

An Evaluation of Serials Solutions Summon

**As a Discovery Service for the
Dartmouth College Library**



Submitted to the Dean of Libraries and Librarian of the
College November 10, 2009

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SUMMARY

Summon is a “first-of-breed” discovery service: a single, central database whose ambition is to contain all the scholarly material made available by academic libraries to their users. Summon is designed to be an entry point for all sorts of scholarly queries, with tools in its interface to help one limit searches, save references, and read abstracts.

Since August 2008 Dartmouth College Library has been a beta partner with the Summon development team, influencing the early functionality of the service and conducting user evaluations with Dartmouth College faculty, staff, and students.

This report summarizes the history of the project; the current state of the Summon service; the findings from user evaluations; the current limitations of the service; the potential for further development; concerns and cautions; and the potential impact on library staff.¹

BACKGROUND

Defining the Need

Library users are too often frustrated by the disjointed array of databases, services, catalogs, and publisher Web sites that confront them when they seek information. Users perceive our discovery layer as complex at best and confusing at worst; they are unclear exactly what the catalog covers; they find federated searching to be useful but also slow and duplicative; and they want a convenient starting point for library resources of all kinds.²

In some disciplines, and for more specialized users, an existing service such as Web of Science or PubMed may allow for comprehensive discovery. But most users face a set of disparate and time-consuming information discovery systems that leave too many of our rich resources under-utilized.

¹ More detail on outreach and assessment can be found in Appendix B; more on the beta process generally is available on the Beta Team’s Final Report wiki page, although this has not been edited for ease of reading: <https://libwiki.dartmouth.edu/twiki/bin/view/Libopen/SummonBetaFinalReport>.

² We know these frustrations and needs from sources such as the comments on the recent ARL LIBQUAL survey and the 2008 *Dartmouth College Library Next Generation Systems Report*.

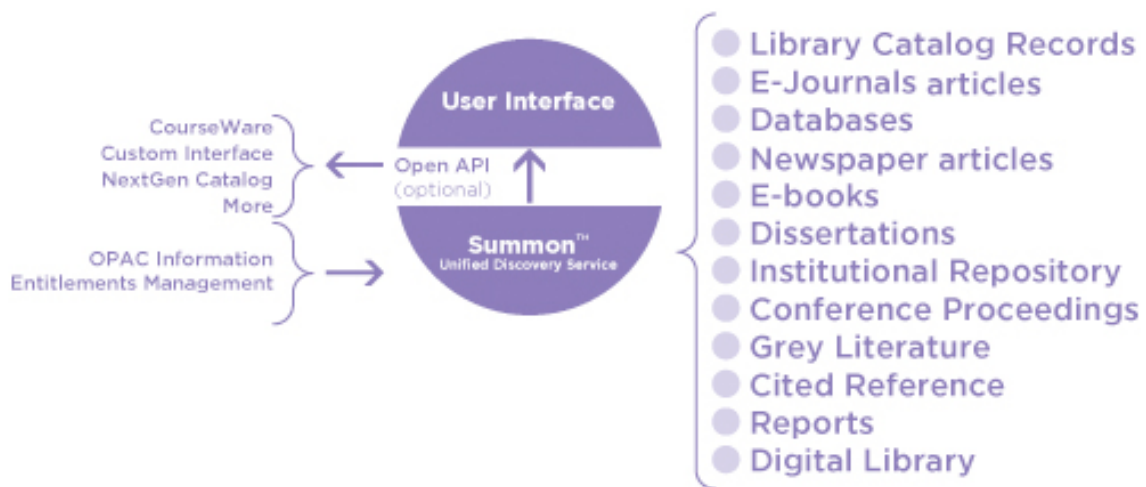
The Summon Opportunity

In August 2008, the Dartmouth College Library accepted an invitation from ProQuest to work with them on the early development of a new type of library discovery service. Their market research had exposed the same need we saw for a single starting point for scholarly enquiry, and they proposed to build a massive central index of metadata and full-text content that would allow fast, convenient, and comprehensive discovery of our library materials.

SUMMON

Scope and Content

The intended scope of Summon is no less than all the materials we subscribe to, buy, or build, including all of our library catalog records. Summon currently contains 534 million items (6,000+ publishers' content; 50,000+ journal and periodical titles).³ Newspaper and scholarly journal articles predominate.⁴



The Dartmouth College collection within Summon currently includes 303 million items, or 56% of the total Summon holdings (see **Appendix A** for holdings by content type). Included in this collection are 2.2 million of our local catalog records, and the majority of the digital articles, dissertations, and other materials to which

³ These figures were as of November 4, 2009. Summon holdings increased from 453 million to 534 million items while this report was being created (Oct-Nov 2009).

⁴ A title list of Summon holdings, with coverage years, is available at <http://www.serialssolutions.com/assets/publications/Summon-represented-titles.pdf>

we subscribe, as well as some freely available online scholarly material.⁵

Dartmouth patrons can search Summon to discover material that they have access to, and click through to an online article, an eBook, or to a library catalog record for a physical item; or they can search all material that Summon indexes, even that for which Dartmouth College has no subscription, but which may be available via Inter-Library Loan.

Summon acquires content chiefly through agreements with content owners, primarily journal and newspaper publishers, eBook publishers, and third-party aggregators. Other sources include the libraries subscribing to Summon, which contribute library catalog records and other locally digitized collections.

Summon was announced publicly in January 2009 and went on sale in July 2009. The sales model for Summon is an annual subscription one, and the service is a hosted solution.

The Index

Summon is based on a vast central database of metadata and – whenever possible – full-text content. Much of its database design is proprietary, but its technical underpinnings include Lucene/SOLR, an open source enterprise search server used by many other massive searchable indices.⁶ It aims to have one record per item, even when it receives several versions of a metadata record from multiple sources (the publisher; several aggregation services). These records are matched and merged into a single entry within Summon whenever possible, to cut down on duplication.

Relevance ranking has been an area of particular investment over the course of the beta project, and this area is likely to remain an ongoing development need.

The Web Interface and API

Users query the Summon database through a web interface. A “Google-like” search box generates an initial result set quickly, and the results appear in an interface that includes facets (e.g. date; content type) that allow one to limit searches further: <http://www.dartmouth.edu/~library/home/find/summon/>. An API is available that allow a customer to craft customized local interfaces, or to embed Summon in other services such as Blackboard.

⁵ In the beta period we have not been specific about what publicly-available resources we want in “The Dartmouth Collection,” and what in “Beyond Your Library’s Collection.” We still need to decide where we want public items such as the Library of Congress’ *American Memory* materials, or local digitized collections from other Summon customers, to appear.

⁶ <http://lucene.apache.org/solr/>

BETA TEAM ACTIVITIES

Timetable

Secret⁷ Beta Period [September 2008-January 2009]

- Met with the vendor to see the first prototype and discuss testing.
- Exported the library catalog for the vendor to load into Summon.
- Repeatedly evaluated the evolving interface.
- Analyzed how the content was being indexed.
- Discussed findings regularly with the vendor and with Oklahoma State University -- the other "secret beta" partner.

Staff Beta Period [January-June 2009]

- Presented Summon to library staff via workshops and announcements.
- Set up a feedback form in Summon (input going immediately to both the vendor and the local beta team members).
- Conducted tests of Summon with selected students.
- Implemented "One-Click" linking from Summon straight to online articles.
- Continued evaluation of functionality, content, and relevance ranking.
- Worked with the vendor to integrate our data into Summon, and investigated workflows needed for us to keep our catalog data current.
- Selected some locally digitized content to be ingested into Summon.

Public Beta Period [June-December 2009]

- Repeated testing sessions held with Dartmouth staff, faculty, and students.
- An *About Summon* statement linked to the main search page.
- Summon beta test advertised prominently on the library website.
- Summon Outreach Coordination Team (SOCT) established and completed their work (July-October 2009).

Assessment

A feedback form was available as part of Summon by spring 2009, and selected local partners such as faculty members on the Council on Libraries were asked for feedback on Summon early in its development.

The user assessment portion of the beta test was accelerated by the work of the Summon Outreach Coordination Team (SOCT), established in July 2009 to promote Summon to the Dartmouth community and to gather feedback. From

⁷ From August 2008-January 2009, a small team of Library staff worked with Summon's developers under non-disclosure agreements, prior to the public announcement of the product.

August-October 2009 SOCT organized an intensive marketing campaign, a 3-minute survey, a faculty discussion program, and formal user testing sessions (see **Appendix B** for a detailed SOCT report).

FINDINGS

The user assessment activities yielded the following feedback:

- Ninety-four web feedback submissions.
- Sixty-four 3-Minute Survey responses.
- Nine reports detailing individual hour-long interviews with faculty.
- Six direct response email messages from faculty.
- Six 1-hour “remote viewing” sessions of graduate students.

Undergraduate students (36 respondents) found Summon to be fast, simple, and familiar. Their searches returned items relevant to their topics, and they considered Summon more important for their research than any other available tool.

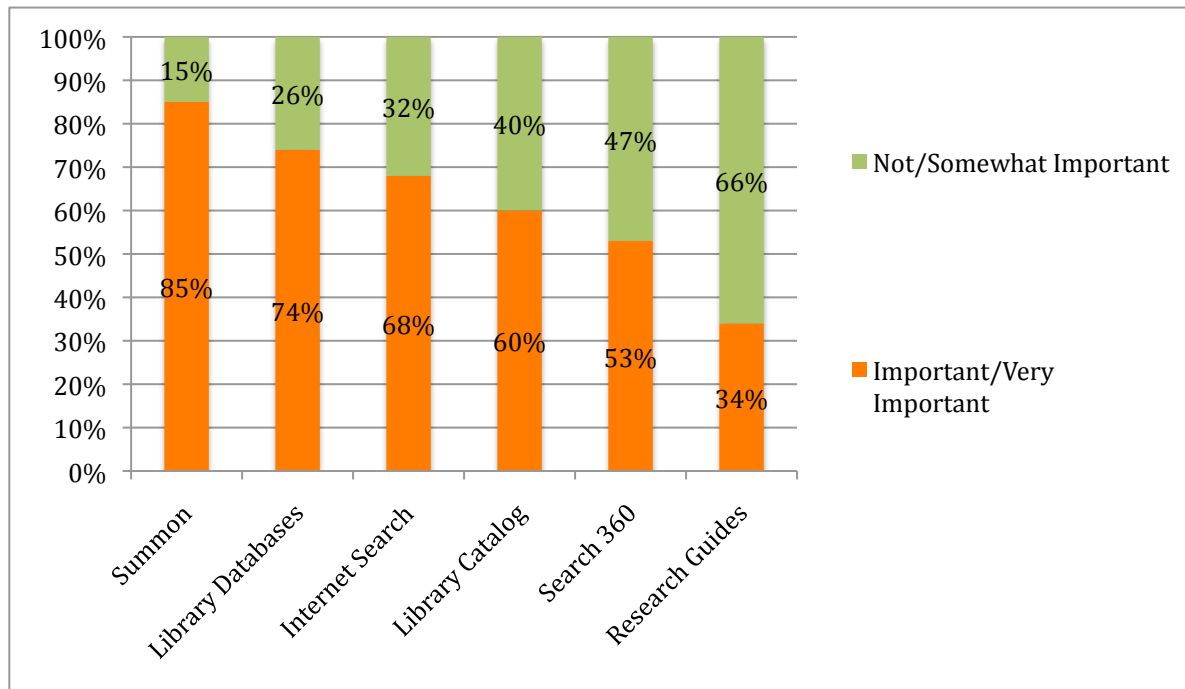


Chart 1: Undergraduates Indicating Importance per Service for Research

Undergraduates complained when the full-text icon did not lead directly to the full-text article. In several cases they used the facets and found them to be helpful.

Graduate students (9 respondents) held a generally negative view of Summon when compared to subject-specific databases that they use (e.g. PubMed, SciFinderScholar). They asked for more information about the source data that Summon was searching and requested a cited-reference feature.

Faculty (21 respondents) found Summon to be fast, simple, and familiar, and they would recommend it to students to be used in conjunction with other resources. One of the features that they felt was missing from Summon was the ability to look at “cited by” references for a given item. Overall, they were able to retrieve articles relevant to their research topics, but felt that searching relevance could be improved.

Library Staff (12 respondents) also generally found Summon to be fast, simple, and relevant. They would recommend it as a tool to others. The majority of the feedback received via the feedback button contained very specific criticisms of individual capabilities and features from a small number of library staff members. While faculty tended to write about their research and the search terms, library staff wrote about their search techniques.

DISCUSSION

Discovery Needs Addressed

Summon is likely to become the starting point for many types of research. It makes an excellent first impression, using a familiar “Google-like” single search box to traverse masses of disparate resources and return relevant results in an attractive, simple presentation. Students and faculty commented favorably on the design of the Web interface; one can ask a question of Summon easily, and apply limits and qualifiers to search results after they are returned, via facets.

Summon delivers initial search results quickly. Links to abstracts and to full text are also speedy. It is fairly fast in resetting limits, but occasionally those processes took more time than the searcher wanted.

Summon has content that people want, and the beta test has generated many favorable comments about the one’s ability through Summon to discover material that offered different views of a topic, to limit to scholarly journals only, or to search for materials across many disciplines. Being able to get the full text of an article or e-book in one click was very popular. Summon also helps searchers have a better sense of the scope of a topic by finding items in a variety of sources (e.g., books, book-reviews, newspaper articles, journal articles, dissertations.).

The Summon API and RSS feeds potentially allow deeper, more customized integration into library services; the use of Unicode throughout Summon means that

it can be searched in multiple languages (Arabic; Chinese; etc) where records exist in these scripts, a feature often requested by those who work in these languages.⁸

The Summon service already includes all of our library catalog records and has the potential to include Dartmouth's locally-digitized collections, finding aids to Special Collections materials, and so on. While the library catalog is an "include" option in the Search360 federated search tool, Summon has provided our first instance of library bibliographic records appearing alongside article-level metadata in integrated result sets.

Unmet Discovery Needs

In this category, faculty and graduate students most often mentioned the lack of cited reference searching, as found in Web of Science, Google Scholar, and other services.

Summon did not function well for users who wanted to work only with a single author. Summon does not regularize personal or organizational names, and may be able to use author-resolver resources to help with this.

Summon does not work well for users who want to search only in a single discipline. Users in specific disciplines may have been disappointed because they sensed that their Summon search was not covering every disciplinary source, or disappointed with the relevance ranking because the metadata from a key database are not yet included.

Users commented that there is no search history and therefore no easy way to document one's search strategy – a research requirement for some projects.

And a few experienced searchers were surprised that Boolean operators have to be entered in capital letters, and that they had no control over the degree of "fuzziness" applied to a search.

⁸ For example, our catalog records in Summon will be searchable in their native languages; non-Western scripts can be viewed in the library catalog currently but not searched, due to the extreme cost of this feature from the catalog vendor.

Potential For Development

The following items have already been raised as potential future improvements, many of which are under our control using the rich API programming toolkit that Summon provides:

- We could identify additional campus content for ingestion in Summon.
- We could use the API to create different interfaces to Summon to serve local user communities.
- We could work with Summon to create a "MySummon" personal portal service that would know a user's subject area, literature format preferences, interface preferences, saved searches, etc.
- We could work with Summon to encourage the information companies we buy and license data from to improve full-text linking to their publications from within Summon.
- We could design a process to take a user directly from a citation to our Inter Library Loan services.
- We could make the case with Summon to add something like PubMed's "Single Citation Matcher" or Ovid's "Find Citation" in the main interface (or use the API to see if we can add this ourselves). Currently in Summon, one must use Advanced Search or search for multiple words and rely on relevance ranking to find a known item.

Concerns and Cautions

- Summon should not be seen as a replacement for all other key information sources, which may have content not yet in Summon, or features that are critical to a given discipline.
- This is a new product in a turbulent market that is dependent on vendor-to-vendor negotiations.
- Resources that Summon does not cover may be used less, and some key resources may never be part of Summon (this is not a concern unique to Summon – it is also true of Google Scholar and Search 360).
- Users may have the impression that Summon is flawed when the direct link to full text does not work perfectly, often due to failings outside Summon.

- Summon needs to compare favorably to Google Scholar to win over those users who rely on this service. Summon already exceeds Google Scholar in the amount and breadth of material it contains (as far as one can tell through comparative searching); the level of faceted control over searches; and the ability to know something about the titles that are in the database (see footnote 4).
- Some members of the beta team are uneasy that we do not know exactly what content is in Summon, observing that this knowledge is important for "selling" Summon to faculty and expert users, or to librarians who educate users about discovery tools.
- If adopted, Summon would likely replace the Serials Solutions WebFeat federated search product we currently use (called *Search360* locally), for both service and cost reasons – it would be confusing and expensive to retain both. However, we will need to retain the ability to federate a small number of services: we may want to federate Summon with WorldCat, for example; to continue to federate the Dartmouth College catalog with the Howe Library catalog; or to offer a federated search across the Dartmouth College Library for Alumni (<http://www.dartmouth.edu/~library/alumni/search.html>). Various LibGuides also federate discipline-specific databases into useful mini-portals (see <http://libguides.dartmouth.edu/content.php?pid=6052> for one example). Users will be poorly served if they are forced to search sources not included in Summon one at a time.

Impact on Library staff

Summon is a hosted service, with no local indices or dedicated hardware to maintain, which limits its impact on staff workflows. Our hope is that if adopted its chief impacts are positive, service-oriented ones.

Impacts will be felt by those who promote services and train users, those who create or manage local data and metadata that needs to be loaded into Summon (or deleted from it). The process of exporting bibliographic data from the Library Catalog, for example, is complex, although the purchase of the Millennium Scheduler product from Innovative Interfaces can automate some of this work.

Summon will require ongoing administrative management and troubleshooting. It relies heavily on the Serials Solutions Knowledgebase and the Article Linker OpenURL resolver service to provide the essential links to full-text. We will most likely maintain separate settings for the OpenURL resolver in Summon than those settings used by Article Linker in other environments.

Adopting Summon would also mean developing an ongoing evaluation plan, including the evaluation of problem reports, continued user assessment, and the analysis of usage statistics.

Exploiting the API to customize Summon can be very staff-intensive and may be more than we will want to justify.

CONCLUSION

Summon has had early success in the market⁹ and has no real competitors to date.¹⁰

Summon has tested well in the Dartmouth College Library environment -- it is already the single most popular discovery tool for the undergraduates surveyed, for example -- and we are relatively clear on its benefits, shortfalls, and potential for development.

If we proceed from beta testing to purchase there are some licensing questions to resolve, and some information to request on the nature of Summon's usage statistical reporting, planned future developments, and ongoing customer support.

In addition, we will have to think carefully about how to place Summon in our local discovery landscape – where does it go on the Library website? How prominent is it relative to other services?

In its current form Summon would provide the most convenient, large scale discovery tool over most of our holdings that we have been able to offer Dartmouth users to date, and addresses an articulated current need; the potential for future improvements and a further increase in holdings is considerable, given what we have observed of its development to date.

⁹ For example, an October 2009 *Summon Newsletter* announced the following new customers: Edith Cowan University; Western Australia Erasmus University; Rotterdam Florida Atlantic University; La Trobe University, Australia; North Carolina State University; Northumbria University, UK; University of Adelaide, South Australia; University of Dundee, Scotland; University of Manitoba, Canada; University of Missouri-Columbia; University of Western Australia; University of Queensland, Australia; Arizona State University; University of Huddersfield, UK; University of Texas at San Antonio; and VTT Technical Research Centre of Finland.

¹⁰ A partnership between OCLC WorldCat and EBSCO is readying *EBSCO Discovery Service*, scheduled for launch in December 2009 that claims to address the same need with a central searchable database.

Appendix A: Summon Subject Types (November 3, 2009)

All Holdings (503,059,222 items)	Dartmouth Collection Only (303, 547,204 items)
Newspaper Article (397,504,947) Journal Article (122,521,779) Dissertation (6,514,730) Book (2,499,641)	Newspaper Article (219,689,327) Journal Article (74,765,936) Dissertation (5,295,837) Book (1,815,848)
Conference Proceeding (991,804) Patent (726,471) eBook (626,119) Report (605,762) Trade Publication Article (603,193) Newsletter (488,521) Archival Material (363,450) Book Review (144,244) Special Collection (113,555) Journal (110,916)	Conference Proceeding (260,611) Patent (4,321) eBook (312,491) Report (223,625) Trade Publication Article (378,759) N/A Archival Material (277,252) Book Review (144,207) Special Collection (113,555) Journal (107,605)
Book Chapter (62,971) Government Document (61,788) Music Score (24,229) Music Recording (22,423) Video Recording (14,735) Image (14,343) Map (10,772) Poem (8,590) Play (5,557) Web Resource (4,296) Photograph (3,191) Computer File (3,028) Art (2,398) Transcript (1,031)	Book Chapter (20,893) Government Document (61,612) Music Score (23,483) Music Recording (22,398) Video Recording (14,589) N/A Map (10,703) N/A N/A N/A Photograph (339) Computer File (3,016) N/A N/A
Spoken Word Recording (732) Painting (521) Standard (418) Manuscript (392)	Spoken Word Recording (732) N/A N/A Manuscript (56)

Paper (347)	N/A
Drawing (339)	N/A
Presentation (327)	N/A
Invalid (309)	N/A
Poster (306)	N/A
Postcard (248)	N/A
Pamphlet (158)	N/A
Artifact (119)	N/A
Ceremonial Object (90)	N/A
Audio Recording (85)	N/A
Houseware (69)	N/A
Course Reading (50)	N/A
Equipment (48)	N/A
Publication Article (30)	N/A
Furnishing (22)	N/A
Realia (18)	Realia (9)
Personal Article (15)	N/A
Kit (13)	N/A
Album (13)	N/A
Tool (12)	N/A
Architectural Drawing (12)	N/A
Newspaper (10)	N/A
Microfilm (10)	N/A
Publication (6)	N/A
Musical Instrument (5)	N/A
Catalog (4)	N/A
Blueprints (3)	N/A
Clothing (3)	N/A
Model (1)	N/A
Blueprint (1)	N/A
Implements (1)	N/A
Microform (1)	N/A

Appendix B: SOCT Summary Report

SUMMON OUTREACH COORDINATION TEAM

Summary Report

Team Members: Laura Braunstein, John Cocklin, Barbara DeFelice, Lucinda Hall, Janifer Holt, Noah Lowenstein (Chair), Mina Rakhra, Cheryl Wheelock.

10/30/2009



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“Report on Observations of Dartmouth Graduate Student Sessions using Summon, September-October 2009,” by Sarah Weeks, Usability Consultant, Serials Solutions/ProQuest.	

Executive Summary

Response to Summon Beta

During the three-month period (July 26 – October 23, 2009) of active data acquisition, the Summon Outreach Coordination Team (SOCT) collected the following:

- 94 web feedback submissions
- 64 three-minute survey responses
- 9 reports detailing (one-on-one, ~hour-long) interviews with faculty
- 6 direct response email messages from faculty
- 6 UserVue session materials packets (each packet included 3 or 4 written records of a 1-hour session, as well as a video capture file)

As an overview, here is a look at the typical responses from each group:

Undergraduates

Undergraduates who responded to the three-minute survey found Summon fast, simple, and familiar to other tools they use (such as Google and Google Scholar). Overall, their searches returned items relevant to their topics, and if Dartmouth purchased Summon they would consider it an important or very important tool for their research. They complained when the full-text icon did not lead directly to the full-text article. In several cases, they used the facets and found them to be helpful. Undergraduate students also suggested other features that they would like to see.

Graduate Students

The 3 graduate students who responded to the three-minute survey and 2 of the 6 who participated in UserVue testing held a generally negative view of Summon. Graduate students tended to know a small number of subject-specific databases well (PubMed, SciFinderScholar) and compared Summon directly with them. When Summon returned different results, or when Summon's features differed from familiar databases (or even worse, if Summon did not have those features) then they viewed Summon negatively. Likewise, when Summon outdid features from familiar databases (for example, the quick "hover" view of abstracts on the search results page, or functionality related to the "Saved Items" folder), their view of Summon was positively impacted. As might be expected, graduate students showed greater sophistication in their searching compared to undergraduates. They expected a new tool such as Summon to be better than what was already available to them. If they did not perceive it to be better, then they judged Summon negatively and preferred to work with familiar resources.

Four of the graduate students who participated in UserVue testing liked many aspects of Summon, particularly the interface and the full-text links, and agreed with faculty and undergraduates that it was fast and simple to use. They asked for more information about the source data that Summon was searching.

Like the faculty, some graduate students requested a cited-reference feature such as that found in Google Scholar (and Web of Science). They also appreciated getting to full-text

quickly, but were quick to complain when they encountered some trouble with linking to full-text, as did members of the other groups.

Faculty

Overall, faculty who were interviewed and responded to the three-minute survey held a positive view of Summon. Like undergraduates, they found it fast, simple, and familiar. However, they made it clear that this was not a replacement for other tools or resources such as Web of Science and subject-specific databases. While they generally felt they would recommend it to students (both undergraduate and graduate – one faculty member referred to it as a "thinking tool"), they would recommend it with the caveat that it should be used in conjunction with these other tools and resources. Many of them noted they were already using Google Scholar, which they liked. One of the features that they felt was missing from Summon was the ability to look at cited references, a feature that is in both Google Scholar and Web of Science. In fact, a few wondered why Summon was needed if it did not have this feature. To them, the network of cited references provides an important research map. Like the undergraduates, they also liked getting to full-text quickly. However, they commented when the full-text icon did not lead directly to the full-text article, since that frustrated them. Overall, they were able to retrieve articles relevant to their research topics, but felt that searching relevance could be improved.

Library Staff

Those who responded to the three-minute survey generally agreed with faculty and undergraduates and viewed Summon positively. They found it fast, simple to use, and that it retrieved materials relevant to their research topic. They would recommend it as a tool to others.

The majority of the feedback received from library staff via the feedback button tended to be more critical of Summon and usually contained very specific criticisms of Summon's search capabilities and features. The majority of this feedback was received from a small number of library staff members. While faculty tended to write in sophisticated terms about their research and the search terms they used in Summon, library staff wrote feedback in sophisticated terms about their search techniques and their interaction with the Summon product (as might be expected from information professionals). Library staff often advocated on behalf of library users. However, in some cases their perceptions of Summon differed from that of library users.

Introduction

The Summon Outreach Coordination Team (SOCT) was officially formed and the team's charge delivered in July 2009. Although the SOCT will remain active until the close of the Summon beta period (December 2009), the submission date for the main deliverable (this summary report) is October 30, in recognition of the timetable for the larger report-writing and decision-making processes. The SOCT reports to, and is submitting this report to, the Summon Project Team.

The SOCT was charged with coordinating the Library's outreach efforts during the Summon public beta test period, monitoring and responding to user feedback, developing approaches to gather user responses to Summon, participating in UserVue assessment sessions (focusing on graduate students), and providing a summary report to the Project Team of the findings of all assessment efforts. A special focus of the SOCT's assessment work was to highlight the response to Summon from different parts of the Library's user community. Prior to the formation of the SOCT, the Summon Project Team had done some assessment on the response of undergraduate students to the Summon product, but the response from graduate students and faculty was largely unknown. This report focuses on the varied responses of these user groups.

This report summarizes the results of all SOCT assessment efforts and provides an overview of the group's outreach efforts and feedback/input gathering mechanisms. A full overview of the work undertaken by the SOCT is available on the SOCT wiki site, along with supporting documents:

<https://libwiki.dartmouth.edu/twiki/bin/view/Libopen/SummonOutreach>

Outreach Efforts

All SOCT outreach efforts were focused on raising general awareness of the Summon beta and encouraging the submission of feedback and input from a broad cross-section of Dartmouth faculty, students, and staff.

The SOCT coordinated with the Library Marketing and Communications Committee on the development and dissemination of a general advertising campaign. Once artwork and text were developed, the SOCT employed the following strategies:

- Large posters at all library locations.
- Displays on plasma screens at libraries.
- 5,000 postcards that were ordered and distributed to all library locations for dissemination at service desks, and for use at special events, classroom visits, and other opportunities for direct interaction with our user community.



- Advertisements using the artwork (both half-page and quarter page) in *The Dartmouth*.
- Posts and items using the advertising artwork on the Library's Facebook page and LavNotes publication.

Other outreach efforts included:

- Coordinating and assisting in writing an article about the Summon beta in *The Vox* (October 2009 issue – <http://www.dartmouth.edu/~vox/0910/10/library.html>)
- Creating a “talking points” document used to inform library personnel about the Summon beta in anticipation of their interacting with Library users (distributed to staff at the September All-Staff Meeting, to service desks with postcards, and to liaison librarians prior to their faculty interviews)
- Presenting, in conjunction with the Summon Project Team, information about Summon and the SOCT's work at the September All-Staff Meeting.
- Staffing a table at the Class of 2013 Library Open House, introducing incoming students to Summon and encouraging them to supply feedback.
- Creating Summon beta modules in the LibGuides environment and informing all LibGuides authors about their availability.
- In conjunction with the Library Education & Outreach group, addressing all librarian-teachers with information about the Summon Beta and suggesting strategies for speaking about Summon during teaching sessions and orientations.

Feedback Gathering

Four feedback-gathering mechanisms were utilized in the work of the SOCT.

1. Web feedback (submitted through the “Feedback” link on all of the Summon beta test pages).
2. Online survey, or the Three-Minute Survey. Created a survey instrument to gather a set of feedback that was easily amenable to analysis.
3. UserVue testing with graduate students (successfully completed six sessions).
4. Liaison-mediated, one-on-one interviews with faculty.

Data Analysis Overview

INTRODUCTION

Number of responses as of October 23*, 2009						
	undergrad	grad	faculty	college staff	library staff	TOTAL
Feedback**	?	?	?	?	?	94***
survey	36	6	7	3	12	64
interviews			9			9
emails			6			6
uservue		6				6
TOTAL	36	12	22	3	12	179

*Feedback was collected through October 19, 2009; all other input was collected through October 23, 2009.

**Feedback did not provide a demographic question. While some respondents did identify themselves, there is not enough information to provide responses per group for this row.

***Some individuals sent more than one feedback message. There were 94 total feedback messages, not 94 individual respondents.

UNDERGRADUATE STUDENTS

The undergraduate results from the three-minute survey should be understood in light of past experience, which has shown that people are not afraid to share negative views of library services or resources, especially through anonymous online surveys.

As well, this is a small sample of 36 students. They were a highly self-selective group that not only took the time to use Summon at the beginning of a fall term, but also made the effort to complete the survey. Generally speaking, their comments demonstrated their familiarity with library resources. Though perhaps not representative of all their peers, these are the types of undergraduates most likely to use library resources such as Summon.

TEXTUAL RESPONSES – 21

36 undergraduate students completed the three-minute survey, and 21 of these also answered at least one of the following open-ended questions:

1. If you could change something about Summon to make it better, what would that be?
2. What is the best thing about Summon?

Their answers mirrored and helped to clarify their responses to the survey questions.

- Like the faculty, the undergraduate students were positive overall about Summon (26 positive to 13 negative comments). This is keeping in mind that one of the questions (“If you could change something to make Summon better...”) prompted respondents to provide criticism of Summon.
 - *I like how simple and easy it is to use.*
 - *Fast, reliable, has a lot of full text links.*
 - *Works like Search360 should.*
 - *I want it to be a permanent resource!*
- The survey results indicated that undergraduates were able to find relevant information on their research topics (see Completed Surveys – 33 below). In their comments, they did not provide much more information about their perception of their search results outside of being generally satisfied with Summon overall. When they did comment specifically on relevance, they tended to be satisfied. (4 positive relevance comments to 2 negative).
 - *It understood what I was looking for very well.*
 - *It appears to miss articles that I know exist under the search terms. This could be an issue with ‘relevance’ as it also seems like sometimes the most relevant*

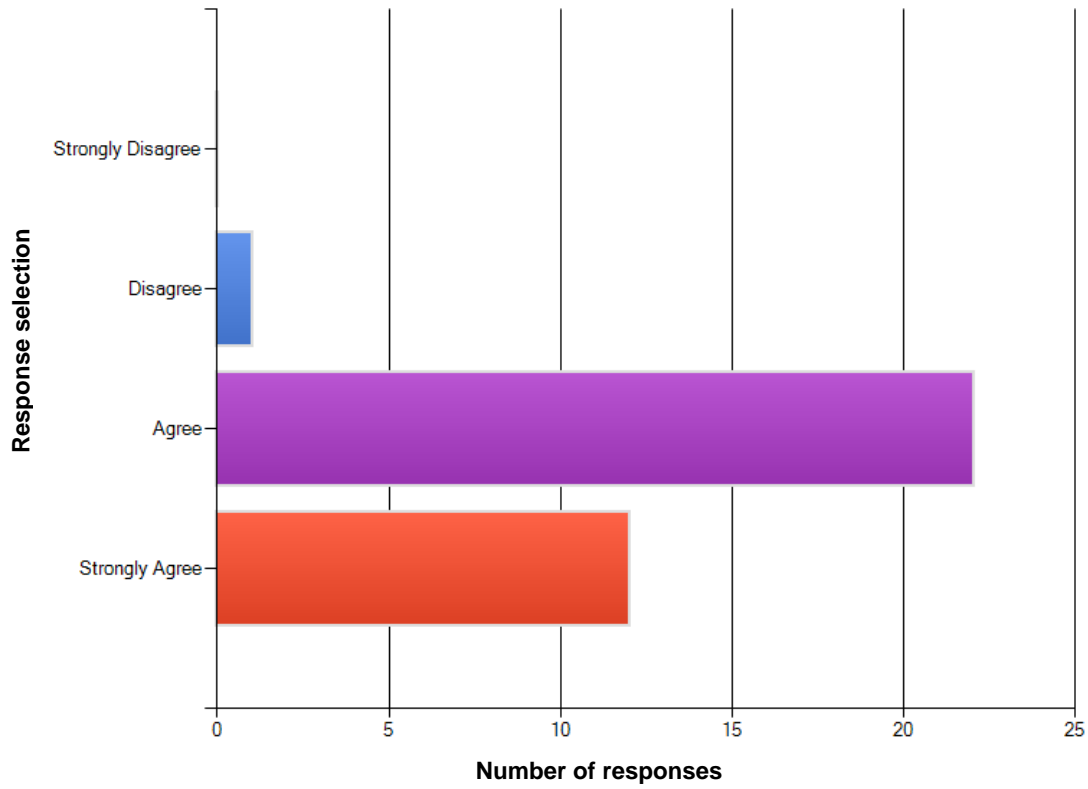
results do not show at the top of the search.

- Also, like the faculty, they liked the access to full-text – when the links to it worked. Their frustration showed in the numbers: 5 negative full-text comments to 2 positive.
 - *Getting to the full article that I searched for took a lot longer when I tried to use the full text link as opposed to the citation only link. The full text link should take you DIRECTLY to the article instead of making you chase it.*
 - *I would want to be able to click full text and have the full text of the article appear; currently, Summon sometimes links you to another database, which links you to another database, and then you get the full text.*
- They were very clear about the features they liked – peer-reviewed limit, previews, refine your search.
 - *What is the best thing about Summon? Being able to tell it to only find peer reviewed results.*
 - *What is the best thing about Summon? When you hover over a link, it shows you the abstract of that article.*
- They were also very clear about the features they would like to see – refine a search from the beginning (like Search360, 3 comments), remove duplicates, limit results by language, refine search by length of article, and title search.
 - *The ability to refine a search from the beginning would be nice.*
 - *I would add the ability to search based on the length of the article (if you want a really long article or one that's short and to the point) based on a range of page numbers.*

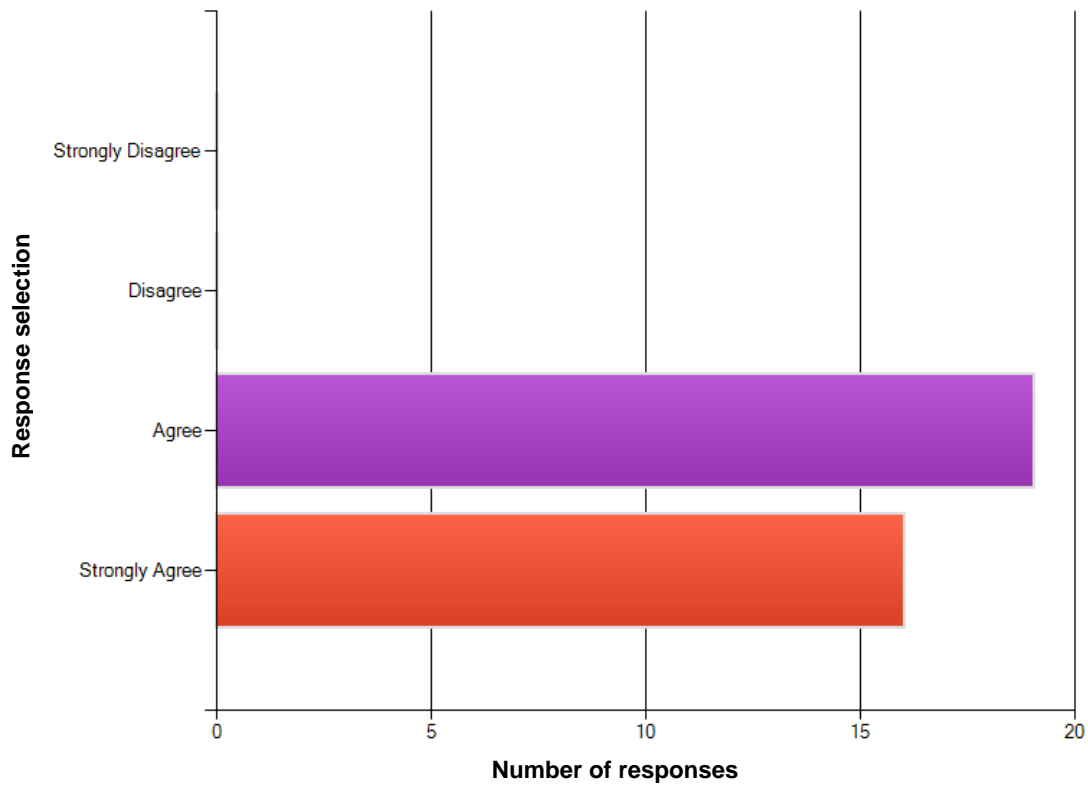
COMPLETED SURVEYS – 36

Here is a summary of the undergraduate student responses to the questions asked in the three-minute survey.

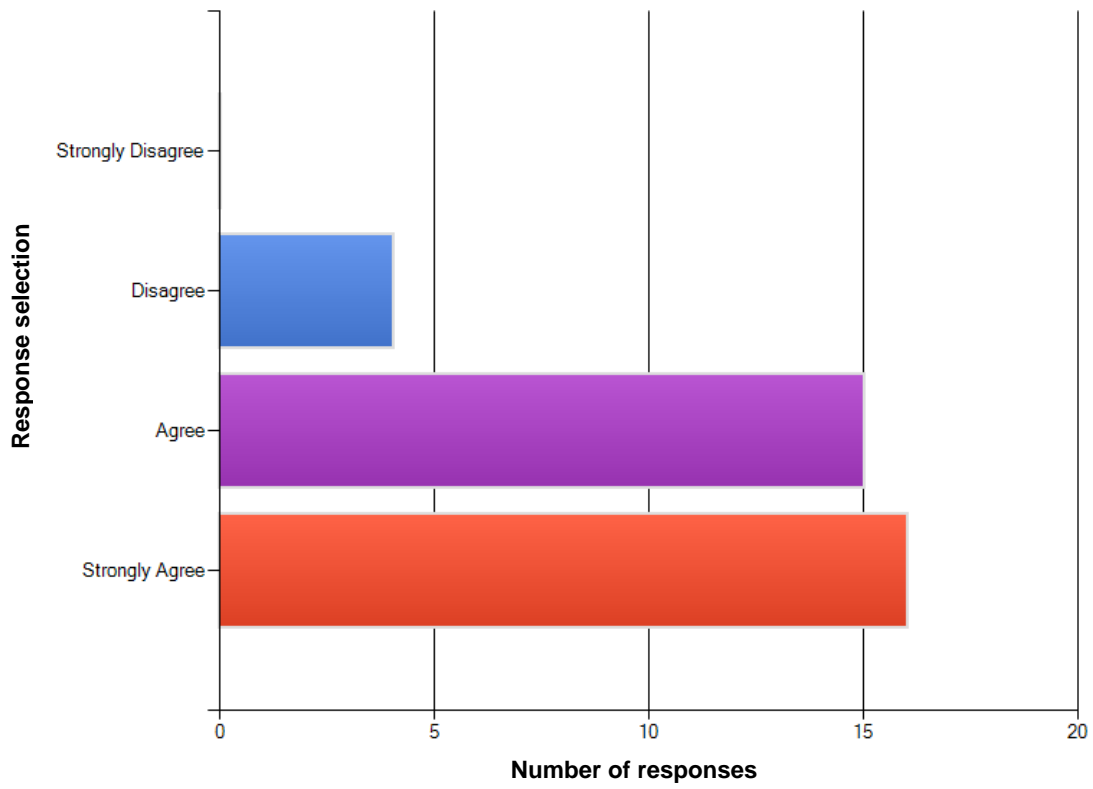
I was able to find relevant information on my research topic.



I would recommend this search service to a friend or colleague.



If Summon would be available in future, I would begin my research with Summon.



If Summon were available to you in the future, how important would it be to your research?

	Not Important	Somewhat Important	Important	Very Important
Summon	0%	15.2%	66.7%	18.2%

33 respondents answered the question – 3 skipped the question.

How important are the following resources to your research?

	Not Important	Somewhat Important	Important	Very Important
Dartmouth Library Catalog	0%	40%	28.6%	31.4%
Internet Search Engines (Google, Bing, etc.)	5.9%	26.5%	41.2%	26.5%
Search 360	20.6%	26.5%	23.5%	29.4%
Library Databases	2.9%	22.9%	37.1%	37.1%
Library Research Guides	20%	45.7%	14.3%	20%

35 respondents answered the question – 1 skipped the question.

GRADUATE STUDENTS

Although the number of inputs from graduate students was not large (9 total: 6 UserVue and 3 survey inputs), the UserVue sessions were a particularly rich form of input compared to the three-minute survey or feedback link submissions. Due to the intense (interactive one-hour sessions with 3-4 information professionals watching remotely and recording observations) and naturalistic (participants were working on a real research task in their normal study environment) character of these sessions, we were able to observe a deep level of interaction with the Summon product. This gave us a clearer view of the strengths and challenges of Summon for graduate students, but complicated, somewhat, comparing graduate student responses to other user groups. Six graduate students were surveyed using UserVue; four were in medical/health related fields and two were in the sciences.

Generally speaking, these students are familiar with web search engines and subject-specific databases such as Google, Google Scholar, and PubMed. Their comments showed their familiarity with library resources and research. Given the broad coverage of Summon, SOCT was particularly interested in discovering if graduate students found Summon as useful as the general web search engines and the more subject specific-databases for their sophisticated and complex research topics.

PRE-SESSION, OBSERVER NOTES, and POST-SESSION

Each session included three pre-session questions and six post-session questions. During the session, the facilitator and observers took notes as the students searched Summon with their research topics.

As expected, their search strategies and responses were as varied and complex as their research topics.

Post-Session Questions

1. How successful would you say you were today? If not successful, what was the cause of your not finding what you needed? What would help you be more successful?

Pretty successful found papers she had not found before; would like to identify the difference between a letter or news note and a full article; If program had a way to cancel out identical titles

Overall pretty successful, did the job he expected; would like to see a feature to filter on the kind of study important in his field; how to categorize by subject, save do RSS advance search.

Relatively successful, 70%; having more limits like Google Scholar;

Definitely; need a way to keep track of what he looked at, especially when you get hundreds of articles; could use limits like randomized control trial or placebo control trial.

I had problems with the subject terms...the fact that the subject terms were not relevant to my search and to my refining process was very frustrating.

Not knowing, or being able to guess, that Boolean operators have to be entered in ALL CAPS, was very frustrating, and non-standard.

2. What was most valuable about it for your research process?

User friendly, can preview and save quickly; scanning abstracts worked well.

Get him quickly to top tier journals; filtering by full-text availability

Ability to type in a natural language search and get results; it is very fast.

The citations are really easy to use; this works better for working with citations.

3. Anything you really liked or disliked? What and why?

Expectations are high for any web application; user interface is very nice.

Did not like not finding items that were supposed to be full-text available, or having to search again in the source database/publisher's; did not like the Article Linker screen coming up instead of the article.

I would make it only report items as available if they're actually available... in other words, if it doesn't have access to a particular title, it should NOT report itself having Full Text access to that title!

Liked saving my citations, emailing them to myself, they alphabetized them for me, and I could export them to RefWorks.

4. Are there utilities or features that you would like to see added?

Easy download the full PDF button.

A barrier to this product is that no one knows if this is an authoritative source; need an easily digestible explanation of what is inside the black box to help with acceptance of this tool.

I like the way Google Scholar has the number of times this article was cited; Google Scholar shows articles ranked by importance.

Like it to track what I have done; a read/unread checkbox; I would like this method to carry over into other search sessions on other days.

5. Where do you normally begin research?

Answers included Google, Google Scholar, SciFinderScholar, and subject specific databases such as PubMed, Ovid MEDLINE, the Astrophysics Data System, and the ACS Publications search engine.

6. How did this search tool compare?

Preview is a major positive feature; Nice to narrow by subject facets; likes the publication date to narrow it down. Easier than in PubMed where you need to know more to be specific.

PubMed is more sophisticated but not as user friendly or as nicely laid out.

Previews. Liked the mouse over to get to full abstract.

I found the same, if not more with Summon than with the other tools I use.

I like SciFinder and Web of Science better, because I get only [subject specific] articles. I can also put in [subject specific information] and get results.

OVERALL

- Overall, the four graduate students from medical/health sciences who participated in UserVue testing were more positive about Summon, while the two graduate students from the sciences, and the three-minute survey respondents, were largely negative about Summon.

STRENGTHS

- They liked that it was fast.
- They liked the full-text – when they could easily get to it.
- They liked it when the search results were relevant and overall felt the results were relevant (though it could use improvement – see CHALLENGES below).
- Several had positive comments for the interface.

- They liked the facets features – when they saw them. At times they needed to be prompted to recognize and use some of Summon's features.

CHALLENGES

- They liked the full-text – when they could easily get to it.
- As noted (see STRENGTHS above), overall they felt results retrieved were relevant, but often felt that this could be improved.
- They would like more information about the data sources Summon searches.
- Summon lacked either content or features they were familiar with from Google Scholar or other resources, like subject-specific databases.

SUMMON AND GOOGLE, GOOGLE SCHOLAR, SUBJECT-SPECIFIC DATABASES

Graduate students use Google, Google Scholar and subject-specific databases for their research. When comparing these search engines and databases to Summon, graduate students were analytical and critical concerning the features that would be desirable for their searches.

FACULTY

Librarians from around Dartmouth College Library conducted interviews with 9 faculty members (1 humanities, 3 sciences, 4 social sciences, 1 unidentified discipline) and received email responses from 6 faculty members (all social sciences). In addition, 6 of the 6 faculty who completed the three-minute survey also provided textual responses to the following questions:

1. Would you recommend Summon to your undergraduate and/or graduate students? Why or why not?
2. If you could change something about Summon to make it better, what would that be?
3. What is the best thing about Summon?

STRENGTHS

- Overall the faculty were positive about Summon (48 positive comments to 24 negative).
 - What did you like about Summon? *Liked it very much, quite pleased with it. Liked the results, the interface, and the responsiveness.*
- They liked that it was fast.
 - *We can do what this does, it appears to me, by negotiating our current categories serially, but that is time-consuming and a bit boring.*
- They liked it when the search results were relevant and overall felt the results were relevant. However, 13 positive to 11 negative comments also illustrated they felt the relevance could be improved (see CHALLENGES below).
 - *My known item search (author last name and journal title) found the article of interest as the 3rd match. The search for my publications found most of what I'd expect and some materials I didn't expect (like newspaper articles about my work, work by and about family members, and more).*
 - *I also liked how forgiving the search was...I didn't have to be overly specific and careful in crafting a search to find what I was looking for.*
- Several had positive comments for the interface.
 - *I liked the intuitive and easy to use interface*
- Many of them would recommend it to their students. Of the 14 faculty interviewed or who sent emails, 8 explicitly stated they would recommend it to students while none of them explicitly stated they would not. Of the 6 who responded to the three-minute

survey, 3 would recommend it to their graduate and undergraduate students, 2 would not recommend it to their students, and 1 did not answer the question.

- In terms of teaching, one professor liked it quite a bit as a *thinking tool*, a place for students to explore the dimensions of a topic rather than a source for really thorough research.
- One professor would recommend it to graduate students more than undergraduate students.
- Several faculty members cautioned that students need to be introduced to other resources as well, including subject-specific databases and the library catalog. Summon was just one resource, albeit a fast and convenient one, among many. This was an important point for their research, as well.
 - *It is good for quick article identification, for cross-disciplinary searching, and for finding information from sources you wouldn't have thought to search...but, clearly, I will still need other tools for more in-depth and exhaustive searching in my field.*
 - *I would recommend Summon to both my undergraduate and graduate students. However, I would be sure to recommend this tool in the context of also teaching them about more focused and discipline-specific sources of information. I think Summon meets a research need, but it clearly doesn't meet all research needs.*
- Some faculty liked the facets features – when they saw them. Others commented on the need for controlled vocabulary (4 comments on the facets, 8 comments on subject terms, 4 comments on dates or the date slider). They would like their date and subject terms to stay selected as they executed new searches.
 - Didn't see facets at first. Then they looked interesting, and the faculty member tried adding a facet “social policy” to the topic search and liked the results.
 - *Would like it (or some resource) to help in identifying the search terms to use for a concept for which the main terms vary across disciplines.*
 - *I would like the subject terms (selected in the subject facets list) to stay selected as I try new search terms...with the option to start a new fresh search when I want, but otherwise keep my selections on.*

CHALLENGES

- Cited references. Google Scholar has it – faculty want it in Summon. Cited references may also be one of the reasons that Web of Science is so popular with faculty (8 comments).
 - *In Google Scholar, 'related articles' and 'cited by' are ENORMOUSLY helpful features – for Summon to be a real competitor it would need those enhancements. I always expect 100s of irrelevant results with Google Scholar*

but these related/cited features help me 'network to the relevant material.'

- *In terms of a comparison with Web of Science, Summon does not have the ability to work with citations (for a specific article in Web of Science, I can easily navigate to the articles it cites, as well as articles published later that cite the specific article...this ability to track the research literature backwards and forwards through citation is indispensable, and Summon doesn't do this).*
- Faculty liked the full-text when they could easily get to it. This was actually one of the few areas that received more negative comments than positive comments (8 to 5) mostly due to frustration over dead links.
 - *Why, when the icon next to an item seems to indicate that "full text" is available does clicking on the item turn up the response that the item is not found?*
 - *A weakness is the use of an intermediate search engine for many items; the "full text" becomes available only after a successful search via the intermediate engine, and I did not succeed in getting through that on all tries. So a "full text" promise at the first level did not always lead to full text in fact.*
- As noted above, overall they felt results retrieved were relevant, but often felt that this could be improved.
 - *For a literature review topic, it was good for identifying a book and reviews, but after about five results it goes random.*
- They would like more information about the data sources Summon searches.
 - *If you could change something about Summon to make it better, what would that be? Making clear what material is actually available here.*

SUMMON AND SEARCH360

- Those who had used Search360 in the past unanimously felt that Summon was a great improvement. Search360 was "too slow" and "cumbersome."
 - *I've given up on Search360, both for myself and for my students.*

SUMMON AND GOOGLE SCHOLAR

- Faculty use Google Scholar. When discussing Google Scholar and Summon, faculty were divided on whether they preferred Google Scholar, Summon or had no preference. As noted above, Google Scholar includes cited references, which was a major feature desired by several faculty.
 - *I found Summon to work better than Google Scholar. It seemed like I received less false matches and more relevant results in Summon than I do in Google Scholar. In comparison to Google Scholar, I also liked the frequency with which I*

was able to navigate to the PDF in one or two clicks (Summon is better than Google Scholar in this sense).

- *How important to your research could you foresee Summon becoming when compared to other tools such as the library catalog, Search360, or Google? Probably not very, as I still will use search engines like Google Scholar, Web of Science, and so on for different purposes.*
- *Google Scholar search syntax didn't work well in Summon. GS has cited references. Summon gets you to full text quicker.*
- *A faculty member and a group of graduate students performed a similar search in Google Scholar and Summon. As a group, we ran several searches side-by-side in Google Scholar and Summon. We were more impressed with Google Scholar, which retrieved a greater breadth of results (some articles seemed to be missing from the Summon search result sets, though this may have been simply that they were buried down in the list) and better, more targeted relevancy at the top of the result set.*

LIBRARY STAFF

(also see WEB FEEDBACK)

Twelve library staff members completed the three-minute survey. Library staff also sent feedback to the Summon working groups and to Serials Solutions via the feedback link on the Summon Beta web site. Unfortunately, this feedback form did not have a demographic question so in many cases the type of library user (student, faculty, staff) was unclear. A small number did identify themselves as library staff. Because of this, and because of the unique nature of feedback responses (which tended to differ in nature from the responses to the three-minute survey), analysis of library staff feedback responses can be found in the WEB FEEDBACK section of this report and is not included here.

TEXTUAL RESPONSES – 6

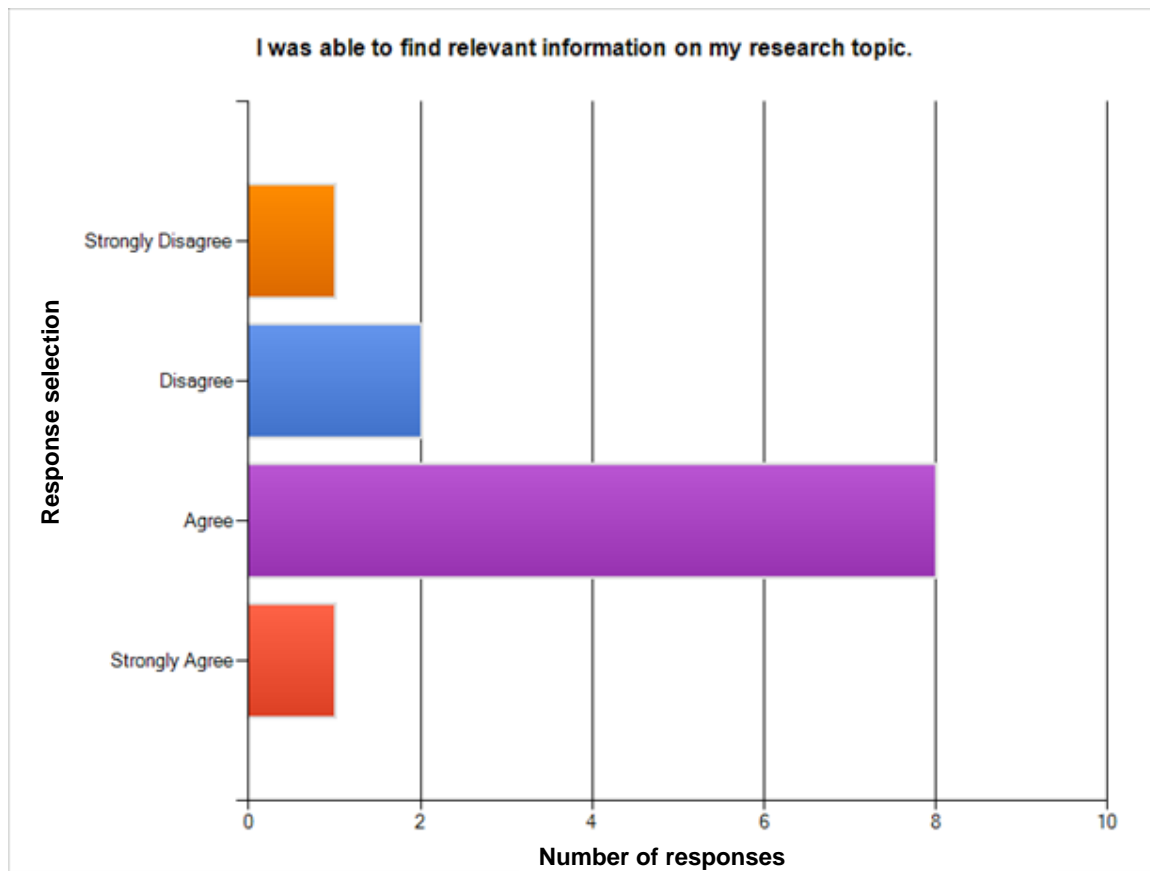
Of the twelve library staff who completed the three-minute survey, six also answered one or both of the open-ended questions at the end of the survey. Here are these questions with selected library staff responses.

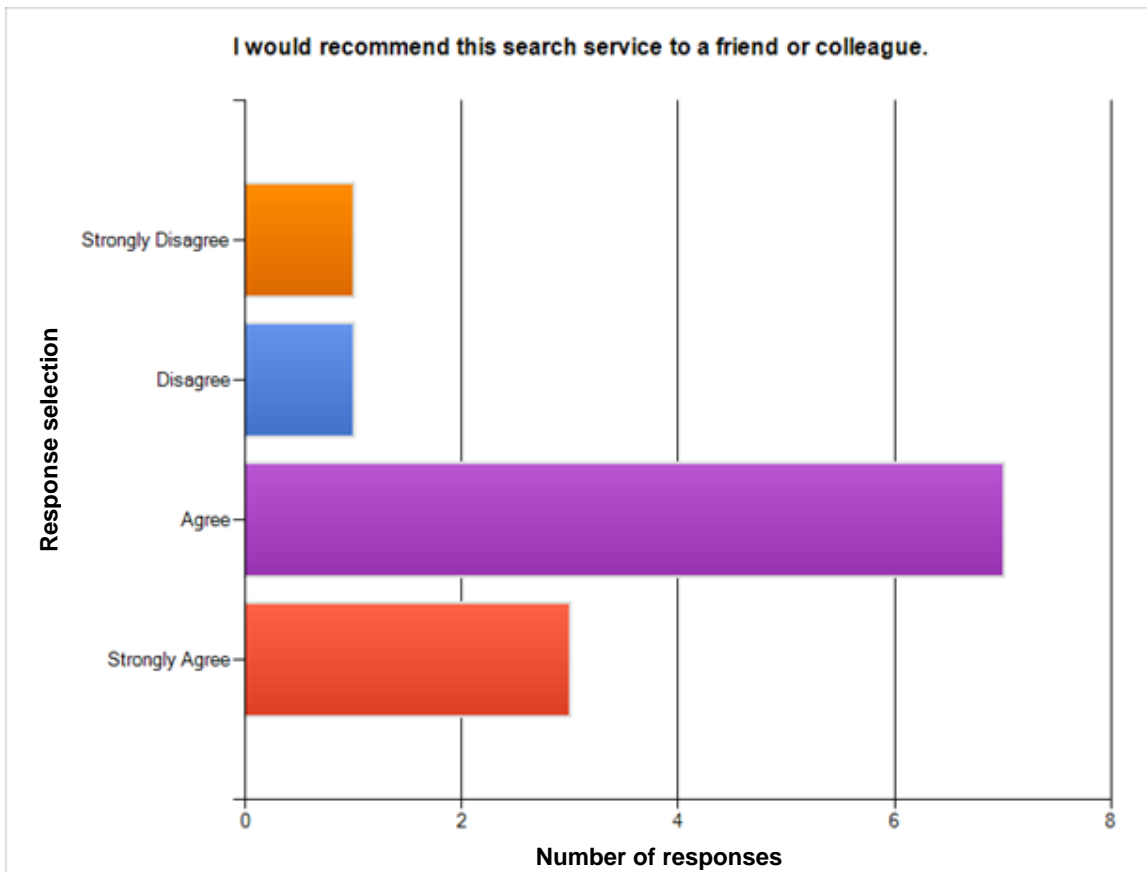
1. If you could change something about Summon to make it better, what would that be?
 - *Better icons.*
 - *Improve the relevancy of results. Improve the ability to limit initial search results.*
 - *More choice to refine search.*
 - *I get my Summon results and wonder what databases the citations came from. If the databases were listed (such as EbscoHost), I would know what I didn't have to pursue further. I really found in my several "test" searches that I got few good results, and in only one...did I find something unique....I am not thrilled with Summon.*
 - *Relevancy.*
2. What is the best thing about Summon?
 - *The speed.*
 - *It searches across multiple types of publications.*
 - *It seems very intuitive and easy to find good information.*
 - *It's federated searching, gathering up citations from the Dartmouth Library Catalog as well as other sources. The screens are clear and easy to read, and the full-text links are clearly marked.*
 - *Discovery tool.*

COMPLETED SURVEYS – 12

It is interesting to compare the library staff survey results with the undergraduate student survey results. Overall, each group held a positive view of Summon (with undergraduate students holding a stronger positive view than library staff). Of the twelve library staff who responded, 9 agreed or strongly agreed that they were able to find relevant information on their research topic and 10 agreed or strongly agreed that they would recommend Summon to others.

A relatively larger number of library staff who took the three-minute survey felt negatively about Summon, as illustrated by the number who disagreed or strongly disagreed with these two questions (3 library staff to 1 undergraduate on the first question, 2 library staff to 0 undergraduates on the second).





Web Feedback

The Summon feedback form received 94 responses submitted by approximately 41 library staff (a few staff members submitted multiple responses). There were 7 responses from external sources (one request for information on Summon from the Queensland University of Technology Library in Australia, and the remaining 6 presumably from non-library staff). Since the feedback form did not collect any demographic information, it is difficult to state whether the respondent was a library staff member, faculty member, student or college staff. Half the users self-identified and the remainder were anonymous. The feedback form showed whether the feedback came from within the Dartmouth network (internal) or from outside (external); this information was used to estimate which category the respondent belonged to.

Compared with the responses from faculty, undergraduates, and the staff who took the three-minute survey, overall web responses from library staff were negative. While most comments were highly critical of Summon, staff members were mostly undecided when asked if they would recommend this product to friends or colleagues.

- Definitely recommend: 2
- Very likely to recommend: 7
- Maybe recommend: 19
- Not very likely to recommend: 3
- N/A: 63

STRENGTHS

Staff submitted 8 positive and 20 negative comments about Summon. Many of the favorable comments are tempered by the concerns about how well the product works (recurrent themes were relevancy, metadata quality, and broken links on vendor sites) and indicate that library staff have mixed feelings about the product (i.e., it's a good product but it needs improvement).

- *Summon seems like a good resource for searching for library items. It is fairly straightforward and provides good results.*
- *We don't always get complete or correct citations for articles that are requested...But enough information is usually there that I can enter in to summon to find the article. Search 360 works too, but I have to scroll down and really look at the page to find the article, and it's much slower.*
- *I worked with a professor using Summon...He was impressed with the breadth of results he received, but also disappointed. Especially with the newspaper articles, he found broken links...However, overall he was impressed and would recommend Summon to students, especially graduate students.*

- *While I've been sending in feedback about things in Summon that need improvement, I'd like to tell you about one success story...while I couldn't get to the full text, I was able to find useful newspaper abstracts by searching beyond the library's collections. It retrieved items I wasn't finding in Factiva or Lexis Nexis.*
- *I wanted to let you know that Summons is fun but not as useful as some of the other databases. I liked it a lot but I think what would make it more useful and interesting is if they focused their searches more on the present, even when I limited it to just 2009 few articles, newspaper article, etc.. were achieved...*
- *I'm searching a...honors thesis topic sent to me by a student. SUMMON turns up the most relevant book I've located so far as the second citation - great! ... The "article" results were very disappointing. If there's a relevancy ranking here I fail to discern it...This is just as frustrating/bad as a Google search and perhaps not as focused as Google Scholar (which I haven't tried yet for comparison)....*

CHALLENGES

Library staff identified the lack of relevant results as the most significant problem with Summon (of the 55 comments on relevance, 29 were negative, 4 positive, and 22 general). Their comments reveal concerns about the lack of up-to-date content and metadata, as well as interface behavior (refining searches or applying limits).

- *When I go to advanced search and look for the most recent articles limited to "New Yorker," [a recent article] isn't there. If SUMMON is going to be a "go to" resource, it needs to be *really* up to date. I hope there's a way that can be addressed, because many people are looking for information about very current issues.*
- *I continue to be frustrated by the difficulty of finding relevant _and_ recent items easily.*
- *...it strikes me after a number of sample searches over the past several weeks – users are going to look at the titles retrieved to determine relevance. If their terms aren't there, and in the absence of subject terms, they won't see the relevance.*
- *I was disappointed in the results, especially when comparing with Google Scholar, which has the advantage of including books, which are indexed at a much deeper level.*
- *It's very confusing how Summon can't distinguish between books and book reviews.*
- *After working with a student, I searched Summon for relevant citations. With the results, I wasn't sure why I got what I got. Even after reading the abstracts. That is worrisome as that could confuse novice searchers.*

OTHER CONCERNS: Facets, Features, and Interface

Eighteen comments were submitted on facets (whether they used the term "facets" or talked about using limits or any of the "refine your search" options), 14 on features (12 negative, 2

positive) and 13 related to the interface. The majority of the comments suggested that significant improvement was needed in these areas.

- *Are the facets behaving correctly?*
- *Another facet to add (or at least information to make more transparent) -- SOURCES of the items found (i.e., which database, collection, etc.).*
- *I don't like having to choose between relevancy ranking and date (newest). It would be great if Summon could behave like Google Scholar, which allows me to click on a link to view recent articles that are also highly ranked.*
- *I'd like to have a history of searches I could go back to, at least for the session.*
- *It would be nice if you could sort results by content type.*
- *I wish there was a start over button of some sort.*
- *It would be great if the search could anticipate some synonyms.*
- *I am increasingly annoyed by the lack of information about the page range of articles. Start page is not enough; I want to see how substantial an article is. Also: exclude book reviews feature is desperately needed.*
- *Trying to edit my advanced search: my search terms disappear but the date limit sticks. (I wanted to edit the terms and get rid of the date limit: there is no Clear button). In fact, only the date sticks (and can't be easily cleared), the check marks disappear.*
- *It's very annoying that every time I change the search words, I have to recheck the boxes on the right.*
- *I would love it if the record in the search results contained the data I searched...Very frustrating not to know why a record is retrieved.*

FULL-TEXT

Of the small number of comments (7) regarding full-text, 3 were negative. Failure to access full-text was caused by incorrect data in Summon, and library staff members were able to successfully get to the full-text via the vendor databases.

- *Clicking on the full-text icon takes you to Lexis Nexis, which says "No documents found." Drilling down from the record...in the catalog gives several options, and I was able to readily connect to full text via Proquest. Strong rationale for giving users the option to choose among full-text providers.*

GOOGLE and GOOGLE SCHOLAR

Most library staff found that Summon compared unfavorably to Google and Google Scholar, particularly in terms of relevance and timeliness of content.

- *It would be great if Summon could be more up-to-date. For better or worse, Summon will be compared to Google Scholar, which has its own issues, but has content that's much more up-to-date. When I sort my results by date in Summon, I often find that the most recent items are from last January (NOTE: that is, 8 or 9 months ago).*

Appendix A

NOTE: Sarah Weeks, Usability Consultant for Serials Solutions/ProQuest, provided support to the SOCT in organizing, scheduling, and running all of the UserVue sessions that we completed. In addition to her invaluable administrative and organizational contributions, Sarah also served as an observer for every UserVue session that was completed. After each session, she forwarded the notes she had taken during the activity (these notes are designated "Observer02" in the UserVue materials, see the "Activity Area: Feedback (gathering)" section of the SOCT wiki at <<https://libwiki.dartmouth.edu/twiki/bin/view/Libopen/SummonOutreach>> for access to complete session reports). When all of our sessions were completed, Sarah created a summary report that summarizes of our Summon testing with Dartmouth graduate students, delineates trends, and provides her observations. This report has been reproduced in full below.

Report on observations of Dartmouth Graduate Student sessions using Summon, September-October 2009

Sarah Weeks, Usability Consultant, Serials Solutions/ProQuest

This report presents the results from our user testing of the prototype for Summon as implemented on the Dartmouth College Library website. In this round, we interviewed six graduate student participants between September 29 - October 16, 2009 in hour-long sessions. The users were queried about their majors, areas of research, and current research needs. They were then told to search normally, speaking aloud to explain their process and impressions as desired. We then asked a series of questions near the end of the session to assess the participants' experience.

Students were all either master's or PhD students. While some were just looking for background and others were deep into their topic, all were able to convey to us a detailed picture of their needs. Each proved to have an interesting approach to their work, and to need nuanced and specific kinds of results from their search. A few descriptions of students and their projects are as follows:

- A chemist who is looking for others who have used methods she can consult and then use in her own experiments, because she's kind of stuck.
- A PhD student doing health services research, studying what's working and not working in a clinical setting. His areas include shared decision-making with patients and caregivers, and human-computer interaction. He is also a web designer and had feedback about how Summon itself works, as well as the topical search results.
- A Public Health student who is doing a systematic review on the use of growth-hormone axis and its relationship to lipodystrophy in HIV+ patients. It has to be comprehensive - he can't miss any of the research that's out there.
- An astrophysics PhD student who is studying a certain sample of clusters of galaxies. He needs to do a literature search for these objects to see what publications have been done on them. Before he proceeds with his work, he wants to see what research is out there so he doesn't duplicate it. If he finds research similar to what he's done, he wants to compare his work to it, for consistency's sake.

Graduate students are not the primary intended user group for Summon; however, they can use it to add a valuable dimension to their usual search strategies. For instance, one user wanted to control the search through inputting variables himself, "rather than the system being super-smart." Summon is, in fact, designed as a "smart" system: it's good for novice users who are not used to crafting complex search strategies. That user noted that Summon's Advanced Search did not have different text box fields that he could connect with Boolean operators; however, he knew he could accomplish Boolean searching by using

quotes, parentheses, and operators within the one text box given. In this way, Summon can appeal to novice users, but still be functional at an advanced level for experienced searchers.

However, two users had trouble amending their usual search strategies to get good results in Summon. One involved looking for a proper name of an astrological cluster. The user wanted only the results referring to the galaxy cluster, not the star cluster of the same name. Adding "galaxy cluster" to the search string may have aided him - but this didn't occur to him, and his results contained the noise of star clusters as well as the relevant galaxy clusters.

Another user was searching a topic relating to sodium amalgamation, and received results including those about dentistry and other topics. She would have been better served if she had entered "chemistry" along with her other terms, to keep results within her field. She also wanted results that included the phrase "sodium amalgamation," with that proximity - but did not use quotes to accomplish this.

This brings up the issue of the degree of sophistication of the search tool. If the system is "smart," but the user would rather control the search him/herself and cannot, they can become frustrated; however, if the system leaves all criteria choice and search strategy to the patron, a novice user will not be able to use the system to its full advantage. Summon is a hybrid of both kinds of systems, which leads to varying success among users. An advanced user, who is used to manipulating the interfaces of complex databases, might fall victim to surprisingly simple search strategy mistakes when using Summon.

These advanced users did want features that Summon was not able to provide. Chief among them was the ability to limit to controlled randomized searches - which has to do with all participants working in scientific or social science fields. If any had been humanities scholars, their needs would have been different. One participant brought up an interesting point: When one does a systematic review of the literature in preparation for publication, you must describe your search process. There are almost canonical sources for this process, he said, and it is expected you'll do it in a certain way. For a new search tool, this could be a barrier, because publishers and reviewers will not know whether to trust research done with the new tool. To combat this, Summon could include a feature including easily digestible information about the mechanics of its search algorithm and its coverage of subjects, to help with acceptance of the tool.

Problems

The following is a list of specific issues participants pointed out during testing:

- Many users would like an option to limit to types of studies - for instance, randomized controlled trials or placebo controlled trials.
- Doesn't want duplicates. Wants a way to know if he's already viewed a document.
 - Could possibly accomplish this via a checkbox next to article, perhaps in a "like" or "dislike" format.
 - This is a known issue; Summon will at some point be able to normalize for redundant articles provided through multiple vendors.
- Doesn't know how far back the content goes.
- Would like the Saved Items Folder to be more prominent.
- Wishes Article Linker function was more integrated.
- Would like the ability to filter by full-text availability.
- Wants the ability to see the limits/criteria on left side once he has scrolled far down a page of results.
- Doesn't understand why Boolean operators have to be in all caps.

Particularly useful features

Preview - When hovering over the title of a result, a preview, including the abstract, pops up. Many participants liked this feature, and commented that no other system has it. They dislike having to click away from a results page to see an abstract when using other databases.

Content Type - an often used feature among these participants.

Saved Items folder - Students we consulted had various systems of their own for saving citations, ranging from Papers, a Mac-based system that stores PDFs, to just using Word to copy and paste data. Summon's

Saved Items folder was not something they found on their own. But when told about it, each liked or really liked it, and found it easy to use immediately.

Modern, fast, friendly - Users liked Summon's look and feel. One found it easy to scroll through 40 or 50 articles to get a quick overview before going deeper into search results.

Quantity of results - Many users found same amount, if not more, results in Summon than other systems.

Good perspective on topic - after doing the same searches over and over on favorite databases, using Summon let one user know if she was missing anything, and caused her to rethink her usual search strategy.

Subject terms - One participant found these useful; another misinterpreted this feature completely, using it instead of entering new search terms. Some wondered where Subject Terms come from.

Timeliness - One user said she found more recent articles than her usual source.

Suggestions:

Participants had a few specific, technical suggestions to make Summon better:

- change the date restriction input method input from drop-down menus to small calendars
- provide a short video tutorial showing someone using basic features of the system
- add a way to annotate citations within the Saved Items folder
- provide a way to download PDFs directly from the results page