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Discovery Tools in the Classroom: A Usability Study and Implications for Information Literacy Instruction

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ABSTRACT

In 2016, the University of Colorado Colorado Springs (UCCS) library acquired ProQuest's discovery tool Summon. To determine when information literacy instruction using Summon would be effective and what aspects should be taught, librarians conducted a usability study. Students completed tasks focused on determining whether Summon is intuitive and whether the interface needs to be taught. Results indicate that students are comfortable with the interface and have few problems with the tool. Instead, participants struggled with critical thinking processes associated with research. Results were used to integrate the *ACRL Framework for Information Literacy for Higher Education* into instruction.

KEYWORDS

Discovery tools; information literacy; instruction; Summon; usability; ACRL Framework

Introduction

As web scale discovery tools become a staple resource in libraries due to student demands for more intuitive searching options than what traditional databases and catalogs offer, librarians are confronted with their own misgivings about discovery tools and technology's place in the research process. Librarians must decide whether or not to incorporate discovery tools into information literacy instruction, how they should be taught, and what best practices are for developing information literacy skills in undergraduate students.

Librarians at the Kraemer Family Library at the University of Colorado Colorado Springs (UCCS) asked similar questions when it was announced that Summon was going to be implemented as the primary search box on the library homepage. Instruction librarians had to resolve the question of how to integrate Summon with our information literacy instruction program. At the UCCS, the progression for traditional four-year undergraduate students includes first-year student orientation, second-semester English Writing Program, and certain discipline-specific senior thesis courses.

Information literacy is delivered through classroom instruction, individual consultations, and online tutorials. With the introduction of Summon as the primary search tool for the library, we needed to decide what courses and which student groups would benefit the most from Summon, and what the best practices would be for teaching it. We hoped that the transition would provide an opportunity to develop new activities for instruction with Summon and would allow us to update our instructional outcomes to align with the ACRL *Framework for Information Literacy for Higher Education*.

We decided the best course of action for decision-making was to conduct a usability study. Librarians typically conduct usability studies to aid in decision-making related to the design and layout of a website or to help decide between systems for purchasing. Our goal was to guide the development of best practices for teaching Summon.

Literature review

It is commonly understood that users want library search interfaces that are simple to use and that make resources easy to access, especially as commercial internet search engines like Google have simplified searching the open web. The user demand for simplified searching has impacted the systems that libraries choose to implement to consolidate traditional search tools, like the catalog and individual database searches. Even with simplified search tools, librarians are still working to ensure that users develop the necessary information literacy skills to understand the research process.

An early move towards simplified library search tools was federated searching, which attempted to streamline the discovery process by allowing users to search multiple databases from a single search box, but each database was still searched individually which limited functionality. Thomsett-Scott and Reese (2012) identified multiple functionality issues that plagued federated searching, like slow response times and an inability to limit results, and Lampert and Dabbour (2007) found that those issues, along with librarian concerns about the lack of a controlled vocabulary and comprehensive searching across all library resources, meant that most librarians did not teach federated searching. Federated searching could not match demands for easy-to-use tools or generate enough confidence to be included in library instruction.

Discovery tools attempt to address the problems of federated searching by further simplifying how library resources are searched. Thomsett-Scott and Reese define discovery tools as products that “offer a single point of access utilizing a centralized consolidated index that combines library catalogs, e-journals, databases, and Web-based resources, as well as digital archives” (2012, 127). There are a number of these tools available today, including commercial and open source products like ProQuest Summon,

EBSCO Discovery, ExLibris Primo, VuFind, and Blacklight. **Discovery tools claim to have simple designs that are intuitive for users by creating a Google-like experience for libraries.** While discovery tools are seen as an improvement, there are mixed reviews about how to best utilize them for instruction and if they are beneficial for students.

Numerous studies have been conducted that assess librarians' opinions about discovery tools in instruction. Howard and Weibrands (2011) found that patron response was overwhelmingly positive, but librarians had generally negative responses due to concerns about what is included in the index, dumbing down the search process, and the amount of work required to modify instruction for the tools. Kulp, McCain, and Scrivener's (2014) survey found that over fifty percent of librarians rarely or never taught students how to use discovery tools in one-shot instruction because of patron complaints about too many results and librarian perceptions that the tools were not appropriate for certain disciplines. These studies demonstrated how librarian reluctance with new discovery tools impacted if instruction was provided for patrons.

In libraries where discovery tools became the primary homepage search box and students responded positively to the change, studies revealed librarians were more willing to integrate them into instruction. Buck and Mellinger's (2011) survey found that many librarians integrated Summon into instruction based on factors like discipline, course level, and the content included in the tool. Of those who taught Summon, the majority taught it to lower-division undergraduates or in courses that had a variety of research areas. Buck and Steffy (2013) later identified promising practices from librarians who taught discovery tools, mainly that they should be taught in lower-division courses that have an in-person instruction session focused on researching general, non-discipline specific topics. Fawley and Krysak's survey discovered that the majority of librarians used discovery tools in instruction because they "are a good starting point for research and the tools search many different formats" and created an entry point for academic research (2014, p. 289). Most recently, Nichols, Crist, Sherriff, and Allison (2017) found that librarians typically used discovery tools for the broad search functions they provide. Best practices are being identified and shared, but little has been published about how to best address the weaknesses of discovery tools and align their use with information literacy standards.

Usability studies with discovery tools have started the conversation about what aspects of the tools students struggle with while doing academic research, which can help inform instructional practices. Asher, Duke, and Wilson (2013) found that regardless of the discovery tool, **users were overwhelmed by the number of results that searches retrieved.** Comeaux (2012), Gross and Sheridan (2011), and Nichols, Billey, Spitzform, Stokes, and

Tran (2014) all detected that users had a hard time distinguishing different resource formats and struggled with interpreting records. Another significant issue that multiple studies identified was with accessing full text (Dalal, Kimura, & Hofmann, 2015; Hanrath & Kottman, 2015). Users had difficulty navigating the different systems that were all integrated into one tool. However, Comeaux (2012) and Nichols et al. (2014) found that users were able to quickly learn how to use different features of the tools and implemented what they had learned faster with each subsequent task. While the tools are learnable, some aspects of using discovery tools for research still require instruction.

As with any tool in an instructional setting, it is important to consider how to provide instruction that aligns with information literacy standards, such as ACRL's *Framework for Information Literacy for Higher Education* (*Framework*). At the time of writing, there is no formal literature available that discusses the use of discovery tools in support of the knowledge practices and dispositions of the *Framework*. However, there is a limited body of literature that proposed some benefits of using discovery tools to teach the previous *Information Literacy Competency Standards for Higher Education* (*Standards*) from ACRL. Azadbakht and Polacek (2015) and Rose-Wiles and Hofmann (2013) both agree that teaching students to use discovery tools is beneficial for building search skills that are transferable outside of academic research, which is an outcome mentioned in both the *Standards* and the *Framework*. While librarians are still becoming comfortable with discovery tools, there are promising practices for integrating them into instruction. First, we must understand what needs to be taught, what student groups need this instruction, and how to best utilize discovery tools to align information literacy instruction with the *Framework*.

Methodology

The purpose of this usability study was to determine the intuitiveness of Summon for research and whether library instruction should focus on teaching students the Summon interface; critical thinking skills such as keyword development, search strategies, and source evaluation with limited interface training; or a combination of traditional databases and Summon. A mixed methods study was conducted at the UCCS. UCCS has an FTE of more than 12,000 students, including 10,400 undergraduates and 1,800 graduate students as of 2017. The study was specifically designed to answer the following questions:

- How intuitive is Summon?
- How learnable is Summon?
- Does the Summon interface need to be taught to undergraduate students? If so, what do we need to teach about it?

Data collection methods included pre- and post-surveys to collect demographic information and feedback about the five tasks of the usability testing. The tasks simulated common scenarios encountered during library instruction.

We recruited all nine participants via messages to the campus student email listserv. From the pool of respondents, we recruited five first-year students, one sophomore, three seniors, and a graduate student. We based our optimal participant numbers on Nielsen's (2012) recommendation that using at least five participants will identify the majority of usability problems. We provided participants with a 10-dollar gift card for use at the UCCS dining facilities as an incentive for participation. Participants signed a consent form prior to participating in the study.

All usability sessions were conducted in the lead researcher's office and recorded using TechSmith's Camtasia software, Okemos, MI. The lead researcher facilitated the sessions while the other researcher acted as observer and note taker. Participants were instructed to use a think-aloud protocol to narrate their thought process as they completed each task. Having participants talk aloud as they completed the task portion of the study allowed us to hear their thought processes as they developed search strategies, reviewed search results, and navigated the interface.

The usability study consisted of five tasks that were intended to demonstrate whether Summon is intuitive and learnable. The first four tasks were basic searching tasks that included locating known items and using the interface provided tools, such as email and citations. These tasks were intended to be completed in two minutes or less. The fifth task asked participants to research one of two topics. The topic research task was intended to be completed in less than five minutes if appropriate facets and limiters were used. The full scripts and questions for each task are located in [Appendix B](#).

Before each session, the lead researcher read a brief script that explained the purpose of the study and reminded the participant that the goal was to test the functionality of Summon, not research abilities – a statement intended to put students at ease and alleviate any anxiety. Participants completed a pre-study survey with questions about demographics, previous library usage and instruction, use of Summon prior to the study, and confidence using library resources (see [Appendix A](#)).

After the pre-study survey, participants were guided to Summon's basic search screen. The lead researcher read each task aloud and provided a written copy of the instructions. After completing each task, the participant was asked to verbally rate the difficulty of the task on a five-point Likert scale (see [Appendix B](#)). The lead researcher then directed the participant back to the basic search screen to begin the next task.

After completing all five tasks, participants filled out a post-study survey that asked them to describe what Summon does, rate their experience with the difficulty level of using Summon for research, rate how they liked using Summon compared to the library's OPAC (online public access catalog) and common databases, and rate how confident they felt using Summon for known title searches and topic research. Both surveys were administered using SurveyMonkey. The pre- and post-surveys are provided in [Appendix A](#).

Results

Participant demographics

Participants included four first-year students, one sophomore, three seniors, and one graduate student. Most participants were familiar with the library's resources and had used at least some of them prior to the study. Only one, a first-year student, had never used the library's OPAC or any subscription databases before. However, none of the participants reported having used Summon before. These results were unsurprising since **Summon was a new service at the library and was not integrated into the website as the primary search box until after our study was completed.**

In the pre-study survey, we asked participants if they had ever received formal library instruction at UCCS and only two reported they had. Although library instruction is fully integrated into the English Writing Program, seven of the participants had not taken the second-semester English class where library instruction is provided. Given that the study was conducted in the summer and fall, it is unsurprising that the four first-year students had not yet taken the class, as they would not take it until the following spring. Of the remaining three participants who had not received library instruction at UCCS, it is possible they were transfer students who had already completed their English requirements before coming to the university. When we compared the performance of the two students who had received library instruction with the seven who had not, we noted that they performed consistently better on each task (see [Figure 1](#)).

Known item searches

Overall, participants performed well when using Summon to locate known items in the library's collection. All nine participants completed Task 1 and Task 3 – which asked participants to conduct known item searches – in under two minutes. For Task 1, eight of the nine participants searched for the title of the book only, with one participant searching for the title and author. Only two of the nine participants used Summon's Book/eBook

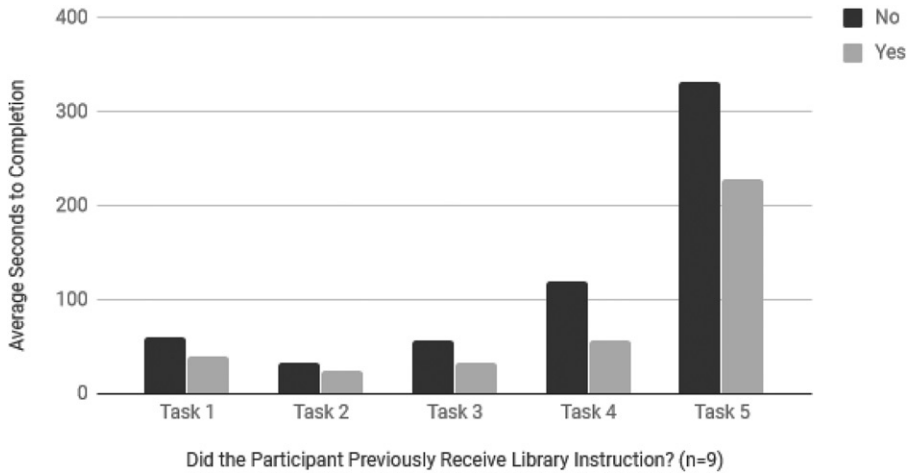


Figure 1. Performance of participants who previously received library instruction vs. those who had not.

Content Type facet to restrict their results to books, but this did not hamper or improve their ability to locate the item since it appears first in the results list when searching for the title.

Participants performed similarly on Task 3, with one key exception: only two of participants used the Content Type facet to complete Task 1, whereas seven participants used it for Task 3. We attribute this to the students' increased familiarity with Summon after completing the first two tasks. Task 2, which asked participants to identify the number of books and eBooks in the library's collection about "cyberbullying," was specifically designed to test whether or not students noticed the Content Type facet. It was unsurprising, then, to see them employing it in the subsequent task. Indeed, every participant used the Content Type facet while completing Task 2, though it took varying amounts of time for them to select it (see Figure 2). Participants who used it during Task 1 took an average of three seconds to select it during Task 2, whereas those who did not use the facet during Task 1 took an average of 44 seconds to select it during Task 2. Once they noticed it, participants made greater use of the Content Type facet throughout the rest of the tasks, demonstrating the overall learnability of Summon.

Although all nine participants completed Task 3 in less than three minutes, three of them rated this task as "difficult," despite its similarity to Task 1. The difficulty noted was Summon's requirement that users click "More" under the Content Type facet to reveal the "Video Recordings" option and then "Apply" to enable it (see Figure 3). These participants initially failed to notice the "Apply" button and were confused as to why their search results did not update to limit to video recordings. Our own librarians have been frustrated by the "Apply" button, so we were not surprised to see that it was a source of confusion for students too.

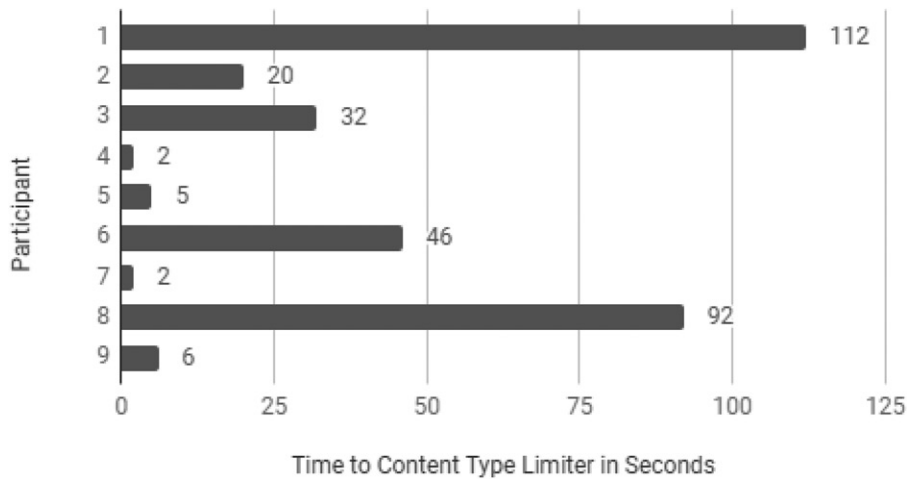


Figure 2. Time to content type limiter in seconds, Task 2.

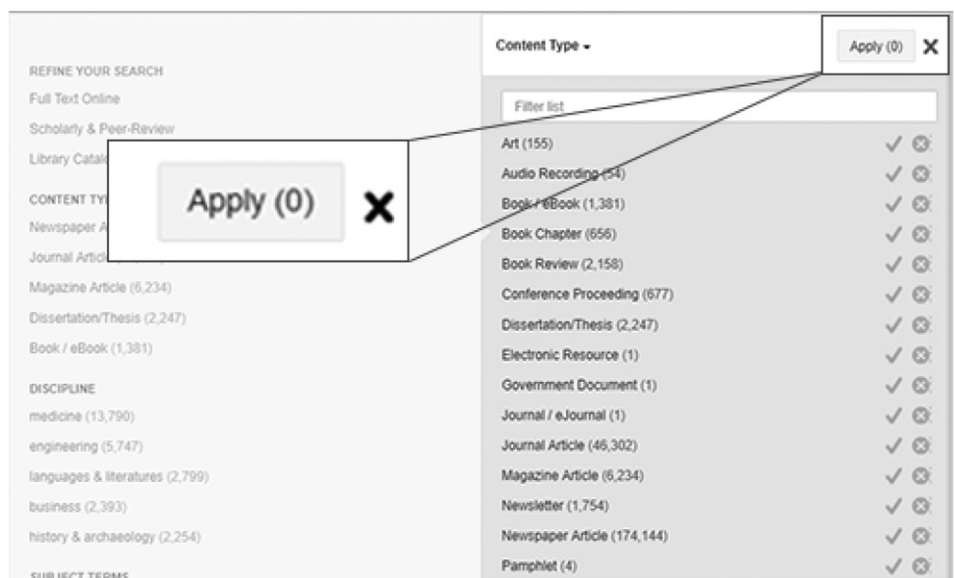


Figure 3. Summon's apply button for content type limiter.

Results were mixed with Task 4, which asked participants to find a known journal article, access the full text, and email and cite the article. While six participants completed the task in less than two minutes, three participants took longer, with one taking more than six minutes. The participants all located the correct article in less than 10 seconds, where many struggled was in locating Summon's built-in citation feature. Three of the participants took more than a minute to find it and one participant took more than four minutes. Participant 1 tried a variety of Summon's facets (including Subject Terms, Content Type, and Discipline) in their search for the citation and then unsuccessfully tried searching for the author's name

and “MLA.” Finally, the participant returned to the original result and located the “cite” button. Participants did not experience the same difficulty locating Summon’s “email” button, most likely because it is located next to the “cite” button.

Topic research

The most dramatic differences in performance occurred with Task 5, which required participants to locate two journal articles published in the last five years about a research topic. Completion times varied from 68 seconds to 16 minutes (see Figure 4). Participants employed a range of search strategies with differing levels of success. Participants who completed the task the fastest used a straightforward approach, performing a simple keyword search that included the main concepts of the research topic, then filtering the results using the “journal article” Content Type facet, and setting the publication range to “last five years.”

Participants who had difficulty with this task struggled with keyword development. Participant 6 simply searched for “Facebook romance” and Participant 8 searched for “social media and relationships.” Both omitted the “college students” aspect of the research topic. Additionally, the least successful participants used Summon’s facets ineffectively. Participant 1, who took more than 16 minutes to complete the task, did not use the Content Type and Publication Date facets, so the results included a variety of publication types as well as items older than five years. Participant 1 repeatedly expressed that there were “too many out of date results” but never noticed the Publication Date facet. Participant 9 used the journal article Content Type facet but not the Publication Date facet. Participant 9

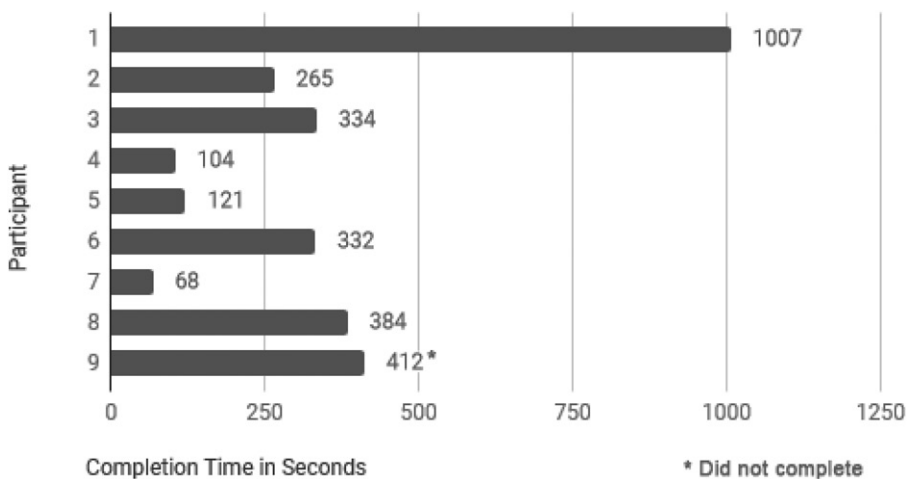


Figure 4. Completion time in seconds, Task 5.

ultimately gave up after the eight-minute mark due to their inability to find a second article published in the last five years.

We noticed several interesting trends in the relative success of participants in completing Task 5. The two participants who previously received library instruction completed the task the quickest, finishing in a median time of less than three minutes versus more than five minutes for those who had not had instruction. Additionally, the participant who self-identified as “confident” in using library resources performed Task 5 in a minute, while the six participants who felt “somewhat confident” took an average time of 5 minutes, and the two “neutral” participants took an average of more than 11 minutes.

Most interesting were the participants’ responses to the post-survey question that asked them to rate their confidence in their “ability to use Summon to research a topic.” Despite many participants struggling with Task 5, seven of the participants said they were “confident” in their ability to research a topic using Summon and two said they were “somewhat confident.” Their actual performance on this task suggests that most participants were overconfident in their abilities, findings which mirror the results of other studies (Angell & Kose, 2015; Black & Krawczyk, 2017; Molteni & Chan, 2015). Indeed, it is interesting to compare the participants’ answers to the post-study survey question that asked them to rate how confident they felt using Summon to “research a topic” with how difficult they found Task 5. The majority of the participants found Task 5 difficult. Four participants rated the task as “difficult,” one rated it as “very difficult,” two rated it as “easy,” one as “very easy,” and one as “neutral.” The discrepancy between their answers regarding the difficulty of Task 5 and the post-survey question about their confidence in using Summon for topic research suggests that they may not have realized they were conducting topic-based research in Task 5.

Relevance of sources found

When evaluating Task 5, it is also important to consider the relevance of articles that participants identified for their given research topics. In analyzing the articles selected by participants, only 11 of the 17 total articles found were relevant to the given research topic – and one of these 11 articles, despite being relevant to the topic, was older than the five-year or newer requirement specified in the task. The remaining five articles were ultimately irrelevant to the given topic.

For instance, Participant 2 located a 2014 journal article titled “Controlling Parents Survey: Measuring the influence of parental control on personal development in college students” and identified it as relevant to the

topic of how parents affect the romantic relationships of college students. From the title alone, one can see how this article might sound tangentially relevant to the topic, since it addresses parental influence on college students. However, the abstract makes clear that the influence in question relates to academic performance and personal well-being in college students, not romantic relationships. The participant stated that they selected this article by title alone because “it talks about parental influence on college students” and did not consider the abstract in making their selection.

Similarly, Participant 3 identified an article titled “The unique role of parents and romantic partners on college students’ financial attitudes and behaviors” as being relevant to the assigned research topic. However, the abstract makes clear that the article discusses how parents and romantic partners influence college students’ attitudes toward money and personal finance, and does not comment on parental influence on college students’ romantic relationships. Again, the participant selected this article on title alone. The student stated that they felt the article would work, but that they “would have to read the whole article to know what [the article] was really about to be sure.” The participant noticed the abstract and subject headings below the article’s title in Summon’s search results, but did not seem to consider them in deciding relevancy.

The problems participants encountered with Task 5 were two-fold: first, those that struggled with the task had difficulty constructing keyword search queries appropriate to the provided research topic. Then, once they arrived at a list of results in Summon, they had problems selecting articles relevant to the research topic. These difficulties had less to do with the design and layout of the Summon interface, and more to do with participants’ relative abilities to formulate appropriate keywords and critically evaluate search results.

Implications for instruction and the ACRL framework

From the results of the tasks, a few things about Summon became apparent, many of which confirm previous research on how students search and utilize discovery tools. First, other than a few interface functions, few participants had issues locating and utilizing tools within Summon. Dempsey and Valenti confirm this finding when they noticed that “students will most likely use a limiter or facet” that will help the student meet the assignment requirements, especially if it is emphasized by librarians presumably during instruction (2016, p. 205). Our findings support that observation but also acknowledge that even if participants struggled to locate a tool or feature within Summon, once they found it, they were faster to utilize that tool in subsequent tasks.

Second, we found that participants intuitively knew how to use Summon's single search bar and did not struggle with constructing searches that retrieved the appropriate record when searching for known items or basic research topics. Meadow and Meadow specifically found that "the single search box model of discovery is sufficient for most students" and that "most search queries are legitimate" (2012, p. 171). Many other usability studies agreed that participants intuitively knew how to start a search because of experience with commercial search tools (Bull, Craft, & Dodds, 2014; Cardwell, Lux, & Snyder, 2012; Fagan, Mandernach, Nelson, Paulo, & Saunders, 2012).

Our third finding indicates that participants struggled to construct complex searches. Task 5 demonstrates that self-identified confident and experienced researchers had difficulty identifying all of the necessary concepts of a research topic and formulating effective keywords for topics. Previous research has hypothesized a few different reasons why this may be true. Warwick, Rimmer, Blandford, Gow, and Buchanan (2009) propose that this difficulty may be due to "strategic satisficing" (p. 2409) and the idea that "less expert seekers are more likely to use what expertise they have to support the retention of familiar strategies and limit both the effort and scope of information seeking" (p. 2413). Dempsey and Valenti suggest that this difficulty may be due to students "lack[ing] the appropriate language context for their research needs" (2016, p. 205).

Finally, Task 5 also demonstrates that participants struggle to identify appropriate sources from the large list of results that Summon returns. Many participants used facets to narrow their lists down to appropriate source types but struggled to evaluate other aspects of articles during the decision-making process.

Our results and findings from previous studies indicate that although a small amount of interface instruction is necessary, the more important skills that students – specifically lower-level students and novice researchers with less experience, as they struggled the most – need to learn are search strategy development and results evaluation, i.e., critical thinking. Students are coming into their undergraduate educations with experience using a single search box and locating "good enough" information, but students have not had to develop high-level searching skills and have developed inflated views of their online research skills, as pointed out by Bloom and Deyrup (2015).

With these results in mind, where does Summon fit into information literacy instruction and how can it be taught effectively? At UCCS, all students are required to take the second semester first-year student-level writing course English 1410, where library instruction is integrated into the curriculum. Based on our results and the current outline plan for information literacy integration, teaching Summon in the English 1410 writing

course is the best fit. By utilizing these required information literacy sessions to focus on critical thinking skills and not interfaces, librarians have the opportunity to reformulate outcomes for the course. Cmor and Li present an overview of what this process can look like and provide insight into how a discovery system can facilitate a shift in a pedagogical approach from being explanatory to exploratory in order to move the focus away from teaching “explanations and procedurals” to “understanding and evaluating information” (2012, np). However, during our process to integrate Summon into information literacy instruction outcomes, we also wanted to align the revised outcomes with the new ACRL *Framework for Information Literacy in Higher Education (Framework)* (2016). To do this we identified areas where outcomes could move from skill-based competencies to align with concept-based dispositions as described in the *Framework*.

For instance, one outcome stated that students would “be able to apply Boolean strategies in online searching to produce concise search results.” We shifted our focus for this outcome to the frames of “Searching as Strategic Exploration” and “Research as Inquiry” and changed the outcome to “Students will be able to develop search strategies that are appropriate to the research question and to the tools being used.” This shift means that librarians can teach transferable skills for various information-seeking scenarios regardless of the search tool.

While the shift to focus instruction on concepts and dispositions brought our practices in alignment with the *Framework*, determining how to implement changes for instruction was more challenging. There is literature supporting these changes for the *Standards*, but there is not literature surrounding the *Framework* on the topic, and moving from skill-based outcomes to concept-based ones can be difficult. In order to understand what this shift can look like practically, the authors offer an example of an activity for integrating discovery tools into in-person information literacy instruction that aligns with the *Framework*. You can see a summary of how the restructured outcomes relate to the Framework and the sample instructional activity in [Table 1](#).

Results analysis activity

A frame that Summon works particularly well with is “Searching as Strategic Exploration.” Because Summon typically returns a high number of results and students generally have a hard time working effectively with those results, it allows for a number of knowledge practices within the frame to be addressed. This activity looks at the knowledge practice that “learners who are developing their information literate abilities design and refine needs and search strategies as necessary, based on search results”

Table 1. Results analysis activity summary.

Activity	Results Analysis
Previous Outcome	Students will be able to apply Boolean Strategies in online searching to produce concise search results.
Revised Outcome	Students will be able to develop search strategies that are appropriate to the research question and the tools being used.
Associated Frames	Searching as Strategic Exploration Research as Inquiry
Activity Summary	<ol style="list-style-type: none">1. Choose a topic for your instruction session.2. Have students perform the same search that the instructor demonstrates.3. On the results page, ask students questions about the information provided. <p><i>How many results did the search return? Do you think the search is too broad or narrow based on that number?</i></p> <ol style="list-style-type: none">4. Pair students together and assign a record number to each from the results page.5. Have pairs write a one-sentence summary of the topic of their result and indicate what type of material it is. Compile these responses.6. As a class, group the results into their more specific topics based on the summaries.7. Discuss topics such as:<ul style="list-style-type: none">• How the results grouping can help with topic formation and specificity• How to make search strategies more specific• How search terms impact results• Where to locate more specific search terms on the results page

(Association of College and Research Libraries, 2016, p. 9). A result analysis activity is a constructive way to address this practice (see Table 1).

A results activity like this works best when the class is brought back together to reinforce what students learned during the exercise. For instance, once everyone has submitted their topic and material type, work as a class to group the results into more specific topics. A simple search on *community college student debt*, for example, returns results that can be grouped into specific topics like student debt and retention, loan choices for community college students, and the impact of the state government on community college student debt. The wide variety of topics leads to a discussion about how to make search strategies more specific and how search terms impact results. You can also discuss where to find more specific search terms on the results page and demonstrate the importance of key-word choice. These conversations begin building the foundation for students’ understanding that searching is an iterative process.

While Summon can be controversial among librarians, it is a tool that students are drawn to and feel comfortable using. It is important for information literacy instructors to recognize that discovery tools can be valuable tools for engaging students in a more organic research process. Utilizing Summon instead of numerous different research interfaces allows for more time to include discussions and concept-based instruction as the time needed for interface demonstrations is minimized.

Conclusions

The Summon usability study helped drive decisions at the Kraemer Family Library about how to integrate discovery tools into library instruction and

led to the development of new activities to bring our information literacy instruction in line with the *Framework*. For our institution, based on our information literacy instruction opportunities throughout the curriculum and the background of our typical students, we found that discovery tools are best taught to our first-year students; however, the interface does not need to be extensively taught. These findings increased the opportunities that librarians have to focus on critical thinking skills during instruction, specifically how to understand results, develop complex searches, and select the best resources for a research topic.

While the usability study was instrumental in our ability to align our instruction with the *Framework*, there are still gaps in the research around instruction and discovery tools. One area that needs to be investigated further is how instructional activities using discovery tools impact information literacy skills. The question remains, too, as to why students find it so difficult to understand the research process. Although they often express confidence in their abilities, it is clear they continue to struggle with research skills such as keyword formulation, evaluating search results, and selecting relevant sources. Further research is also needed to validate best practices in using discovery tools to build the knowledge practices and dispositions identified in the *Framework*. At the UCCS, we specifically need to understand if the switch to teaching information literacy skills with Summon has positively impacted how students locate and select articles in the English 1410 writing course. Since discovery tools have been widely implemented, but there is still librarian reluctance to adopting them, providing practical activities to encourage their integration in instruction is the next step to understanding the impact that discovery tools have on our students and information literacy development.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix A. Pre-test survey

1. What is your classification at UCCS?
Freshman/Sophomore/Junior/Senior/Graduate student

2. What is your major or degree program?
3. Have you taken ENGL 1410/2080/2090 at UCCS?
Yes/No
4. Have you received any other librarian instruction?
Yes/No
5. Have you used Summon before today?
Yes/No
6. How frequently do you use the library catalog?
Never/Once a semester/Once a month/Weekly/Daily
7. How frequently do you use library databases, such as Academic Search Premier?
Never/Once a semester/Once a month/Weekly/Daily
8. How confident are you in your ability to use library resources?
Confident/Somewhat confident/Neutral/Somewhat unconfident/Unconfident

Post-test survey

1. How difficult did you find it to use Summon?
Very difficult/Difficult/Neutral/Easy/Very Easy
2. How do you like Summon in comparison to the library catalog?
Much worse/Worse/About the same/Somewhat better/Much better/Can't compare
(Optional) Explain:
3. How do you like Summon in comparison to library databases?
Much worse/Worse/About the same/Somewhat better/Much better/Can't compare
(Optional) Explain:
4. How confident are you in your ability to use Summon to locate a specific item (book, movie, article, etc.) when you already know its title?
Confident/Somewhat confident/Neutral/Somewhat unconfident/Unconfident
5. How confident are you in your ability to use Summon to research a topic?
Confident/Somewhat confident/Neutral/Somewhat unconfident/Unconfident
6. Now that you have used Summon, how would you describe what it does?

Appendix B. Tasks

After each task, participants were asked to answer the following question aloud and provide a reason for their choice:

How difficult was this task to complete using OneSearch?
Very Difficult/Difficult/Neutral/Easy/Very Easy

1. Known Item Book Search
You need to read the book *Schindler's List* by Thomas Keneally for your English class. Is there a print copy of the book available in the Kraemer Family Library? If so, what is the call number of the book?
2. Books on a subject
You are writing a research paper about cyberbullying and need books on the topic. How many books and eBooks does the library have on cyberbullying?
3. Known Item Video

You are taking a class on children's film and you have been asked to watch the Pixar movie *Wall-E*. Is there a video recording of the movie available in the Kraemer Family Library? If so, what is the call number of the video?

4. Known Item Article

You need to read the article "Branded worlds and contracting galaxies: The case of star wars galaxies" written by M.J. Clarke. Identify the correct article. In Summon, find an MLA citation for the article. Then in Summon, email the link to the article to yourself. Finally, locate the full text of the article.

5. Find Two Journal Articles on a Given Topic

You are writing a paper and need to research how social media use affects the romantic relationships of college students. Your professor said to find two journal articles published in the last 5 years to use as sources. Find two articles on the topic that meet these criteria. Then, using the options in Summon, email both articles to yourself.