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Craig Leonard Brians
Virginia Tech, cbrians@vt.edu

Bruce Pencek
Virginia Tech, bpencek@vt.edu

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Discovery Systems: Analyzing the Gap Between Professors' Expectations and Student Behavior

Craig Leonard Brians, Associate Professor and Associate Chair, Virginia Tech
Bruce Pencek, College Librarian for Social Sciences and History, Virginia Tech

Abstract

Professors want their students to develop habits of mind that empower them to cross the gap that separates opportunistic searchers from thoughtful, purposive researchers. The marketing of discovery systems (e.g., Proquest/Serials Solutions' Summon, EBSCO Discovery Service, etc.) to academic libraries suggests that even neophytes will be able to easily maximize their research skills using these tools. These multifaceted search tools certainly do provide rich and accessible initial search results. But observation shows great disparities between search results that students submit as satisfactory and relevant and what their professors want them to select. Perhaps, pedagogically speaking, discovery systems are too rich, too multifaceted, and too beguiling for many students' own good as they are guided through the transition from searcher to researcher.

Focusing on the question of how students understand and apply the idea of relevance among articles identified by Summon, this presentation updates preliminary findings we presented at last year's Charleston Conference. Our ongoing research finds strikingly similar research-skills deficits in students' use of Summon to discover and select related journal articles. Spanning several academic terms, our qualitative and quantitative results reveal: (1) that students' perceptions of relations among articles are often cued by discovery systems more than by the actual content of articles and (2) this deficit requires professors to adapt instruction (including assignments) to compensate.

This presentation is an update to one we made at last year's Charleston Conference (Brians and Pencek, 2011). It is a report of a modest investigation into Virginia Tech's implementation of the Summon discovery system. Unlike the bulk of the research (and certainly outreach and promotional information from discovery system vendors), our concern is with satisfaction of users one step removed from the actual student-searchers: their professors, who are more concerned with the efficacy of students completing research assignments than with students' subjective reaction to a tool.

Pedagogically, our concern has been to advance our students' approach to information from being merely searchers to being researchers. Where mere searchers are incrementalists, researchers are purposive, designing and revising their inquiry purposes and rationales in mind. Searchers want to find *something*, even if problematic, with the least effort; researchers understand that null results increase knowledge and rethink their projects accordingly. Where searchers reflexively

employ familiar tools and techniques, researchers evaluate for their fitness to their particular research purpose. Where searchers all too frequently outsource judgments of relevance to their tools, researchers assess the results of their inquiry in light of their research goal. Searchers feel that finding good-enough information should be easy; researchers understand that finding the right information and applying it appropriately takes work—often hard work. In other words, our approach to information literacy and information literacy instruction is to start at the earliest time to help students become conversant with the habits of mind of social science researchers, along with the appropriate methodologies and instruments.

For the past academic year and a half Professor Brians has used a two-part assignment to introduce students in his introductory classes to the conventions of political science scholarship and writing, concurrently. The first part is essentially about retrieval; the second part, about relevance or, closer, relatedness among articles.

This assignment coincided with our university’s implementation of Summon, giving us a natural opportunity to gauge what effects Summon might have on instructional design and delivery. In large classes, student response systems (“clickers”) have been an integral part of the teaching and assessment toolkit. Additionally, the graduate teaching assistants are asked to track student questions about research assignments. End-of-semester qualitative assessments (“retros”) provide additional insights directly from the students about how they used library resources and services. He has used very similar assignments and assessments in upper-division courses in political communication and, once, in the second part of a graduate-level research methods seminar.

The first part of the standard assignment is an unambiguous known-citation search exercise—the sort of thing at which we would expect a web-scale discovery system in a research library to do very well. Students were each assigned a citation to one of ten recent articles in political science journals, the online availability of which Professor Brians confirmed at the beginning of each semester. These citations were in the *American Political Science Review* style (essentially, Chicago author-date style), which is the norm in the discipline (Table 1). After a lecture session addressing the typical ensembles of attributes that distinguished scholarly articles and the salient elements of Summon, students were instructed to use the discovery system to locate their respective articles, print the PDF, read, and then summarize their key ideas. Students were specifically instructed to diagram their assigned articles to call attention to their scholarly attributes, research questions, and findings.

Generally, the students performed this part of the assignment competently, and simple searches in Summon gave accurate, high-value results. The most commonly reported difficulty came when they pasted the entire citation into the Summon search box, over-specifying the search: Our implementation of Summon privileges bibliographic records from Web of Science, which reduces given and middle names to initials whereas APSR style does not. The difficulty was

Final Digit of VT ID#	Article Citation
0	Brady, H. E., & McNulty, J. E. (2011). Turning Out to Vote: The Costs of Finding and Getting to the Polling Place. <i>American Political Science Review</i> , 105, 115–134.
1	Fridkin, K. L., & Kenney, P. J. (2011). Variability in Citizens' Reactions to Different Types of Negative Campaigns. <i>American Journal of Political Science</i> , 55, 307–325.

Table 1: Sample Assigned Article Citations

resolved by suggesting that students copy/paste article titles, in double quotation marks, into the search box. In at least one case, however, the literalness of a quoted search string caused trouble owing to a student transcription error that was hiding in plain sight. However, in exploring how Summon handled author-name searches, Brians was disturbed by Summon’s stemming feature, which depreciated his family name in favor of the common first name, Brian. In contrast, Google Scholar put his articles at the top of the results list. Given how teaching and research faculty frequently use author names to direct students to whole bodies of research, this ostensibly helpful feature may well get in the way.

The second part of the assignment required each student to find a number of articles that were related to his or her assigned article and to explain their connection. Here we saw how algorithms can force teaching faculty to adapt to the resources librarians initiate. Last year’s version of the assignment asked students to “locate and print out four articles that are related to the assigned article.” Far too often students were thoughtless and superficial. They thought like searchers, space not researchers—not necessarily bad, but not pointing to the kind of thinking courses were trying to cultivate. In describing their reasoning, most thoughtful students said things like these: “I looked at the title and abstract—similar words.” “I read the abstract,

look at the tags, and go off of the title for relevance.” “I used the same keywords for each search.” The least thoughtful simply accepted machine-calculated resemblance among documents in lieu of choosing articles that were substantively related not only to one another, but that together spoke to the same research question, theory, hypothesis, or finding.

This past summer and fall, we revised the instruction to clarify it and, we hoped, create incentives for the students actually to read and try to make sense of several pieces of typical political science scholarship: “locate two scholarly articles that are related to the main point of the assigned article.” This clarification of faculty expectations to align with demonstrated student behavior was in itself modeling what social science researchers do. Students’ explanations of their selections were encouraging; the teaching assistants seeing many more accounts saying things like: “articles have the same main point.” “I thoroughly read and found a few main topics.” “[I decided an article was related,] if the main point was like my article are similar to it.” Students said that they generally looked at two to three articles for every one they ultimately identified as relevant to their assigned article.

Student’s explanations of their searching were varied, but some suggested awareness of the value of Summon’s un-Google-like features. Most notable was the use for subject headings to locate works sharing some thematic connection; remarks that were made about both the subject tags in individual bibliographic records suggested that students found them useful; entries in the (syncretic) subject-facet table sometimes were cited for their value, but in other cases mere repetition of the same subjects was cited as enough warrant to claim a substantive relation among articles. This attention to subject cues was particularly interesting in as much as we devoted much less attention to tags and facets in formal instruction this year than last. We are not persuaded that the handling of subject Summon interface became any more intuitive or persuasive. It seems to us more likely that students have become aware of the value of

subject labels through experience and instruction, especially in university-wide, first-year initiatives.

On the other hand, some students were simply confused. Some of this, of course, has to do with the novelty of reading scholarly articles in a discipline that may itself have been unfamiliar to many lower-division students. (Some, alas, may have to do with not reading attentively.) We encountered relevance measured in a merely formal sense: “the article is related because it is scholarly,” or it appeared in the same journal. Too, some students had difficulty differentiating the general topic of an article from its key finding. Such responses were anticipated: one point of the assignment was to create teachable moments about how researchers in the discipline work and communicate.

Arguably, our clearer instructions to address substantive relatedness highlighted a problem with relatedness to which we were previously inattentive: format. Even though Summon offers facets to limit results to peer-reviewed articles, too many of our students listed among their related articles such unexpected document types as blog posts, letters to the editor, journalistic articles, obituaries, and even lists of “memorable quotations.” These responses raise a question: In what respects can they be attributed to student naïveté, to student laziness (for want of a better word), to problems in our university’s implementation of Summon, or to inadequacies of the assignment design and instructions?

Instructors have long wrestled with the problem of how students “get” the difference between scholarly and popular publications. Indeed, at last year’s Charleston Conference we noted that the format facets in Summon, though meaningful to teaching faculty, librarians, and Summons’s designers, may not be self-explanatory to students unaccustomed to reading articles in traditional print publications, with their attendant conventions of design as well as writing. We argued that it will be increasingly necessary for course instructors and curricula to explain the conventions of knowledge generation and dissemination in heretofore traditional genres as well as new formats; along with this would come greater attention to internal clues in an article

about its nature inasmuch as the external (i.e., physical format) clues are effectively invisible to an ever-larger number of readers. We continue to believe so as an obligation of instructional faculty and librarians alike, though, as a practical pedagogical matter the burden will lie with the instructors. In the most narrow, instrumental sense, it will require explicitly calling attention to facets or filters in literature-search tools that identify peer-reviewed articles, even though doing so prioritizes formal characteristics over substantive one that may bear more on the appropriateness of a document to a particular research objective.¹

Moreover, insofar as library tools (not limited to discovery systems) aggregate scholarly articles from multiple disciplines, teaching faculty must address not only the techniques and orientations of the disciplines in which they teach, but also take into account those of other disciplines that may surface because a relevance algorithm found a formal resemblance among articles. Conscientious instructors ought to test-drive their assignments in Summon to anticipate the results.

As we contended last year, for inexperienced students, disciplinary conventions—and discipline-focused discovery tools—pedagogically are more akin to scaffolds than the silos advanced researchers decry. Contrasted with the omnium-gatherum of Summon in a research library, we suspect, finding fewer results that nonetheless share in the analytical and discursive practices on one discipline presents less of a cognitive burden for students transitioning from searchers to researchers. We also remind our students that discipline-specific databases, with their tighter foci and relatively smaller results sets, may simply be easier to manage in limited time.

¹ The common use in library tools of “journal” instead of “periodical” does no one any good. Indeed, it is deceptive to naïve researchers, given how social science faculty, at least, commonly deprecate “journalism” as methodologically and often substantively simplistic. Similarly, there is a dodge, which should be explicitly taught around, between a journal that incorporates peer-reviewed research articles and the status of any particular article therein.

How do we address the instructional challenges revealed by our students’ use of Summon? Seemingly simple discovery tools require sophisticated, ongoing instruction, perhaps especially for the current generation of students whose previous schooling has been shaped by standardized tests. We cannot assume anything a priori about how students will react to the cues and clues they receive from their information environments, even ones that seem to be as simplified and normalized as Summon. Today and last time we suggested some of the things we do in the introductory courses. Attention to clarity of assignments and awareness of obstacles likely to impede students would be good pedagogy even without Summon making them more pressing.

On a more comprehensive level, with a colleague we have developed and teach a literature-search sequence for using different kinds of tools to suit different tasks in the research process (Brians et al., 2011, ch. 3; Pencek and Nelson, 2007), starting in the sophomore-year introductory course in research methods. The sequence is a learning model: at each stage, students learn more refined search terms while also integrating additional knowledge into their larger research design and execution. In this model, Summon is best suited for two roles (in addition to its virtue in known-citation searches). It is useful early, while evolving the research question, and provisional theory and hypotheses, for scanning the information environment: testing search terms for ambiguities or other problems, beginning to compile additional search terms, using the facets as cues to patterns in information sources that might refine the research question, scoping resources available in our library as they relate to the provisional research ideas, and identifying works that can potentially be useful points of departure. This use is impressionistic and rapid. We suggest that the bulk of the most literature searching be done in disciplinary databases, starting with abstracting and indexing tools (starting with *Worldwide Political Science Abstracts*) to get the value of subject searching and focus one’s thinking on the potentialities compressed in abstracts and descriptors, then moving to full-text sources (typically ranging from *JSTOR* to *Factiva*) that require different habits of mind and different

power-tools for searchers. Summon returns as a tool for gathering outlying information in the final, mopping-up phase, when the researcher has learned a more precise vocabulary, refined his/her understanding of research, and needs to determine what research outside the social sciences may contribute.

For a political professor to attend a library conference is mildly unusual. But Brians and Pencek have had a close working relationship for over a decade, including collaborative research on library-related aspects of teaching and learning in political science. Thus, it may be easier for Brians

than for most teaching faculty to tell librarians and library vendors about of Summon: “It’s not you. It’s me...”—that it is up to course instructors to live with the tools librarians provide, determine if those tools matter to student performance, and to adjust their teaching to those realities. But that is unrealistic, given the more common separation between teaching faculty and librarians. Rather, it is up to academic faculty, librarians, and vendors together to map out an agenda for understanding how the tools affect student performance from the standpoint of the people whose judgment about that performance matters most—their teachers.

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