Discovery Layers and the Distance Student: Online Search Habits of Students

Jessica Mussell
Rosie Croft
Royal Roads University

Abstract

Has your institution purchased discovery layer tools? Are you wondering how students are using them and how much return your institution is getting on that investment? Not only are there more resources available to students online than ever before, but there are also more avenues for students to discover those resources. RRU Library puts links to Google Scholar, Summon™, LibGuides, Captivate tutorials, and more onto its web pages; this paper is an investigation of how students are using those resources and what they think of them. It presents student feedback on these discovery layers combined with empirical evidence from usage statistics. The paper explains how RRU Library will use this evidence to inform both the electronic paths designed to lead students to its resources and the outcomes of its information literacy instructional sessions.

Introduction

In order to compete with the simple interface and intuitive design of search engines such as Google and Google Scholar, many academic libraries are reconfiguring their websites around the concept of the single search box to provide their users with a Google-like search experience. Web-scale discovery services such as Serials Solutions' Summon™, OCLC's WorldCat® Local, and the EBSCO Discovery Service™, allow libraries to accommodate the search preferences identified by their users and provide them with the option to search most of their library's collection all at once. But if we build it, will they come?

Academic libraries spend a considerable amount of money purchasing and supporting online databases, electronic collections, web-scale discovery tools and also spend a considerable amount of staff time building and maintaining subject guides (e.g. LibGuides) and online learning objects (e.g. animated tutorials) to provide their users with multiple information access points. Given ever narrowing budgetary constraints, it is important for libraries to evaluate which resources are used and how well they are used to better inform decision making regarding resource allocation. It is within this pretext that the Authors explore the various electronic pathways and search options available both at our institution and others, to investigate if there has indeed been a return on investment.

Literature Review

Regardless of all the time and effort libraries put into providing a variety of research tools and resources on their websites, the literature suggests that students still prefer to start their research using Google or some other form of search engine (Lippincott, 2005; Mizrachi, 2010; OCLC, 2002). One of the more telling studies that illustrates this preference is a recent OCLC survey titled *Perceptions of Libraries* (OCLC, 2010), a portion of which was dedicated to looking at the information seeking behavior of college students. It found that 83% of college students start their research at a search engine and even more importantly for libraries; none of them start their search at a library website (2010). There are many reasons for student preference to start research on search engines such as Google or Google Scholar. For

one, search engines are seen as faster, more convenient, reliable, and easy to use (2010). Lippincott (Lippincott, 2005), in an article examining the information-seeking behaviour of Net-Generation students (Millenials), notes that their preference for Google is tied to its simplistic and responsive design as compared to "library-sponsored resources [that are] difficult to figure out" (p.57). This sentiment of 'ease of use' is echoed by many studies, but particularly in the conclusion of a study by Brophy and Bawden (Brophy & Bawden, 2005) who compared Google with academic library resources. They found that "[a]ccessibility is likely (rightly or wrongly) to be favoured over quality as a determinant of choice by the student users...." (p. 510).

One might think this preference to start with Google, Google Scholar, or other search engines might be tied solely to the younger, undergraduate generation, but this does not seem to be the case. The preference for search engines over library resources extends from undergraduate through to upper-level students and spans generations. One study (Dubicki, 2010) examined the research habits of undergraduate and graduate business students and found Google the starting point for research for almost 50% of their students. Dubicki also found that more than 25% of their graduate and undergraduate students never used the library's databases (2010). A study from Virginia Tech that compared the information-seeking behaviour of international and American graduate students found students used the Internet most frequently (Liao, Finn, & Lu, 2007) regardless of national origin. A study at Kent State (Earp, 2008) which looked at the information source preferences for master's and doctoral level education students found that the majority reported using the Internet first. Even though graduate students tend to be a bit more experienced at searching than their undergraduate counterparts, they too tend to prefer information that is quickly accessible and does not require too much effort to obtain.

Looking at the themes emerging, it is clear that there is an overwhelming preference for easy to use, familiar search tools that transcend education level, discipline of study, and student demographics. Much of the literature examined thus far compared library gateways and databases to Internet search engines before the prevalence of the more recent and sophisticated discovery tools. With these new tools now in place, do students still prefer to start their research using a search engine such as Google and Google Scholar or are these new discovery tools luring students back to the library?

As these new discovery tools require significant financial and labour investment both initially and perpetually, a couple of recent studies have taken a closer look at these new web-scale discovery services to see how they compare to the simplicity of Google and Google Scholar and also explore the user experience in this new paradigm. Gross and Sheridan (Gross & Sheridan, 2011) explored their newly redesigned library website at Edith Cowan University which featured the Summon™ search tool on the main page. In this study, a group of first-year undergraduate students were recruited to complete four common search queries using the new website, and their movements and verbal comments were recorded using Camtasia software with a microphone headset. While some of the searches they were asked to perform were specifically designed to be completed using tools other than Summon™, the results showed that Summon™, which had been renamed Library One Search, "was by far the preferred navigation path" (p. 242) regardless of activity.

Another study conducted at Grand Valley State University Libraries (Way, 2010) took a different approach to evaluating the effect of a discovery tool on user searching by comparing link resolver statistics before and after the implementation of Summon™. The author found a decrease in the linking from the more traditional indexing and abstracting databases, an increase in the linking from Summon™, and an overall increase in electronic resource access in general, which lead the author to conclude that Summon™ had been broadly adopted by library users. This research supports what others have suggested: these new discovery tools with their simple search interfaces are beginning to compete with Google Scholar with regards to helping students find quality, vetted, academic and scholarly information (Joint, 2010; Vaughan, 2011) in a timely fashion.

The Royal Roads University Library Context

Royal Roads University (RRU) is a small, primarily graduate-level university that provides degree programs in applied subject areas that are primarily taken at a distance. The FTE student count hovers around 2,000 and the Library serves a diverse student population that includes young adults finishing off the senior years of their undergraduate program, mid-career professionals returning to undergraduate or graduate programming after often significant years of absence from an academic setting, as well as a small number of doctoral students. To add to this mix, the University has an increasing number of international students.

The distributed learning model at RRU is primarily a blended approach of both on-campus 'residencies' of 2-4 weeks as well as online learning. It is also worth noting that programs are not offered within a semester system framework at RRU and therefore use patterns are intrinsically varied; program intakes are scheduled at various times throughout the calendar year. RRU Library is unusually fortunate in that the librarians are able to see the majority of students for at least one in-person training session during the course of their program, if not more than one, within a hands-on computer lab environment. This generally has two effects: that the majority of students are introduced to a variety of library resources at some point in their program and that our vendor-captured use statistics include use during these research settings.

In January of 2011, RRU Library launched a redesigned website which provides users with a variety of research starting points. With the help of user testing, the new website was reconfigured with a default Summon™ search box featured at the top of the page, with additional tabs to change the search box to a catalogue-only search, a journal A-Z search, and a searchable database A-Z list. Also on the home page are various menus with links to subject guides (LibGuides), tutorials (via moodle and Adobe Captivate), and librarian help. The assumption was that by providing several access points to a variety of resources, the Library would accommodate users' diverse search preferences.

While RRU students' ages, gender, expertise, and familiarity with libraries and research resources vary, one thing remains the same: they are all trying to find information in a rapidly changing and complex online environment. It is in this context that this study sought to better understand how RRU's diverse body of mostly distributed learners are finding the information they need online. The goal was to better understand how the addition of Summon™ affected students' search patterns and which of the myriad of starting points now available on the Library's website (and beyond) they preferred, to assist in determining whether or not return on investment is being achieved.

Research Methodology

Previous studies on the search habits of students employed methodologies such as in-person interviews (Mizrachi, 2010), a combination of focus group and survey methods (Dubicki, 2010; Gross & Sheridan, 2011; Head, 2008), or some form of observation (Currie, Devlin, Emde, & Graves, 2010; Gross & Sheridan, 2011). Because the majority of RRU students are studying online, it would have been difficult to obtain enough participants to produce a statistically significant number of responses through in-person observation, interview, or focus group methods. Instead, the authors chose to gather information about students' online information-seeking behaviour through an electronic survey and look for corroboration of this data in the Library's database and website usage statistics.

SurveyMonkey was selected as the online survey tool. As the study involved student participation, the survey was submitted to the University's Research Ethics Board which reviewed the survey and gave its approval. To try to get the best possible response rate, the survey was designed so that it would take 15 minutes or less to complete. As added incentive, participants were given the option to enter a prize draw to win a $200 gift card. The survey was emailed to all students currently enrolled in for-credit courses at RRU and remained open for six weeks (Sept 20 – Oct 28, 2011).

The survey was comprised of 21 questions: 4 demographic and 17 information-seeking questions (see Appendix). The demographic questions were posed to identify the program students were enrolled in

(which also identified whether or not they were an undergraduate, graduate, or doctoral student), what age range they fell into (Millenial, Generation X, or Baby Boomer), gender (male, female, other), as well as name/email if the student wished to enter for the gift certificate. The remaining 17 questions asked students to describe their information-seeking behaviours and share their opinions about the usefulness of research resources available through the Library website and beyond. Response was not required for all questions – only questions that had been assessed as crucial. Students were specifically asked to think back to their most recent research assignment as this would likely be foremost in their mind and would assist them in answering the survey more concretely. While most of the questions had a set list of choices or required a ranking, opportunity was given for textual commentary, and some questions were designed to have students enter their own answer before ranking a preset list of likely answers to the same question.

To corroborate the students' self-reported information-seeking behaviour, empirical data was collected through Summon™ usage statistics, Serials Solutions 360 Link usage statistics, individual database usage statistics, Library website and LibGuides usage statistics. To see how often Summon™ was being used by Library patrons, usage statistics on the number of visits per month were downloaded for the period of January 1, 2011 to October 31, 2011. This time frame was chosen to coincide with the launch of Summon™ and the Library's new website, to the closing of the student survey. To get a better sense of where people were accessing Summon™ from for the same time period, referral source statistics were also collected.

A combination of Serials Solutions 360 Link usage data, as well as individual database usage data for the five-month period prior to the launch of the Library's new website with Summon™ (August-December, 2010), and the five-month period post-launch (January-May, 2011) were also gathered. As Serials Solutions only tracks database usage traffic through its products and not all database usage traffic, individual database usage statistics were also examined for the same time period, focusing on the usage of the top eight most accessed databases as identified through the 360 Link click through statistics.

Finally, to better understand what resources students were accessing via the Library website as a whole, especially which non-database resources people were accessing (e.g. LibGuides), Google Analytics statistics were gathered for the Library's website and LibGuides for the period from May 1, 2011 to October, 31, 2011.[1]

Results and Discussion

The survey response rate was extremely high with 1038 total responses which, given a headcount of approximately 4500 students (British Columbia Ministry of Advanced Education, 2011) , puts the response rate at about 23%. However, given that RRU's continuing education programs (certificate and diploma students) comprise 3300 of the 4500 headcount (Royal Roads University, 2010), and only 128 respondents who would fall into the category of continuing education programs responded, the response rate from our degree program students was closer to approximately 75% (910/1200).

In terms of the demographics of the respondents, 269 (26%) were undergraduate students, 641 (62%) were graduate students, and 128 (12%) were continuing education students (for credit certificate and diploma students). As our overall institutional gender split is comprised of slightly more women, it is not surprising that our survey respondents were 611 (58.9%) women, 424 (40.8%) men, and 3 (0.3%) listed 'other'. Similarly, the survey demographics reflect our institutional demographics in terms of age, where 287 (28%) were 17-29 years old, 488 (47%) were 30-45 years old, 253 (24%) were 46-60 years old, and 10 (1%) were over 60 years old.

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[1] Because we only recently implemented Google Analytics to track Library website usage, we have less data to analyse in this area.

In response to whether or not they had used RRU Library research resources, 822 (79%) said 'yes' and 215 (21%) said 'no'. It is important to note though that, in the textual responses, a significant number of students said that they had not started their program yet (student email accounts are activated up to two months prior to program start date). Therefore, rather than this representing a true measure of the rate of library use among respondents, it represents a mixture of non-use by active students and non-use by inactive students.

A total of 806 students let us know which library resources they had used in the past. A majority had previously used Summon™ at 66% (531/806), Google Scholar via RRU (proxied to enable full-text linking to RRU library databases) at 67% (536/806), what was defined as the 'publisher research databases' (library databases) at 75% (602/806), and Refworks 51% (411/806). Other resources that had more minor use were the library catalogue at 43% (345/806), what were called the 'resources by program guides' (LibGuides) at 20% (163/806), the modular online library tutorial named 'Infoquest' at 28% (226/806), and 'other' at 4% (29/806) (which from the accompanying text field was mostly comprised of contacting a librarian for help). As mentioned previously, the majority of degree enrolled students at RRU attend at least one library instruction session during their program, so these numbers likely reflect use within that context as well as the during students' research activities.

The responses to the question "Think about your most recent assignment for which you had to do some research. What online research resource did you start with? (Please select just one)" reflected the findings of the literature review in that when the responses of Google and Google Scholar are added together, Google proved to be the most popular starting place with 42% (336/806) of students reporting that they started with a form of Google (Google at 20% (162/806) and Google Scholar at 22% (174/806)). Second to the combined Google responses were the library databases at 26% (211/806), then Summon™ with a strong showing for a relatively new service at 22% (180/806), the library catalogue at 3% (27/806), LibGuides at 1.9% (15/806), Wikipedia at 1.7% (14/806), 'contacted a librarian' at 1.1% (9/806), Infoquest at 0.6% (5/805), and 'other' at 1.1% (9/806).

The students' responses to why they chose their starting point were analyzed and collocated together into broad categories for the most popular tools of choice. Again, corresponding with the literature review, most of those who chose a form of Google as the starting point for their research cited ease of use as the rationale for their choice. This reason was followed closely by Google's ability to provide a broad overview of a topic, then less importantly in descending order: habit, the quality of results, recommendation by others, and good search options. For those who chose Summon™ as their starting point, ease of use was again the most cited rationale, followed closely by both its ability to provide a good overview and its content of credible library resources, then less importantly in descending order: recommendation by others, good search options, and first-order presentation on the library website. Conversely, for those who chose the library databases as their starting point, most of them cited the academic quality of the results as the rationale for their choice, followed closely by the very focused nature of the results, recommendation by others, and familiarity as a habitual starting point; ease of use was also mentioned but much less often than for Google or Summon™ and as one of least noted reasons. For those who chose Wikipedia as their starting point, all noted that it was a quick and easy starting place. Moreover, the strong recurring theme throughout all of the commentary was that students wanted good results quickly, and they wanted to do as little review of results to weed out inessential results as possible. It is also worth mention that the majority of those who responded that they had started with either the library catalogue or Infoquest likely did not understand which tool they were actually choosing; comments such as "It can crawl across so many different databases – best bang for the effort" and "I thought it would give me scholarly

articles that would be relevant to what I am searching" (for the library catalogue) and "the one I have used most in the past" and "I can search via keyword" (for Infoquest) do not correlate with the functionality of the tools chosen which indicates that the frequencies for those particular choices are likely faulty. It is also worth noting that the seemingly high rate of use of the library databases and the rationale of 'recommended' for their use reflects the influence of library instruction on the students, particularly those whose library instruction sessions occurred prior to the introduction of Summon™.

An overwhelming majority of the survey respondents - 81% (655/806) - said that they used other online research resources as well as their first choice. Students were encouraged to select all other online tools that they used in their research, and Google Scholar came out as the top other choice with 41% (267/654) of students using that as one of their other choices, followed by the library databases at 39% (256/654), plain Google at 26% (169/654), Summon™ at 24% (156/654); the library catalogue at 19% (121/654), Wikipedia at 17% (109/654), contacting a librarian at 10% (62/654), 'other' (mostly noted as using other libraries' resources or using specific websites) at 7% (46/654), LibGuides at 7% (43/654), and the RRU Infoquest tutorial at 4% (27/654). The textual responses to "Please comment on which resource you think is the most consistently valuable research tool for you", were analyzed and collocated together into broad categories; in descending order of response frequency the categories are: library databases, Google/Google Scholar, Summon™, a combination of Summon™ and Google, a combination of the library databases and Google, and various other responses with low frequency. That the library databases, Google, and Summon™ were all rated with similar frequency in terms of their value - as well as combinations of those tools - indicates that the library databases and discovery layer are at least complementing Google well. The results in Table 1 further demonstrate the value that students place on the results they gain from an array of resources.

Table 1

How helpful were the results that you found for your most recent research assignment via the following sources:

	Not useful	Marginally useful	Helpful	Essential	Did not use	Response count
Google	23 (3.1%)	165 (22.6%)	**291 (39.8%)**	187 (25.6%)	65 (8.9%)	731
Google Scholar	7 (0.9%)	75 (10.2%)	**291 (39.4%)**	261 (35.4%)	104 (14.1%)	738
Wikipedia	55 (8.0%)	201 (29.2%)	**238 (34.5%)**	52 (7.5%)	143 (20.8%)	689
Summon™ (search box on the library homepage)	17 (2.4%)	61 (8.6%)	206 (29.0%)	**280 (39.4%)**	146 (20.6%)	710
Publisher research databases (e.g. EBSCOhost, etc.)	10 (1.3%)	22 (2.95)	152 (20.1%)	**484 (64.1%)**	87 (11.5%)	755
Library catalogue	15 (2.2%)	57 (8.3%)	215 (31.3%)	128 (18.6%)	**273 (39.7%)**	688
Resources by subject guides	20 (2.9%)	64 (9.4%)	174 (25.6%)	85 (12.5%)	**337 (49.6%)**	680
					Answered question	788

			Skipped question	251

Interestingly, the student respondents rated both Summon™ and the library database results as 'essential' rather than 'helpful' with higher frequency than for the Googles and Wikipedia, and conversely, Google and Wikipedia results were more likely to be rated as 'not useful' or 'marginally useful' than Summon™ or the library databases. While the Googles and Wikipedia came out ahead on ease of use, the results in Table 1 indicate that library resources nonetheless provide students with resources that they deem critical. This value to students was reaffirmed by the responses to "How important are the library services and resources overall to your success in your program?", to which 75% (585/779) of respondents answered 'essential', 20% (157/779) said 'helpful', 5% (37/779) said 'marginally helpful', and no respondents said 'not useful'.

As the study was motivated by a particular interest in gathering information from students regarding their use of Summon™, students were asked specifically whether or not the introduction of Summon™ on the library website had improved their ability to search. A majority of students reported that Summon™ had improved their ability to research effectively, with 61.4% (484/788) saying 'yes', 10.2% (80/788) saying 'no', and 28.4% (224/788) saying that they have not used Summon™. The survey also allowed for comments in response to this question, and 174 students made comments. Interestingly, the comments were primarily from those who responded that Summon™ had not improved their ability to research, with the predominant complaints being too many clicks to get to full-text and results that were not very useful. From an administrative point of view, these comments are not surprising as the Summon™ knowledge base itself has required ongoing updates since implementation and recent major database interface changes have caused glitches in Summon™ linking.

The survey also asked students about the features of search engines that they most valued, so that the library might favour the addition of products that include these features where possible in the future. The question was initially asked in a manner that requested open ended comment. These responses were analyzed and thematically categorized. The most popular feature by a large margin was ease and speed of use, followed by having an advanced search or filter, immediate relevance of results, immediate full-text, ability to link to a reference management software, that results be peer reviewed, ability to limit by date specifically, ability to save results, ability to view abstracts immediately, and other infrequently mentioned features and comments. The question was repeated with a list of options, and the results are listed in Table 2.

Table 2

How important to you are the following features in any online research resource that you have used:

	Not useful	Marginally useful	Important	Essential	Response count
Advanced search option	13 (1.7%)	114 (14.9%)	**381 (49.8%)**	257 (33.6%)	765
Folder or marked list feature	98 (13.7%)	**288 (40.3%)**	251 (35.2%)	77 (10.8%)	714
Ability to limit or sort by date	19 (2.5%)	149 (19.7%)	**383 (50.5%)**	207 (27.3%)	758
Ability to limit to scholarly articles only	9 (1.2%)	79 (10.4%)	333 (43.7%)	**341 (44.8%)**	762
Ability to sort by relevance	5 (0.7%)	92 (12.2%)	**373 (49.3%)**	287 (37.9%)	757

Auto-generated search refinements tips (e.g. "did you mean…")	39 (5.2%)	269 (36.0%)	**325 (43.5%)**	114 (15.3%)	747
Ability to export to a citation manager	43 (5.8%)	165 (22.1%)	**304 (40.8%)**	234 (31.4%)	746
Ability to search by subject headings	14 (1.9%)	114 (15.2%)	**389 (51.8%)**	234 (31.2%)	751
				Answered question	777
				Skipped question	262

Given the results from the open text responses to the same question, it is surprising that the only feature rated as essential was the ability to limit to scholarly articles.

Students were also asked about the challenges that they encounter during their research. In a structurally similar manner to the search tool features question, they were asked what their most significant challenge was during their research with a request for open ended comment first. These responses were analyzed and collocated together into broad categories of challenges. By almost threefold, the top challenge for the survey respondents was the ability to narrow their search effectively. Other responses were: inability to find full-text, difficulty finding peer-reviewed results, not having enough time to spend researching, not knowing where to start, managing references, technical issues such as connectivity, getting no results, results that are not current enough, and maintaining focus on only the question being researched. The question was repeated with a list of options, and the results are listed in Table 3.

Table 3

Please rate some of the challenges that you may typically encounter while doing research:

	Easy	Marginally difficult	Challenging	Impossible	Response count
Evaluating what constitutes a credible source	239 (30.9%)	**349 (45.1%)**	184 (23.8%)	2 (0.3%)	774
Becoming overwhelmed by the number of results in searches	108 (14.0%)	290 (37.5%)	**360 (46.6%)**	15 (1.9%)	773
Figuring out which is the best search tool to use for my topic	138 (18.1%)	**308 (40.4%)**	297 (39.0%)	19 (2.5%)	762
Figuring out how to narrow my search results effectively	107 (13.9%)	299 (38.8%)	**344 (44.6%)**	21 (2.7%)	771
Figuring out how to broaden my search results effectively	167 (21.7%)	**303 (39.5%)**	287 (37.4%)	11 (1.4%)	768
Locating the fulltext of a document for which I have found a citation	119 (15.5%)	301 (39.2%)	**315 (41.0%)**	33 (4.3%)	768
Figuring out which search terms to use	126 (16.4%)	298 (38.8%)	**320 (41.7%)**	33 (4.3%)	768
				Answered question	777
				Skipped question	262

The results in Table 3 corroborate the textual responses of the majority of students who noted being overwhelmed by the number of results and effective narrowing of search results to be their biggest challenges. While overall the respondents seemed to be reluctant to rate the challenges as 'impossible', the two with the highest frequency of 'impossible' were locating the full-text and establishing appropriate search terms.

The demographics of various responses are also of some interest. Perhaps not surprisingly, graduate students were more likely to use both Summon™ and the online databases than undergraduates, and undergraduates were more likely to start with Google. The percentage of undergrads who used either Google or Google Scholar as a starting point was 52% (93/180), Summon™ was 19% (34/180), and the online databases was 18% (33/180). For graduate students, the Googles rated a 38% (200/544) response rate, Summon™ was 25% (138/544) and the online databases were 29% (155/544). For the continuing education students, the Googles were top at 38% (31/82), Summon™ at 10% (8/82), and the publisher databases were 28% (23/82). There were no significant differences between student type and the frequency of use for the other less used starting points.

There was little difference between undergraduate and graduate responses to whether or not Summon™ had improved their ability to research effectively. Undergraduate students responded with 'yes' at 65.5% (113/175), 'no' at 7.5% (15/175), and 'have not used' at 27% (47/175). Graduate students responded with 'yes' at 63% (336/534), 'no' at 11% (60/534), and 'have not used' at 26% (138/534). Continuing education students were less impressed with the effects of Summon™ on their searches but because fewer of them had used Summon™; they responded with 'yes' at 44% (35/79), 'no' at 6% (5/79), and 'have not used' at 50% (39/79).

As might also be expected, graduate students placed more value on library resources than undergraduates, though a majority of students of all types rated the library services and resources as 'essential' In response to how important the library services and resources were to their program, undergraduate students responded with 'essential' at a frequency of 58% (101/173), 'helpful' at 35% (60/173), and 'marginally useful' at 7% (12/173). Graduate students responded with' essential' at 82% (434/528) frequency, 'helpful' at 15% (79/528), and 'marginally useful' at 3% (15/528). Continuing education students responded with 'essential' at 64% (50/78) frequency, 'helpful' at 23% (18/78), and 'marginally helpful' at 13% (10/78). None of the students in any category rated the library services and resources 'unhelpful'.

Also cross-tabulated were the results to the two questions of which resource did students start with and whether Summon™ had improved their ability to do research; the results are in Table 4.

Table 4

Cross-tabulation of first search tool of choice and the effect of Summon™ on students' ability to research

Think about your most recent assignment for which you had to do research. What online resource did you start with? (Please select just one)	Has the Summon™ search service on the library website improved your ability to research effectively?			
	Yes	No	Have not used Summon™	Response count
Google	67 (13.8%)	23 (28.6%)	65 (29%)	155 (19.7%)
Google Scholar	106 (21.9%)	18 (22.5%)	46 (20.5%)	170 (21.6%)

Wikipedia	6 (1.2%)	0 (0%)	8 (3.6%)	14 (1.8%)
Summon™ (primary search box on the library homepage)	**171 (35.3%)**	7 (8.8%)	0 (0%)	178 (22.6%)
Publisher research database (e.g. EBSCOhost, etc.)	101 (20.9%)	**28 (35.0%)**	**79 (35.3%)**	208 (26.4%)
Library catalogue	15 (3.1%)	0 (0%)	11 (4.9%)	26 (3.3%)
Contacted a librarian for help	4 (0.8%)	2 (2.5%)	3 (1.3%)	9 (1.1%)
'Resources by Program' guides	8 (1.7%)	0 (0%)	7 (3.1%)	15 (1.9%)
Infoquest Tutorial	2 (0.4%)	2 (2.5%)	1 (0.4%)	5 (0.6%)
Other (please specify)	4 (0.8%)	0 (0%)	4 (1.8%)	8 (1.0%)
Answered question	484	80	224	788

The results of Table 4 seem to indicate that those who started with Summon™ were or became fans of the Summon™ service in high numbers. Those who started with the publisher databases were the least likely to have used Summon™ or to respond positively to its effect on their research if they had. The Google users in both its forms were significantly also in favour of Summon™, though a fairly high number of them had also not used Summon™.

Students' starting tools and their opinion of the library overall was also of interest; the results are tabulated in Table 5.

Table 5

Cross-tabulation of first search tool of choice and how important library services and resources were to students

Think about your most recent assignment for which you had to do research. What online resource did you start with? (Please select just one)	How important are the library services and resources overall to your success in your program?				
	Not useful	Marginally useful	Helpful	Essential	Response count
Google	0 (0%)	**18 (48/6 %)**	**49 (31.2%)**	87 (14.9%)	155 (19.7%)
Google Scholar	0 (0%)	6 (16.2%)	31 (19.7%)	130 (22.2%)	170 (21.6%)
Wikipedia	0 (0%)	2 (5.4%)	5 (3.2%)	7 (1.2%)	14 (1.8%)
Summon™ (primary search box on the library homepage)	0 (0%)	3 (8.1%)	20 (12.7%)	154 (26.3%)	178 (22.6%)
Publisher research database (e.g. EBSCOhost, etc.)	0 (0%)	7 (18.9%)	35 (22.3%)	**163 (27.9%)**	**208 (26.4%)**
Library catalogue	0 (0%)	1 (2.7%)	10 (6.4%)	15 (2.6%)	26 (3.3%)
Contacted a librarian for help	0 (0%)	0 (0%)	2 (1.3%)	7 (1.2%)	9 (1.1%)
'Resources by Program' guides	0 (0%)	0 (0%)	2 (1.3%)	12 (2.1%)	15 (1.9%)
Infoquest Tutorial	0 (0%)	0 (0%)	2 (1.3%)	3 (0.5%)	5 (0.6%)
Other (please specify)	0 (0%)	0 (0%)	1 (0.6%)	7 (1.2%)	8 (1.0%)
Answered question	0	37	157	585	779

While a majority of students who either started with plain Google or Google Scholar rated the library services and resources as 'essential', those who started with plain Google were much more likely to rate the library services and resources as only 'marginally useful' or 'helpful' than students who started with Summon™ or the online databases. Again, RRU librarians promote our proxied version of Google Scholar to students during library instruction, and students accessing Google Scholar in that manner, though they may prefer to use Google Scholar over Summon™ as a first choice, do still see the value of library services and resources overall.

To take a quantitative, empirical look at the influence of Summon™ on the use of library resources overall since its launch, usage data was pulled from Serials Solutions Summon™ Administration Console for the number of visits as well as the referring source. Between January 1, 2011, and October 31, 2011, 41,721 visits to Summon™ were logged, with the RRU Library homepage being the number one referring source at 75% (31,153/41,721). Identifying the second most popular referral point is problematic as at the time this data was gathered, Serials Solutions documentation and staff were unable l to explain where some of the referral source data originated. As the report stood, RRU's second most popular referral source was Summon™ itself at 19% (7,831/41,721), which does not make very much sense. The third most popular mode of access was direct linking to Summon™ by users typing the URL into their browser's address bar at 5% (2045/41,721). It is not surprising that the most popular referral source to Summon™ is the RRU Library homepage as it is a default search box prominently presented to users each time they visit. Prior to redesigning the Library website with Summon™, RRU Library was already using Serials Solutions' 360 Core e-journal portal on its website, as well as the 360 Link open URL resolver throughout the library databases and Google Scholar. This baseline database usage data or 'pre-Summon™' library database usage statistics was compared to 'post-Summon™' database usage statistics to see what (if any) effect Summon had on usage, and whether or not this corroborated the information-seeking behavior students reported in the survey. Table 6 shows the results of this comparison.

Table 6

Serials Solutions Click Through Statistics by Database Before and After Summon™

Databaseª	Before Summon™ (Aug – Dec 2010)	After Summon™ (Jan – May 2011)
Science Direct	4,034	6,566
SAGE Premier 2010	3,477	5,467
Taylor & Francis Online (Informaworld)	2,129	2,726
ABI/Inform Global	2,107	4,536
Academic Search Premier	2,053	5,154
Business Source Premier	1,646	3.939
Emerald Journals Online	1,547	3,997
Lexis Nexis Academic (Canada)	1,110	5,809
Total	18,103	38,194

Note. Click through statistics is a numerical count of all e-journal and database clicks patrons access using Serials Solutions resource discovery tools.

ªMost accessed databases as identified by Click Through statistics pre-Summon™.

While it was expected to see some form of increase, it was surprising to see that click throughs to databases had almost doubled. As Serials Solutions click through statistics only capture the portion of the traffic funneled through Serials Solutions products, a closer look at individual database usage statistics for the

same time frame was also warranted. The database usage statistics show only a modest increase after Summon™. Before Summon™, the total number of database sessions for the databases outlined in Table 6 was 69,189. After Summon™, the total increased to 74,881sessions, an increase of 5,702.

While overall use of library databases remains steady pre- and post-Summon™, this increase in 'click throughs' perhaps indicates that students are choosing to increasingly avoid the native database interfaces in preference to Summon™. Since the acquisition of Summon™, librarians have been vigorously promoting this discovery layer both in formal information literacy sessions and in response to reference questions, which may be another possible reason for the increase. Regardless,, these results support the survey findings of Summon's™ positive effect on students' ability to research and library services and resources majority rating as 'essential'.

Part of what RRU librarians do in information literacy sessions is highlight the various LibGuides that are available on the Library's homepage to assist students in finding and using the resources that are best suited to their program. Part of this study was to explore how well the LibGuides were being used. In order to gauge this, Google Analytics was used to capture the number of visits to the Library's LibGuides. Between May 1, 2011, and October 31, 2011 (post website redesign), RRU Library's collection of LibGuides had 8,211visits. During the same time period the Library's homepage, where links to the LibGuides are situated, received 76,083 visits. This implies that slightly over 11% of the library's website traffic during this time frame was to the LibGuides. This also corroborates the survey findings, where students reported low use of the LibGuides.

From the relatively low use of non-database Library resources such as LibGuides and the library's Infoquest Tutorial as reported in the survey results and from the usage data, it can be surmised that students do indeed want a Google like experience, where they are taken directly to a search interface that is easy to use and has immediately relevant results, and that library resources should be primarily devoted to continuing to improve that direct and easy access rather than descriptive tutorials and guides.

Conclusion

The pervasive use of Google by students to do their research – either the Scholar version or not – has been well recorded in other studies. The results of this survey and usage data affirm that a user-friendly library discovery layer tool – in this case Summon™ - as well as the library databases are generally considered by RRU students to be essential to their scholastic success. Moreover, rather than existing only in competition to Google, these library search tools are often used in conjunction with Google and serve as complements to it within a multi-part search process.

Yochai Benkler, Harvard Law School professor and faculty co-director of the Berkman Center for Internet & Society, said "...when you think of what is the critical innovation of Google, the critical innovation is outsourcing the one most important thing: the decision about what's relevant to the community of the web as a whole doing whatever they want to do" (Benkler, 2005, 9:50). The textual comments throughout the survey responses echoed this desire for and value of tools that enabled the student respondents to search and find the best possible results immediately. To put this another way, the comments demonstrated students' willingness – if not demanded right – to be able to outsource the relevancy that they may place on research results to someone or something other than themselves. Offsetting that willingness to outsource their relevancy determinations, however, is the students' choice to use multiple search tools to get all the research that they need. At least for the time being, these tools have differing relevancy ranking capabilities and each presents different valuable – and less valuable - results. Whether or not students will be missing something essential in the research process by increasingly being able to avoid going through result lists to determine which results are most relevant for themselves perhaps presents itself for future investigation.

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Appendix

Search habits of RRU Students

Welcome!

We are Rosie Croft, RRU University Librarian, and Jessica Mussell, RRU Instruction and Public Services Librarian. The results from this survey will be used to compile a paper and presentation called Discovery Layers and the Distance Student, and also used to improve and streamline the library's online services. Our credentials with Royal Roads University can be established by telephoning Roberta Mason, Associate Vice President at Royal Roads University, 250.391.2600 ext: 4432.

The primary research will consist of this survey and is foreseen to take about 15 minutes to complete. You will be asked to describe your research strategies and to share your opinions of the research resources available via the RRU Library. You can submit your name and contact information at the end of the survey to be entered to win a $200 Future Shop gift card. This personal information will not be used to identify your responses and submitting this information is entirely optional.

The research findings will be shared with RRU administration and will form the basis of a presentation at the 2012 Distance Library Services conference and made publicly available as a paper published in the Journal of Library & Information Services in Distance Learning.

The information you provide will be summarized, in anonymous format, in the body of the final report. At no time will any specific comment be attributed to any individual. All documentation will be kept strictly confidential. In the event that your survey response is processed and stored in the United States, you are advised that its governments, courts, or law enforcement and regulatory agencies may be able to obtain disclosure of the data through the laws of the United States.

You are not compelled to participate in this research project. If you do choose to participate, you are free to withdraw at any time without prejudice. Similarly, if you choose not to participate in this research project, this information will also be maintained in confidence.

Your completion of this survey will constitute your informed consent.

Tell us a little about yourself:

1. What program are you in?

- BA Justice Studies
- BA Professional Communication
- BComm Entrepreneurial Management
- BSc Environmental Management
- BSc Environmental Science
- MA Conflict Analysis and Management
- MA Disaster and Emergency Management
- MA Educational Leadership and Management
- MA Environmental Education and Communication
- MA Environmental Practice
- MA or MSc in Environmental Management
- Master of Global Management
- MA Human Security and Peacebuilding
- MA Intercultural and International Communication

- MA Interdisciplinary Studies
- MA Leadership (including Health specialization)
- MA Learning and Technology
- MA Professional Communication
- MBA Master of Business Administration
- Tourism program (any of them)
- Doctorate in Social Sciences
- Any certificate or diploma program with the Centre for Applied Leadership Management (CALM)
- International program (Study Group)

2. How many years young are you?

17-29
30-45
46-60
over 60

3. Are you:

Male   Female   Other

Library use:

4. Have you used the RRU Library research resources?

- Yes
- No

Tell us about your experience with online research resources:

5. Which of the following RRU Library online research resources have you used? Check all that apply.

- Summon (primary search box on the library homepage)
- Google Scholar via the RRU Library site
- Publisher research databases (e.g. EBSCOhost, Springer, Mergent, etc.)
- Library catalogue
- 'Resources by Program' guides
- InfoQuest Tutorial
- RefWorks
- I did not use any RRU Library resources to do my research
- Other (please specify) TEXT BOX

6. Think about your most recent assignment for which you had to do some research. What online research resource did you start with? (Please select just one)

- Google
- Google Scholar
- Wikipedia

- Summon (primary search box on the library homepage)
- Publisher research databases (e.g. EBSCOhost, etc.)
- Library catalogue
- Contacted a librarian for reference help
- 'Resources by Program' guides
- InfoQuest Tutorial
- Other (please specify) TEXT BOX

7. Please tell us a bit about why you chose this tool to begin your research.

TEXT BOX

8. Again, thinking of your most recent assignment, did you use other online research resources? (if yes to 9, if no to 10)

- Yes
- No

9. Where did you go next? (Please select all that apply)

- Google
- Google Scholar
- Wikipedia
- Summon (search box on the library homepage)
- Publisher research databases (e.g. EBSCOhost, etc.)
- Library catalogue
- Contacted a librarian for reference help
- Resources by Program guides
- InfoQuest Tutorial
- I did not use other resources, just my first choice
- Other (please specify) TEXT BOX

10. Please comment on which resource you think is the most consistently valuable research tool for you.

TEXTBOX

11. How helpful were the results that you found for your most recent research assignment via the following services (1=not useful; 2= marginally useful; 3=helpful; 4=essential; and 5=did not use):

	1	2	3	4	5
Google					
Google Scholar					
Summon (search box on the library homepage)					
Publisher research databases (e.g. EBSCOhost, etc.)					
Library catalogue					
Resources by subject guides					

12. Has the Summon search service on the library website improved your ability to research effectively?

- Yes
- No
- Have not used Summon

Comments TEXT BOX

13. What is the most important feature in any online research resource that you have used?

TEXTBOX

14. How important to you are the following features in any online research resource that you have used (1=not useful; 2= marginally useful; 3=helpful; 4=essential):

	1	2	3	4
Advanced Search Option				
Folder or marked list feature				
Ability to limit or sort by date				
Ability to limit to scholarly articles only				
Ability to sort by relevance				
Auto-generated search refinement tips (e.g. "did you mean….")				
Ability to export to a citation manager				
Ability to search by subject headings				

15. What is the most significant challenge that you typically encounter while doing research?

TEXTBOX

16. Please rate some of the challenges that you may typically encounter while doing research (1=easy; 2=marginally difficult; 3=challenging; 4=impossible)

	1	2	3	4
Evaluating what constitutes a credible source				
Becoming overwhelmed by the number of results in searches				
Figuring out which is the best search tool to use for my topic				
Figuring out how to narrow my search results effectively				
Figuring out how to broaden my search results effectively				
Locating the fulltext of a document for which I have found a citation				
Figuring out which search terms to use				

Tell us about how you organize and manage your research:

A citation manager is a tool designed to store and organize your collection of citations as well as generate your bibliography.

17. Which citation manager do you primarily use? (Please select just one)

- RefWorks
- EndNote
- Zotero
- Mendeley
- Qiqqa
- I did not use a citation manager
- Other (please specify) TEXTBOX

Tell us which services are helpful to you:

18. Please tell us how helpful the following library services are to you (1=not useful; 2= marginally useful; 3=helpful; 4=essential; and 5=did not use):

	1	2	3	4	5
Infoquest Tutorial					
RRU library's "Resources by Program" Guides					
Interlibrary Loan (we get books/articles from other libraries for you)					
Document Delivery (we send out books from the RRU library collection to you)					
In-person library instruction sessions					
Reference help from a librarian					
RRU Library's online collection (ejournals/ebooks)					
RRU Library's print collection					

19. How important are the library services and resources overall to your success in your program you (1=not useful; 2= marginally useful; 3=helpful; 4=essential)?

1   2   3   4

20. Please share with us any comments you have regarding the library or its services.

TEXTBOX

Enter to win a great prize!

20. To be entered to win a $200 Future Shop gift certificate, please enter your name and email below. This information will not be used to personally identify your survey responses.

- Name
- Email

Thank you for taking our survey. Your responses will help us improve RRU Library resources and services for all students!