

**To Search or To Browse:  
How users navigate a new interface for online library tutorials**

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### Abstract

As academic libraries create online learning objects, it is important to consider whether such resources actually reach and answer the questions of intended users. This study considers three points of inquiry for one academic library: how its users make their way to the library's tutorials; user preference for searching or browsing for resources, when given both modes of access; and, the kinds of online learning objects or tutorials users are seeking. A close examination of web analytics and users' search terms within the tutorials interface helped to illustrate patterns of access and highlighted users' needs for tutorials and online learning objects.

*Keywords: online learning objects, web analytics, web usability, online tutorials, users' search behavior*

## **Introduction**

As post-secondary classroom instruction moves increasingly online, academic libraries have followed suit: the creation of library-centric tutorials and learning objects to meet learners' needs has been a topic of conversation and scholarship for nearly two decades. An important part of this conversation is whether such resources do, in fact, reach intended users and answer their questions. How do users make their way to the library's tutorials? If given different modes of access, do users prefer to search or browse through our repositories of instructional materials? And, what kinds of online learning objects or tutorials are our users seeking?

Our academic library considered these questions through a close examination of web analytics and a qualitative analysis of users' search terms on the tutorials' main interface. These strategies helped illustrate patterns of usage and access as well as highlight users' most prevalent needs for tutorials and online learning objects.

## **Project Description**

During the 2012-2013 academic year, Oakland University (OU) Libraries redesigned and re-deployed its online learning objects and tutorials with users in mind. This process, which coincided with the libraries-wide website redesign, was led by the e-Learning and Instructional Technology Librarian and occurred in three phases. First, a detailed process of internal review took place in the fall of 2012. This included examining the libraries' existing online learning objects, how they were designed and developed using instructional technology, how they were presented to users, and how management of these objects functioned on the back-end. This phase of the process focused on behind-the-scenes workflows, and as such, collection of feedback and development of best practices focused

on the librarian perspective. Through informal meetings, the e-Learning and Instructional Technology Librarian also collected feedback from OU Libraries' faculty; they provided perspective on what worked – and what *did not* work – about the Libraries' online learning presence, and their feedback helped identify additional points of inquiry. This internal information provided the guidance for a detailed review of existing scholarship in the field, and, in conjunction with this research, the eLearning and Instructional Technology Librarian surveyed other university libraries' online learning resources and tutorials offerings. While student feedback was not sought as part of this study, the existing research and in-the-field instances of online learning objects helped to determine best practices and identify areas for growth for the libraries' instructional staff (Nichols Hess, 2014).

Second, in the winter of 2013, best practices were developed and implemented so as to make OU Libraries' online learning objects maintainable, available, geared at users, informative, and customizable (Nichols Hess, 2013). Over the course of the winter 2013 semester, these guidelines were subsequently developed into job aids and resources for library faculty to use in instructional practice (Nichols Hess, 2014). And third, OU Libraries' online learning objects were transitioned into a content management system, SubjectsPlus, in the spring of 2013; the look and functionality of this interface was designed in a collaborative session with library faculty and with users' needs in mind. This tool, while not new to OU Libraries, presented new options for managing freestanding online learning objects (i.e., those not embedded into a course) and also enabled the libraries to tag, categorize, and index resources. Most importantly, transitioning instructional content to SubjectsPlus also allowed OU Libraries to provide a searchable interface for this content.

Once the libraries' online instructional content had been transitioned into

SubjectsPlus, evaluating how users interacted with the new interface and delivery model was important. OU Libraries' Coordinator of Web Services led this usability study, which occurred during the 2013-2014 academic year. Data were collected through two channels to assess how students, faculty, staff, and guests accessed and used the libraries' online learning objects. First, search terms users entered in the new searchable tutorials interface, along with the date and timestamp were tracked and recorded. Second, the Coordinator of Web Services developed Google Analytics dashboards to collect web usage data for this new online learning objects interface. These dashboards analyzed data on the user audience and its demographics, user behavior in accessing and using online learning resources, and with what technology tools (e.g., tablets, mobile phones) users accessed the tutorials.

In gathering and analyzing users' search terms and web analytics data, OU Libraries hope to understand how its library users navigate the libraries' freestanding online instructional presence. This is particularly relevant as libraries of all missions – academic, public, special, and school, among others – consider how to best reach users with instructional content twenty-four hours a day, seven days a week, 365 days a year. For OU Libraries specifically, examining this data will help identify if the redesign efforts for both its online learning objects and the online learning objects delivery system have reached users where they are. From this identification, OU Libraries can then determine how to improve service to its users and focus more on their needs on a go-forward basis. By understanding how our users search for, access, and use online learning objects, OU's library faculty – and librarians more generally – can better design objects and systems to help facilitate learning.

## **Literature Review**

In any consideration of how library users interact with and employ online learning objects, it is important to consider several facets of the user experience. First and foremost, the effectiveness of library tutorials should be examined, specifically in how these resources impact users and help learning to occur.

### **Online Library Learning Objects: Effective Instructional Tools?**

Research has demonstrated that, when designed effectively and used correctly, online library tutorials can effectively impact students' learning and facilitate positive library experiences (Beile and Boote 2004; Donaldson 2000; Grant and Brettle 2006; Lechner 2005; Lo and Dale 2009; Nichols Hess 2014; Silver and Nickel 2005; Tronstad et al. 2009; Willis and Thomas 2006). Dewald's (1999) analysis of online library learning objects was the first to identify the characteristics essential to facilitating learning. Subsequent research has confirmed her assertions that the most effective online learning resources relate to a specific learning need, have clear objectives, provide active/collaborative learning opportunities, present content in varying but appropriate media formats, focus on higher-level concepts rather than procedural skills, integrate feedback, and include help options (Bianco 2005; Blummer and Kristkaya 2009; Bowles-Terry, Hensley, and Hinchliffe 2010; Clark and Mayer 2011; Dewald et al. 2000; Gold 2005; Macklin 2003; Oud 2009; Reece 2005; Somoza-Fernandez and Abadal 2009; Somoza-Fernandez and Abadal 2011). According to Blummer (2007), there are three levels for evaluating online library tutorial effectiveness: general assessment, which gauges if a resource functions as it should and shares desired information and can be measured through user surveys; individual user assessment, which can be assessed post-tutorial through a quiz, test, or other traditional

learning assessment tool and determines if the resource has impacted learning; and program-level assessment, which considers whether online learning objects accomplish stated goals at the institutional or macro levels.

### **Findability of Content on Library Websites**

One of the crucial program-level assessment concerns is whether library users are, in fact, finding and accessing online learning objects. As early as 1999, Dewey addressed online library resources' findability: she considered how the Committee on Institutional Cooperation's (CIC) thirteen member libraries situated their services on their websites and found that key services were often buried in websites by requiring two or more clicks to access. This made essential resources difficult for users to locate.. Furthermore, Dewey (1999) found that when resources or services *were* prominently listed on library websites, they frequently used jargon and obscured the service's meaning to *users*. Other studies since this foundational work have illustrated that findability continues to be a concern in academic library web design (Blummer 2007; others????).

Two lenses through which findability can be considered are how users *seek* information and what users *do* with the information they find. From a basic web design perspective, the incorporation of a search box into a web interface can bolster resource discovery. Best practices in website design and usability note that search boxes can respond to the varying needs of power users, frequent users, and the visitor looking to access information quickly (Powell 2000). In its usability guidelines, the U.S. Department of Health and Human Services (2006) notes that websites should provide searching options on *every page*, and that such search boxes should allow users to conduct simple, keyword-based searches that are not case-sensitive. These guidelines also note that a search feature

should clearly define which parts of a website will be searched, and that search design should be defined by user behavior (U.S. Department of Health and Human Services 2006).

However, implementing a search box on a library website can be problematic because it may lead users to believe, incorrectly, that it functions the same way as an online search engines (Swanson and Green 2011; Teague-Rector and Ghaphery 2008). In their examination of an academic library's metasearch tool, Lown, Sierra, and Boyer (2013) confirmed that their library users sought to answer a range of questions through the interface *beyond* finding books and articles. They asserted that knowing how users employ search options is critical to providing the most effective tools that meet their information-seeking needs. Mussell and Croft's (2012) study on use and perceptions of a discovery tool found that, broadly, library users are seeking tools that facilitate search and discovery of the most relevant resources for their needs. So while academic libraries may currently incorporate electronically searchable catalogs, federated search systems, or discovery tools into their online presence, integrating a search tool for a repository of online learning objects may serve to further meet users' needs and desire to search.

How users *use* online library learning objects is another component to to consider when working to ensure findability. For online library learning objects, the ideal placement is embedded within a learning experience, such as an academic course, with the object focused on course-specific needs (Blummer and Kritskaya 2009; Dewald 1999); this limits findability issues, because it is truly placed at users' point-of-need. However, establishing these embedded relationships with subject area faculty can prove challenging, and not all library users are enrolled in courses where library instruction – either online or face-to-face – is a component of their learning experiences. One way to address this issue is to



place online library learning resources at users' various points-of-need and in the context of library services; Lindsay et al. (2006) found such practices significantly increased tutorial usage. Therefore, a case can be made for also providing access to online library learning objects on academic library websites. Su and Kuo (2010) asserted that, in such instances, resources should be available in three clicks or fewer from the homepage; burying instructional resources any deeper into a library website will make them less likely to be discovered and used. However, in their study, Bowles-Terry, Hensley, and Hinchliffe (2010) found that, even when located two clicks from an academic library home page, users did not find the online learning objects. To increase findability, they recommend using common expressions, such as "Get Help," instead of library jargon.

In addition to proximity to a homepage, academic libraries can also consider how to present online learning content to best address users' needs and expectations. For instance, Bowles-Terry, Hensley, and Hinchliffe (2010) found that students sought short and to-the-point resources that addressed specific needs, and *not* resources rich with interactive multimedia content. Also, Detlor and Lewis's (2006) examination and assessment of ARL websites recommended that instructional tutorials and content be packaged in ways that consider users' needs with structures that allow users to customize their learning experience. In considering the promotion of online learning objects, Booth (2011) recommended a strong marketing push and presence via library communication channels and a presence on the library's website, particularly in the announcements. Veldof (2008) also recommended that academic librarians identify "fail points" where users encounter confusion or frustration. At these points, online library learning objects or resources can be embedded so as to mitigate the issues users face in developing information literacy skills

and competencies. This can help users self-engage in knowledge building to meet a specific need *at point-of-need* (Su and Kuo 2010).

### **Methodology**

With this scholarship in mind, OU Libraries collected data on users' behavior and interaction with its online learning objects over the course of the 2013-2014 academic year.

### **Definitions of User Interactions**

The main access interface to the online tutorials offers three methods of interaction. Each method is defined below to clarify how it is operationalized in the context of this analysis and to highlight any differences important for comparison purposes. See Figure 1: Tutorials' Main Access Interface.

[Insert Figure 1 here]

Organic searching for tutorials from the main access interface refers to the actual input of search terms in the search box provided. This can be done multiple times in a browser session, because the results page offers the opportunity to revise one's search. Organic searching behaviors are captured through web traffic data, i.e. a data set derived from Google Analytics that tabulates how many times each unique URL has been accesses. Organic searches can be captured in this manner because they produce unique URLs containing the search keywords.

Facilitated searching for tutorials refers to the use of the tag cloud located under the search box. The tag cloud consists of words from tutorial titles and from keyword tags applied to tutorials by their authors. The arrangement represents frequencies and dynamically changes to display up to 4 text sizes (frequency levels) at any given point.

Thus, it highlights words that are well represented in the online tutorials, and it gives an overview visual representation of what content one can expect to find in the tutorials. The researchers still consider this interaction a type of searching, because using any of the terms in the word cloud leads to a results page and the opportunity to manually revise one's terms, i.e., a subsequent organic search. Facilitated searching behaviors in the web traffic data are identified through the unique pageviews of URLs that contain variables coming from the tag cloud.

Browsing for tutorials refers to using the list of links to the pre-determined collections of tutorials. The collections represent traditional groupings of the online tutorials with an explicit effort to avoid jargon in their naming. The librarians agreed that collection names ought to represent active phrases that start with the gerund of a verb whenever possible, e.g., "Using Databases." At a group discussion, the librarians heuristically arrived at the names of the collection by focusing on two criteria: (1) the removal of all jargon from the initially brainstormed collection names and (2) attempting to rephrase collection names in as active of a manner as possible. Subsequently, tutorials were grouped in collections by their authors, who assign each new tutorial to all the relevant collections without being mutually exclusive. Browsing behaviors in the web traffic data are identified through the unique pageviews to the listings of tutorials within each collection. Even though the online tutorials are managed in the same system as the subject and course guides, the browsing interface remains focused only on tutorials; it does not provide access to any of the subject or course guides.

### **Data Sets**

The data for the current analysis consists of two distinct data sets: web traffic data

and search terms data. Each has been collected separately and analyzed using appropriate methods.

Web traffic data was collected through the use of Google Analytics, a free web-based tool for collecting web traffic data. The tutorials' main access interface contains a snippet of code that communicates user activity to the Google Analytics tool. While Google Analytics collects extensive web traffic data, it does maintain the anonymity of users by not reporting specific IP addresses, even as it reports locations and network providers. The data set for this study consists of web traffic data resulting from 5,638 unique pageviews of the tutorials' main access interface. It encompasses data for the two long semesters in 2013-2014 academic year, i.e., fall 2013 and spring 2014. Given the quantitative nature of this data set, descriptive statistical methods have been employed for its analysis.

Search terms were collected separately from web traffic data. Although search terms can be extrapolated from Google Analytics when they are part of each web page's URL (Uniform Resource Locator), the researchers found it useful to have a data set that contains more than a list of keywords. To that end, each search resulted in a record containing a date, a time, and a keyword or phrase. The data set consists of 14,428 data points collected during two semesters in the 2013-2014 academic year. The search terms data set was analyzed using grounded theory textual analysis (Charmatz and Bryant 2007); i.e., the researchers coded the search terms with categories that arose organically from the data. In using the grounded theory method to conceptualize search data, one of the researchers coded all search terms collected during the period of September 2013 through April 2014. Once a basic coding structure had been developed, the categories generated, as well as a random 10 percent sample of the search terms, were shared with two librarians

independent of the research study. These librarians coded the search term samples, and their data served to validate the grounded theory analysis that had been developed. A comparison of data sets revealed a 92 percent consensus in data coding.

## **Findings & Discussion**

### **Access to Tutorials**

Overall frequency of access to the tutorials interface coincides with the typical research assignment cycles within academic semesters. The interactions with the main tutorials interface, however, highlight previous unsuspected trends. Figure 2 summarizes monthly access, comparing the different user interaction with the main tutorial interface. It is noteworthy that organic searching is well utilized and most months it is used more frequently than facilitated searching through the use of the word cloud; organic searching exceeds facilitated searching for seven out of the eight months tracked. Browsing the tutorials by collection happens just as frequently as either form of searching, which indicates understanding of the collection labels. Browsing exceeds organic searching for six out of the eight months tracked; browsing exceeds facilitated searching for all eight months tracked. The librarians ensured that collection labels start with action verbs whenever possible and make minimal use of library jargon. The use of browsing seems to confirm the success of that naming strategy.

[Insert Figure 2 here]

The category of 'other' represents all interactions on the main tutorial interface other than the three tracked ones, including clicks on the featured tutorials, clicks on any menu items available on the page, or just leaving the site altogether. The high levels of 'other' interactions can be accounted for through the usage of one tutorial, the libraries'

plagiarism avoidance tutorial. Since it is a tutorial that many courses on campus require, a large number of users visit the main tutorials interface explicitly to get to it. The category of 'other' is included in all figures in order to represent the total web traffic accurately, but the three tracked interactions remain the focus of the current analysis.

It is reasonable to assume that users with different levels of familiarity with the library website and with the library tutorials will choose different searching or browsing interactions. For example, librarians and faculty might use browsing more often than students. Such an assumption, however, does not hold true with our data. Figure 3 highlights access methods by location. Despite the expected high use of tutorials by librarians showing those tutorials to students in class sessions or at the reference desk, the patterns of interaction seem comparable between on-campus and off-campus students. In fact, the slightly higher usage of browsing off-campus than on-campus confirms that our users, rather than our staff, find that access method useful. Both organic searching and browsing constitute the top interaction choices, while facilitated searching via the word cloud is used less often.

[Insert Figure 3 here]

The manner in which users are arriving at the main tutorials interface seems to coincide with different interaction choices. Figure 4 shows access interactions by traffic type. Direct traffic represents users who are arriving at the main tutorials interface directly by typing the URL or, more likely, by using a link in a document, such as a course syllabus in MSWord or PDF (not a website). This type of traffic speaks to the level of embeddedness of the tutorial main interface within course documents on campus and as part of users' bookmarks. Referral traffic includes the users who visited the main tutorials interface

through a link on another website. Search traffic represent users who found the main tutorials interface through a search engine. Most of the traffic to the main tutorials interface is referral traffic, indicating that users navigate to our tutorials mainly through the library website and the other websites on campus. The top choices for interactions with the tutorials represent the pattern already established by the figures above. Search traffic, however, departs from the expected pattern in that users who discover the tutorials main interface through a search engine seem to be choosing to either use facilitates search via the word cloud or browsing the list of tutorial collections. Even though search traffic constitutes a small portion of overall traffic, it is noteworthy that users who have already performed a search do not seem to be choosing the same interaction method as they arrive at the tutorials interface. In fact, they seem to be the only user group that gravitates to the word cloud.

[Insert Figure 4 here]

### **Keywords in Organic and Facilitated Searching**

As we transition our discussion from web access data to organic and facilitated search data, it is useful to examine when the search feature was most frequently used. Interestingly, usage of the tutorials search box does not seem to have a consistent pattern; while the date with the highest usage, April 22, 2014 (353 unique searches) fell at the end of the academic semester, the date with the next-highest usage, September 16, 2013 (223 unique searches), occurred within the first two weeks of the fall semester. Generally, it does appear that users are conducting organic and facilitated searches with greater frequency as the academic semesters draw to a close, but many users are employing these options in the earlier weeks of the term.

April represented the most popular month for searching (n=2741), followed by October (n=2313), February (n=1894), January (n=1644), November (n=1621), March (n=1609), September (n=1389), and December (n=1263). Tuesday (n=2408) was the weekday on which organic searches were most frequently performed, followed by Wednesdays (n=2206), Mondays (n=2191), Fridays (n=2072), and Thursdays (n=1967); perhaps not surprisingly, Saturday (n=1955) and Sunday (n=1675) were the days on which the organic and facilitated search features were least used. For librarians, this information may be helpful in guiding timing-based decisions, such as when to post new resources or information, when to highlight content, or even when to offer a learning object (i.e., synchronous webinar) with a higher level of interaction. By aligning the cycle production and distribution of learning resources when users are actively engaging with online content, librarians' time may be more effectively used and library-produced or provided resources may see higher levels of adoption.

[Insert Figures 5 & 6 here]

Regarding the terms used in the over 14,000 unique searches performed, the grounded theory textual analysis clearly illustrates that specific resources and tasks are of primary interest and importance. References and RefWorks, the libraries' citation management tool, are two of the most frequently searched words. This suggests that users are interested in how to generate references and export them into the citation management tool, and it validates the notion that users seek tutorials to solve specific problems or resolve immediate needs. Moreover, specific names of academic databases -- such as CINAHL, ERIC, PsycINFO, JSTOR, Academic OneFile, Opposing Viewpoints, and others -- represent a significant percentage of users' searches. This, too, implies that users are



employing the seeking specific, focused, and targeted assistance in using library resources rather than conceptual knowledge in information literacy concepts.

Another frequently searched term found in an analysis of users' terms is plagiarism; this refers to the libraries' plagiarism avoidance e-course. This is particularly interesting, since this resource is highlighted specifically on the tutorials homepage. In spite of this featured link, there were 304 searches for plagiarism (including various spellings of the term). This may suggest that some users gravitate to the search box without examining the other features on the web page.

[Insert Figure 7 here]

The grounded theory textual analysis confirmed this interpretation of users' keywords; the majority of search terms were classified either as searches for learning objects to aid in the use of academic databases or other library-provided resources (i.e., reference works). Users' searches also focused on skill-centric processes, such as *finding full-text articles*, and on concept-centric topics, such as *conducting research*, *avoiding plagiarism*, and *understanding the peer-review process*. There were, however, lower search numbers for specific citation styles, such as American Psychological Association (APA), Modern Language Association (MLA), and American Medical Association (AMA) citation styles, which may suggest that users either access external resources (i.e., the campus writing center website), or move directly to the provided tutorials collection on Citing Sources, for assistance in this area. Few searches focused on reference works; this may imply that such resources are not frequently used, perhaps because of the nature of research assignments that emphasize the use of peer-reviewed articles. Encouragingly, very few searches focused on research questions, which suggests that users understand the

kinds of content represented in the libraries' tutorials and do not view the search bar as a catch-all for their searching needs.

[Insert Figure 8 here]

As we consider what this coding means for current and future library-provided services and resources, this helps make clear the kinds of learning objects to provide. Users are focused heavily on how to use library resources such as databases and citation management tools; thus, guides on how to do this can help to meet users' needs. Because many companies and professional organizations (i.e., APA) now offer multimedia learning objects (e.g., videos and text-based instructional guides) for their resources, it may be useful to examine further integrating these types of learning objects into the libraries' tutorials repository. If these resources can meet the searched-for needs of users, the libraries' resources (i.e., staff time) may be better used elsewhere. Since 30 percent of search terms reference concepts and skills, librarians may use their time more efficiently and effectively in creating online learning objects that respond to these needs rather than on resource interface tutorials.

### **Limitations**

Reliance on web traffic data introduces an inherent limitation. Web traffic represents agents that can be human or not. Some of the web traffic numbers can be affected by page refreshing, for example. Others might be affected by repeated usage of the same page by the same person from different computers or within different browsing sessions. To minimize the effect of the limitations inherent in the data, the researchers have focused exclusively on unique pageview, which ensures that excessive usage from computers such as the one at our reference desk does not skew the data. Furthermore, we

consider web traffic data in relative terms within our analysis, comparing different interactions rather than drawing meaning out of the absolute values of each interaction.

The use of web traffic data represents an imperfect proxy for human interactions with our interfaces. Even with the limitations in mind, the data informs our overall understanding of users; it can be an invaluable indicator of overall trends and a precursor to the design of targeted usability studies with members of our audience.

Similarly, coding the organic search terms assumes some level of understanding about users' motivations and intentions behind each search. Whether these assumptions are correct, though, is difficult to determine without individual user interviews. Using the grounded theory textual analysis attempted to counteract this limitation, and the consensus across the researchers' coding attests to its success. However, to further investigate the needs that search terms represent, one-on-one interactions with the web page's users may be necessary.

The timeframe for this study is also a limitation. A single academic year of user search and access data represents a benchmark for us as we begin to conceptualize how users access online learning resources. However, there is no prior usage data to which we can compare this information; therefore, we cannot assert that this interface constitutes a direct improvement over our previous browse-only tutorials access point. Over time, though, this data set will become useful in additional ways as we compare organic and facilitated searches and browsing data.

### **Conclusion**

The data collected through this multi-point usability study implies that our initial interpretations of users' needs were largely on point. First, the libraries' tutorials are being

accessed and used, even though they are separate from users' academic courses. This suggests that there is a case to be made for the maintenance of a library tutorials page separate from other academic resources (i.e., courses in a course management system). Also, the librarian-generated browsing categories, which were created to be user-centered, are in fact being used; this suggests we accomplished our goal in considering and addressing users' needs when grouping like learning objects. Also, the search interface represents a viable option that users employ to find help using resources, understanding concepts, and learning skills.

Although this data analysis highlights the features of the libraries' tutorials resources that are working for users, future research in several areas may help us, and other librarians, reach a wider range of users. First, we need to consider the non-user and further examine the barriers that these students, faculty, and staff encounter in accessing our online instructional content. Understanding unmet needs may help us reach a broader portion of our campus community. Also, it would be useful to develop a more thorough understanding of users' motivations in their different search strategies. This may help us as we continue to develop and provide online learning resources in different formats. Continued research on the usability and users of library tutorials can ensure more effective online library learning, whether independent or connected to academic coursework.

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