PROMISING PRACTICES IN INSTRUCTION OF DISCOVERY TOOLS

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ABSTRACT

Libraries are continually changing to meet the needs of users; this includes implementing discovery tools, also referred to as web-scale discovery tools, to make searching library resources easier. Because these tools are so new, it is difficult to establish definitive best practices for teaching these tools; however, promising practices are emerging. A promising practice is "a program, activity, or strategy" that shows early promise for being effective in the long term and generalizable across institutions (Dare Mighty Things, n.d.). The researchers used three methods to develop a list of promising practices for teaching discovery tools— a review of the current literature on the tools, a survey for practicing instruction librarians, and interviews with teaching librarians. More research and assessment is needed to determine whether these promising practices are in fact best practices for teaching discovery tools.

INTRODUCTION

Libraries are rapidly adopting discovery tools, also referred to as web-scale discovery tools, in continuing efforts to accommodate patrons and make library searching easier and more attractive. These discovery tools streamline searching and aim to provide a user-friendly experience that meets the expectations of today's user. While these tools simplify the search experience, search results still require refinement. Librarians have expressed concerns about discovery tools that search so much and so many different types of content but lack some of the familiar refining options of a subject database such as a controlled vocabulary. Thus many librarians are left wondering how to teach patrons what to do with search results once they have retrieved them and how to most effectively integrate the teaching and learning of discovery tools into library instruction.

Examining promising practices can help answer these questions. Discovery tools are still relatively new and are changing so rapidly, making establishing best practices challenging. Leandri (2005) defined best practices as practices that "have been proven to return desirable (and often measurable) results" (p. 20). Because little assessment has been performed on discovery tools and information literacy, the authors aim to uncover promising practices for teaching patrons how to use discovery tools. A promising practice is any "program, activity or strategy" that shows an early promise for being effective in the long term and generalizable across many institutions (Dare Mighty Things, Inc., n.d.).

In circumstances in which the literature does not always provide the answers to research questions, particularly in new areas of interest, other methods of developing best or promising practices may be used. These methods may include a review of local practices that have been effective. The uncovered practices may not be generalizable yet but can be understood as a promising practice that may be adaptable to another local situation. Other methods include surveys, focus groups or interviews during which the most successful trends or activities can be elicited by questioning and comparing responses. A review of policies or guidelines that have been implemented on local or regional levels can also yield promising practices. To develop a set of recommendations or promising practices that can be implemented at any library regardless of the discovery tool used, the authors turned to the trends uncovered in their own survey and interviews in addition to current information literacy practices and the relatively small amount of research available on the use of discovery tools.

LITERATURE REVIEW

A growing number of vendors are providing discovery tools to libraries. Online Computer Library Center's (OCLC$^{®}$'s) WorldCat$^{®}$Local became publicly available at the end of 2007, Serial Solutions' Summon$^{®}$ in 2009, EBSCO's Discovery Service in July 2010, and Ex Libris' Primo™ in mid-2010 (Vaughan, 2011). Early studies of discovery tools were mostly usability studies conducted when libraries decided to implement and customize the tools (Fagan, Mandernach, Paulo, & Saunders, 2012; Gross & Sheridan, 2011; Way, 2010; Williams & Foster, 2011). Recently, there have been studies that delved more specifically into the search behaviors of students using discovery tools and the librarians who are teaching them (Asher, Duke, & Wilson, in press; Fawley & Krysak, 2012; Kulp, McCain, & Scrivener,

in press).

Discovery tools allow users to search across many sources in a single search interface, simplifying how people search and allowing patrons to "interact consistently with results" across databases (Fagan et al., 2012, p. 84). The single search box, while favored by many students for its simplicity, is a topic of tension for many librarians. Kern and Emanuel (2009) believe a single search box allows users to search like users and not to have to try to think like librarians; users search a keyword first and then refine their search based on the results displayed. When librarians search, they develop a search strategy prior to searching (pp. 119-120). However, other librarians believe using a single search box is effectively "dumbing down" a search, despite the fact that there are features to filter a search once the simple search is completed. Howard and Wiebrands (2011) noted that the "tension between simplification and 'dumbing down' continues to exist, especially when considering the needs of professional and advanced users" (Simplification vs. "Dumbing Down," para. 3). Despite this fear of *dumbing down*, librarians cannot ignore the trends apparent in the research on user search habits; these trends show a desire by students for library search facilities to be similar to traditional search engines because that type of interface is familiar to them, and easier to understand.

Recent studies look more specifically at the use of the tool by students and librarians as well as instructional practices. Asher et al. (in press) compared the search results of students at two institutions using various search tools, including EBSCO's Discovery Service (EDS), Serial Solutions' Summon, Google Scholar, and the local library catalog. Their purpose was to discover how successfully students used these tools to locate sources most closely associated with their topics. In all four search systems, students had difficulty evaluating the sources they found and accepted the tool's relevancy algorithm as an indication of quality. The researchers concluded that students are easily overwhelmed by the results of a search, leading them to choose their information sources inappropriately, an action that emphasized the need for continual training in using research tools. While Asher et al. (in press) are concerned with student search behavior and its impact on instruction, Kulp et al. (in press) investigated librarians' willingness to teach a web-scale discovery tool, emphasizing the one-stop search aspect of these tools. Their investigation indicated that while the one-stop shopping approach had some appeal, given the choice, librarians "still overwhelmingly prefer to teach the native database interfaces over their institution's one-box product" (Kulp et al., in press, Discussion and Conclusion, para. 1).

While most of the literature set out to examine user search preferences, usability of discovery tools and librarians' willingness to teach them, the research documented in that literature lacks best or promising practices to teach these tools. In fact, only one other research article set out to develop best practices for teaching discovery tools. Fawley and Krysak (2012) developed a list of best practices for teaching with discovery tools based on recent usability studies of discovery tools, the literature on digital natives and their research habits, as well as on extant work on discovery tools in general.

The literature to date has discussed the implications of teaching discovery tools and librarians' perceptions of discovery tools, but researchers have only begun to examine how librarians are actually teaching these

tools and the methods that are effective. Interviews and surveys can provide important evidence on how and why librarians are actually teaching these tools. The authors of this paper aim to fill that knowledge gap by including literature as well as interviews to provide comprehensive insight into promising practices for teaching discovery tools.

METHODOLOGY

The authors gathered data through a survey of teaching librarians and conducted interviews with seven academic librarians who teach discovery tools regularly.

Survey

The researchers developed a 22-item survey to help uncover promising practices for integrating a discovery tool into the classroom environment. The survey was deployed in June 2012 via the Information Literacy Instruction Discussion List (ILI-L) sponsored by the Association of College and Research Libraries. This website was selected as a place where librarians who teach using discovery tools would be likely to see the survey. Librarians were asked to respond if their institution had one of the four most common discovery tools currently on the market—EBSCO's EDS, Ex Libris' Primo, OCLC's WorldCat Local, and Serials Solutions' Summon; however, they could enter an *other* if their institution used a different tool.

The questions on the survey included demographic information such as what type of institution, how long the institution has had access to a discovery tool, and where and when the respondent teaches the discovery tool. In addition, the survey included six open-ended questions. Questions on the survey were designed to uncover the types of instructional activities

and strategies librarians have found successful in teaching discovery tools, features of the tools that librarians emphasized in the classroom and why, and what kinds of active learning and instructional materials librarians have found effective. The survey was open for 10 days.

After the responses were received, the researchers used an emergent coding model for independently coding the open-ended questions. Once the process was complete, the researchers compared notes and reconciled differences between the two sets of codes and developed an agreed-upon list of codes based on themes found in the results, including ways librarians introduced students to discovery tools, instruction techniques, types of instructional support materials, relevance and appropriateness of the tool, and essential features of the tool. The researchers independently recoded the open-ended remarks using the shared codes previously stated.

Interviews

The researchers also interviewed seven instruction librarians from academic institutions to learn about how they use the discovery tool, how they introduce the tool to students, what successful classroom techniques they use to demonstrate the tool, and how they share what they have learned with others. Interviews can provide additional insights into librarian thinking about discovery tools and expand upon the topics found in the survey. The interviewees were recruited at the end of the survey. All seven interviewees are experienced instruction librarians who teach primarily lower-division students at 4-year institutions. The size of institutions ranged from Carnegie classifications medium (2,000 or more) to very large (10,000 or more).

The researchers' goal was to obtain an equal

number of interviews for each discovery tool; however, it was not possible to find enough teaching librarians willing to be interviewed about their practices to equally represent the tools. Due to a low number of volunteers, the researchers contacted various libraries to solicit interviewees. Each interview lasted between 30 and 45 minutes and was recorded for later analysis. Results were then coded independently using agreed-upon codes previously described.

The relatively small number of respondents to the survey and of interviewees made is difficult for the researchers to offer any generalizations, but they can provide an informed look at the methods and practices in use in the classroom and suggest practices that are effective.

RESULTS

To provide some background on level of experience and interaction with the discovery tool of this study's participants, the results begin by briefly describing their demographics. Then the responses to the survey and the interviews are presented organized into themes. Each theme is discussed in a progressive fashion, starting with the decision to teach a discovery tool to the methods used in the classroom. These themes form the basis for the promising practices developed by the authors.

Survey Demographics
Seventy-one respondents completed the survey. The survey respondents are experienced instruction librarians. Sixty-one percent have been teaching for 6 or more years. The majority of the respondents are at a research university or 4-year university (non-research). Of these, 62% have the EBSCO Discovery Service, 21% have Serial Solutions' Summon, 11% have OCLC's

WorldCat Local, 4% have Ex Libris' Primo, and one respondent has more than one of these services available at his or her institution. At the time of the survey, 47% of the respondents had their discovery service for less than 1 year, 45% had it for 1 –2 years, and 8% had the service longer than 2 years.

The Decision to Teach a Discovery Tool
A perceived significant challenge of teaching discovery tools is that they are based on a very different model of information and meta-data gathering than the traditional, federated search tool or traditional databases. For some librarians, this has raised questions about how to teach the tool and how to determine where and when the tool is most appropriate. For many, answering these questions starts with a clear understanding of how these tools differ from other tools and what is the exact composition of the tool. If that information is lacking, the librarian may choose not to teach the tool. One respondent to the survey indicated that at his or her institution the librarians "have been reluctant to teach [the web-scale discovery tool] in classes since we find it can be confusing and buggy." Another respondent reported that her institution has an annual instruction workshop but that most of the individuals who plan the workshops "are very anti-discovery tool. They don't like them so they don't talk about them or address how to teach them appropriately." As other researchers have also found, an understanding of the issues of why the tool may not work in the expected way is a significant factor in a librarian's willingness to teach the tool (Howard and Wiebrands, 2011).

Kulp et al. (in press) found that "a wide range of factors go into [librarians']

decision making" when choosing to teach a discovery tool (Results, para. 6). Survey respondents indicated their decision to teach a discovery tool is based on three major factors: the discovery tool should be relevant both to the level of the student, the course content, and the assignment. There is some debate among teaching librarians over which level of students benefit the most from learning how to use discovery tools; however, many librarians surveyed and interviewed favored teaching these tools to students in lower level courses that require general research (see Table 1). As students' research progresses from general education course requirements to discipline-specific requirements, the respondents favored moving from teaching discovery tools to teaching subject-specific databases.

The level of student alone does not dictate whether a discovery tool is relevant to the assignment. In a recent webinar sponsored by Serial Solutions, Amy Faye Fyn (2012), reference and instruction librarian at Bowling Green State University, said that Summon (and by extension other discovery tools),"really shines at the interdisciplinary level" when students are researching "things that are not falling into neat boxes or

collections." This sentiment, along with the desire to teach discovery tools in upper level courses as a way to round out research is also expressed by many respondents. Although some respondents felt that discovery tools may actually hurt upper-division students, other librarians plan to incorporate them into higher level and graduate courses but emphasize that there are "specialized databases that compliment this tool."

Conceptualization of Discovery Tools
Respondents' comments suggest that students have a difficult time grasping what a discovery tool is and is not. Unlike the librarians, students are generally less interested in the underlying mechanics and want something that *just works*. The best way to describe the concept of a discovery tool is a challenge and point of controversy among the responding librarians. For some, understanding how a tool works and when to use it is a basic information literacy skill that's necessary for students to grasp in order to choose the appropriate tool and to critically evaluate the search results. A few respondents felt that the ability to make that assessment requires that the students have a firm grasp of what databases are and how a

TABLE 1 — LIKELIHOOD OF TEACHING THE USE OF THE SEARCH TOOL IN CLASS

Class level	Very likely	Likely	Neither likely or unlikely	Unlikely	Very likely
Lower-division 100-200	61%	21%	4%	10%	4%
Upper division (300-400)	25%	40%	19%	9%	6%
Graduate level (500+)	28%	22%	20%	17%	13%

Note. Participants were asked to respond to the question: How likely are you to specifically instruct students to use [your institution's discovery tool] in your classes?

discovery tool fits in:

> *Anytime I introduced this concept, I talk to them about what the library is, what it isn't and what the difference is between the open web and the library because I want them to understand conceptually that there are certain things that have to be paid for, certain things that have to be accessed only through the library that just are not available on the open web, and then I say no one database has everything, there's no one collection that has everything we need and then I show them our list of, I think we're up to 300 databases right now, and so then I introduce our discovery tool . . ., as a way to search across multiple collections at once.*

Most respondents felt that explaining too much about how the tool works only leads

to confusion and that students can grasp the concept without a great deal of detail. Asher et al. (in press) argued that an understanding of at least some of how the tool behaves is essential to student success in using the tool. In particular, the relevancy ranking algorithm, in so far as it is known, can greatly improve a student's ability to select the most appropriate source from a long list (Qualitative findings, para. 12). None of the responding librarians addresses the issue of relevancy specifically as something students need to understand, but they do acknowledge the need to conceptualize the tool by thinking of ways to explain the concept of discovery tools to students. When asked in the survey, "What descriptions do you believe are successful for introducing students to the concept of web-scale discovery tools?" 57% of respondents described them as "a place to 'launch' your research," 51% said discovery tools are used to "search across the library databases," and 50% describe a web-scale

TABLE 2 — RESPONSE PERCENTAGES TO DESCRIPTIONS OF WEB-SCALE TOOLS

Description	Response
A place to "launch" your research	57%
Search across the library databases	51%
One-stop shopping	50%
All of the library content in one spot	44%
Like Google	41%
Interdisciplinary tool for finding information on all topics	40%
Credible sources all together	34%
Use a demonstration instead	32%
Like Google Scholar	15%

Note. Respondents were asked to select from a list of descriptions the one they thought are successful in introducing students to the concept of web-scale discovery tools. One item in the list was "Other," which if selected required the respondent to write an explanation.

tool as "one-stop shopping." The various responses to this question are summarized in Table 2. While 50% of respondents chose the concept of "one-stop shopping," one respondent commented that discovery tools "are perfect for demonstrating there is NO such thing as a 'one stop shop.'" In some cases, librarians are comparing this new tool with known items such as a subject database to put them in perspective with other known tools. Other respondents chose to use non-library metaphors to explain this complex concept. One respondent wrote:

> *I use the 'evolution' metaphor—putting up an image of the ascent of man, calling the chimp Google, the Neanderthal Google Scholar, and the homo sapiens DISCOVER. This evolutionary approach builds nicely into the way the classes are structured, i.e., taking students from the known and familiar (Google) to the less familiar (Google Scholar) to the unfamiliar (DISCOVER).*

Another interviewee used a metaphor adopted from the literature. A discovery tool is similar to a large department store such as Walmart where everything is available and the quality of the merchandise can vary, whereas a subject database is more comparable to a boutique store, smaller selection but higher quality.

Although many librarians admit that they have no concrete evidence that these metaphors actually work to help students understand the concept of discovery, many note that anecdotally the students seem to grasp the concept of discovery tools through metaphor, a teaching strategy supported in education literature as "a 'change bearing' agent" that helps "students transform what they know into new understandings" (Levine, 2005, p.172).

Active Learning and Instructional Materials

The survey participants strongly advocated for active learning practices when introducing students to discovery tools. The types of active learning described in the survey and interviews vary, but most involve some kind of hands-on activity, allowing for student exploration. For example, some librarians in the authors' study preferred to have students explore the tool and then have a librarian demonstrate it, some librarians demonstrated the tool first and then allowed the students to explore, and others did not specify whether the exploration or demonstration came first but said that they included hands-on activities throughout the information session. According to one survey respondent:

> *A lot of students would rather jump into using a tool rather than sit through a librarian having to show them how to use it. Once they jump in, then they will start having questions that the librarian can tailor to their specific need, either one on one or in front of the class.*

One interviewee has students explore the discovery tool and a more conventional database to discover differences and similarities that then leads to a class discussion about the value of each tool. Other respondents reported that they encourage students to discover the different options for refining a search on their own and share that experience with the class. Many survey respondents and interviewees noted that active learning activities allow the students to see how difficult or easy a tool is to use and also allows them to see what they are doing right and how they can improve in their search.

Responding librarians agreed that face-to-

face, hands-on instruction is the most successful way for students to learn the tool. However, the use of instructional materials such as worksheets, tutorials and web guides, and embedded chat services was also recommended by the respondents, particularly in cases when hands-on instruction is not possible. Fifty-six percent of the responding librarians create some sort of instructional materials to help students learn the web-scale discovery tool at their institutions and use these in a variety of instruction settings including one-shots, workshops, and library classes. The researchers included a question on the survey about the use of supplementary instructional materials and asked the respondents to select the top three instructional material types from a list and explain why they thought these are the most important. These choices and reasons are summarized in Table 3.

Worksheets and similar instructional materials are useful in promoting self-directed or independent learning, thereby encouraging students to take responsibility for their own learning (Hepworth, 2000). Respondents felt that the worksheets, both print and online, are useful for keeping the students on task and for guiding them to the important features of the tool, which, respondents felt, are often overlook. One respondent noted that instructional materials also enable students to "practice and demonstrate their skills." These benefits

TABLE 3 — TEACHING MATERIALS USED BY RESPONDENTS

Instructional Material	Course-related One-shot	Workshops (1-4 hours)	Workshops (1 full day)	Course-related, multi-week sessions	For-credit, multi-week library class	Total
Screencasts (demonstration)	75%	25%	5%	10%	25%	28
Screencasts with interactive features	86%	43%	14%	29%	14%	13
Web-based guides	96%	42%	4%	13%	8%	39
Print handouts	85%	45%	5%	10%	10%	31
Worksheets	81%	38%	6%	6%	13%	23
Other	57%	14%	14%	14%	14%	8

Note. Respondents answered the question: Which of these instructional materials do you use when you teach [your institution's discovery tool]? Participants were provided a drop down list of items to choose including an "other" option, which if selected, was to be accompanied by an explanation.

help guide the students not just in locating sources but also in developing the search process itself. One respondent recommended including "open-ended questions to encourage them to think about the ways they might use [a discovery tool] … in their future work."

Those who cannot incorporate hands-on work in their sessions acknowledged that many students will need additional help. Worksheets, online tutorials, and web-based research guides afford students the opportunity to go back and reference information they learned in class. Respondents did not feel that worksheets are always relevant or necessary; the determination lies in the level and need of the students as well as the assignment requirements. The results of the survey indicate that librarians have a combination of instructional materials available to them. Even though they would not use all of them in every situation, they consider it important that "these materials are made available online for students to use at a later time."

Information Overload

A common complaint among respondents was that while the discovery tool is easy to use, it is not always easy to teach because of the large amount of information students retrieve:

> *Students are sometimes (understandably) overwhelmed with the amount of results they get from the discovery tool and are often put off by any seemingly irrelevant results. We have found it very important to teach limiting strategies and the concept that searching is trial and error, so if they get results that are not successful, it does not mean the tool is not worth using.*

Retrieving a great amount of irrelevant

literatures can be a great source of frustration for both students and librarians, leading to *information overload*, a term defined by Bawden and Robinson (2009) as "a loss of control over a situation and sometimes with the feeling of being overwhelmed" (p. 183). This is a common issue when students are conducting research using online tools, but it is exacerbated by the large universe of information that exists in a web-scale discovery tool (Asher et al., in press).

Discovery tools offer built-in features that help students reduce and refine the information that they retrieve. The authors asked participants taking the survey to identify the three most important features in their web-scale discovery tool they bring to the attention of their students and indicate why they feel these three are the most useful. By far, the most useful feature identified was the ability to limit a search to scholarly and/or peer-reviewed sources (71%). This was followed by the advanced search (38%) and the ability to restrict a search by format/content type (37%). The top three choices fall into the category of refining a search rather than managing results, which includes actions like saving and emailing. The large results sets students retrieve makes these refining features especially beneficial.

The ability to limit searches to scholarly and/or peer-reviewed sources is in many cases a requirement for an assignment, and students have a difficult time identifying those items in the results list. One respondent felt that "limiting to scholarly articles is especially important for new students, as this concept will be new to them (early classes focus on understanding the different species in the academic information ecosystem, stressing the importance of peer-review to the academic

process)."

While some respondents found the advanced search too complicated or intimidating for the students, others reported it as an important feature to help students find known items, sometimes a challenging thing to do in a web-scale discovery tool. It more closely emulates the search interfaces of discipline-specific databases and offers additional control over a search. The Google -like search box and its lack of refinement features concerned many of the respondents because it is so imprecise; the advanced search can assist students in searching for more specific items and can help librarians emphasize the transferability of skills. One respondent noted that "often students want to be able to use the *three box* approach in the advanced search, as it's familiar to them from other EBSCO databases." It also affords the librarian an opportunity to discuss ways to formulate a search in depth. Format and content type criteria help reduce students' confusion about what they are finding. Bawden and Robinson (2009) referred to this difficulty as the "homogenization" of information; everything looks and feels the same. Physical cues as to content type are lost in an online environment (p. 181). The content type facets help students search for a specific source type, which may also be a requirement of the assignment.

Surprisingly, locating the full text is not a heavily emphasized feature although it is one of the often touted benefits of a discovery system. Those who do consider it a top feature (25%) do so primarily to help fulfill student expectations. Other features also mentioned in the survey but which were less frequently included in the classroom are using the date feature (32%), the subject headings/topics feature (21%), emailing and saving (29%), and citation

management (14%). Some respondents recommended showing the subject/topic feature so students can combine topics easily or "become aware of the issues related to their topic [and] can help them learn the vocabulary of the topic." Other respondents found the subject headings confusing because they do not correspond to a known, controlled vocabulary.

Overall, the respondents chose to emphasize features based on two main criteria, the level of the students and the nature of the assignment. One respondent stated:

> *I think the primary feature is the ability to limit – in whatever way there [sic] particular search and/or topic dictate. The faceted nature is one of the skills or experiences they may well bring with them from other sites (Target, Auto Trader, etc.), so it allows them to feel some sense of command early on.*

Transferability

Many respondents noted that discovery tools allow them to get back to teaching the basic information literacy skills that are necessary regardless of the library tool or search engine used. Some emphasized the functionality of the tool, including advanced features such as facets and multiple search boxes found in many databases and search engines. One librarian emphasized that although these features may look different in different databases and search engines, they exist in the tool; and the students should be aware of how to use them to improve their searches.

Responding librarians used activities that focus on evaluating the search capabilities and results list of discovery tools in comparison to other sources. For example, one interviewee said that when introducing

the web-scale tools, she has a group of students perform a search using the discovery tool and another group of students perform the same search using a subject-specific tool. The groups then present their findings and discuss the tools and their strengths and weaknesses. One other interviewee learned a technique he plans to integrate into his sessions.– He will split the class into three groups that will perform the same search, but one group will perform the search using the discovery tool, one group will use Google, and one group will use Wikipedia. The groups will then evaluate the searches and compare the experiences and results.

The interviewees focused specifically on the ideas of teaching search techniques that can be used across databases and evaluating the search results as well as the strengths and weaknesses of the databases. While none expressly used the term, many responding librarians are moving beyond simply teaching techniques for retrieving information to teaching critical thinking skills, which is a recommended primary focus of instruction sessions (Atton, 1994).

PROMISING PRACTICES

As is the case whenever a new tool comes along, it takes some time to determine where and when to teach discovery tools and where these fit into librarians' instructional toolbox (Grotti & Sobel, 2012, p. 13). Librarians are coming to the conclusion that they need to teach discovery tools. Library literature clearly indicates that discovery tools are having a significant impact on library instruction and will continue to do so. Discovery tools are no longer completely new, but they still have an aspect of novelty and uncertainty when it comes to integrating the tool into the classroom. Librarians have expressed

concerns about the best way to teach the use of this tool. Promising practices can provide guidance.

Determine the relevancy of the tool to your class. The course content and level of the class should be the determining factors whether to introduce discovery tool to students. Respondents noted that some disciplines such as nursing or business are not well represented in their discovery tool. For librarians to make this determination, they need a thorough understanding of the tool.

Develop a strategy for introducing the tool. This concept is important for both students and librarians and will take different forms depending on the audience. Students must understand how a discovery tool works in order to determine whether it is the best resource to use in a research situation. In some cases, librarians have found that letting students discover this for themselves has been helpful; in other cases, librarians prefer to present the information up front.

Engage students in active learning. Librarians continue to struggle with how to make instruction sessions active, given the short time frame allotted. The incorporation of discovery tools in their instruction offerings has not changed that reality. Active learning has proven to be an effective practice in many pedagogical situations, a fact supported by the authors' survey and interview responses and which is proving to be valuable in teaching discovery tools.

Manage information overload. Information overload is one of the biggest complaints about web-scale discovery tools search results; students need to learn coping techniques. Which strategies to choose depends on the student level, assignments,

and topic; but techniques like refining by content type (format) or peer-review and using the advanced search feature to control searching are frequently recommended features.

Use instructional materials that support student learning (not just busy work). Supporting instruction with materials such as handouts, web-based tutorials, or guides that scaffold student searching are essential ingredients, particularly if there is no opportunity for hands-on work in the classroom.

Emphasize the transferability of search skills. Because discovery tools do not cover all information sources, skills that students need to successfully search other library tools (either discovery tools or subject-specific databases) need to be emphasized. Students need to learn transferable skills they can use once they no longer have access to library tools. Those transferable skills include the ability to critically evaluate search results, to formulate a research plan, and to narrow results.

Share successful instructional practices and experiences. The responding librarians rarely formally shared their successful experiences with others through workshops or instruction meetings. In some cases, this had not occurred to them; in others cases, it was only done informally. Librarians should be intentional about creating spaces or venues for sharing successful techniques and experiences on how to overcome instruction challenges.

CONCLUSION

Whether librarians embrace the concept of discovery tools, they are becoming a part of the information literacy landscape that cannot be ignored. Their ease of use and familiar interfaces appeal to users, and it is likely that they will continue to be prominent research tools. There are many questions regarding the benefits and drawbacks of discovery tools. Libraries who have implemented or are hoping to implement these tools soon are looking for the most effective way to teach them. This concern often carries the implication that they must think differently about teaching these new search tools. However, this study revealed that librarians are not teaching these tools in any vastly different fashion than they teach other tools. The list of promising practices the researchers compiled are, in fact, not significantly different from good pedagogical practices used to teach any subject database, catalog, or web search tool. The difference identified thus far is not in the pedagogy but in the emphasis of the library sessions. Early evidence and the results of this study suggest that when teaching discovery tools, librarians are spending more time teaching transferable skills such as evaluating and refining search results and are spending less time teaching skills such as choosing a database and using database mechanics. There is an inherent promise in discovery tools—the promise to improve users' information literacy skills overall because they will learn techniques to effectively search any tool they may encounter in the library and after they no longer have access to library resources.

Because these discovery tools are still relatively new, more research must be conducted to discover if these promising practices are in fact *best* practices. Librarians need to assess current teaching techniques and their impact on users' ability to use the tools to determine:

- whether an actual pedagogical change is necessary,

- if simply shifting the focus of current pedagogical strategies is sufficient, or

- if discovery tools can actually fulfill the promise to improve users' basic information literacy skills.

Throughout continued evaluation and revaluation of teaching practices as the tools develop over time, promising practices may become best practices, and new promising and best practices will emerge.

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