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Student Use of Keywords and Limiters in Web-scale Discovery Searching

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ABSTRACT

Using transaction log analysis of student search histories in EBSCO Discovery Service, which we branded RVOneSearch, we seek to answer: 1. Do students use the limiters provided in RVOneSearch? 2. How effectively do students use keywords in RVOneSearch after receiving instruction on keywording? In Spring 2012, RVOneSearch became an integral part of our 80-minute librarian-led sessions that are required of all English Composition I courses. We began focusing our instruction on selecting appropriate keywords when we noticed that regardless of interface, students struggled most with identifying the right search terms. With RVOneSearch we stopped teaching multiple interfaces and instead began teaching one reference database for background and context, and RVOneSearch for scholarly sources. We spend less time on the nuances of interfaces and more time on evaluating results. We also teach students to use the facets and limiters available in RVOneSearch. In this study we wanted to determine if students used the available facets and limiters and whether they chose appropriate keywords after instruction on how to do so. Our results inform how and what we teach students and are applicable to others teaching with web-scale discovery.

INTRODUCTION

Web-scale discovery services are becoming an integral component of academic libraries. Seeking to provide students with an enticing alternative to Google for their research needs, librarians have been implementing "one-stop searching" services since the early days of federated search. However, these tools proved to be cumbersome and slow with poor relevancy ranking. With the introduction of Google Scholar in 2004, Breeding (2005) declared that libraries' "strategy of metasearch that depends on live connections casting queries to multiple remote information sources" could not compete with the speed, simplicity, and relevancy ranking of systems based on centralized indices (p. 27). Vendors responded and began offering full-service discovery products like Summon (Serials Solutions), EBSCO Discovery Service, Primo Central (Ex Libris) and WorldCat Local (OCLC). These tools meet the need—be it real or perceived—for single search boxes on library websites that give students one-stop access to many of their library's resources.

The Evelyn S. Field Library at Raritan Valley Community College implemented EBSCO Discovery Service (EDS) in September, 2012, and rebranded the tool as RVOneSearch. Instruction librarians began teaching RVOneSearch in the spring, 2013 semester as an integral part of our Information Literacy I sessions, which are 80-minute librarian-led sessions required of all English Composition I (ENGL 111) courses. We recognize that there are a number of pedagogical limitations to one-shot information literacy instruction. These limitations are compounded by students' desire to find sources quickly and easily, their over-reliance on Google searches to find all types of information, and the satisficing search behavior that is characteristic of information seekers (Simon, 1979), especially college students (see for example Barrett, 2005; Connaway, Dickey, & Radford, 2011; Prahba, Connaway, Olszweski, & Jenkins, 2007; Warwick, Rimmer, Blandford, Gow, & Buchanan, 2009). Historically, we have taught students in ENGL 111 how to search the catalog and two or three other databases. The majority of class time was spent demonstrating search techniques in the various interfaces. Over time, the librarians moved away from a focus on tool instruction and began spending more time on selecting appropriate keywords. We noticed that regardless of search interface, students struggled most with identifying the right terms to find the sources they needed. Implementing RVOneSearch helped our efforts because we decided to stop teaching multiple interfaces to ENGL 111 students and instead teach one tool for background information (CQ Researcher, Credo Reference, or a Facts on File database, for example) and RVOneSearch for all other sources. Now, a significant portion of class time is spent working with students on refining their topics and identifying keywords. Many students have some familiarity with the EBSCO search interface because EBSCO products are used in a number of the area high schools. When teaching RVOneSearch, we spend less time on the nuances of the interface and more time on selecting keywords and evaluating search results. Because narrowing results is an important skill when using a discovery system, the librarians also teach students how to use the facets and limiters that are available in RVOneSearch.

We determined that we could evaluate student search behavior in RVOneSearch by analyzing Search Histories, which are stored by

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RVOneSearch during a user's search session. We wanted to answer the questions:

1. Do students use the limiters provided in RVOneSearch?
2. How effectively do students use keywords in RVOneSearch after receiving instruction on keywording?

Around the same time that we undertook this research, Badke (2013) asserted that discovery systems encourage students to pursue the path of least resistance when it comes to research:

> You can't tell me that even 5% of users actually facet their discovery searches… They just muddle through whatever result their initial keyword searches got them. (p. 66).

Our research uses search log analysis to determine if this is true of students taking their first college composition course.

LITERATURE REVIEW

In 2005, Breeding proposed that libraries begin making the switch to metasearch tools that rely on centralized indices rather than on distributed search (p. 29). Within a couple of years, vendors began responding to this type of transition by offering web-scale discovery products. The introduction of this promising new technology to meet students' desire for easy information retrieval and librarians' desire to get library resources into students' hands has produced a flurry of literature related to the selection, implementation, usability, and instruction of web-scale discovery products. In January, 2011, *Library Technology Reports* devoted an entire issue to web-scale discovery, including an explanation of what web-scale discovery is and why it is important, and individual chapters devoted to the big four that had emerged by that time: OCLC WorldCat Local, Serials Solutions Summon, EBSCO Discovery Services, and Ex Libris Primo Central (Vaughan, 2011). Numerous library trade magazines and journals have offered descriptions and comparisons of specific products (Birong, Kelley, & Garrison, 2009; Chickering & Yang, 2014; Fernandez, 2011; Rowe, 2011; Vaughan, 2011), explanatory articles to serve as web-scale discovery primers for librarians (Little, 2012; Notess, 2011; Wisniewski, 2014), and speculations on the potential value or impact of web-scale discovery to libraries (Richardson, 2013; Vaughan, 2012; Way, 2010).

Several usability studies have been conducted and the findings relate to the questions investigated in this study. Usability tests have revealed that participants are either unaware of or choose not to use limiters and facets (Dalal, Kimura & Hofmann, 2015; Gross & Sheridan, 2011), cannot understand which limiters would improve their results (Cassidy, Jones, McMain, Shen, & Vieira, 2014), or are more likely to use advanced search, limiters, and facets for open-ended searches rather than when searching for known items (Hanrath & Kottman, 2015; Nichols, Billey, Spitzform, Stokes, & Tran, 2014). Williams and Foster (2011) found that all but five of six participants used a post-search limiter or refinement when searching EBSCO Discovery Service although they were used sparingly, in contrast to the participants of a follow up study who used post-search refinements more frequently in Serials Solutions' Summon (Foster & MacDonald, 2013, p. 8).

Gross and Sheridan (2011) and Dalal, Kimura, and Hofmann (2015) discovered that most participants failed to use appropriate keywords to articulate their information needs. Johnson (2013) shares that even a faculty member could not appropriately keyword an information need in a single-search box; the faculty member commented he "would just try Google" as his next step, rather than alter search terms or try one of the library's subject-specific databases (p. 73). Johnson concludes that although users like the single-search box interface, they are ineffective at refining a search for better results. Asher, Duke, and Wilson (2013) compared student search behaviors in EDS, Summon, Google Scholar and conventional library resources and found that students searching EDS used the highest quality resources to complete given tasks. Regardless of the tool, though, "students treated almost every search box like a Google search box, using simple keyword searches in 81.5 percent of the searches observed" (p. 473). Thus large numbers of results are obtained, students have difficulty evaluating the quality of results, and they put a lot of trust in the search tools' relevancy-ranking and markers of authority (peer reviewed or "scholarly" designations).

Another area related to the current study is the impact of web-scale discovery tools on information literacy instruction (ILI), but fewer research studies have been conducted on this topic. Authors have speculated on how web-scale discovery tools support or will change ILI (Cmor & Xin, 2012; Fagan, 2011; Fawley & Krysak, 2012) or have related their own personal experience teaching a web-scale discovery tool (Azadbakht & Polacek, 2015). In a conceptual article, Seeber (2015) argues that particularly in an era of web-scale discovery, librarians should be teaching the process of information creation, not how to search an interface. Buck and Steffy (2013) use the results of interviews and surveys of teaching librarians to propose promising practices for teaching web-scale discovery tools.

According to Dalal, Kimura, and Hofmann (2015), findings from their usability study have informed changes to their library's information literacy instruction. They found that students lack an understanding of the scholarly publishing process and the purpose of a discovery tool, and that students fail to use advanced search techniques or locate the full text of articles. Knowing these challenges, they conclude that they need to "teach more slowly and with more repetition to ensure real mastery of even the most basic concepts" (p. 675). Our research reveals similar findings about the impact of web-scale discovery on ILI.

METHODS

Data were collected in the spring semester of 2013 from 118 students enrolled in 27 sections of ENGL 111. After conducting their own independent research using RVOneSearch, students were verbally instructed by the teaching librarian to print out their Search History. Students were informed that printing out their Search Histories was optional and that they were not obligated to share them with us, and student names were not identified on the Search Histories. Since Raritan Valley Community College has no Institutional Review Board (IRB), approval could not be obtained. However, no identifying data were collected that could be traced back to any individual student.

By default, a Search History is not visible in RVOneSearch but a user can opt to make it visible by clicking the Search History link directly below the search box. When visible, individual searches in a history can be selected and combined using Boolean connectors. The results of a prior search can be viewed, and prior searches can be revised from the Search History. A Search History can also be printed (Fig. 1).

The number of searches varied from section to section of ENGL 111 and across individual students within sections. The number of searches students performed ranged from 1 to 26 with the average number of searches as 5.9.

Student Search Histories were analyzed based on two broad criteria:

- Use of EBSCO provided limiters
- Student keyword abilities.

EBSCO Discovery Service provides a number of limiters that can be applied before or after conducting a search. Our librarians teaching IL instruction for ENGL 111 normally only teach one or two of these limiters so as not to overwhelm the students. The most commonly taught limiter is 'Peer Reviewed' because nearly all ENGL 111 instructors require students to use at least one peer reviewed article as a source. This and other limiters appear on the left side of the results screen. When a limiter is selected, the search is modified and new results appear that