Teaching Outside the Box: ARL Librarians' Integration of the "One-Box" into Student Instruction

Christina Kulp, Cheryl McCain, and Laurie Scrivener

This article reports the results of a survey that targeted reference and instruction librarians who work at libraries that are members of the Association of Research Libraries (ARL). Respondents were asked to indicate whether or not they teach students to use the one-box tool, and why or why not. Based on the responses of the 352 librarians who participated in the study, the researchers found that most reference and instruction librarians at ARL libraries are "teaching outside the box."

The homepages of many academic libraries' websites have Google-like search boxes that allow researchers to search more than one electronic resource at a time. Regardless of the technology behind them (federated search, metasearch, broadcast search, web-scale discovery, and the like), these "one-box" search tools have generated much philosophical discussion, both pro and con, in the library profession. The debate has been well-documented and summarized in the literature.[1]

In general, some believe the one-box provides a familiar and simple tool that serves as a great option for novice researchers, while others maintain that the one-box is not as easy to use or as helpful as some might think and may not promote the development of information literacy skills. Many see both the positive and the negative aspects associated with the one-box. At the same time, the tool itself continues to change as a handful of companies are hard at work improving their technologies to produce a one-box product that libraries will want to buy.

Even as the debate about the appropriate role of the one-box continues, these search tools are being implemented by more and more libraries. It is in this environment that individual reference and instruction librarians must personally consider the pros and cons of the one-box and decide whether or not to integrate it into their instructional opportunities. Their opinions, experiences, and philosophies determine whether or not they promote use of the one-box search tool by including it in their teaching activities.

This article reports the results of a large-scale survey of reference and instruction librarians who work at libraries

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that are members of the Association of Research Libraries (ARL). Survey participants were asked questions regarding their practice (what they do), their reasoning (why they do what they do), and their philosophy (their professional opinion) regarding the one-box search concept. Librarians' thoughts and opinions were explored further through open-ended questions.

Literature Review

The literature was searched for reports of studies that were directly related to instruction and reference librarians' practices, opinions, or philosophies regarding a one-box search tool. Although most articles about such products do not specifically refer to the term or concept of a "one-box," it is apparent from the context and discussions in these articles that the products are presented on libraries' homepages as simple, Google-like search boxes that allow researchers to search more than one database at a time. The authors reviewed over 65 articles on one-box search technologies (federated search, metasearch, broadcast search, web-scale discovery, and so on), finding only three reports of studies that directly address the issue of instruction and reference librarians' practices and philosophies regarding the one-box. A fourth article, although not based on formal research, contains anecdotal examples and librarians' perspectives.

A 2005 study (published in 2007) of librarians in California found that 61 percent of 33 respondents did not teach their library's federated search tool to students, while 21 percent did teach it.[2] The reason most librarians (69%) chose for not teaching the one-box indicated they still preferred to teach the native interfaces of individual databases. Other reasons given for not teaching federated searching included loss of controlled vocabulary and specialized search features, problems with recall and relevancy, lack of time to present another search option during instruction sessions, and their belief that the search results were too confusing to students. Some rejected the notion that libraries need to be more like Google. Of the 33 participants, 21 percent taught the federated search tool as a way to teach information literacy skills to students by pointing out both the positive and negative aspects, and they promoted the search option as a good starting point.

Tang, Hsieh-Yee, and Zhang surveyed 22 library school students and 20 librarians in 2006 about their experiences with and understanding of their library's federated search tool to compare and contrast the responses of the two groups.[3] The study was limited to those affiliated with libraries that were members of the Washington Research Library Consortium. The authors reported that the 19 librarians who participated in the study expressed a general dissatisfaction with the federated search tool, with 74 percent of them reporting that they used it less than once per month. The librarians were asked to indicate how they would integrate the federated search tool into their instructional activities. However, those librarians interviewed were not all reference and instruction librarians and the resulting paper did not directly address their responses. Instead, the authors concluded, "Information literacy on federated searching, as many librarian participants rightfully pointed out, would need to go beyond basic search skills typically taught about individual databases. Searchers will need to take the system limitations into account to conduct effective searches."[4]

The thoughts of six academic librarians and one library science professor on the topic of federated searching were solicited and reported by King in 2008.[5] The main focus of the article was whether federated searching was winning back users from Google. Although not the result of a formal research project, King's article records a few instruction and reference librarians' perspectives on the one-box as a library's response to Google. Their comments articulate several points of the one-box

debate. Four of the interviewees noted the value of offering students a simple, Google-like search option that will help them access the library's resources, while three respondents believed the one-box either sends the wrong message that library research is easy, or fails to make library research easier. Two participants' comments noted, "Not one librarian at my institution teaches WebFeat as part of their one-shot library instruction classes,"[6] and another stated, "I almost always ignore the federated search box."[7] All seven participants noted limitations of the one-box, including concerns about ranking, relevancy, too much junk, and that certain disciplines were not adequately represented.

A recent study by Buck and Mellinger, published in 2011, focused on the perceived impact of a one-box search product on librarians' information literacy instruction.[8] Their survey was sent to instruction librarians at institutions known to have Serials Solutions' Summon, and it was also distributed via two discussion lists. Responses from 74 librarians at academic institutions worldwide indicated that most (86%) were teaching students to use the one-box search tool, but as a supplement to rather than a replacement for other search options. Several who were teaching the one-box were doing so because of its prominence and promotion on their library's website, not because they believed it was the best way for students to search. The authors' conclusion states "most librarians are not viewing Summon as a replacement for other tools, but as a supplement, and they are teaching it in combination with other sources."[9]

The handful of studies listed above represent a small-scale glimpse of attitudes and practices of reference and instruction librarians at a limited number of institutions or with a specific "one-box" product. In addition, they represent only a snapshot in time of a technology that continues to change. No large-scale surveys of academic librarians' practices and opinions, which attempt to include an entire population and cover a range of "one-box" products, have been conducted prior to the present study. The literature review confirmed what Cox noted in his 2009 article about federated searching and the information literacy curriculum: "little has been written on whether any change in teaching has actually occurred, or even how instruction librarians might introduce federated search to their students or successfully integrate it into their curricula."[10] In the present study, the authors endeavored to address the first gap in the literature by determining how instruction and reference librarians at ARL libraries are currently dealing with the one-box when they teach students to use library resources, whether one-on-one or in a classroom setting.

Methodology

Beginning in April 2011, the websites of 113 of the 126 ARL member libraries were examined to locate the e-mail addresses of librarians whose job titles or departmental affiliations indicated that they might provide reference or instruction services to students. Only ARL libraries affiliated with a university and with English-language websites were examined and no medical, veterinary, law, special collection, or government documents libraries were included. Instruction services were defined as teaching "one-shot" library instruction sessions, providing individual research consultations, or serving at a public service desk (Reference, Information, Research Assistance, and others).

An original survey of ten questions was developed by the researchers, and IRB approval of the study was received on July 27, 2011. On October 10, 2011, an e-mail with a link to the survey and a deadline of October 31 was sent out via SurveyMonkey; on October 25, a follow-up e-mail with a survey link was sent to those who had not yet replied. The survey was e-mailed to 1,984 librarians and 480 responses were received, for an initial response rate of 24.2 percent. To ensure that only librarians who actually

instruct students and whose libraries have a Google-like search box on their homepage were included, the first two survey questions related to those criteria and closed the survey to participants who did not meet them. Survey questions 3 through 7 addressed the research inquiry about librarians' practices, reasoning, and philosophy, while questions 8 through 10 asked for standard demographic data. Though gathered, the demographic data was not analyzed for this paper.

In answer to Survey Question 1, regarding whether their library's website had "a Google-like search box (one-box) that allows researchers to type in words and retrieve articles and/or other resources from multiple (3 or more) databases without having to make any type of resource or subject selection," 354 answered affirmatively, 82 answered negatively, and 44 answered that they have a one-box but it is not on the library's homepage. On Survey Question 2, two respondents indicated that their job duties did not include any teaching activities (which disqualified them from completing the remainder of the survey), resulting in a total of 352 study participants and a final response rate of 17.7 percent.

It is important to note that all survey-based research must account for "non-response" bias. The authors' goal was to survey a specific population—ARL reference and instruction librarians—and thus structured the survey and its distribution method to ensure that participants met the study population criteria. However, any survey study can only represent the practice and opinions of those who chose to participate. In addition, this survey only measures librarians' practices based on current "one-box" capabilities and cannot anticipate future practices or technology. This research study was not concerned with the specific mechanisms behind existing one-box products. Users do not know the difference, and whether or not changing technologies might affect librarians' practices is a topic for future study.

Results

Librarians were asked to indicate how they typically do or do not integrate the one-box during one-on-one instruction opportunities and in a classroom setting, and why or why not. Questions fell into three categories: practice, reasoning behind that practice, and overall philosophy.

Practice

The first question about practice (Survey Question 3) asked how the librarian would typically help an individual undergraduate student find scholarly articles on a topic. See table 1 for the survey question, answer options, and results. Out of 346 respondents, 261 (75.4%) indicated that they would direct the student to subject-specific databases or subject guides, while only 32 (9.2%) would direct the student to use the one-box on the homepage. The remaining 53 (15.3%) selected "Other" and commented that their instructional approach would depend on a variety of factors related to the specific situation, such as the student's topic, the level of

TABLE 1
General Practice Regarding Teaching the One-Box to an Undergraduate

Survey Question 3: An undergraduate needs help finding scholarly articles for a research paper. Once you have determined the student's topic, you are most likely going to…

	Percentage	N = 346
Show the student how to locate a subject page or guide, or recommend specific databases.	75.4%	261
Direct the student to the one-box on the library's homepage.	9.2%	32
Other	15.3%	53

information need, the amount of time available, and the student's level of experience. The quotes below represent the most common themes from the comments:

> I'm almost always going to direct them to a subject page or guide or subject-specific databases, but depending on the question, I may show them Summon as one more tool in their arsenal. I never send them just to that source alone.

> Depends on the topic and level of information needed—sometimes our one-box will do the job adequately, often (probably more often than not) I am aware of special features and/or content of individual databases that will give better focused results for the student's needs.

> 1) First, direct the student to the one-box (if they have not already gone there), look at the results, then 2) Show the student a research guide and/or subject-specific database, then 3) Look at everything we've found and consider the next steps. The "one-box" might be the first step, but not the only one.

The second question about practice (Survey Question 4) asked whether or not librarians typically incorporate the one-box when teaching "one-shot" library instruction classes. See Table 2 for the survey question, answer options, and results. Of the 324 responses, 194 (59.8%) indicated that they rarely (131, 40.4%) or never (63, 19.4%) teach the one-box, while 130 (40.1%) indicated that they always (46, 14.2%) or often (84, 25.9%) teach students how to use the one-box. Supplementary comments provided by 117 respondents highlighted a wide range of factors that go into their decisions. For example, inappropriateness for certain subject disciplines or issues with the technology were given as reasons not to teach the one-box, while other respondents noted that they do teach it in specific situations but often teach the one-box along with databases:

> It depends on the discipline. My discipline is chemistry, and google-style search boxes are next to useless in that subject, so I generally either ignore the option or advise against using it.

> I have had FAR TOO MANY complaints from students and faculty that the one box option yields overwhelming results. In fact, faculty always ask me to focus on the databases that are specific to their disciplines when instructing their students.

> Well, I do any of these depending upon their discipline, major, and specific subject/topic that they are researching. For a freshman comp class, I always teach students how to use the one-box. For a junior

TABLE 2
General Practice Regarding Teaching the One-Box during Library Instruction Classes

Survey Question 4: When you teach "one-shot" library instruction classes, how do you incorporate the one-box on the library's homepage into the sessions?

Answer	Percentage	N = 324
I always teach students how to use the one-box.	14.2%	46
I often teach students how to use the one-box.	25.9%	84
I rarely teach students how to use the one-box.	40.4%	131
I never teach students how to use the one-box.	19.4%	63

level English lit class, I briefly mention the box. For nursing students, I advise them to avoid the box in favor of individual article databases. However, I never avoid the one-box option.

Reasoning

Those who teach the one-box in any setting were asked to indicate their reasons for doing so (Survey Question 5). See table 3 for the survey question, answer options, and results. The response choices were those most often noted in the literature or that the researchers were aware of, and respondents could select multiple options from the list. An "Other" response box was included to capture reasons not listed as choices. Of the 202 respondents who selected options from the provided list (those who did not select from the list or only gave an "Other" response were not included in the numerical analysis), the three most often selected reasons for teaching the one-box were "it's a good way to get students to use the library's resources" (107, 53%), "the one-box makes library research more intuitive to Google users" (95, 47%), and "it provides 'good enough' results" (94, 46.5%). This indicates that most librarians who teach the one-box see it as an opportunity to encourage student use of the library in a way that meets students' experiences and expectations. The only unanticipated choice provided in the "Other" option, noted by 13 librarians, was that they must teach the one-box because it is the only access point to their library's catalog.

In addition to selecting from the list provided, 132 respondents wrote supplementary comments on why they teach the one-box. As a whole, the comments revealed that the decision to teach the one-

TABLE 3
Reasons for Teaching the One-Box

Survey Question 5: During library instruction sessions or one-on-one consultations in any setting, if you ever teach students to use the one-box on the library's homepage, what are your reasons for doing so? Select all that apply.

	Percentage	n = 202
It's a good way to get students to use the library's resources.	53.0%	107
The one-box makes library research more intuitive to Google users.	47.0%	95
It provides "good enough" results.	46.5%	94
The one-box is what students want.	38.6%	78
My library's search product is effective.	37.6%	76
Having to select a subject or specific database is too complicated for some students.	30.7%	62
The students or instructor asked me to.	22.8%	46
If library research isn't easy, students will give up and search elsewhere.	20.3%	41
There isn't enough time to introduce specific databases.	17.3%	35
It promotes the development of information literacy skills.	16.8%	34
I am required to teach it.	5.9%	12

NOTE: This table shows the responses where something was selected from the provided list. Respondents who indicated they "Never teach the one-box" or only provided an open-ended "Other" comment were not included in the above count.

box is not necessarily a reflection of one's opinion of the one-box search concept or the technology, but rather a practical choice: because it is there, students need to be taught its strengths and weaknesses, and in some situations it can provide a good starting point:

> Because it is right there on the homepage; even if it isn't the best search tool we can't ignore it and pretend it doesn't exist.
>
> It's often the best starting point for multi-disciplinary questions, or for questions where it's difficult to determine which database would be best. It can be very helpful in getting a student started.
>
> The product we use works well, and part of the learning process is helping students understand the strengths and weaknesses of various tools—both available through the library and through the free internet. There is not 'one box to rule them all'.

Librarians who do not teach the one-box were asked to indicate their reasons for not doing so (Survey Question 6). See table 4 for the survey question, answer options, and results. The options listed to choose from mirrored those from the previous question. Respondents could select multiple choices, and an "Other" box was included to capture reasons not listed. Again, those who did not select from the list or only gave an "Other" response were not included in the numerical analysis. The majority of librarians, 269 out of 300 (89.7%), selected "subject-specific databases are more appropriate" as one of their reasons for not teaching the one-box. The next three most often selected reasons for not teaching the one-box were "search results are confusing to students"

TABLE 4
Reasons for Not Teaching the One-Box

Survey Question 6: During library instruction sessions or one-on-one consultations in any setting, when you do NOT teach students to use the one-box on the library's homepage, what are your reasons? Select all that apply.

	Percentage	n = 300
Subject-specific databases are more appropriate.	89.7%	269
Search results are confusing to students.	52.0%	156
My library's search product is ineffective due to technical and/or implementation issues.	33.7%	101
It does not promote the development of information literacy skills.	32.7%	98
Search results are not "good enough" for an academic setting.	28.7%	86
It reinforces poor searching habits.	27.7%	83
It makes research more difficult for inexperienced users.	26.3%	79
The one-box gives a false impression that library research is easy.	22.7%	68
There is not enough time to cover both the one-box and individual databases.	20.3%	61

NOTE: This table shows the responses where something was selected from the provided list. Respondents who indicated they "Always teach the one-box" or only provided an open-ended "Other" comment were not included in the above count.

(156, 52%), "my library's search product is ineffective due to technical and/or implementation issues" (101, 33.7%), and "it does not promote the development of information literacy skills" (98, 32.7%).

Comments provided in the "Other" box by 75 respondents added specific details for the reasons selected, primarily discipline-related reasons (some subjects, such as business, music, and engineering, are not served well by the one-box) and issues related to information literacy:

> If students get used to relying on it, they'll miss other resources on the assumption that "everything" is included in the one-box. Also, full-text and index databases are thrown in together, skewing results, and students don't understand the difference.

> I wouldn't say it reinforces poor searching habits, but it doesn't encourage good searching habits. It is also very easy for students to be overwhelmed with the results.

> I am a Business subject specialist. The majority of my patrons' needs are not for books or articles, which are the kinds of resources a one-box is intended to address. Instead, the resources my students need are specialized and data heavy. Such sources never have been included in attempts to create federated search tools, and I don't know that they ever will.

Philosophy

The last survey question was open-ended, asking: "What is your opinion or philosophy regarding the presence of a Google-like one-box on an ARL library website's homepage?" Of the 352 survey participants, 282 (80%) chose to respond to this question, resulting in a great deal of feedback. To categorize each of the comments contained in the responses as objectively as possible, the three researchers met to review and discuss each one, coming to a consensus on how to categorize each statement. Many of the responses contained multiple statements; in some cases, a single comment expressed both positive and negative views.

From the 282 responses, a total of 465 separate statements or concepts regarding the one-box search option were identified and categorized; 94 (20.2%) were considered positive, 127 (27.3%) were neutral or ambivalent, and 244 (52.5%) were deemed negative. Responses were also categorized by content, and the analysis revealed several recurring themes that provide valuable insights into what instruction and reference librarians at ARL institutions think about the one-box concept.

Most of the positive opinions or philosophies expressed in the responses focused on how the one-box can be a good option for novice researchers, like undergraduates, and encourage their use of the library's resources:

> Love it…If we can give them one thing that is easy to use and works fairly well, then we have their attention and they will come back to the library and the library staff.

> At least it can get people into the resources. Sometimes it is a really smart way to search, or if used as a discovery tool. And not all library users in an ARL library have to do hard-core research. I think it is better to give people options as long as somewhere along the way they realize the pros and cons/limitations of all the options.

> This is a good option for many students. It gets them started on library research. No matter what we do some students will be frustrated or confused as they learn to do research. Having a simple first step will be helpful to some, in mindset if nothing else.

Respondents whose opinions or philosophies were categorized as neutral or ambivalent do see great validity and value in the one-box concept, but they expressed reservations about the technology:

> I am ambivalent about the search box. I am not crazy about how much can be missed and what is or isn't included. However, it can be a good starting point for an undergraduate who is not [experienced] in library research, and doesn't know where else to start.

> Philosophically, I like the idea of one-stop shopping for students. A lot. In actuality, they rarely seem to live up to expectations given the plethora of issues related to combining search results from many different search interfaces into one manageable and understandable results list. I think the interface we use has a long way to go to being user friendly.

> I think an all-in-one search is a valuable tool, but it should not be promoted as a first choice. It is not as effective as looking at discipline-specific databases, and the fact that it does not cover absolutely everything is not made explicit to the user. Therefore, while I think it's important for our institutions to invest in these products, I don't agree with putting the search box prominently on the library home page.

Most of the negative comments expressed dissatisfaction with the one-box search technologies, such as: subject databases and the catalog work better, the number of search results are overwhelming or the way results are displayed is confusing, there is a lack of transparency regarding what is or is not being searched, and the poor quality of search results. Also mentioned frequently were issues with one-box product selection or implementation at their specific institution, negative effects on information literacy, and doubts that the one-box can really meet all the hype:

> The problem with a one-box is that it masks the enormous complexity of the information that lies underneath and the factors that determine why something will or will not be retrieved. Also, it presents the false impression that research is "easy," ignoring the fact that database searching requires some measure of skill that exceeds the capacity of what we assume to be "intuitive." In short, it "flattens" the world to an unrealistic, untrue degree.

> It is very misleading to users. They will go to whatever they think is quick and easy, rather than what is best—and not know the difference. Users may think the one-box is searching everything that exists on a topic, when it is not. Users may not know that it may not [be] searching the most relevant subject databases for their particular search. Technical constraints sometimes lead to misleading or incomplete holdings data.

> Fast Food Scholarship, with no nutrition. Decision-making by IT people and managers who are remote from the research process, and want to keep up with other libraries.

> At our institution we cater to the undergraduate because of their large numbers. But the one-box only inhibits serious research by distracting from more effective tools. Federated search is the Holy Grail of the library world—something that everyone is searching for, but it remains in the realm of myth. It can never fully deliver on its promise to deliver an all-in-one

search tool. Promoting it as such is akin to claiming that the [Internet] has everything and it's all free.

Discussion and Conclusion

When examined overall, the current study reveals that reference and instruction librarians still overwhelmingly prefer to teach the native database interfaces over their institution's one-box product. At the reference desk, 74.5 percent of the participants in this study still start with subject-specific databases. In the classroom, there is a 60/40 split between those who rarely or never teach the one-box versus those who often or always teach it. When asked to indicate their primary reason for not teaching the one-box, 89.7 percent of survey participants stated that subject-specific databases are more appropriate. Another interesting point raised by the open commentary revealed that librarians have practical reasons for deciding whether or not to teach the one-box, in addition to philosophical reasons. Those who do teach the one-box overwhelmingly focus on novice, undergraduate researchers and multidisciplinary topics. However, even these librarians pointed out limitations to current one-box technologies. In fact, many teach the one-box to expose its flaws to students who are most likely to use the one-box to make them informed users.

This study focused on librarians' practices rather than students' perceptions or search behaviors. Libraries invest great amounts of time and money into one-box products, yet most of the 352 ARL instruction and reference librarians who participated in this survey are not teaching students to use their library's one-box search tool. ARL reference and instruction librarians are on the "front-lines" of the library and are the main segment of librarians who deal directly with students. They are hired to be research and resource experts for faculty and students. Thus their observations of one-box limitations should be weighted significantly compared to user studies that focus on inexperienced undergraduates who are often conducting their first foray into academic level research. When one-box technologies can meet the expectations of both experienced professionals who teach research skills and the user preferences of students, it will ensure that ARL libraries are spending their money effectively.

While this study has identified that most ARL reference and instruction librarians are not teaching their one-box product, there are still many more questions that could be addressed by future research. For instance, does the specific product influence librarians' perceptions? Several librarians in this study noted implementation conflicts at their institutions, so could this play a significant role in either negative or positive opinions about the one-box? Are technological complaints decreasing or disappearing as newer products emerge? In addition, with regard to one-box product usability, one key user group seems to be understudied: faculty and advanced researchers. Are students who use the one-box for their research meeting their professors' expectations? It is not enough to determine whether students are getting what they *think* they want. Research needs to be conducted to determine whether one-box products benefit undergraduate research or undermine it.

By placing swiftly changing one-box technologies prominently on a library's homepage without addressing limitations such as those repeatedly noted by reference and instruction librarians in this and other studies, ARL libraries are potentially biasing an entire generation of researchers with a false promise that research can be "one-stop." The siren song of technology has failed libraries before, which raises the most important research question concerning one-box technology: Is an effective "one-box" for academic level research truly attainable? Subject disciplines are each inherently different from one another, using unique vocabularies, types of data, research methodologies, and ways of organizing

knowledge. Given such parameters, can one search tool ever be THE search tool for everyone?

This study does not solve the one-box debate, but it does highlight the fact that significant obstacles remain for many ARL reference and instruction librarians. At this time, even many of those who do teach the one-box see it as a limited and flawed product that benefits primarily undergraduates and some interdisciplinary topics. In addition, many specialized librarians openly discourage researchers in certain subject disciplines from using it. As long as students' needs seem to be met better by other research tools, ARL instruction and reference librarians most likely will continue teaching outside the box.

Notes

1. See, for example, William Baer, "Federated Searching Friend or Foe?" *College & Research Libraries News* 65, no. 9 (Oct. 2004): 518–19; John Boyd, Marian Hampton, Patricia Morrison, Penny Pugh, and Frank Cervone, "The One-Box Challenge: Providing a Federated Search That Benefits the Research Process," *Serials Review* 32, no. 4 (Dec. 2006); 247–54; Charles Lockwook and Patricia MacDonald, "Implementation of a Federated Search System in the Academic Library: Lessons Learned," *Internet Reference Services Quarterly* 12, no. 1–2 (2007): 73–91; Dennis Warren, "Lost in Translation: The Reality of Federated Searching," *Australian Academic & Research Libraries* 38, no. 4 (Dec. 2007): 258–69; Christopher Cox, "Integrating Federated Searching into Your Information Literacy Curriculum: A How-To Guide," *College & Undergraduate Libraries* 16, no. 4 (2009): 311–21; Nicholas Joint, "The One-stop Shop Search Engine: A Transformational Library Technology? ANTAEUS," *Library Review* 59, no. 4 (2010): 240–48.

2. Lynn D. Lampert and Katherine S. Dabbour, "Librarian Perspectives on Teaching Metasearch and Federated Search Technologies," *Internet Reference Services Quarterly* 12, no. 3–4 (2007): 253–78.

3. Rong Tang, Ingrid Hsieh-Yee, and Shanyun Zhang, "User Perceptions of MetaLib Combined Search: An Investigation of How Users Make Sense of Federated Searching," *Internet Reference Services Quarterly* 12, no. 1–2 (2007): 211–36.

4. Ibid., 232.

5. Douglas King, "Many Libraries Have Gone to Federated Searching to Win Users Back from Google. Is It Working?" *Journal of Electronic Resources Librarianship* 20, no. 4 (2008): 213–27.

6. Ibid., 217.

7. Ibid., 221.

8. Stefanie Buck and Margaret Mellinger, "The Impact of Serial Solutions' Summon™ on Information Literacy Instruction: Librarian Perceptions," *Internet Reference Services Quarterly* 16, no. 4 (2011): 159–81.

9. Ibid., 177.

10. Cox, "Integrating Federated Searching," 312.