>2.71</td>
<td>0.81</td>
</tr>
</tbody>
</table>

Table 4 - Mean and Standard Deviation of Responses from Engagement Questionnaire
Figure 4 - Means of Engagement Factors
Discussion

The results of the pre-test are interesting because they give an indication of students’ prior knowledge. To qualify for this study, students had to be undergraduate students who had never taken the *Introduction to Library Research* tutorial. However, no questions were asked about their previous library interaction or whether they had attended a library instruction session in the past. Future studies may want to further restrict participants or ask questions to determine library interaction prior to the study.

There were two questions in the pre-test for which students scored extremely low. The first asked the students “Which library maintains the print and electronic reserves collection?” The correct answer is the Undergraduate Library, but only 33% answered correctly. None of the seniors were able to provide the correct answer, with the majority choosing the “all of the above” option. This may reflect either a sense that this library service is offered at the main three libraries or it may reflect a lack of knowledge because this may not be a service they have used before or at least recently. The sophomores as a group scored the highest on this question with 67% of them choosing the correct answer.

The other question that many students answered incorrectly was “If you want to find the library databases, which link should you click on?” Once again, only 33% of the students were able to identify the correct answer, which was “E-Research Tools.” However, 58% of the students chose “Library Catalog,” which technically is correct. All of the subscription databases are cataloged and can be found by searching the UNC Libraries’ online catalog. To do this, though, a user needs to know part of the name of the
database or else they will have to sift through many catalog records pertaining to books about databases, database management, or similar. So while databases can technically be found through the catalog, this was not considered a correct answer because it is not the link to click on to find all the databases in one place. In future studies, this question should be made clearer to avoid confusion. Interestingly, if “Library Catalog” had been an acceptable answer, the average number of correct questions would have been 9.92, and the average score would have been 82.63%. This question and its answer may also have implications for library website design. If students believe that the catalog search box is the place to go to find everything the library has, then perhaps libraries should work to promote that idea and teach users how to more effectively use the catalog and build features into the catalog rather than build special tools like the E-Research Tools page. This is an area that could be explored in greater detail in future studies.

The most surprising result was the high rate of correct answers in response to the question “Which search would result in the narrowest set of results?” Boolean logic is often a source of confusion for students, so it was surprising to see 75% chose the correct answer. One cause could be that the question is asking for the narrowest set of results, and students may be making the logical conclusion that “and” makes the focus narrower. It may also be that students are able to choose correctly when presented with multiple-choice answers, but would struggle to actually construct a search using Boolean operators.

While there were no questions on the post-test that had as low of scores as the two questions on the pre-test, the post-test did have four questions that had much lower scores. The first two dealt with library services. The first asked students to identify a service found in Davis Library from a list of four. The second asked “Which library service
allows you to recall books that are already checked out or reserve a group study room?”

Thirty-three percent of the students selected “Reserves” as the right answer, though “Circulation” was the correct choice. There could be several reasons for this. For one, the word “reserve” in the question may have influenced students to choose “Reserves” because of the similarity. Another reason may be that in the Undergraduate Library the desks for the Reserves and for Circulation are in a shared area, though several feet away from each other. Even though the tutorial explicitly discusses this function of Circulation, it may be that the term “Circulation” just does not hold as much meaning for students.

The other two questions that received low results on the post-test dealt with reference sources and Google. The Google question asked students to select “true” or “false” in response to the statement that “Regular Google searches can find scholarly, peer-reviewed articles.” Forty-six percent of the students said this was true. It is possible this question may be too nuanced for a true-false response, and in the future researchers should consider altering this question.

Comparing the pre-test and post-test reveals that there was only a very slight increase in the average number of questions answered correctly (from a 9.29 to a 9.38) and average overall score (from a 77.46% to a 78.17%). After running a paired sample t-test, it was clear this increase was not statistically significant. Comparing the pre-test and post-test scores shows that 15 of the 24 students (62.5%) scored the same score or higher on the post-test and, conversely, 9 (37.5%) scored worse. There could be a variety of reasons that individuals scored worst on the post-test, including the possibility that the questions were harder since they were asked directly following the completion of the tutorial or that students were fatigued and had more difficulty focusing on the questions.
If this study is replicated, future researchers may want to do a pilot test to test out question order and question integrity.

Overall there was an increase in average overall score for 5 individual questions on the post-test over the pre-test counterpart question. One question had the same score for the pre-test and post-test counterpart questions. Since the same questions were not asked in the pre-test and post-test, but rather questions addressing the same subject were compared, it is possible that good equivalency questions were not chosen. Perhaps some of the pre-test questions were too easy or the post-test counterparts too hard. This will have to be an area for further investigation.

The engagement questionnaire was really helpful in identifying student opinion about and engagement with the tutorial. In the Focused Attention portion of the questionnaire, which O’Brien and Toms (2010) said consists of “items related to users’ perceptions of time passing and their degree of awareness about what was taking place outside of their interaction,” the students indicated that they disagree or strongly disagree that they ‘lost themselves in the tutorial,’ ‘lost track of the world around’ them, or ‘let themselves go’ (p. 17). However, when the question referred to blocking things out while taking the tutorial, students were more likely to agree.

The Perceived Usability section of the engagement questionnaire, which O’Brien and Toms (2010) said “pertained to the emotions experienced by respondents when completing their…task,” indicated that students for the most part disagreed or strongly disagreed that the tutorial experience was annoying, frustrating, discouraging, or confusing (p. 17-18). This category also assessed “whether users felt they could perform the tasks they wanted,” and in general students disagreed or strongly disagreed that the
tutorial was mentally taxing or demanding (O’Brien and Toms, 2010, p. 18). Students also indicated that they felt in control of their experience and disagreed that they were unable to do things they wanted to within the tutorial.

This tutorial scored very high in the Aesthetics category with the majority of students agreeing that they found the tutorial visually pleasing, attractive, and aesthetically appealing. The graphics and images in the tutorial, as well as the layout, also scored high with the students. This response regarding the aesthetics of the tutorial is encouraging since the anecdotal evidence indicated that students liked the new design of the tutorial; having empirical evidence to back up anecdote helps make a stronger case for refreshing and updating the design of online tutorials.

According to O’Brien and Toms (2010), the next category, Endurability, “measured respondents' willingness to return to the shopping Website and to recommend the Website to others, as well as their overall evaluations of the experience” (p. 18). In this case, since the scale was adapted for use for online library tutorials, endurability measures the likelihood that students would recommend the tutorial or whether students consider their own experience worthwhile or successful. For the most part students found the tutorial worthwhile and their experience successful. Fifty percent of the students neither agreed nor disagreed that the experience was rewarding; however, 59% would recommend the tutorial to a friend or family member who needed to learn about library research. Even though the students may not have strong opinions regarding whether the tutorial experience is rewarding, it is remarkable that they found it worthwhile enough to recommend to friends and family who might need it.
The Novelty category addressed “the curiosity evoked by or participants' interest in the shopping task,” or in this case the tutorial experience (O’Brien and Tom, 2010, p. 18). While the majority indicated that they did not continue to explore the tutorial out of curiosity, 50% did say that the tutorial piqued their curiosity. This may seem contradictory, but one possible explanation for this is that the students did not feel free to continue to explore the tutorial since they needed to finish all the questionnaires.

The final category in the engagement scale addressed Felt Involvement, which according to O’Brien and Toms (2010), “pertained to respondents feeling of being drawn into and involved,” was a fairly low-scoring category for the tutorial (p. 18). In general, students did not feel drawn into the tutorial experience, and they did not feel involved in the tutorial nor did they feel it was fun. The low scores in this Felt Involvement category coupled with the literature that discusses the need for interactivity makes a case for revisiting the content of the tutorial in order to make it more interactive and hopefully create an experience that will allow students to feel involved and drawn into the tutorial.

One limitation of this study was the small sample size. Since only 24 students participated, it was difficult to generalize and draw specific conclusions about the tutorial. Another limitation was that no qualitative data was gathered that might have given more context to some of the negative responses. For example, students indicated that they disagreed that the tutorial was “fun;” however, if there had been a follow-up focus group, I might have discovered, as Bowles-Terry, Hensley, and Hinchliffe (2010) did in their usability study at the University of Illinois, that UNC students are not interested library tutorials being “fun” or interactive, so this might not be a useful evaluation criterion.
The reliability of this study, both in the pre-test/post-test and the engagement questionnaire can be determined by how varied the responses are; for example, Choemprayong and Wildemuth (2009) discussed reliability in terms of “an inventory’s internal consistency” and noted that this “addresses the issue of whether all the items are measuring the same construct” (p. 284). In the case of this study, the emphasis is on student opinion of content and student understanding of content. The validity of this study relates to how well the questions asked in the questionnaires relate back to the research questions: are my data collecting methods gathering information that will answer my questions? Choemprayong and Wildemuth (2009) refer to this as “content validity” (p. 285). I developed the pre-test and post-test questions myself based on the content of the tutorial, though ideas for questions were adapted from Churkovich and Oughtred’s (2002) questionnaires as well as from the quiz within the tutorial itself, and Choemprayong and Wildemuth (2009) warned that “small changes in wording can affect the reliability or validity of the inventory” (p. 286). This is a concern, too, with the engagement scale that was adapted from O’Brien and Toms’ (2010) scale which was originally developed for testing e-commerce experiences.
Conclusion

The creation and maintenance of library tutorials consume a great deal of a librarian’s time. In order to maximize and streamline these efforts, evidence needs to be gathered about what students learn from the tutorial, as well as their engagement with and opinions of the tutorials. This data will be used to provide evidence for the future tutorial design process as well as for the value of the Introduction to Library Research tutorial, both for library administration and the larger university community.

A review of the literature revealed that while formats of tutorials and methods for studying them vary, in general the typical discussion surrounds the concept of interactivity, the benefit of easing library anxiety, and the role these online tutorials play in the realm of library instruction. Since there is such variation from study to study, uncertainty exists whether tutorials should be more interactive or remain as they are. This uncertainty made a good case for investigating the Introduction to Library Research tutorial focusing on the local user group of undergraduates at the University of North Carolina at Chapel Hill.

In an attempt to begin to provide this evidence, data was gathered from an experimental study involving a pre-test, treatment, and post-test, as well as from an engagement questionnaire. Twenty-four undergraduate students from UNC took part in this study. Data gathered from the pre-test and post-test revealed a slight, though statistically insignificant, increase in overall student scores. Individual performance varied widely; however, comparing the pre-test and post-test scores shows that 15 of the
24 students (62.5%) scored the same score or higher on the post-test. Data gathered from the engagement questionnaire showed that while students did not feel drawn into or involved in the tutorial, they were interested in the content of the tutorial and felt that it incited their interest. Additionally, 76% said they felt taking the tutorial was worthwhile, and 59% said they would recommend the tutorial to friends and family needing to learn about library research. Also, the majority of students like the aesthetics of the tutorial, finding it attractive and visually pleasing.

While not conclusive, these results begin to give a picture of student engagement with the online tutorial, and somewhat reflect what students have learned from the tutorial. Certainly the pre-test/post-test design can be revisited and the questionnaires edited to gain a better sense of student learning through future studies. Future researchers may want to experiment with delaying the post-test or including a task-based post-test rather than a multiple-choice design. Since students indicated an interest in and curiosity about the content, but indicated that they did not think the current tutorial was fun nor did it drawn them in, future researchers could find a scale that measured interactivity more explicitly or form a focus group to get more qualitative input about this aspect of the tutorial. At the very least, this study has served as a model for one possible way data can begin to be collected in order to inform tutorial design, creation, and updating.
References


Appendix A

Demographic Questionnaire

Please enter your number __________

What is your sex?
○ Male
○ Female

What is your age? __________

What year are you in school?
○ Freshman
○ Sophomore
○ Junior
○ Senior

What is your major? __________
Appendix B

Pre-test Questionnaire

Please enter your number __________

Which library maintains the print and electronic reserve collections?
  ○ Wilson Library
  ○ Undergraduate Library
  ○ Davis Library
  ○ All of the above

Which library service allows you to borrow materials not available at UNC-Chapel Hill?
  ○ Reserves
  ○ Circulation
  ○ Interlibrary Loan
  ○ Reference

The library has movies I can check out or watch in the library.
  ○ True
  ○ False

Why should you gather background information before you begin your research?
  ○ To get an overview of your topic
  ○ To learn specialized language in that field
  ○ Finding background information is unnecessary—you can just figure it out as you research
  ○ A and B
  ○ None of the above

If your topic is too broad, what is NOT a way to narrow it?
  ○ By time period
  ○ By population group
  ○ By switching topics
  ○ By focusing on a particular issue
Where is the best place to go for up-to-the-minute information about an event that just happened?

- Website like CNN
- Newspaper
- Magazine
- Scholarly journal

The library has information that can’t be found through a Google search.

- True
- False

Which search would result in the narrowest set of results?

- college OR university AND grade point average
- college AND athletics AND grade point average
- college OR athletics OR grade point average
- college OR university AND athletics AND grade point average

What is the difference between scholarly journal articles and magazine articles?

- Scholarly journal articles are better than magazine articles
- Magazine articles are poorly researched
- Scholarly journal articles undergo a rigorous review process
- Scholarly journal articles are written for a wide audience

If you want to find the library databases, which link should you click on?

- E-Research Tools
- Library Catalog
- E-Journals
- Google Scholar

Which is an example of a question to ask yourself when evaluating a website’s currency?

- Who is the author and what are his/her credentials?
- When was the content on the website last updated?
- Does the website have relevant information for my topic?
- Is the information presented in an objective manner?

In which case is citing a source unnecessary?

- When paraphrasing
- When quoting a source directly
- When presenting common knowledge
- When using someone else’s ideas, opinions, or theories
Appendix C

Post-test Questionnaire

Please enter your number __________

Which of the following can be found in Davis Library?
- Microforms
- Media Resources Collection
- Reserves
- Special Collections

Which library service allows you to recall books that are already checked out or reserve a group study room?
- Reserves
- Circulation
- Interlibrary Loan
- Reference

The library has a lab where I can work on multimedia projects.
- True
- False

Which is NOT a reason to use a specialized dictionary or encyclopedia?
- To get an overview of your topic
- To learn specialized language in that field
- To get a sense of how the topic relates to other issues
- To cite first-hand, original research

Which of the following is an example of a topic for which it may be hard to find published information because of limited available research?
- Risk factors for AIDS among 18-20 year old males in Chapel Hill
- Advances in AIDS treatments over the past 10 years
- Economic impact of AIDS on South Africa
- Effect of sex education programs on the spread of AIDS
Where is the best place to go for peer-reviewed analysis of an event that took place a year ago?

- Newspaper
- Magazine
- Scholarly journal
- Website like CNN

Regular Google searches can find scholarly, peer-reviewed articles.

- True
- False

Which search would result in the broadest set of results?

- climate change OR global warming AND ice caps
- climate change AND global warming AND ice caps
- climate change OR global warming OR ice caps
- climate change OR global warming AND ice caps AND polar bears

Which of the following would indicate that an article is from a magazine rather than a scholarly journal?

- It has in-text citations and a list of references
- The author is a well-known researcher in that particular field
- It is full of jargon and specialized language
- It was written for a wide audience

If you want to find out if the library has a particular book, which link should you click on?

- E-Research Tools
- Library Catalog
- E-Journals
- Google Scholar

Which of the following indicates a website may NOT be a good source for your research?

- You can find the author
- The information is presented with a strong bias
- The sponsor of the website is reputable
- The website was recently updated

Which of the following is NOT true of plagiarism?

- It is not as serious if you accidently misuse someone else’s work
- It is a violation of the UNC Honor Code
- You can avoid it by citing sources
- It is a violation of copyright law
Appendix D

Engagement Questionnaire

Please enter your number __________

I lost myself while taking the online tutorial.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

I was so involved while taking the online tutorial that I lost track of time.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

I blocked out things around me when I was taking the online tutorial.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

When I was taking the online tutorial, I lost track of the world around me.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

The time I spent taking the online tutorial just slipped away.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

I was absorbed in online tutorial.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

During the online tutorial I let myself go.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

I felt frustrated while using this online tutorial.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

I found this online tutorial confusing to use.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

I felt annoyed while using this online tutorial.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

I felt discouraged while using this online tutorial.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>
Using this online tutorial was mentally taxing.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

The online tutorial experience was demanding.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

I felt in control of my online tutorial experience.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

I could not do some of the things I needed to do with this online tutorial.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

This online tutorial is attractive.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

This online tutorial was aesthetically appealing.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

I liked the graphics and images used on this online tutorial.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

This online tutorial appealed to my visual senses.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

The screen layout of this online tutorial was visually pleasing.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

Taking this online tutorial was worthwhile.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

I consider my experience with this online tutorial a success.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

The online tutorial experience did not work out as I had planned.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

My online tutorial experience was rewarding.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

I would recommend taking this online tutorial to my friends and family if they had to learn about library research.
Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree
I continued to explore the online tutorial out of curiosity.

Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

The content of the online tutorial incited my curiosity.

Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

I felt interested in the online tutorial information.

Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

I was really drawn into the online tutorial.

Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

I felt involved in the online tutorial.

Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

The online tutorial experience was fun.

Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree