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ABSTRACT

Discourse surrounding the pedagogy of undergraduate information literacy sessions is robust and plentiful, but graduate students in research-oriented degrees also need a strong understanding of disciplinary resources throughout the coursework stage of their programs. Library sessions guided by ACRL's Framework help to scaffold graduate students' knowledge of the current scholarly information landscape and how to navigate this landscape effectively and efficiently. In addition, these sessions establish the significance of the literature review in identifying subject epistemologies, paradigms, methodologies, and theoretical approaches. For graduate students, this provides an opportunity to conceptualize how to employ the presented material in the context of their research ideas.

At our institution, we present information literacy sessions for graduate students enrolled in research methods courses prior to starting their theses and dissertations. Based on our experiences conducting individual research consultations with graduate students and our discussions with faculty who supervise graduate students' theses and dissertations, we developed a set of elaborative interrogation questions regarding the literature review process. Elaborative interrogation, as an instructional strategy, has been widely used in education, but its potential has hardly been explored in the context of information literacy instruction. We embed these questions throughout the sessions to help students develop a mental framework for the purpose of a literature review as it relates to the development of a thesis or dissertation. The purpose of adding these elaborative prompts is to engage students metacognitively, making them aware of the research process with the information presented during the session, and it helps them to acknowledge the iterative nature of literature review process.

Keywords:

Information literacy; Graduate students; Elaborative interrogation; Instruction strategies; Literature review; Thesis; Dissertation; Research proposal

Introduction

Developing a research proposal is often a key requirement in graduate studies. In preparing a research proposal, either as a research methods course requirement or as an opportunity to use the proposal for a masters' thesis or doctoral dissertation, graduate students learn the nuances of research design. The analytical and organization skills learned during this process not only introduce students to their disciplinary vocabulary and methodological and theoretical approaches but help them develop a strong research acumen. Yet there is limited research in approaches to information literacy instruction specifically in the context of research design. In a review of information literacy programming for graduate students, Blummer (2009) noted that most efforts are focused on teaching the organization of disciplinary knowledge and less on the acquisition of research skills. While navigating the key disciplinary resources is critical to the overall goal, it is equally important that students internalize the nuances of research process—synthesis of literature, identifying themes, and recognizing assumptions and limitations for prior research.

It is often assumed that graduate students possess the skills to organize and critically evaluate prior research (Harkins et al., 2011). This is partly due to faculty who assume that graduate students possess adequate research skills on entering the program (Boote & Beile, 2005). Analysis of dissertation literature reviews suggests that few dissertations meet the criteria and standards for a rigorous literature review—criteria such as coverage, synthesis, methodology, significance, and rhetoric (Boote & Beile, 2005). In addition, students are often unprepared for graduate level research, find it difficult to live up to the expectations, and are more likely to seek help from their professors than from librarians, while academic programs do not always provide assistance in acquiring these skills (Bussell et al., 2017).

As a metropolitan university with graduate student enrollment numbers increasing each year, our librarians have positioned themselves to be of service to masters and doctoral students by offering instruction sessions guided by the ACRL Framework and tailored to specific upper-level courses' learning outcomes, as well as one-on-one research consultations to further discuss and delve deeper into interrogative prompts. At our university, we offer over 90 graduate programs—with over 80 at the master's level and seven at the doctoral level. Upper-level programs in the social sciences account for approximately 27 graduate and five doctoral programs, including Psychology, Criminology and Criminal Justice, to Public Administration, Educational Leadership, and Exercise Science. The subject librarians work closely with faculty to integrate information literacy at various stages of the programs. Focused information literacy sessions are offered during the coursework stage-particularly in the research methods courses along with individual research consultations for the research proposals, and during the theses and dissertation phase. On occasion, our faculty colleagues have requested information literacy sessions specifically for students about to embark on their theses and dissertations phase of their programs.

Information literacy instruction for graduate students

Blummer's (2009) review of the literature discussed various approaches to information literacy efforts geared towards graduate students—ranging from faculty-librarian collaboration in thesis literature reviews (Green & Bowser, 2002), to a one-credit course designed to prepare graduate students for thesis research (Toth, 2005), and literature review workshops to teach graduate students the fundamentals of the process (Rempel & Davidson, 2008). These approaches, collectively, do improve students' information literacy skills. In a systematic review to examine the effectiveness of library instruction for graduate and professional students, Grabowsky and Weisbrod (2020) found the overall effect to be significant, noting that on average, a student scored about one standard deviation higher on an information literacy assessment after library instruction.

Framing the literature review process as an essential foundation for the thesis or dissertation highlights the importance of discovering the body of literature on the topic, the associated methods and their limitations, along with the theoretical assumptions (Rempel & Davidson, 2008). In essence, the literature review process requires that students read extensively on their topic, identify gaps in the body of literature, and come up with an original research question that not only advances the field but also addresses an important current disciplinary issue. Boote and Beile (2005) referred to this process as generativity—as in generating new lines of inquiry out of existing literature—an aspect critical to students' development as independent researchers. These scholarly "gestures" are also an essential part of the grooming of graduate students if they are to make important contribution to the research landscape in their discipline (McNabb, 2001). The value of the literature review in scaffolding the research proposal, both theoretically and methodologically, is often unclear to graduate students (Rempel & Davidson, 2008), and little support is initiated by the faculty advisors to this end (Austin, 2002; Boote & Beile, 2005).

However, given the complexity of the task of writing a thesis or a dissertation, graduate students and their advisors welcome the opportunity to work with subject librarians to get focused help in identifying literature, methods, and analysis approaches specific to their research questions. Exner (2014) highlighted the significance of information planning, research tools, and most importantly, how these tools interact to support the research process. Our focused review of this literature reveals that there is a significant gap between information literacy instruction for graduate students that incorporates instructional strategies that cultivate an understanding of research design and conceptualization.

As subject librarians, we acknowledge the need to incorporate instructional approaches that help students through this sustained effort and the role we play in helping graduate students through this final stage of their programs. Going beyond the traditional literature review workshops offered to graduate students (Boote & Beile, 2005), we identified and incorporated the use of elaborative interrogation prompts in our instruction geared towards students preparing research proposals in general, and thesis and

dissertation projects in particular. This approach goes a step beyond the integrated library instruction throughout the coursework stage of the graduate programs where the instructional focus is on effectively navigating the discipline-specific resources. In our approach, we emphasize the information literacy skills needed to analyze and synthesize prior research as an integrative activity in the research design using elaborative interrogation prompts as a pedagogical tool.

Use of elaborative interrogation prompts as an instructional strategy

There is a substantial body of literature on effective instructional strategies that help students achieve their learning goals in a variety of different educational contexts (Dunlosky et al., 2013). These strategies include elaborative interrogation, self-explanation, summarization, practice testing, distributed practice, and interleaved practice (for a full review of these strategies, see Dunlosky et al., 2013).

As the name suggests, elaborative interrogation strategy involves prompting learners to generate an explanation for an explicitly stated fact or idea (Dunlosky et al., 2013). This explicit attention to the content enhances learning by facilitating the integration of new information with learners' existing prior knowledge (Dunlosky et al., 2013), and makes this strategy particularly useful for the higher order cognitive synthesis tasks. Grounded in Vygotsky's constructivist learning principles, elaborative prompts facilitate the acquisition of knowledge through an active process of building or constructing on prior knowledge (Fox, 2001; Liu & Matthews, 2005; Phillips, 1995; Vygotsky, 1962/2011). For example, using prompts such as "Which examples can you think of that illustrate, confirm your interpretations?" have significantly improved learning outcomes (Dunlosky et al., 2013). Similarly, the use of elaborations as personal examples or restatements of key concepts have been effective (Dunlosky et al., 2013; Hannon, 2012). These examples highlight the cognitive mechanisms activated by elaborative prompts that engage learners' prior knowledge, acknowledging the gaps in understanding, linking new ideas, and scaffolding their conceptual understanding. It is beyond the scope of this review to fully examine the use of elaborative interrogation prompts in different learning contexts; the prior research suggests that there are cognitive benefits of explanatory questioning that can facilitate higher cognitive tasks, although the relative effectiveness across different contexts varies (for a full review of elaborative interrogation strategy in improving students' learning see Dunlosky et al., 2013; Farooq, 2019).

Elaborative prompts for instruction

The use of elaborative prompts as an instructional strategy evolved as we became involved in teaching research methods courses and thesis and dissertation students in a group setting and during our research consultations with graduate students. The genesis of these prompts dates back to our own graduate courses in preparation of research proposals guided by one of our faculty mentors, Dr. George Cheney, a prominent Communication Studies scholar who mentored many doctoral students and introduced the use of question prompts to develop strong research proposals. We have

deliberately kept the descriptions of the prompts informal to illustrate how we incorporate them in our instruction sessions—as we discuss the literature review process, research design, data collection, and analysis. We acknowledge that not all prompts will be appropriate during all instruction sessions, but our colleagues who teach focused sessions for both graduate and undergraduate courses with research proposal components will be able to tailor these prompts as needed:

1. What is your fundamental motivation for doing this study?

Ask yourself "Why do I care?" What interests you about this topic? Did this interest emerge during your coursework stage, or even before that? Writing a thesis or a dissertation is a long and laborious process; how will this motivation sustain you through a long effort?

2. How did this interest develop? What or who inspires your work?

Further discussing the interest in this research area, are there any scholars and researchers whose work has inspired you? As you scan the literature, can you identify traditional, representative, or emergent studies in this area?

3. How would you describe your focus?

Getting more specific, are there certain key concepts or variables you are interested in? This could be a sub-area of focus under a broad umbrella topic of research.

4. What is your primary research question?

Related to your area of focus, what primary research question/s are you asking? Your primary research question initially acts as a guide to draw the scope of your review, but as you start reading the literature, you may end up refining your ideas and revising your question/s.

5. What is driving your research question?

Is your research question driven primarily by practical, theoretical, value-driven, or methodological concerns? Does this question directly inform practice, test some theoretical assumptions, add value to an applied area, and/or examine a new methodological approach for a specific problem? Can you use a foreground-background metaphor to examine these questions or another way to illustrate the sorting process?

6. How does your topic relate to the broader issues in your discipline?

You may need to address how the review of the literature points to broader issues or concerns. Are these issues explicit in the body of literature? Similarly, does your question follow or continue a recognized research trajectory?

7. How is your proposed study both distinct from and related to other studies on your topic?

Identify what is distinct about your study highlighting the gap in the literature you may have discovered. The same topic can be explored from different lenses—sociological, psychological, anthropological, economic, management, literary, or historic.

8. What would you say makes your study truly distinctive?

Drawing from the gap in the literature, does your proposed study offer a new theoretical approach to an old question or a new method to test prior theoretical assumptions? This is the "Hook to hang your study" or the "So what?" or "Why should anyone care about this?"

9. Do you have secondary or subsidiary questions to support your primary research question?

If so, how do they support the primary research question? Are these on the same analytical plane with one another? How are your methods tailored to address your secondary questions?

10. Does your study center on a case, episode, text, object, organization, issue, campaign, network, movement, or other artifact, event, domain?

How would you justify that choice? If your focus is not on a particular case, is theory, methods, or research questions on the foreground? Which major features will you highlight in your proposal?

11. Does your study involve a comparison between two or more cases, theories, or methodologies?

If so, what is the rationale for selecting these? And what is the logic of these interrelationships?

12. How would you explain your epistemological or meta-theoretical position/s?

How would you describe your theoretical position, epistemology, and ontology to the reader? It is important to make the distinction between the broader terms such as empirical/post-positivist, interpretive, critical, or postmodern. Epistemology is "How do scholars know what they know in a particular field?" What paradigm shifts guide their work—both theoretically and methodologically? How is this body of knowledge structured, i.e., the ontology of the field?

13. Are you drawing primarily from one theory or multiple ones?

What theories guide your work? What arguments will you make for using a particular theoretical framework? Why is it important to have this theoretical foundation for your research?

14. How are your research methods tailored to address your research questions?

Are you using a quantitative, qualitative, or a mixed-methods approach to answer your research question? How you frame your research might signify the use of a

methodological approach. Is your approach consistent with or a departure from previous studies?

15. Would you say that your approach to the collection and analysis of data is primarily inductive, deductive, or some blend of the two?

What kind of data do you plan to collect? Why have you chosen to collect and analyze data in this way? How will collecting and analyzing your data in this fashion help you answer your research questions?

16. What sorts of data, resources, and experiences do you need to answer your research question?

Under which paradegm does your method of collecting data collection fall? How do previous studies you have examined use data, resources, or experiences to answer their research questions? What types of data resources are available to you? How will you determine if you have sufficient data?

17. How are you selecting your samples of data?

What sampling strategy will you use? What are the limitations of this approach to sampling, i.e., quota, snowball, other statistical approaches? How would you address the question of adequate sample size?

18. How are you proposing to analyze your data?

How will analyzing data in this manner help you answer your research questions and test your hypotheses? In addition, what level of analysis will be needed? What post-hoc tests will you conduct? If you plan to gather qualitative data, how will you ensure trustworthiness in analysis?

19. How do you plan to structure the analysis, interpretations, and findings in writing?

How would you outline your results section? Will including charts or graphs support your findings or allow the reader to understand your results easier or in a new way?

20. What would count as sufficient data in terms of interpretation of results, claims, or conclusions made?

How do you demonstrate the value of your data? How do you justify sufficient data collection/data saturation?

21. What modifications might you make in the structure and content of your proposal as a result of carrying out the investigation?

To what extent will you need to revise your introduction, literature review, and methods sections based on your results? Specifically, in the case of qualitative research, how did data collection inform your analysis?

22. How will you check your findings, interpretations, analysis through supplemental analyses, other coders, later replication, feedback to participants, or longitudinal investigation?

What types of interpretations do you see yourself or other researchers making because of your analyses? How have others in your field checked or interpreted their findings? Could providing feedback to participants, member checking, building rapport, and other ways of triangulating your findings add trustworthiness and rigor to your research design?

23. What strengths and limitations do you see to your project?

How would you describe the limitations of your chosen methods, approaches, and level of analysis? Are some of these limitations theoretical, methodological, or a combination of both? Can you suggest alternative approaches to addressing some of these limitations for future research?

24. What is the added value of your study? How do you respond to the "so what?"

What implications does your research have on future research? How will your research impact the scholarly conversation surrounding this topic? Did your project address any gaps in the current scope of research? How would you explain the impact of your project to someone who is not in the field?

25. What forms of follow-up work including publications, community engagement, policy-related efforts, and training/education do you foresee?

Does your research have an impact on the people or policy in your community? Do you intend to submit a paper or presentation proposal about your research? What conferences and journals are relevant to your area of research? Where do you see this line of research in the next 5–10 years? Do you notice any interdisciplinary connections? How does it fit in with your short-term and long-term research goals? More broadly, what long-term value does it bring to your discipline?

Discussion

While using these prompts, we recognized that it is important to note the differences in the scope of projects between master's and doctoral level research. Graduate programs that offer professional or practice-oriented degrees rarely require a thesis but focus on a capstone project or portfolio as the culminating work. Our graduate faculty note that students engaged in empirical research, either at masters or doctoral level, have similar expectations, even though the scope and depth of research might differ to some degree. Some of the prompts may be more suited to include with doctoral students and vice versa. Some of the prompts may be better suited to address at different stages of the dissertation writing, data collection, analysis, and so forth. Collectively, these prompts offer an understanding of the magnitude of graduate level research—from research motivation to impact in the field.

We view graduate instruction as an outreach opportunity to our students as well as the faculty. These sessions are beneficial for librarians who want to get a better understanding of the scope of graduate level research. In turn, it highlights faculty research agendas. It is no surprise that faculty advisors guide students to research that mirrors their own research interests. Knowledge of this research trajectory is critical to developing a research collection that supports faculty research. Focused sessions for students in the dissertation stage also provide support during a critical stage, where there is an increased risk of students leaving their programs (Ali & Kohun, 2006; Ali & Kohun, 2007; Berger, 2015).

From a pedagogical standpoint, this approach expands on the theory, practice, and philosophy of graduate information literacy instruction. Focused instruction sessions geared towards graduate students in the proposal stage of their programs offers unique perspectives on challenges related to research design, the role of literature review in providing guidance on the theoretical and methodological assumptions and limitations, and most importantly, identifying the research gap, the rationale and the "so what" of the proposed research. As noted in the introduction, the ACRL Framework provides a theoretical grounding for instructional design and assessment of key knowledge practices and dispositions of learners navigating the scholarly information landscapes. With these prompts as guides, students not only identify but critically evaluate the contribution of the body of literature scaffolding their proposed research, and in turn participate in the creation and dissemination of research, adding their voice to the disciplinary scholarly communication—as highlighted in the "Scholarship as Conversation" and "Information Creation as a Process" frames.

The value of any instructional approach can only be measured with effective assessment. However, incorporating these prompts in our "one-shot" instruction sessions and during our individual research consultations does not provide enough opportunity to assess how effective these prompts are in terms of engaging students with the content as they explore the literature on their own. We recognize that it would be difficult to assert that the use of prompts is solely responsible for successful synthesis of prior literature. Such assessment would require synthesis measures such as integration and transformation—typically used in the multiple documents comprehension literature (Farooq, 2019), while acknowledging the effects of other covariates. In addition, the knowledge practices in individual frames of the ACRL Framework may prove helpful in identifying key variables for future assessment using a variety of qualitative, quantitative, and mixed-methods approaches such as survey instruments, qualitative reflections, rubrics, and evaluation of student projects using synthesis measures.

Through our informal post-session discussions with students and faculty, we received positive feedback and appreciation of these prompts. Students stated that they found the prompts helpful in understanding the connection between literature review and research design. Faculty colleagues acknowledged the value of using elaborations to

highlight various stages of the research process in both coursework assignments and theses or dissertations.

We also recognize the disciplinary differences in research proposal preparation. Since we support Social Science disciplines specifically, we realize that our prompts might be more tailored for topics in Social Sciences. However, our colleagues in Arts, Humanities, and Science, Technology, Engineering, and Math areas may find some overlap here to create prompts that reflect their disciplinary research practices. We hope our colleagues who teach graduate information literacy sessions will use these prompts to facilitate synthesis and generativity of new ideas—two of the key objectives of graduate level research.

Declaration of competing interest

None.

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