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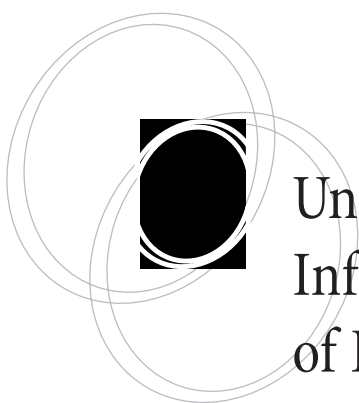
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Understanding the Information Behaviors of Doctoral Students: An Exploratory Study

Monica Moore and Emily Singley

abstract: This exploratory study seeks to understand how the research experiences of humanities PhD students influence their information behavior. The authors interviewed 10 participants from two academic institutions multiple times over several months. The study used open-ended, unstructured interviewing techniques in an attempt to avoid the introduction of library bias. The authors found that the information behavior of PhD students is driven by their need to understand and follow a scholarly dialogue. Resource discovery was heavily influenced by people, and resource use was varied, distributed, and unpredictable.

Introduction

This study, a qualitative approach to understanding the information behavior of humanities PhD students, was motivated by a desire on the part of both authors to more deeply understand the research experiences of academic library users. Each author has worked in technical services in libraries for many years, and each has a deep knowledge of the resource acquisition and discovery infrastructure that provide access to the library's collection. Data that track how users interact with this infrastructure provide a limited view of the total research experience. Such data points are, in fact, artifacts of user information behavior and fail to explain how users satisfy their information needs when they do not engage with the library infrastructure.

The authors are librarians at Boston College in Chestnut Hill, Massachusetts, and the University of Notre Dame in Notre Dame, Indiana. Both institutions have strong graduate programs in the humanities, and both libraries devote significant resources to supporting advanced degree students. In addition to this shared professional experience,

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each author was particularly interested in doctoral students as a population, since PhD candidates are beginning their careers as researchers and theoretically have a greater need to engage with the scholarly literature and discourse as they move through their coursework and begin their dissertation.

Through a series of open-ended, unstructured interviews, the authors invited 10 early-stage humanities PhD students to speak freely about their research experiences. The authors chose the population, students in their third year of study who were beginning their dissertations, because they believed that such students would be at an exploratory stage of their research that would require access, evaluation, and synthesis of a wide variety of information resources. The method was chosen to avoid imposing a library-centric worldview through the introduction of library-specific terms or jargon. No preconceived research questions were defined. The intent was to allow participants to cover topics beyond the scope of the interviewers' knowledge, thus providing insight into behaviors that the interviewers might not articulate as specific questions. By capturing the research experiences of PhD students in their own words, this study provides insight into how these experiences influence their information behavior.

Literature Review

The influence of technology on the information seeking of graduate students has been a dominant theme in the library literature over the last two decades. Many studies focus on how graduate students in various disciplines have responded to the shift from print to digital resources and how this development has affected their interaction with the library.

Graduate students have distinct characteristics as a user group within the library.¹ Many studies have confirmed their preference for remote, convenient, online access to resources, while acknowledging that print still has a distinct place in their world.² Libraries have sought to understand the needs of this population through studies designed to perceive the students' use of and opinions about library services, workshops, and resources.³ A common finding has been that many graduate students lack awareness of library offerings or misunderstand their intended use.⁴ Many studies have recommended increased outreach and more integration of information literacy instruction within student coursework.⁵ Interestingly, despite this perceived lack of awareness, graduate students have also been shown to be satisfied with, and appreciative of, library services and librarians.⁶

Studies examining information-seeking behaviors related to a specific resource or in response to a task also appear in the literature. In particular, Google and Google

Discovery of scholarly content happens in a multitude of ways, through multiple channels.

Scholar figure prominently in the findings of many investigators,⁷ especially in relation to questions comparing usage of them to library subscription resources.⁸ Graduate students clearly use Google, just as undergraduates do, as well as other publicly available websites that provide them with relevant background

information.⁹ Google Scholar coexists with other library resources, and the situation is not an "either-or."¹⁰ Discovery of scholarly content happens in a multitude of ways, through multiple channels.



Beyond this library-centric view of graduate student information needs is another category of studies that have sought to understand the information behavior of this population in a broader context. These studies focus on scholarly activity and the library's presence, or absence, within it. A key finding from these studies is the importance of people in graduate students' information-seeking behavior.¹¹ Carole George, Alice Bright, Terry Hurlbert, Erika Linke, Gloriana St. Clair, and Joan Stein found that the research and information behavior of 96 percent of graduate students studied was influenced by academic staff, including their advisers, professors, and committee members.¹² This percentage was consistent across all disciplines.¹³ In addition to providing students with key resources, advisers and professors offer an introduction to other authors or scholars related to their area of interest.¹⁴ Fellow students also provide help,¹⁵ and this type of networking extends to conferences and connections outside the students' home university. Katharina Penner found that the first thing students do when their usual research methods fail is to turn to colleagues or reach out to others in the field through e-mail or posting to Internet forums.¹⁶ In short, people are a critical resource for graduate students in their research process.¹⁷

What graduate students already know when they start their course of study also influences their information behavior. A study of education doctoral candidates in Australia and the United States looked specifically at "the ways that existing understandings shape their information engagements" to "situate the doctoral learner rather than information literacy skills at the center of the discussion."¹⁸ This study was particularly relevant for its population, which included students who had returned to school after years of teaching and who brought considerable experience to the pursuit of a doctoral degree. Most had come from a traditional, print-based research background and continued to consider print as well as electronic resources when seeking information. Researchers have found that prior knowledge—defined as familiarity, expertise, and past experience—has a positive correlation with specific information-seeking behaviors, such as judgment of relevance, creation of new ideas, and search efforts.¹⁹

Numerous investigators have noted information behaviors that reflect the David Ellis model,²⁰ including reliance on footnotes and references, and **citation chaining—that is, searching the literature to find additional relevant papers using the original paper as a starting point.**²¹ The students' information behaviors follow this model regardless of the format of the resource (electronic or print.) A multidisciplinary study of academic researchers tested the

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applicability of this model in the digital environment and confirmed that the six stages described by Ellis—*starting, chaining, browsing, differentiating, monitoring, and extracting*—were still evident in the population's information behaviors. The investigators also extended this model by suggesting two additional behaviors—*preparing and planning, and information management*.²² The evidence of these information behaviors in both the print and digital worlds indicates that much of the research and scholarly activity of graduate students has not changed, even though developments in format and technology have altered the way they get to resources.

As online access to information resources has become integrated into the research process, questions of format and technology seem less critical than seeking to understand how the holistic research experiences of graduate students affect their information behavior. These experiences vary not only between disciplines but also between master's and PhD students. Doctoral candidates, in particular, move through various stages as they

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complete their coursework, study for their comprehensive exams, develop their dissertation proposal, and begin to research and write their actual dissertation. These stages are distinct enough to warrant further study,²³ though a focus solely on doctoral students as a specific user group within the library is rare in the literature. An increase in information literacy skills and an awareness of the benefits of library resources come with experience as students move through graduate school,²⁴ and more sophisticated searching techniques also emerge.²⁵ The students' information behaviors evolve due to the requirements of the program and the changes in identity—from undergraduate to graduate student, from generalist to specialist, and from student to scholar—described by Rachel Fleming-May and Lisa Yuro in their 2009 study of PhD candidates in the social sciences.²⁶ The current study explores the idea that humanities doctoral students are becoming scholars with rich research experiences that impact their information behavior and investigates the role of the library within the students' experiences.

Methodology

Ten humanities PhD students were recruited for the study: five from Boston College and five from the University of Notre Dame. Two participants were international students. The students came from six different programs: three from history, two from theology, two from English, one from philosophy, one from medieval studies, and one from peace studies. The students were all in their third year of study and had all recently completed their coursework and begun work on their dissertation proposals.

The study was designed to consist of 10 participants, five per institution, because the researchers wanted to collect rich, in-depth, longitudinal data. Each researcher performed 15 one-hour interviews (three interviews per participant) over the course of the study. Each researcher also transcribed the interviews she performed.

Students were recruited with a direct e-mail that described the study and indicated the amount of compensation they would receive. The participants were informed that they would meet with the researcher to share their research experiences and that they would participate in no more than three interviews of approximately 60 minutes each. They were also told that they would be asked to participate in a journaling activity, logging their research activities for 10 minutes per day over one week. Eligible participants were identified with the assistance of subject librarians at both the Boston College and the University of Notre Dame libraries. Participants were compensated for their time with \$25 for each one-hour interview, and an additional \$25 for the journal activity, for a total of \$100 per participant who completed the study. The institutional review boards at both the University of Notre Dame and Boston College reviewed and approved this study, and a grant from the University of Notre Dame funded it.

The first interview with each participant began with the researcher asking the broad question "Tell me about your experience researching your dissertation topic." The interviewer then asked follow-up questions about specifics mentioned in the initial response. The researchers used such phrases as "What did you find helpful about . . ." or "What were your reasons for . . .," allowing them to dig deeper without inserting their own language or ideas into the conversation. Because each interview was unique, only the first question was the same for all participants.

All participants completed the study, each performing three one-hour interviews and one weeklong journal activity. The interviews commenced in April 2017 and concluded in October 2017, with the journal activity occurring between the second and third interview for each participant. The researchers recorded a total of 30 hours of interview data and collected 10 journal artifacts.

The interviews were coded and analyzed using a grounded theory approach. First used by Barney Glaser and Anselm Strauss,²⁷ grounded theory proposes that qualitative data be analyzed to find repeated ideas, then group them into categories that are informed by the data rather than conceived prior to coding. Grounded theory was considered appropriate for this research because it is suited for the process of discovery, where the researcher looks for findings to emerge from the data rather than tests a preexisting theory.

Coding was applied only after all interviews had been performed and transcribed. Both researchers coded all interviews, and both coded separately. After both researchers had completed their individual coding, they met to agree upon final codes, in some cases eliminating duplication or combining similar codes. Codes were then categorized and grouped into broad thematic areas.

While this study's methodology yielded much valuable data, there were some limitations. The use of open-ended, unstructured interviews, with no predetermined set of questions, meant that the interviews could not be quantitatively compared with one another. Each interview stands as a highly individualized portrait of a single researcher's experience. This information was valuable in that it provided an authentic glimpse into each student's life, but findings could not be easily generalized across the group. For example, it was not possible to determine exactly how often participants used library resources versus nonlibrary resources: the researchers did not ask that specific question and tried to avoid steering participants toward that topic. As a result, some participants talked about their use of resources more than others.



Another limitation was that much of the data obtained from the journal activity was not used. While intended to provide an “in the moment” record of the participant’s research process, most participants treated this part of the study like a written assignment, with the result that many of their journal entries seemed contrived and were not useful.

Findings

Three broad themes emerged from the coded data: (1) research as conversation, (2) people as pointers, and (3) world as collection. These three thematic areas are explored in more detail in the following sections and illustrated with quotations from the participants. To protect the anonymity of the participants, references to titles, author names, or topics have been omitted or obscured.

Research as Conversation

This theme emerged from how participants describe interacting with and thinking about the literature they explore. They not only explicitly depict their research experience as a conversation with other scholars but also implicitly illustrate this conversational frame in how they follow citation chains, connect authors through related arguments, and place importance on authorship.

Seven participants used conversational language to describe how they engaged with, contributed to, or dissented from the published scholarship for their discipline. They used such words as “conversation,” “dialogue,” or “discussion,” like a participant who saw herself as being “in conversations with these other philosophers” (University

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of Notre Dame student, interview with Monica Moore) or another who described a “dialogue happening between authors” (Boston College student, interview with Emily Singley). One participant thought of scholarship as being “almost like you’re having a discussion with a group of people, like you’re all sitting in the same room” (Notre Dame

student, interview with Moore). One theology participant saw herself as “also creating the canon” and asked, “Given that theology is shaped by white men, who do I want to dialogue with?” She added that by citing lesser-known authors “I’m also elevating them, right?” (Boston College student, interview with Singley). Another described the importance of diverging voices, saying of her reading, “If it’s not engaged in the conversation I’m interested in, then it might be useful because it’s bringing in another perspective” (Notre Dame student, interview with Moore).

Following citation chains was a common behavior, reported by 8 of the 10 participants. Participants described pursuing citations found in bibliographies, endnotes, footnotes, and even Wikipedia entries. One described this method as a “loop,” saying she would “consult their sources, go here, consult their sources, and going in this loop



and seeing here are the major scholars that are emerging, everyone's consulting this person" (Boston College student, interview with Singley). Two participants compared this process to mining. One described "kind of starting to strip mine" a bibliography, adding, "It's kind of like mining . . . because if they cite someone from 20 years ago, then you go back there, and they probably cited someone from 20 years ago, you know, so eventually you'll kind of get to where this concept came about" (Notre Dame student, interviews with Moore).

Eight of the 10 participants talked about how they connected works through related arguments or ideas found in their readings. One participant described articles as useful because "They were directly related to what I was trying to argue" (Notre Dame student, interview with Moore). The same participant described how finding a seminal author's name through a "control-F" search of an article—a keyboard shortcut to quickly find words or phrases in a document or website—would mean "They're actually engaged with the person that sparked that question." The student would then "know that's going to help me" (Notre Dame student, interview with Moore). Another talked about how he discovered links between works, saying he was "fascinated" by several authors he found because of the "connections they have with the key folks I wanted to study" (Notre Dame student, interview with Moore).

Authorship was important to the participants, as indicated by the frequency with which they referred to authors by name rather than discussing individual works or titles. Eight of the 10 participants talked about their discipline's literature by referencing authors' names. Examples of this language include such comments as "I might turn to scholars who have critiqued [author name]" or "This person's confirming something that I found in [author name]" (both Notre Dame students, interviews with Moore). Another way students indicated the importance of authors was to refer to the literature as people, such as one student who said he was "trying to get precise enough about the people I might be writing about, to figure out how should I connect them . . . who should I leave out or talk about" (Boston College student, interview with Singley).

Participants described pursuing citations found in bibliographies, endnotes, footnotes, and even Wikipedia entries.

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People as Pointers

The participants frequently described how they relied upon personal relationships to identify, contextualize, and access the literature. All participants spoke at length about how people—most often their principal adviser, but also other professors, friends, and peers—helped them to find resources. As one participant summed it up, "The biggest resources have been people" (Boston College student, interview with Singley).



Nine of 10 participants described how people helped them map an unfamiliar domain by providing the names of seminal authors. This concept was expressed in

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ship is still worth reading” (both Notre Dame students, interviews with Moore). One participant was impressed by his adviser’s ability to quickly suggest resources, saying, “He just listed off items, just 20 items on the spot, without a hesitation. It was amazing” (Notre Dame student, interview with Moore).

Three participants explained how getting author names from advisers was more efficient than floundering on their own. One said that she would always go to her professors first because “it saves a lot of time.” She added that consulting her teachers was easier than trying to find things on her own because she was “just starting to figure it out” (Notre Dame student, interview with Moore). A similar thought came from a participant who said that because she did not yet “know how to navigate” the literature, she needed “to know who are the people who are worth my time to invest in, and who are the people that are obscure” (Boston College student, interview with Singley). Another said that following citation chains “can become very time-consuming” and that she would “try to start with asking someone who I think knows more about it” (Notre Dame student, interview with Moore).

The participants also mentioned that advisers would connect them to professors outside their universities. These links were useful, most notably in the case of a Boston College history student who ended up having an outside professor serve as a co-adviser for his dissertation.²⁸ One participant summed up how her adviser connected her to other people, saying, “It’s kind of like she reaches out to her people” (Notre Dame student, interview with Moore).

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described his adviser as sending him “a whole list of other books I need to read” (Boston College student, interview with Singley), and another said, “The professors are really good at handing me a bunch of stuff” to read (Notre Dame student, interview with Moore). Still another said his adviser “did kind of dictate a list” of books for him and that it was “really helpful” (Notre Dame student, interview with Moore).

Three participants described how social media, friendships, and professional conferences link them to other scholars. One participant described how a casual connec-

various ways, such as one participant saying, “My adviser is going to be familiar with the big names that are engaged in this discussion,” or another who intended to “go on the advice of advisers on what kind of scholar-

described his adviser as sending him “a whole list of other books I need to read” (Boston College student, interview with Singley), and another said, “The professors are really good at handing me a bunch of stuff” to read (Notre Dame student, interview with Moore).

tion—joining an informal Facebook group—turned into a valuable scholarly resource and noted how much she depends “on social relationships to open those doors” (Boston College student, interview with Singley). That same participant also described receiving a reading list from a professor she met at a conference. Another participant described his use of Academia.edu, a social networking website for academics, to connect to resources, saying he was “following like 500 people” (Boston College student, interview with Singley). Yet another participant described his use of Facebook, Twitter, and blogs to connect to scholars and learn about their work (Boston College student, interview with Singley).

World as Collection

This theme emerged from the way participants used the entire world—both online and physical—as their research collection, ranging across a wide variety of information tools in pursuit of the voices they followed in the scholarly conversation. Throughout the interviews, participants described finding, using, and accessing information resources. Each mention of a resource was tracked—not only when resources were mentioned by name but also when a participant referred to a resource in a way that could be inferred—

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for example, “like a book review thing that the philosophy department here houses” (Notre Dame student, interview with Moore). Also noted in the data were mentions of the various ways participants accessed resources—including through the library, open Web, archives, and even illegal means.

The participants knew the primary databases, journals, bibliographies, and encyclopedias for their disciplines. They referred to these resources by name and turned to them frequently. They used the most popular sources for their respective disciplines: the historians, for example, mentioned JSTOR, a digital library of journals, books, and primary sources. The philosophy student referred to *Philosopher’s Index*, a database of publications in philosophy, and to *Stanford Encyclopedia of Philosophy*, a free, online encyclopedia of philosophy maintained by Stanford University in California. The English student talked about the Modern Language Association’s International Bibliography (MLA), and the theology student mentioned ATLA (American Theological Library Association). The students had a good understanding of the core journal titles in their fields and knew how to go directly to the publisher’s sites to browse journals. The University of Cambridge and University of Oxford journals in the United Kingdom and the University of Chicago Press were all mentioned at least once by name.

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Seven of the 10 participants mentioned Google resources. They thought of these resources as efficient and comprehensive. As one student said he used Google “because it will turn up an article sometimes that doesn’t immediately show up in other places” (Boston College student, interview with Singley). Another declared, “Google is a really powerful tool” (Notre Dame student, interview with Moore). One said that the journal exercise for this study made the student aware of “just how much I use Google for everything” (Boston College student, interview with Singley).

Six participants described using websites to find what they needed. Sites mentioned included Wikipedia, Amazon, YouTube, and faculty pages for professors at other institutions and other scholarly sites. One participant reported finding a website devoted to rare French anarchist journals,²⁹ and another was ecstatic to come across a site where a scholar had aggregated full-text primary sources for his topic.³⁰ Two participants recounted at length how they leveraged social media and journal alerts to discover new research: they followed scholars on Facebook, Twitter, Academia.edu, blogs, and Scribd, a digital library subscription service. They also subscribed to alerts from such sites as Cambridge Core, which lists books and journals from Cambridge University Press, and Google Scholar.

Four of the 10 participants engaged in archival research and had visited, or planned to visit, archival collections in person. Their programs funded these trips, which in all cases took the students overseas. Two participants needed to consult multiple archives in

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more than one country. All the history students described using archives, as did one theology student.

Three participants mentioned using illegal information resources. One said he sometimes found pdfs posted illicitly “on somebody’s academic website, or something” (Boston Col-

lege student, interview with Singley). Two mentioned using Sci-Hub, which enables users to download scholarly articles that otherwise could not be accessed without a subscription. One mention of Sci-Hub was not explicit but can be inferred: “It’s one of those like Russian sites that changes its address all the time, and it has quite a lot of stuff” (Boston College student, interview with Singley). Another participant described his use of Sci-Hub in detail, claiming that Sci-Hub “has everything” and that “so far there is nothing that I couldn’t find there” (Boston College student, interview with Singley). In contrast, he said that library access was too difficult and took too many clicks. In describing how the library could improve service, he said simply, “Just do what Sci-Hub does” (Boston College student, interview with Singley).

Discussion

Study findings captured participants engaging in a dialogue related to their topic, looking for other people or voices. The information they sought took the form of arguments or viewpoints expressed by other scholars with whom they came in contact, and once they found this thread, they became invested in following it. Other people, primarily their advisers, introduced them to the corpus that embodied this scholarly conversation.

If students encountered an unfamiliar concept or domain, they leveraged their relationships to find the seminal works they needed for entry into yet another conversation. They viewed this technique as the most expedient method because they spent less time on discovery and it helped them understand how deeply they needed to delve into this new domain. Once participants found a relevant work, they identified and recalled it by the name of the author who created it, adding it to their existing collection of voices and arguments. This incorporation of new works, in turn, led them to develop their own voice within this conversation, in which they established their authority to be heard³¹ and thus began the creation of their own scholarly identity through their writing.³²

What the students needed to do to follow this scholarly conversation and the unpredictability of where they needed to go next were reflected in the wide variety of resources mentioned. Because the participants pursued multiple arguments, ideas, and people, they went wherever the conversational trails led, without confining themselves to available library resources. They emphasized understanding and following the dialogue within whatever information source they happened to be using. That their research needs could not be met by any one library's collection was demonstrated by their diverse and expansive use of information resources, turning to websites and social media, traveling overseas to explore archival collections, and accessing materials in any way possible, including through illegal sites. They did not see libraries as either their starting point or their primary corpus. For them, the world was their collection, and their home institution's library merely one small part of that world.

Because the participants pursued multiple arguments, ideas, and people, they went wherever the conversational trails led, without confining themselves to available library resources.

Conclusion

The authors of this study sought to gain a deeper understanding of the research experiences of humanities doctoral students beyond what could be known through their explicit interactions with the library infrastructure. Because the study aimed to explore unknown territory, a specific research question could not be defined. Rather, the authors hoped to uncover new questions to ask and, possibly, new areas of focus for academic libraries. The study successfully captured "nonlibrary" information behaviors and the motivation for them.

This glimpse into the world of the humanities doctoral candidate has highlighted the importance of the adviser-student relationship. Given how much advisers introduce their students to specific resources, it would be interesting to interview advisers or perhaps directors of graduate studies to ask if they train their advisees to search the literature; if so, what methods they use; and if there is consistency in this approach within a department or program. The role of the adviser as the individual who "introduces" the student to the conversation may be incidental or deliberate. How do they follow the conversation themselves, and do they impart these values to their students?



The metaphor of research being a conversation and whether this is captured in local discovery systems might be another area of focus. If the information a scholar needs is so distributed that it cannot be contained in one system, how should libraries adapt? Would more efficient fulfillment of requests for items discovered elsewhere be more beneficial than focusing on local, closed systems? Should more emphasis be put on description and creating more granular identifiers for digital content so that it can be found and linked to more easily?

Finally, from the perspective of students and scholars, is there a problem to be solved? We hope that this study will spur further conversation within our own discipline about how academic libraries can work to facilitate the scholarly conversation that goes on all around us.

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Appendix

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