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Navigating Roadblocks: First-Year Writing Challenges through the Lens of the ACRL Framework

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Abstract

Effectively integrating the ACRL *Framework for Information Literacy* into existing instructional models requires that librarians first understand the host of challenges that many first-year students encounter when conducting research for the first time. This study employs qualitative analysis of semi-structured student interviews to explore how students conceive of and pursue the research process, and how they try to mitigate—and in some cases surmount—the roadblocks they encounter. Although students reported several difficulties, three main roadblocks arose: challenges with understanding academic articles, challenges with the topic/theme of the course, and challenges with navigating the physical space of the library. The findings demonstrate how students employ a variety of strategies to overcome these obstacles. The authors engage with the scholarship on information literacy and the *Framework*, which elucidates how honoring the affective domain of learning in designing instruction could steer students towards more successful research strategies.

Keywords: information literacy, first-year students, ACRL Framework, first-year writing, affective learning

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Introduction

Many undergraduate students encounter information literacy instruction during their first year, often in conjunction with either a first-year seminar or first-year composition course. Although far from ideal, one- and two-shot information literacy sessions are still the norm for many information literacy programs. The Association of College and Research Libraries' (2015) *Framework for Information Literacy in Higher Education* cautions that it is "not designed to be implemented in a single information literacy session in a student's academic career" (p. 10); however, the document also affirms that multiple one-shot sessions over the course of a student's academic program could have a significant impact on student learning. Librarians should, therefore, feel encouraged to integrate the *Framework* into their existing instructional models.

Studying how students conceive of the research process can be of value in determining how to implement the *Framework,* whether within the one-shot model or beyond. This research project is an attempt to learn more about first-year students and their research by engaging them in an extended conversation about how they view research and what behaviors or workarounds they rely on when completing research assignments. It is the culmination of a three-part investigation into the research habits of first-year students, specifically students completing research for their first-year writing course at the University of Illinois at Chicago (UIC) (see Insua, Lantz, & Armstrong, 2018; Lantz, Insua, Armstong, & Pho, 2016).

Researchers interviewed students at the end of their required introductory composition class to try to understand their perspectives of the research process. While many studies have examined the research habits of first-year students, this study emphasizes the strategies students use to overcome obstacles and considers which information literacy frames would be useful to address in instruction sessions to help students transcend these barriers.

Literature Review

The adoption of the *Framework* has spurred many librarians to reconsider, or simply reflect on, their information literacy instruction. Burgess (2015) described it as an opportunity to

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embrace a "beginner's frame of mind" (p. 3), encouraging librarians, who may be crossing an instructional threshold themselves, to share in the intellectual struggles that students experience. Some librarians felt that this new professional document would dictate a completely new curriculum (Charles, 2017), while others disagreed. Bauder and Rod (2016) argued that although the *Framework* differs substantially from the prior *Information Literacy Competency Standards for Higher Education* (Association for College and Research Libraries, 2000), it does not change library instruction practice in a drastic way. Many librarians, they asserted, especially those interested in critical pedagogy, had already moved away from skills-based instruction to focus on higher-order concepts before the *Framework* was adopted. To demonstrate this point, they provided examples of exercises and activities librarians had been using that introduce or incorporate the frames into their teaching. Several librarians (Christensen, 2015; Dempsey & Jagman, 2016; Houtman, 2015; Jacobson & Gibson, 2015) have also written about their success with integrating ideas from the *Framework* into one-shot sessions, individual activities, or workshops.

One idea that permeates the *Framework* is an emphasis on affective learning. This emphasis is not new; Carol Kuhlthau's (1991) model of the information search process largely dealt with affective dimensions such as the anxiety and uncertainty that users experience when searching for information. More recently, Klentzin (2010) examined first-year students' affective domain by asking a simple question: "Do you like to conduct research? Why or why not?" (p. 561). While some students liked doing research (16%) and some disliked it (33%), most (49%) fell on an intellectual "borderland" where the value of library research was dependent on the research topic. As Cahoy and Schroeder (2012) argued, if librarians address the affective needs of students, more of them might move away from this borderland and into a "more productive research landscape" (p. 75).

Other studies have demonstrated similar findings regarding the importance of affective learning. George and Foster (2013) found that student interest in a research topic was extremely important. Students who were engaged and interested wrote better research papers. These students started their research earlier, used the library more often, and identified better resources. Ross, Perkins, and Bodey (2016) also found that "intrinsic motivation to know, or the pleasure and satisfaction derived from learning new things […] is the most important predictor of higher levels of IL self-efficacy" (p. 6). Matteson (2014) explored cognitive and emotional dimensions of student behavior to determine whether either dimension correlated with information literacy skills. She administered online surveys comprised of various psychological tests, demonstrating that of the two dimensions, the emotional dimension correlated more closely with student information literacy.

Students with higher emotional intelligence scores also had higher information literacy scores.

The current study contributes to this literature by providing empirical evidence of the various paths students take through the borderland and the strategies some use to cross into new learning. By analyzing semi-structured interviews of students in a first-year writing course, the current researchers hope to illuminate effective student research strategies and habits of mind and identify instructional interventions librarians might adopt to guide students toward these strategies.

Background

Although students at UIC may take first-year composition at any point in their academic careers, typically it is taken during the first-year. This course, which culminates in a 10-15-page research paper, has a large research component and exposes many students to college-level library research for the first time. Instructors choose different themes for these courses such as gender issues, popular culture, the environment, prison reform, etc. The research team collaborated with one instructor who taught four sections of this composition course with the theme of western philosophy. Students grappled with questions about truth and reality and were introduced to major western philosophers and historical philosophical trends as subject matter for their writing and research. Assignments were scaffolded throughout the semester, so that students could work on research in smaller chunks. An annotated bibliography was due toward the beginning of the semester, followed later by a research proposal, and then finally their research paper. All four sections came to the library twice for information literacy instruction.

After researchers gained approval from the Institutional Review Board to conduct the study, two librarians visited the classes at the beginning of the semester to explain the study, answer any questions, and allow students to opt-out. The larger study included citation analysis of student annotated bibliographies and final bibliographies (Lantz et al., 2016) and qualitative analysis of student research journals (Insua et al., 2018). Students completed research journals at four key points throughout the semester.

Analysis of student bibliographies and research journals uncovered several key findings. The quality of student sources decreased from annotated bibliographies completed toward the beginning of the semester (and closely following library instruction) to final bibliographies completed at the end of the semester, suggesting that timing of library instruction is critical

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(Lantz et al., 2016). Website use increased dramatically, suggesting that students had difficulties understanding academic articles, something they also reported in their research journals (Insua et al., 2018). Students reported feeling ill-prepared for college-level research and often relied on simplistic binaries learned from high school to help them through the research process. The final part of the study uses retrospective interviews with students to provide a third lens through which to consider student research challenges.

Methods

Students who completed all four research journals were invited to participate in semi-structured interviews and were offered a $25 gift card for the university book store as an incentive. (Funds for the gift cards were obtained from the library's research fund.) Nine students responded and were interviewed in total during the last two weeks of the semester, after they had completed the course and turned in their final research papers. Two of the nine students were transfer students.

The interviews addressed topic development, source selection for annotated bibliographies, source use, research challenges, help-seeking, and previous research experience. (See Appendix for interview questions.) Interviews were held in a library conference room with two researchers present, one to ask questions and one to take notes, and lasted between 30 and 45 minutes. The interviews were recorded and transcribed. Most students did not seem nervous; researchers took time to introduce themselves and explain the study. Some students, however, lacked the vocabulary to fully describe their research process. In these cases, researchers asked follow-up questions as necessary to elicit more detailed information. In order to ensure the confidentiality of the data, the researchers assigned each student interviewee a code so that no names appeared anywhere on notes or transcripts. Names and codes were kept separate from the transcript files.

The researchers determined that qualitative analysis was the best method for analyzing in-depth conversations and exploring the variety of ways in which students addressed their research tasks due to the flexibility and room for nuance inherent to this approach (Flick, 2014). Because of the small sample size, there is no claim that students interviewed are representative of composition students in general. Rather, the interviews demonstrate a range of experiences and attitudes that shed light on the research challenges of some first-year students.

Researchers analyzed transcripts using thematic narrative analysis (Boyatzis, 1998). First, each researcher read three full interviews, noting initial impressions and broad themes

related to the interview questions. Then, researchers discussed their impressions and read three additional interviews, this time looking specifically for roadblocks students encountered, choices or decisions students made, and strategies students employed during the research process. After meeting and discussing themes appearing in the transcripts, the researchers read and coded three more transcripts, so that by the end of analysis, each researcher had read all nine interviews. The researchers then met and categorized roadblocks, decisions, strategies, and action taken (if any) into separate themes.

Findings

To prepare for the interviews, the researchers familiarized themselves with the annotated and final bibliographies of interviewees in advance and brought copies of these documents to the interviews to discuss student choices in more detail and refer to specific examples during the interviews. Although the nine students interviewed cited more scholarly articles in their annotated bibliographies than other types of sources, for their final bibliographies, their use of scholarly articles decreased, while their use of websites, reference sources, and books increased (see Table 1).

Table 1: Average Number of Source Types Used in Annotated and Final Bibliographies

Source type	Annotated bibliographies	Final bibliographies
Reference source	3.44	4.44
Book	2.67	4.22
Scholarly article	3.67	1.33
Website	0.56	1.89

All students interviewed reported encountering more than one obstacle in the research and writing process, but they dealt with them in different ways. Students discussed challenges with understanding and using academic articles, with the subject or overall theme of the composition class, and with navigating the physical space of the library. Note: In the following sections, when referring to individual students, "they/them/their" is used for the sake of gender inclusivity.

Roadblock: Understanding and Using Academic Articles

All nine students reported difficulties understanding and using academic articles. Most students had no problem finding scholarly articles, but they had trouble finding articles that they could fully understand. One student admitted:

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> I would say the biggest challenge was looking for academic journals [sic] because they're written for an audience at such a high level that even though I would read the abstract and think to myself, "Oh yeah, I want this," [but then] I would start reading the actual academic journal and I would think, "I have no idea if this person is even speaking English."

Another student discussed their difficulties understanding articles, especially since their first research assignment, an annotated bibliography, was due early in the semester:

> I tried to find scholarly articles at first, which was good for some of them, but a lot of them were actually really long and kind of really in depth. When we did the annotated bibliography, [it] was really early on, and [I] didn't know a lot about our topic, so it was kind of hard to understand what they were talking about.

These students confirm what many of their classmates had written in their research journals throughout the semester and what has been reported by other studies (MacMillan & MacKenzie, 2012; MacMillan & Rosenblatt, 2015; Rosenblatt, 2010): Scholarly articles are difficult for students to understand. This difficulty can lead to frustration and alienation, and often manifests itself in what composition scholars have termed "patchwriting," the practice of paraphrasing too closely or borrowing language directly from sources (Howard, Serviss, & Rodrigue, 2010).

Student Strategies

Some students overcame the obstacle of difficult academic language by finding introductory sources such as encyclopedias, by using dictionaries to look up words, or by rereading an article several times. One student reported: "I had to use a dictionary and look up the words, and I had to reread the articles a couple of times and try and understand what they were talking about exactly."

Another student described their experience and feelings about working with scholarly articles and encyclopedia entries, demonstrating how the latter helped them grapple with difficult concepts and narrow their search: "I felt like [articles] were easier and more informative, so I started using more articles [but] then some theories were really confusing, so I started using the *Stanford Encyclopedia of Philosophy*. That was explaining things pretty well." This student's experience reflects a conception that articles, due to their brevity and ease of access, might seem convenient at first, but they do not help with understanding

difficult concepts in the way that encyclopedia articles do. The confusion both students experienced prompted them to seek out other avenues for understanding.

A few students did not indicate a strategy for understanding scholarly articles. Since the use of scholarly articles decreased and the use of websites increased in their final papers, these students possibly did not overcome the roadblock, but rather worked around it by using more websites as sources.

Roadblock: Subject/Theme of Course

Many students were excited about researching philosophical topics, but they grappled with understanding key concepts that were crucial to their research. These challenges were varied; some students had difficulty brainstorming keywords to use in library databases, while others had a difficult time establishing important context.

One student found it difficult to cross the disciplinary threshold of humanities research. The student had done research in a certain way in the past but did not know how to translate these skills. They reported:

> I don't know if it's just [my topic] or for all of philosophy, but, especially in terms of research, it was tough because this is the first research I've had to do that doesn't have statistics to go along with it. So, you can't actually have a mathematical analysis on the topic saying, you know, because of x, that's y, or because of y, it's better. It was a lot more of my own creativity to try to determine what it was that proved one theory better than the other. Which I thought made it very difficult.

The student understood that research in philosophy involves different skills from research in the social sciences or sciences, but found this difference difficult. They continued:

> It was hard to even explain what both sides of the issues were because it's just some gentleman's theory that he came up with in 1700, and it's tough to relate the theory to an actual practice in the real world.

This student did not report overcoming this challenge; indeed, they admitted they would have dropped the course if possible. Their dislike of the topic prevented them from fully engaging in their research.

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Student Strategies

Some students interviewed overcame their lack of subject expertise by using familiar tools such as Google, sometimes alone, but sometimes in tandem with library databases. Students also reported consulting their friends, family, and instructor.

While describing how they went about searching for sources, one student explained that they used Google to help them with key philosophical concepts:

> You have to be very specific about your topic. You have to know what you're looking for in order to go and find an appropriate journal. So, what I ended up doing was […] using what I used to use. I looked up for Google, "What are philosophers that have to do with mind body problem," and once I got a list of philosophers, I would go into the search engine or whatever [library database] and I would look up that specific [philosopher].

Another student discussed having a difficult time finding context for their research topic:

> There's this theory, and there is this theory, and there is this philosopher, but nothing that would tell you, okay, at this point in time there was this, and this followed, and then this followed, and in light of this historical context, and so that to me was a challenge.

This student knew the importance of context; that research is not about picking random sources to intersperse throughout a paper. However, they had a hard time finding sources to ground their understanding of philosophy. To overcome this challenge, the student somewhat sheepishly admitted to using Wikipedia, saying, "I know it's not a credible site, but I used it to get ideas of things to search like search terms." Using Wikipedia in this way can be helpful, but students are often taught in high school to avoid Wikipedia at all costs.

Students definitely sought help with philosophical topics from their professor. One student talked with the professor before or after class: "If there was ever a theory that I was confused on, … he [would walk] me through what to do … about the problem until I understood why." Other studies have also found that students often turn to their professor for help before or instead of librarians, typically because of the relationship they already have established (Head & Eisenberg, 2009; Miller & Murillo, 2011; Thomas, Tewell, & Willson, 2017).

Roadblock: Navigating the Physical Space of the Library

While librarians at UIC generally refrain from giving traditional library tours, several students interviewed described difficulties finding physical books in the library. One student told the interviewer:

> Well, it was the first time using this library, so I got lost a couple of times. So, they would give me the letters and numbers and tell me, "it's on this floor," and I'm, like, "okay, it's not going to be that hard," and then I come here, and there's all these books on this side, books on that side.

One student spent an hour looking for books before asking for help. When asked whether the difficult part of the process was finding the specific call number, this student responded:

> Not the specific call numbers, but exactly what I was looking for…I was trying to find by numbers, but they were in between all their books. I don't know if people just moved them or something, but it just took me longer to find the book than I had planned.

Unlike online articles, getting to physical books was anything but convenient. Students confronted a maze of call numbers and books, an actual physical roadblock. This finding confirms those of Colón-Aguirre and Fleming-May (2012), who also found that students were "overwhelmed" by the size and organization of the library's book collection (p. 395). Since the instructor in this study required the use of at least one book, overcoming this roadblock was important.

Student Strategies

These two students eventually sought help from a staff member or librarian and were able to find the books they wanted. They both first tried to find the books themselves, but identified that they needed help. The second student, perhaps trying to be self-reliant, spent an hour frustrated before they finally asked for help. The affective domain in this case caused the student to hesitate before asking for help.

Other students used their local public library to conduct their research. One student preferred to use the public library because they had previously been given a tour of that library. Another student told the interviewers that they use the public library "a lot" because "it has a really nice, easy, modern way … you can just go online to their website and, you know, search for books […] and you can reserve online and pick them up when you can." Although these same services were available at the academic library, either the student was

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unaware of this fact, or they found the academic library's website more confusing to use than that of their public library. In any case, they felt much more comfortable at their public library. Convenience was also a factor. This same student said that the public library was "so close," and that was the reason they went there for books.

Discussion

The three roadblocks uncovered by the interviews seem disparate at first glance, and, apart from for the third one (navigating the physical space of the library), largely outside of the librarian's purview. However, all three obstacles relate to the affective dimension of research. Understanding scholarly articles requires persistence, curiosity, and mental flexibility, as does traversing an unfamiliar topic. Similarly, navigating an unfamiliar library requires those qualities as well as the willingness to risk failure. Although the third obstacle seems to require less critical thinking than the first two, it arose repeatedly in student interviews, signaling its importance. It is also often associated with library anxiety (Mellon, 1986), which can have a detrimental impact on student success.

Students fell into three categories based on their strategies for overcoming research obstacles: 1) students who overcame obstacles by exploring new strategies, 2) students who overcame obstacles by combining new and familiar strategies, and 3) students who relied solely on familiar strategies. These categories are explained further with examples of three students who exemplified each.

Students Who Explored New Strategies

Several students demonstrated curiosity and an open-mindedness that served them well in overcoming research obstacles. Student A was an exemplar of this type. They were truly interested in their research topic. Searching for sources was time-consuming because they really wanted to learn: "I spent a lot more time looking for my sources because I didn't just want to do it for the sake of the assignment. I really wanted that to help me in the long term." When they hit a roadblock, their response was to try new things, including many library resources that were unfamiliar to them. This student availed themselves of everything the library and the university had to offer. In addition to meeting with their instructor on several occasions, the student asked for help from librarians and visited the writing center. Despite encountering obstacles at almost every step, Student A displayed perseverance and openness, saying, "I just kept on doing my research, finding more sources" and "I stayed on that track." Student A was motivated to do well on the assignment, to learn about their research topic, and to become a better researcher:

> I think it's really cool. You come to college, you know, thinking you're aware that you need to do reading and writing, but it's like not to this extent. And so the fact that this class has definitely challenged me, I'm happy with the work I ended up doing for this class. There was never a moment where I just felt like I should just do something to do something. I worked full-heartedly for it and so definitely this entire process pushed me, and so I feel like this process is definitely worth it.

Of course, not all students will have this type of intrinsic motivation. Librarians can try to cultivate curiosity and flexibility in students by encouraging them to pick research topics they are genuinely interested in, by incorporating engaging and challenging activities into information literacy sessions, and by dedicating time to student reflection.

Students Who Combined New and Familiar Strategies

Most students tried new things and also employed strategies that had worked for them in the past. Student B was one such student. They picked a topic they were interested in and that they felt would challenge their personal beliefs; the idea of inquiry in the research process was important to them. They used Google in conjunction with library databases to find sources. They used Google to discover which philosophers dealt with their philosophical topic and then used the library database to search for articles about those philosophers. They described their search for sources as one of "trial and error" because they often would find a source but then discover after reading it, that it did not address their topic. Nonetheless, they kept trying, realizing that it was part of the process. They admitted that they only looked for books because their professor required it: "If [our professor] didn't say that we needed book sources, I would not have stepped foot in [the library] I don't think, but I'm definitely glad […] because my number one source came from a book." This student now understands that being open to the unfamiliar can have positive consequences.

Students Who Relied Solely on the Familiar

A few students did not cross any research thresholds or at least did not report doing so. Student C was the most resistant and was so from the start of the research process. They did not understand the scaffolded nature of the assignments. Instead of using the annotated bibliography as a starting point for their research paper, they chose any source tangentially related to their topic because they knew they had time later in the semester to find different sources for their paper. They felt that the annotated bibliography was "redundant" rather than a vehicle to learn about their topic. They had a major challenge with the nature of the

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research process, and they were not "remotely intrigued by philosophy." Considering Klentzin's (2010) findings that students tended to like research if they were interested in the research topic, it is not surprising that this student had a negative experience. However, students may have many reasons for drawing on familiar skills, rather than exploring new territory, not all of which have to do with their interest. Many students today have family and/or work responsibilities on top of their studies (Radford, Cominole, & Skomsvold, 2015), which can leave them with little time or mental energy for developing new skills.

Teaching Implications and the Framework

The affective domain played an important role in the behavior of all three groups of students. Based on their experiences, the most relevant frames to consider when planning instruction for first-year students are "Research as Inquiry" and "Searching as Strategic Exploration." The dispositions of "Research as Inquiry" note the importance of persistence, adaptability, flexibility, and intellectual curiosity, which Student A and others like them displayed. Their positive attitudes enabled them to overcome obstacles, ask for help when needed, and have an overall positive experience. These students were proud of their work. They reported working hard and being pleased with the results. Likewise, some of the dispositions associated with "Searching as Strategic Exploration" are mental flexibility, creativity, persistence, and seeking help from others, qualities displayed by both Students A and B.

Students in Scott's (2017) study on the *Framework* rated "Scholarship as Conversation" as one of the most "troublesome" frames, and they found it especially difficult to enter into the research conversation. Scott noted that a lack of "domain knowledge" (p. 295) prevented students from engaging, but as students in this study demonstrated, gaining domain knowledge is difficult when one has trouble understanding the type of language used in research articles. "Scholarship as Conversation" addresses this challenge to some extent with a disposition that states, "learners recognize that systems privilege authorities and that not having a fluency in the language and process of a discipline disempowers their ability to participate and engage" (Association of College and Research Libraries, 2015, p. 8). Composition instructors may address this obstacle, but librarians can also design reading and analysis activities to build students' confidence. MacMillan and Rosenblatt (2015) argue that librarians often read texts in non-library science fields, making them "expert novices" (p. 760) who can both relate to student reading challenges, but also offer reading strategies. Bronshteyn and Baladad (2006) recommend constructing paraphrasing exercises to help students practice using their own voice to relay scholarly information. As an example, the

current researchers developed an activity involving both close reading and paraphrasing in which students read an abstract, answer a series of questions about its claims, and paraphrase it using both academic and colloquial language. The activity aims to break down barriers to entering scholarly discourse and foster self-efficacy by focusing on a brief text (an abstract rather than an entire article) and by encouraging students to converse with the text in everyday language (students tweeted the main ideas from the abstract). Early anecdotal evidence suggests that the exercise engenders student confidence in working with academic articles, as might other approaches that shift the focus of information literacy instruction from a cursory evaluation of sources to more thorough guidance on how to read them. A more formal assessment, however, will be needed to address the impact of the activity on students' confidence and ability.

In addition to developing instructional techniques that address students who are challenged by various aspects of the research process, librarians can adopt instructional techniques that reinforce the behavior of students who are intrinsically motivated, persistent, and curious. Cahoy and Schroeder (2012) argue that librarians can help these students by acknowledging positive feelings as much as negative ones. Librarians might address students' positive feelings by having students reflect on their experiences in a research journal or other reflective assignment.

Addressing extremely negative student attitudes like those of Student C is more challenging, but most students the researchers encountered did not share entirely all negative or all positive feelings. Johnson and Kolk (2016) suggest that helping students prolong Kuhlthau's (2004) "pre-focus exploration stage" of research can be beneficial. During this stage of the research process, students have broad topics and have started looking for sources but haven't yet narrowed down their topic. They posit that this stage provides an opportunity for librarians to help students foster flexibility, openness, and persistence because students are still open to new ideas but may also be experiencing doubt, making them more receptive to help. Collaborating with disciplinary faculty could help facilitate this experience by having students start the research process early.

Librarians might also do well to use what students are already familiar with as a gateway toward new knowledge. Instead of dissuading students from using familiar tools such as Google and Wikipedia, librarians can encourage them to make incremental changes by using such tools in tandem with new library resources. Librarians can also emphasize that

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becoming a skilled researcher is a long-term process and that even small steps are significant.

While the *Framework* encourages teaching higher-order critical thinking skills, pairing those skills and ideas with some that focus on more physical and navigational tasks might be worthwhile. A simple library tour can do a lot to alleviate the anxiety many students face (Cahoy & Schroeder, 2012). Well-planned scavenger hunts and other way-finding activities and games also engage students in physical exploration of library spaces (Burke & Lai, 2012; Goldman, Turnbow, Roth, Friedman, & Heskett 2016; Rugan & Nero, 2013; Zitron & Drew, 2011). The interviews from this study suggest that students would be receptive to these types of activities.

Conclusion

This study, along with the researchers' prior studies, provides a snapshot of first- year students as they struggle with and learn how to conduct research during a first-year writing course. Students will always encounter some challenges when doing research, but their experiences do not have to be negative. As Johnson and Kolk (2016) note, "Until students encounter dead-end searches, conflicting information, and ill-formed research questions, they do not need to employ the flexibility to find new research paths and the persistence to engage difficult information" (p. 11). How can librarians encourage students to find these "new research paths," rather than give up when hitting a roadblock? Further qualitative research conducted with a larger sample or a cross-section of students enrolled in different courses within one institution or across institutions could provide deeper insights to help librarians and teaching faculty foster student perseverance in the face of common research challenges. This research could use targeted formative assessments, such as student reflections exploring the affective experience of research, as well as assessments of student performance in completing interactive exercises designed to model effective problem-solving during various stages of the research process.

The *Framework* positions librarians to consider the affective domains of the research process and develop metacognitive activities that simultaneously strengthen students' self-efficacy and their critical thinking skills. By encouraging students to choose topics that spark their curiosity, grapple with challenging texts, and dispense with counterproductive habits of mind, librarians can help propel their transformation into independent and productive scholars.

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Appendix

Interview Questions

1. Topic Development

Describe how you identified a research topic. Did your research topic change throughout the semester, and if so, how did it change, and what factored into the change?

2. Completing Key Assignments/Open-ended Description of Process

Describe the steps you went through to complete your annotated bibliography, doing your best to recall how you found sources, how much time you spent finding them, and any challenges/obstacles you encountered.

3. Bibliography Entries

Where did you find your sources for your annotated bibliography? Why did you select X source to use for your paper? (Pick a source that stands out for some reason, either it is very different from the other sources, or has some other interesting quality. If nothing stands out, pick something randomly to help student ground answers in specifics. If necessary, have students show you how they found sources on computer and take careful notes to record their steps).

4. Challenges

What was most challenging to you in completing your research for course assignments? What obstacles did you face, and how did you overcome them? Potential follow-ups (if not previously addressed): Did you seek any help? If so, can you describe your experience and the outcome? Did you change the course of your research as a result? What would've helped you in terms of support?

5. Prior Research Experience

Describe the most significant research experience you've had prior to this class. (This could be related to using libraries, online research, research assignments, etc.)

Potential follow-ups (if not previously addressed): Do you recall if and how you were taught to do research in high school? Did your past experience help prepare you to complete your research for this class? Why or why not? How were the expectations for this research assignment different and what additional knowledge/skills did you need to succeed? Can

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you address how the library instruction sessions you attended for this class prepared you to complete research for this class? Was anything left out of these sessions that would've helped you as you progressed with the research assignments?

6. Concluding

Do you have anything to add about doing research, or how the library could help students?