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"But I just want a book!" Is your discovery layer meeting your users' needs?

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ABSTRACT

In January 2016, the University of Toledo Libraries implemented EBSCO Discovery Services (EDS) as its discovery layer. Administrators questioned whether users were able to find consortial material in the EDS, so they assembled a task force to conduct a pilot usability test. The task force gathered demographic data and recorded the screens of 25 students answering six task questions. Results showed participants could easily find most items except books, and for tasks that were open-ended, many students continued searching even though they found relevant material. To determine why participants could not find books, the task force consulted with EBSCO and discovered a configuration problem that was easily resolved by editing a mapping table and adding a custom limiter for print books. The searching issue was more difficult to determine, and the task force suggests a lack of library instruction may be at least partly to blame. Libraries invest significant resources in discovery layers. If users have difficulty using them or finding relevant material for their assignments, libraries need to address that issue and instruction is one solution. This pilot study reports on what the University Libraries did to make the EDS more usable for its users.

Introduction

The University of Toledo is one of 14 state universities in Ohio and serves a student population of approximately 23,000. The University of Toledo Libraries (UT Libraries) are comprised of the William S. Carlson Library on the Main Campus and the Raymon H. Mulford Library on the Health Science Campus. Eighteen faculty librarians and 25 support staff serve the University community. The University Libraries are members of the OhioLINK consortium and use Sierra from Innovative Interfaces, Inc. as the integrated library system (ILS).

In the summer of 2015, the UT Libraries investigated potential discovery layer systems and chose EBSCO Discovery Services (EDS). The UT Libraries felt that EDS had two main advantages over other discovery layers

under consideration. First, it featured a familiar and easy-to-use interface for faculty, staff, and students because the UT Libraries already subscribed to numerous EBSCOhost databases, and second, the cost was attractive because OhioLINK had negotiated competitive pricing for its members.

Implementation occurred in January 2016 at the start of the spring semester. The University Libraries received very little feedback about the EDS from users, but library faculty and staff immediately noticed that it was not apparent how to retrieve items held by institutions in the consortium. This was mainly due to a pre-limit called "Location: University of Toledo Libraries Catalog, OhioLINK Libraries Catalog." This pre-limit was intended to bring consortial items into every search result, but the wording was unclear and many times consortially held items did not appear on the first page of results. Frustration with the results would lead users to leave the EDS to search via the OhioLINK catalog or the traditional online catalog provided with the ILS (see Figure 1). Because of this issue, library administrators asked the Systems Librarian in the fall of 2016 to take a look at well how the discovery layer was working for users. To accomplish this, the Systems Librarian put out a call for volunteers to serve on a task force to conduct the University Libraries' first usability test. No members of the Usability Task Force had prior experience conducting a usability test, so the goals of this pilot project were to learn about the process of
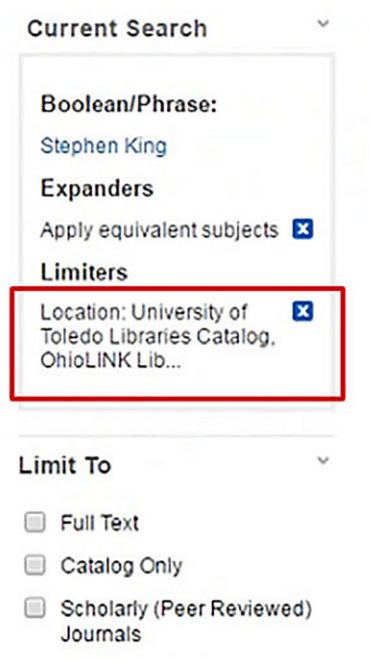

Figure 1. Example showing pre-limit that includes material held by the consortium.

conducting usability tests while simultaneously gaining an understanding of how our users interacted with EDS.

Literature review

Discovery layer platforms have been the subject of numerous usability studies over the years, but the studies do not generally target consortial items within the discovery layer. One article that dealt specifically with this issue was from Jones, Pritting, and Morgan (2014) and their self-built IDS Search catalog. However, their catalog does not include a discovery layer. ==Their findings are relevant to our study because they concluded that word choice may have an effect on usability.== Their library used the phrase "Get it." While this is a simple phrase, it did not give users enough information about the availability of items in their local collection versus the consortial collection. Another article from Valentine and West (2016) featured a question about finding a book that was located outside of the local library collection using Primo, which revealed there was some confusion on how to do this. Users had to select "Everything" from a drop-down menu and it took users several attempts to do that.

==Terminology is equally important in discovery layer systems in general.== In 2013, Foster and MacDonald wrote that users were unable to distinguish between source types. For example, Williams and Foster (2011) found that users understood general formats like books and journals, but not other types like reviews. Brett, Lierman, and Turner (2016) sum up the consequence of not understanding terminology: "Regardless of how simple it is to limit a search to peer-reviewed articles, a user who does not understand what peer-review means cannot complete the task with confidence or certainty" (p. 21).

==General searching behavior while using discovery layers is another area that has been studied extensively and several common themes have emerged.== Dempsey and Valenti (2016) found that users did not understand how to use keywords as an effective strategy and that only a small percentage used limiters. Users also do not use post-search refinements very often (Foster & MacDonald, 2013). Azadbakht, Blair, and Jones (2017) concluded that users "approach library interfaces as if they were Google and generally conduct very simple searches" (p. 43). Valentine and West (2016) take it a step further by stating that "students like things to be simple, familiar, and clearly understandable at a glance, and so do teachers" (p. 191) and that, "when they knew the direct path to the answer, they took it confidently" (p. 184).

Several studies pointed to instruction as a way of helping users conduct better searches. Brett et al. (2016) concluded that "general instruction in

information literacy is prerequisite for effective use of this or any research tool, particularly for undergraduates" (p. 21). Valentine and West (2016) explained that their usability study led their librarians to teach the discovery layer more conceptually so that students could visualize the content they are retrieving and learn how to narrow their results down. These skills can then be applied to other databases.

Finally, Brett et al. (2016) make an important observation that vendors do not seem to be responding to all of these usability study results because the same issues keep reappearing regardless of platform used. They add that vendors and libraries should work together more collaboratively in improving their systems.

Research objectives

When the library administration charged the Usability Task Force with examining the discovery layer, it had one main objective in mind: determine if users were able to search for items located in the OhioLINK consortium. Some library faculty and staff were confused by the location limiters that were available in EDS. Two of these limiters were "Catalog Only," and "University of Toledo Libraries Catalog and OhioLINK Libraries Catalog." The latter was set as a pre-limit, so the EDS would automatically search the entire consortium.

The Task Force identified one additional objective, which was to gain a basic understanding of user search behavior within EDS and how students used the existing EDS customizations. Depending on study results, the Task Force would consider whether or not to make changes to these customizations. Because usability testing had never been conducted at the UT Libraries, this type of data was considered invaluable.

Methods

Williams and Foster's (2011) test was determined to be a good design model and is also recommended in Barnum's (2011) well-regarded book on usability. The design consists of three components: a pretest that gathers demographic information, a set of task questions for the user to perform, and a post-test to gather feedback on the user experience. Each section is relatively short at 5–10 questions each.

The pretest that was developed was anonymous, but it did include information about college major and status (undergraduate, graduate, etc.) and questions to gauge participants' level of familiarity with EDS and whether a librarian had ever visited their class. It included a disclaimer that the user had to accept in order to be a participant. The disclaimer included a yes or no question indicating that the user understood that participation was

voluntary, and he or she could stop at any time, that the participant was at least 18 years of age, and that the information collected might be presented at a conference or published in a journal article. Even though participant information was kept anonymous in the study, the disclaimer ensured transparency between the participants and the researchers. While the Task Force submitted the proposed study to the Institutional Review Board (IRB) for approval, the IRB deemed the study "not human subjects research."

The task questions were targeted to make use of various limiters in the EDS. Users were asked to find both locally and consortially held books as well as full-text articles on various topics. Two software programs are commonly used in usability studies to gather the data from task questions. Morae software from Techsmith was used in several studies (Brett et al., 2016; Clark, Erdmann, Ferguson, Gambrell & Shaw-Munderback, 2016; Hanrath & Kottman, 2015). Camtasia was also used in studies (Williams & Foster, 2011). The Task Force decided to purchase a license for Morae recording software. A benefit of using Morae software is that the recordings could be saved and viewed later. Camtasia software can also do this, but Morae has many more features such as remote real-time viewing, data analysis and graph creation, the ability to search across recordings, and the option to test on mobile devices. Even though the Task Force was not going to use most of these features for this particular test, it chose Morae because of the range of options available for possible future tests.

The post-test questions were used to determine participants' opinion about the ease of the tasks and participants' overall search experience in the EDS. The post-test also included a general question about the name of the discovery layer, UTMOST, since it is featured on the UT Libraries' website and instructional guides, and the Task Force was not sure that users made the connection between the name and the service.

The Task Force tested 19 students on the Main Campus and 6 on the Health Science Campus. The Task Force developed a recruitment strategy to find participants based on recommendations in the literature (Clark et al., 2016; Hanrath & Kottman, 2015; Pendell & Bowman, 2012; Williams & Foster, 2011). For example, flyers were created and distributed at the Carlson Library Information Desk and disseminated on various social media platforms and the website. Potential participants were asked to email the University Libraries' administrative office to schedule an appointment. The Task Force also included an incentive of a ten-dollar gift card to use at various restaurants and stores on campus. Testing was scheduled for April 2017 during National Library Week at the Carlson Library and by appointment at the Mulford Library. This passive recruitment strategy was ineffective for the Main Campus, and no one signed up to take the

usability test. The Task Force decided to approach students directly and asked them to participate as they walked through the library, and this method was successful. On the Health Science Campus, two students responded to posted flyers and four to recruitment emails from library faculty members.

Two computers at the Carlson Library were set up in two offices equipped with the Morae recording software, and one computer was set up in the Mulford Library. Each participant was assigned a number to keep the test responses anonymous. Each student was given a print copy of the pretest, tasks, and post-test. The test was explained to the students, and the software was set to record. Students were then left alone to complete the test. On average, the test took fifteen to twenty minutes to complete. When students signaled that they were finished, they were given a gift card of their choice. Twenty-five students successfully completed the test. Results of the pretest and post-test questions were compiled, and the task results were tallied on a spreadsheet.

Pretest results

The pretest collected demographic information about the students. Students were also asked if a faculty librarian had visited their class to discuss research techniques, and whether they had ever used the discovery layer. Of the 25 participants, 19 were undergraduates and six were graduate students. Together, participants majored in 23 different subjects.

When asked whether a faculty librarian ever visited their class to discuss research, six participants remembered a faculty librarian coming to class. Three participants did not know if a faculty librarian had visited their class, and 16 said a librarian never visited their class to discuss or to demonstrate how to conduct research using library databases or the EDS.

As for whether participants had ever used the discovery layer, five participants did not remember, eight had not used it, and 12 participants had used it prior to the study.

Task results

The Task Force asked all participants to complete six tasks. The completion rate varied between 92 and 100 percent for tasks two through six, however, only 32 percent of the participants successfully completed Task 1. The techniques used by participants included primarily Google-like search techniques, which was consistent with the literature, although some participants located and used the advanced search screen of the EDS without encountering any issues. The findings for each of the six tasks follow.

Task 1: Search for a print book by Stephen King located in the Carlson Library. Click on the title of the book to open the record.

The majority of participants (53 percent) used keyword searching, and a smaller number of participants used the book limiter (34 percent), or the author limiter (33 percent). A few participants chose to use the advanced search (14 percent). The percentage is higher than 100% in the results due to participants using multiple search methods. The success rate for this task was 32 percent. To improve the success rate of Task 1, and to improve the search experience for future users, steps were taken to facilitate searching for books. A description of these steps are included in the Discussion section of this article.

Task 2: Search for the e-book "The Origins of the Boxer Uprising" by Jonathan Esherick. Click on the title of the e-book to open the record.

The majority of participants (55 percent) used the keyword search compared to the use of the title search (28 percent), the advanced search (14 percent), or the author search (3 percent). The success rate for this task was 93 percent. The length of time for completing this question ranged from 24 seconds to 170 seconds. The average participant took 57 seconds to complete this task. The Task Force accounts for the time variances by an error in the spelling of the author's first name, which it discovered midway through the study. As the success rate shows, this did not appear problematic for the participants.

Task 3: Search for the print book, "The Case for Pluto: How a Little Planet Made a Big Difference" by Alan Boyle located at the University of Cincinnati. Click on the title of the book to open the record.

Participants favored the keyword search (54 percent) for this task, but some also used the title search (27 percent), the advanced search (15 percent), and the author search (4 percent). Unlike Task 1, which also asked participants to locate a print book, the success rate for this task was 96 percent. The average time for completion of Task 3 was 51 seconds. The slowest participant took 135 seconds and the fastest finished the task in 15 seconds.

Task 4: Search for the article "A Blueprint for Successful Arts Education" by Laura Perille. Click on the title of the article to open the record.

The keyword search continued to be popular (59 percent) for this task, but some participants also used the title search (30 percent), the advanced search (7 percent), and the author search (4 percent). None of the participants used limiters. For this task, the success rate was 100 percent for all participants. It took participants an average of 32 seconds to complete this task. The slowest participant took 70 seconds and the fastest participant finished in 11 seconds.

Task 5: Search for one article and one book about climate change. Click on the title to open both the book and article records.

Keyword searching (78 percent) was the most popular search strategy used by participants for this task, but some participants also used title (17 percent), subject (4 percent), and advanced search (1 percent). Participants completed this task successfully 96 percent of the time. Most participants completed the task in 94 seconds. The fastest completion time was 30 seconds and the slowest finished in 170 seconds.

Task 6: Search for a scholarly peer-reviewed article about Lake Erie water quality written in the past 5 years. Click on the title to open the full-text version of the article.

This task, unlike the previous five tasks, was deliberately open-ended. The Task Force hoped to assess how much participants had learned by completing the previous tasks. For this question, 33 percent of participants found the appropriate article but continued searching. It is not clear why, but it did not prevent them from being successful. Most participants favored the keyword search (72 percent) for this task, but some participants also used the title (14 percent), the advanced search (10 percent), or subject search (4 percent). The success rate was 92 percent for this task. The fastest participant completed this task in 21 seconds, while the average participant took 78 seconds. The slowest participant took 156 seconds to complete this task.

Post-test results

When participants were asked what they thought about using the discovery layer, collected responses were 80 percent positive, 8 percent negative, and 12 percent neutral. One participant commented, "UTMOST is overall user friendly and well organized." For the participant who struggled a bit, "mostly useful and simple, but some aspects are somewhat frustrating." Overall, the participants found the discovery layer to be user friendly and they located the information they needed quickly.

When asked if they planned to use the discovery layer in the future, the resounding and unanimous response was "Yes!" One participant mentioned, "Yes, this exercise actually leaves me more confident to use it in the future." Another participant commented, "I like how it can search scholarly articles with a date range. It is very customizable with the checkboxes on the side."

Participants were asked whether they would recommend the discovery layer to others and once again, the response was unanimously affirmative. One participant noted, "Yes, if looking for items not necessarily on the shelf at UT." Another commented, "Yes, I would, because it lets you narrow down your search to exactly what you're looking for and provides good information."

The responses from the last question about whether the name UTMOST describes the discovery layer adequately were split. Half of the respondents answered unequivocally with a yes. The other half were either a little confused about the name and did not know what it meant or just answered no. There were some suggestions for other names such as UTSearch, UTGO, UTLib, UTFIND, or UT Catalog. This finding suggests keeping customized catalog names, if used at all, simple.

Discussion

As noted in the results, Task 1 was the most difficult for study participants to complete. The search strategies employed by the participants should have been successful. For example, all of the participants used the supplied search terms and a majority of the participants used suitable limiters. The low success rate of Task 1, and a review of the results list from the Morae recordings provided a clear indication that logical search terms, search strategies, and limiter selections did not produce the anticipated results for print materials. The Task Force wondered if the discrepancy in success rates with Task 1 and the other tasks was possibly a system configuration issue, so it consulted with an EBSCO Discovery Services engineer. The EDS engineer found that returned search results were not what users expected. After examining the EDS configuration tables, the EDS engineer concluded that searches were not producing accurate results because e-books were incorrectly mapped as print books in the catalog mapping table. This setting had been missed by the libraries' Discovery Layer Task Force when it completed the setup questionnaire from EBSCO and was missed and unreported by librarians during implementation. This finding alone makes the case for usability testing and was affirmed by Nichols, Crist, Sherriff, and Allison (2017) who stated: "In order for each institution to take full advantage of the customizations available in their discovery tool and make informed decisions on how to present their discovery tool to their users, libraries should conduct their own assessment on a regular basis" (p. 97).

The EDS engineer recommended that the mapping table be corrected. He also recommended the addition of a custom limiter for print books if the library felt it was a priority for users to have an option to filter out print materials, because the EDS standard book limiter includes books in all formats. Library faculty and staff felt a custom limiter was needed. After EBSCO resolved the mapping issues and added a custom limiter for print books, library faculty tested the print limiter and immediately noted the improved search results when specifically searching for known print books in the UT Libraries collection.

As previously noted, the main concern that led to conducting a usability test was the display and discoverability of items in the OhioLINK Catalog, the consortium's online catalog. The catalog includes the holdings of over 100 member institutions. Library faculty and staff expressed concerns about whether students would be able to identify materials located at another OhioLINK institution while searching in EDS. Task 3 required participants to find a book located at a specific member institution when given the title and author information. Only one participant was unable to complete this task. These findings made the Task Force confident that the user population could identify and locate materials belonging to the UT Libraries and those located at another OhioLINK institution. This was a better result for EDS than it was for a study with Primo where users had some initial difficulty expanding their search to include consortial items (Valentine & West, 2016).

Implications for library instruction

With the exclusion of Task 1, where failure rates can be attributed to the aforementioned catalog mapping issues, the participants' success rates averaged 95 percent across tasks two through six (see Figure 2). Our results are similar to findings from previous studies (Brett et al., 2016; Williams & Foster, 2011); however, Hanrath and Kottman (2015) reported 70 to 88 percent success rates in their study. Success seems to be linked to what kinds of tasks are presented to users. Clark et al. (2016) focused on users' ability to find full-text and that helped identify some issues with their interface, such as how to present full-text links, which could be corrected to improve searching.
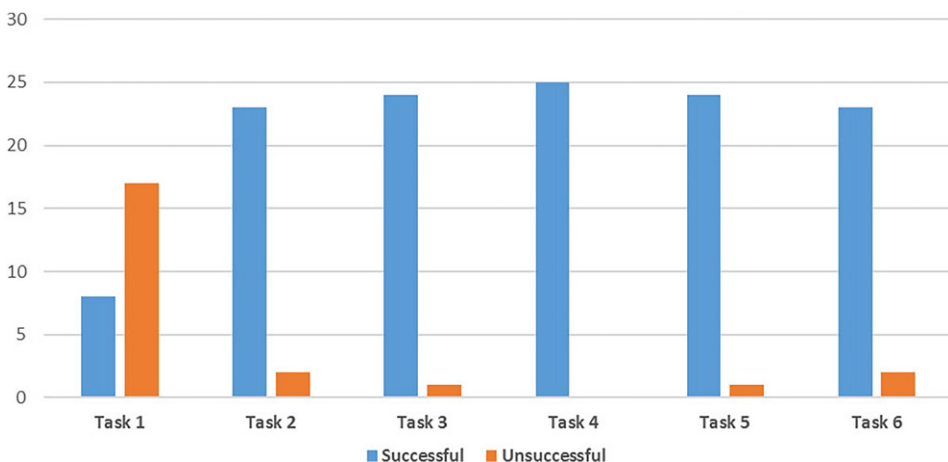

Figure 2. Compiled Success Rates by Task.

Results from the pretest indicated that 64 percent of the participants answered that a faculty librarian had never been to their class to discuss research, and an additional 12 percent reported that they were unsure if a faculty librarian had visited their class. Combining the high success rates of tasks two through six with the feedback gathered in the pretest about library faculty presence in classes, the Task Force concluded that the discovery layer is an effective search tool even without formal instruction on how to use it. Williams and Foster (2011) also discovered that students were able to use the discovery tool without explicit instruction, even though they agreed that instruction would be helpful. Brett et al. (2016) also found this to be the case; however, their users did not take advantage of many features available in the discovery layer such as facets.

Despite the high task success rates in Task 6, study participants continued searching even after finding relevant material. After presenting results to library faculty, some commented that they did not teach the EDS due to the inconsistency of the returned results such as those from Task 1. Participants found it relatively easy to search, but did not necessarily recognize they had all of the information they needed. Brett et al. (2016) concluded that "a common barrier to the successful completion of a task was not the technology itself but a lack of understanding of the task" (p. 20). They point to instruction as a "reasonable way to address usability issues in Primo" (p. 21). It will be necessary to do a follow-up study and see if this search behavior changes.

The Task Force noted that users rarely looked past the first page of results. A similar finding was reported in a usability study conducted at the University of Kansas. Researchers found that, "Students were quick to abandon a search if they did not find pertinent articles within the first page or two of results" (Kliewer, Monroe-Gulick, Gamble, & Radio, 2016, p. 571). Additionally, participants showed little initiative to revise their search strategies beyond those specified in the task questions. This is consistent with results from a study at Brooklyn College that noted, "There was little query reformulation (to broaden or narrow results), no serious reevaluation of search terms or the overall approach to search, and a high reliance on natural language searches" (Georgas, 2014, p. 521).

Limiter use

In this discussion, limiters refer to both the "search by" limiter options as well as the result limiter options within EDS. When examining the use of limiters and search strategies, the Task Force made two observations: First, limiter use at the results-level page was lower when searching for known items by title (see Figure 3). Second, when participants were supplied with
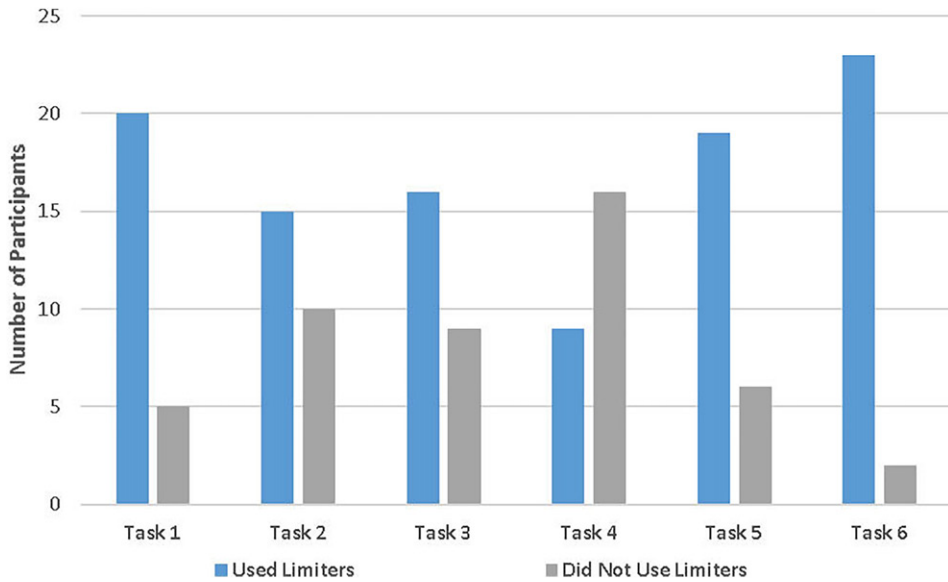
Figure 3. Limiter Use by Task.

the exact search parameters in the search instructions, they were able to successfully complete Tasks 2–4.

When participants were given open-ended search topics as seen in Task 5 and Task 6, participants relied on Google-like search strategies despite using limiters on previous tasks. If the desired results were not found, many participants had the tendency to return and modify the search terms rather than use limiters. Out of the six tasks participants completed, this behavior occurred primarily in Tasks 5 and 6. This behavior was not unique to the UT Libraries as it was also observed by researchers at Newton Gresham Library (Cassidy, Jones, McMain, Shen, & Vieira, 2014) and by Dempsey and Valenti (2016) who conducted an analysis of 118 student search histories.

Participant opinions

Participants' perceptions of the EDS were largely positive except for a few instances. One individual specifically mentioned Task 1 and the inability to exclude e-books. The Task Force resolved this issue by correcting the catalog mapping table. Another individual mentioned disliking that search results automatically updated when selecting the publication date limiter. This is a built-in feature in the EDS and cannot be changed. The Task Force recognizes this as a future instruction opportunity. A majority of the participants reported that the discovery layer was user-friendly and well-organized. Additionally, all the participants reported that they would recommend and use the discovery layer in the future for research. Williams

and Foster (2011) received the same response from their users when testing EDS, as did Hanrath and Kottman when examining Primo (2015). There is a lack of negative reactions to discovery layers in general in the literature.

Summary of responses to findings

As a result of this study, the Task Force made three changes. First, the catalog-mapping issue was resolved to exclude e-books and e-government documents from the results list. Second, the Task Force added a custom limiter for print books. Finally, the catalog options were changed to more easily differentiate between the local catalog holdings and the consortial catalog holdings. This was accomplished by creating two separate limiters: UT & OhioLINK Catalogs Only and UT Catalog Only.

Conclusion

This pilot usability study was a positive first step for our institution in assessing the EDS and users' ability to use it. We should have tested EDS extensively before implementation, and we recommend doing this to all libraries before major changes are rolled out to users. More extensive testing would have enabled the libraries to discover the catalog mapping issue before users had to experience it first-hand. Besides that issue, results from the UT Libraries were consistent with the literature, which shows that we implemented a discovery layer in similar ways to other libraries.

Based on the data collected in our pretest, we also suggest some instruction in how to use discovery layers is necessary. If so, what should be taught? Valentine and West (2016) believe the focus should be on content. Alternatively, perhaps the focus should be on terminology and concepts like "peer review," call numbers, and citation deciphering, because frequently the technology is not the problem, but "a lack of understanding of the task" (Brett et al., 2016, p. 20). Performing frequent testing and following up on our pilot study will provide more information on what users are experiencing so we can keep improving the discovery layer for our users.

About the author

Christine Rigda has worked as the Technology Coordinator/Systems Librarian at the University of Toledo since 2006. Her research interests include usability, emerging technologies and trends in the ILS.

Margaret Hoogland is the Clinical Medical Librarian at the University of Toledo. Previously, she worked in a hospital library, corporate library, association library, and two academic libraries. Her research interests include working with faculty, staff, and students

to identify, understand, and, where appropriate, integrate technology seamlessly into lectures and courses to improve the learning experience for participants.

Jessica Morales worked as the Collection Management Librarian at The University of Toledo from 2016-2018 and currently serves as the Head of Interlibrary Loan and Acquisitions Services at the University of Notre Dame. Her professional career has focused on acquisitions, collection development & management, and user support.

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