Federated Searching

Do Undergraduates Prefer it and Does it Add Value?

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Poll: Institution Type – Highest Degree Offered

A. Associate
B. Bachelor's
C. Master's
D. Doctorate

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Poll: Institution Size – Enrollment

A. Under 1,000
B. 1,000 – 4,999
C. 5,000 – 14,999
D. 15,000 – 24,999
E. 25,000 or more

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Poll: Federated Searching Experience

A. Considering implementing
B. Actively planning for implementation
C. Implementing or pilot project
D. Fully implemented – less than happy with
E. Fully implemented – happy with

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Study Background 1

- Consortium of Church Libraries and Archives (CCLA)
  - Five academic and several special libraries
- All academic institutions interested
  - Competition with Google
  - Desire to promote scholarly subscription resources in an effective way
  - Expose less-used content to greater use

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Study Background 2

- Before implementation
  - Demos from leading vendors for CCLA libraries
  - Discussion and input from library staffs
    - "Let technology mature"
    - "Opt for leading edge not bleeding edge"
- CCLA Directors decided to license
  - Initial 3 year agreement (expires 2007)
  - Actual implementation left under local control

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Study Background 3

- Impetus for study came from impending renewal
  - Is federated searching doing what we hoped it would?
- Four questions
  - Does federated searching save time?
  - Does federated search satisfy students' information needs?
  - Do students prefer federated search to the alternative of searching databases individually?
  - Does federated searching yield quality results?

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Study Methodology – Preparation 1

- Hoped to do at all four institutions
  - Received IRB approval at all four
  - Dropped LDS Business College due to poor response
- E-mailed potential undergraduate participants
- Decided upon hypothetical research questions (both biology)
- With faculty and librarian help, created subjective grading rubric

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Study Methodology – Preparation 2

- With vendor help, designed implementation-neutral web interface
  - Did not want study interface to look like any of the institutional interfaces
- Wrote and tested instructions for data collection
- Printed instructions and questionnaires
- Scheduled rooms and respondent appointments
  - Suggested 30–60 minutes as typical timeframe
  - Provided, on our end, a minimum of two hours to complete

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Study Methodology – Data Collection 1

- Seated student at computer already on main Web page for study
- Provided consent form and asked for signature
- Provided written general instruction sheet

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Directions - Forms 1-F and 2-F

- During this study you will be asked to conduct the research necessary to complete the research portion of 2 hypothetical research paper assignments.
  - You will conduct the research for the first assignment by searching multiple databases simultaneously. You will **not** be able to change the selection of databases.
  - You will conduct the research for the second assignment by searching databases individually. You may search as few or as many of the available databases as you choose.
- Use only the tools that will be provided to you on the computer screen to conduct the research necessary to complete these assignments.
  - Do **not** consult Google or any other outside research service or aid such as the library catalog or a database not included on the list of resources provided for the study.
  - For your information, the "Scratch Pad" of Google Desktop appears on the screen to the right of the Web browser. You will copy citations to the "Scratch Pad" as instructed below.
- Take as much time as you need to compile a list of enough citations to *journal articles* to complete each hypothetical assignment to write a 10 page research paper. The citations will be copied as you see them on screen. They do **not** have to be in a particular format such as APA, MLA, Turabian, etc.
  - Do **not** include citations to books, videos, websites, etc.
  - A typical journal article citation looks something like this. (Some citations include an abstract or short summary such as this example. Others do not.)

    The criminology of genocide: The death and rape of Darfur
    Hagan, J.; Rymond-Richmond, W.
    Criminology, vol. 43, no. 3, pp. 525-561, 2005
    This study examines Sudanese government involvement in the racially motivated murders of nearly 400,000 Africans from the Darfur region of Sudan. Data were obtained from a victimization survey of Darfurian survivors living in refugee camps in Chad ...

  - There is no set number of citations you need to gather. You alone determine what "enough citations" means. Simply gather a sufficient number of usable citations that you feel confident you would be able to complete each hypothetical assignment.
- When you find a citation you want to use, copy all of the citation information available on the screen for the journal article of interest.
  - Highlight text with your mouse as shown in picture 1 below.
  - Press CTRL+C as shown in picture 2 below to copy the highlighted text.
  - Click in the "Scratch Pad" to the right of your screen.
  - Press CTRL+V as shown in picture 3 below to paste the copied text into the "Scratch Pad" as shown in picture 4.

1

2

3

4

Brief explanation of what participant would be doing

Caution against use of other resources

Emphasis on *journal articles* and what meant by "citation"

How to copy from search results to Google Scratch pad

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Study Methodology – Data Collection 2

- Provided specific instruction sheet/ questionnaire combo for 1st question/1st method combination
- Noted participant student login ID
- When ready to start, noted start time for 1st q/ 1st m
- When finished, noted end time for 1st q/1st m
- Copied citations from Google Scratch Pad to MS Word and saved with standard naming convention (loginid.1q1m.q#)

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1 - F

INTERNAL USE ONLY | Start Time 1: _____ | Start Time 2: _____

Net ID: _____ | End Time 1 : _____ | End Time 2 : _____

Hypothetical Research Assignment #1

You've been given an assignment to write a 10 page research paper on the topic outlined below:

Ignoring any ethical issues involved, what is the current status of stem cell research for the treatment of diabetes?

Using only the resources available to you on screen when the study proctor tells you to begin, find enough citations to journal articles to enable you to complete this assignment. Copy the citations to the "Scratch Pad" on the right-hand side of your screen as shown on the "Directions" sheet.

If you lose your place

- press the Web browser's home button
- click on the "Form 1-F" link
- click on the "Hypothetical Research Assignment #1" link

After you have compiled a list of enough citations to complete this hypothetical assignment, stop your work and notify the study proctor.

Hypothetical Research Assignment #2

You've been given an assignment to write a 10 page research paper on the topic outlined below:

According to current research, what are the effects of agriculture on rainforests and biodiversity?

Using only the resources available to you on screen when the study proctor tells you to begin, find enough citations to journal articles to enable you to complete this assignment. Copy the citations to the "Scratch Pad" on the right-hand side of your screen as shown on the "Directions" sheet.

If you lose your place

- press the Web browser's home button
- click on the "Form 1-F" link
- click on the "Hypothetical Research Assignment #2" link

After you have compiled a list of enough citations to complete this hypothetical assignment, stop your work and notify the study proctor.

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Questionnaire

1. How satisfied were you with the citations you were able to discover using the first research method (Hypothetical Assignment #1)? (Circle One: 1=Unsatisfied to 7=Very satisfied)

   1 2 3 4 5 6 7

2. How satisfied were you with the citations you were able to discover using the second research method (Hypothetical Assignment #2)? (Circle One: 1=Unsatisfied to 7=Very satisfied)

   1 2 3 4 5 6 7

3. Which method did you prefer? (First)____ (Second)____

   Why?

4. What other comments do you have about your searching experiences?

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Study Methodology – Data Collection 3

- Cleared Google Scratch Pad
- Repeated for 2nd q/2nd m
- Asked participant to complete questionnaire
- Thanked participant and gave incentive
- Copied MS Word documents from hard drive to flash drive

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Study Methodology – Data Analysis 1

- Entered start/stop times and questionnaire data into MS Excel spreadsheet
- To get into standard format, entered data from each citation set into RefWorks
  - Created new folder for each citation set
  - Removed all non-journal article citations
  - Removed all duplicate citations
- Created master journal list

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Study Methodology – Data Analysis 2

- For journals on master journal list
  - Gathered impact factors from ISI Journal Citation Reports
  - Gathered peer-reviewed data from Ulrichsweb.com
  - Recorded data in MS Excel worksheet
- Output each citation set into MS Word using RefWorks custom format
- Printed citation sets and gave to student grader
- Wrote macro for MS Word to parse data in RefWorks custom format into a csv format capable of import to MS Excel

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Study Methodology – Data Analysis 3

- Imported csv file into MS Excel
- Wrote macros for Excel to
  - Assign impact factor and peer-review data to each citation
  - Calculate timeliness of each citation
  - Calculate for each citation set
    - Ratio of peer-reviewed to total citations
    - Average timeliness
    - Average impact factor
  - Insert data from objective analysis into master spreadsheet
- Entered grades from subjective grading rubric into master spreadsheet

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Study Methodology – Data Analysis 4

- Used SAS to perform statistical analysis

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Purpose Revisited

1:

Does federated searching save time?

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Poll: Time Savings

Does federated searching save time?

a. Yes

b. No

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Time Saved Using Federated Search

2 minutes
23 seconds

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Time Saved Using Federated Search

10.5%

less time searching using **federated** search

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Time Saved Using Federated Search

	Time Saved	%
BYU	4 minutes 11 seconds	20.7%*
BYU Idaho	11 seconds	1.9%
BYU Hawaii	26 seconds	4.4%

* Statistically Significant

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Time Saved Using Federated Search

"[Federated search] **definitely saved time** and was **more convenient** to use than the [non-federated search]."

--BYU Undergraduate (emphasis added)

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Purpose Revisited

2:

Does federated search satisfy students' information needs?

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Poll: Satisfaction

How satisfied do you think the undergraduates were with the results found using federated search?

1=Unsatisfied to 7=Very satisfied

a. <3
b. Between 3 and 4
c. Between 4 and 5
d. Between 5 and 6
e. Between 6 and 7

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Poll: Satisfaction

How satisfied do you think the undergraduates were with the results found using non-federated searching?

1=Unsatisfied to 7=Very satisfied

a. <3
b. Between 3 and 4
c. Between 4 and 5
d. Between 5 and 6
e. Between 6 and 7

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Federated Search Satisfaction Rating

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Non-federated Search Satisfaction Rating

4.8

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Satisfaction

16.5%

more satisfied with **federated** search

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Satisfaction Using Federated Search

	More satisfaction	%
BYU	0.99	20.7%*
BYU Idaho	-0.07	-1.3%
BYU Hawaii	1.44	34.9%*

* Statistically Significant

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Satisfaction Using Federated Search

"I found that **both were not very user friendly**…I was frustrated and very tempted to just go back to good old 'Google'!!"

--BYU Hawaii Undergraduate (emphasis added)

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Purpose Revisited

3:

Do students prefer federated search to the alternative of searching databases individually?

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Poll: Preference

Do students prefer federated search to the alternative of searching databases individually?

a. Yes
b. No

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Federated Search Preference

70%

of the students **preferred federated search** over non-federated search

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Federated Search Preference

	% Preferred Federated Search
BYU	72%
BYU Idaho	52%
BYU Hawaii	81%

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Federated Search Preference

"…[Federated search] **got right to the point**. I found more **useful information**. [With the non-federated search] I had to do a longer search."

--BYU Idaho Undergraduate (emphasis added)

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Purpose Revisited

4:

Does federated searching yield quality results?

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Poll: Quality of Results

Does federated searching yield higher quality results than non-federated searching?

a. Yes
b. No
c. Same quality regardless of search technique

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Federated Search Preference

Ambiguous

results for quality of citations found using federated searching versus non-federated searching

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Quality of Results

	% change in quality between federated and non-federated results	
	Librarian-created rubric	Faculty-created rubric
Overall	-5.6%*	8.1%

* Statistically Significant

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Quality of Results

	% change in quality between federated and non-federated results	
	Librarian-created rubric	Faculty-created rubric
BYU	-5.7%	-2.5%
BYU Idaho	-2.3%	10.2%
BYU Hawaii	-8.5%	-2.6%

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Quality of Results

"I love Google, but this certainly **helps to narrow** your information down to **'good' resources**."

--BYU Hawaii Undergraduate (emphasis added)

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Conclusions

1:

Federated searching **saves time**

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Conclusions

2:

Federated searching **satisfies** undergraduate's **information needs**

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Conclusions

3:

Undergraduates **prefer federated search** to searching databases individually

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Conclusions

4:

There is **no clear difference** between the **quality** of results found using federated search and searching databases individually

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Future Research

Extrapolate results beyond BYU, BYU Hawaii and BYU Idaho

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Future Research

Extrapolate results **beyond undergraduate** population

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Future Research

Study the **effects of** specific federated search **implementations**

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Questions

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Actual Numbers

Table 3: Comparison of results between schools

	Number of Participants	% Preferred Federated	Average Time to Complete Research (in minutes) [5]		Satisfaction of Results – Average Rating (Scale of 1-7; 7 being highest) [5]		Librarian-created Rubric – Average Quality Scores (Scale of 0-30; 30 being highest) [5]		Faculty-created Rubric – Average Quality Scores (Scale of 0-9; 9 being highest) [5]	
			Federated	Non-federated	Federated	Non-federated	Federated	Non-federated	Federated	Non-federated
BYUH	27	81%	21.17	22.14	5.57	4.13[1,2]	17.71	19.35[4]	5.59[1]	5.74[3]
BYUI	21	52%	23.10	23.54	5.41[1]	5.48	17.67	18.08	6.38	5.79
BYU	47	72%	16.76[1]	21.14[2]	5.77	4.78[2]	18.10	19.20[4]	6.15	6.31
ALL	95	70%	20.34	22.72	5.59	4.80[2]	17.83	18.88[2]	6.04	5.59

[1] Statistically significant difference between schools ($\alpha = .05$)

[2] Statistically significant difference between methods ($\alpha = .05$)

[3] Marginally significant difference between schools ($\alpha = .10$)

[4] Marginally significant difference between methods ($\alpha = .10$)

[5] These are adjusted means not pure means. A least squares mean was utilized to create more robust results due to differing sample sizes between the schools.

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Least Squares Mean

Least Squares Mean: The effect of any covariates is statistically removed from the scores prior to computing the means

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