

Learning and teaching about scholarly communication: Findings from graduate students and mentors

Christie Hurrell, Libraries and Cultural Resources, University of Calgary

Susan Beatty, Libraries and Cultural Resources, University of Calgary

James E. Murphy, Libraries and Cultural Resources, University of Calgary

Dana Cramer, Communication and Culture, Toronto Metropolitan University

Jennifer Lee, Libraries and Cultural Resources, University of Calgary

Caitlin McClurg, Libraries and Cultural Resources, University of Calgary

Abstract

Graduate students are increasingly expected to publish peer-reviewed scholarship during the course of their studies, yet predictable mentoring and education on academic publishing is not available to all graduate students. Although academic librarians are well positioned to offer such instruction, their efforts are not always informed by comprehensive investigations of what, and how, graduate students need to learn. This study used focus groups with graduate students and faculty mentors to explore strengths and gaps in current mentoring and learning practices, while also discovering and uncovering suggestions and opportunities for further development in education about scholarly publishing. Thematic analysis of the data revealed that current training and mentorship meet some, but not all, of students' needs and preferences. Future library instruction should employ a blended and compassionate approach to teaching about this complex topic, and this study offers a way forward as librarians-as-partners in scholarly communication.

Introduction

Although many academic librarians develop or contribute to instruction on scholarly communications topics aimed at graduate students, these educational offerings are not always based upon an evidence-informed assessment of graduate students' learning needs. This study sought to gain additional insights from both graduate students and faculty regarding how graduate students are learning to develop scholarly outputs in the form of academic publications. Research questions included: 1) How do graduate students come to understand how information is produced and valued as they begin to contribute to formally published research in a community of learning? 2) What sorts of information gaps currently exist around scholarly communication topics for graduate students, and how are they navigating these uncertainties? 3) What are the formal and informal teaching strategies around scholarly communication currently in place, and where could additional resources support these existing efforts? 4) What are graduate students' learning preferences with respect to these additional resources? To answer these questions, the researchers conducted focus groups with graduate students and faculty supervisors exploring these topics.

Literature Review

Graduate Students and the Scholarly Communications System

Students embarking on graduate studies experience a significant shift in their educational careers when they evolve from consumers to producers of peer-reviewed scholarly literature.¹ The expectation of graduate students at both the master's and doctoral levels to independently or collaboratively publish varies by program and discipline, and librarians frequently field questions about how to find appropriate and high-quality venues for academic work as well as how to

navigate copyright and intellectual property concerns. These questions are anticipated to increase as more students pursue manuscript-based theses, which in turn is influenced by the highly competitive academic job market combined with the research and reputational goals of the institution.² Additionally, the scholarly communications landscape is changing rapidly; phenomena such as preprint servers, so-called “predatory publishers,” and funder mandates around open access and research data management introduce additional complexity. As graduate students start to explore the possibility of publishing or co-publishing academic works, they must become fluent with the complex and dynamic system of scholarly publishing. Lori Townsend, Korey Brunetti, and Amy Hofer describe the publication process as an information literacy “threshold concept” because it is a “[gateway] for student understanding that, once traversed, transform[s] the student’s perspective.”³ The Association of College and Research Libraries’ Framework for Information Literacy also notes that novice learners must “recognize that systems [of scholarly communication] privilege authorities and that not having a fluency in the language and process of a discipline disempowers their ability to participate and engage.”⁴

Faculty Mentors

The role of faculty mentors in helping graduate students navigate the publishing process is very important and represents a crucial component of graduate students’ education and their socialization into an academic community. A scoping review classifies the literature on how faculty mentors support graduate students into two broad categories.⁵ The first is the mentor-protégé model which involves both logistical support around writing and publishing as well as social support and role-modeling successful traits to students. The second is the workshop/course model where faculty members organize writing groups or classes, either within the curriculum or outside of it. However, several studies have noted the uneven nature of such mentorship

opportunities. As mentorship around scholarly communications and other “professionalization” topics is carried out primarily outside of formal curricular structures, many graduate students do not have the opportunity for adequate mentoring.⁶ Another factor is that faculty members may not perceive this topic to be important for graduate students to learn about, or they may argue that this topic is outside the scope of their role.⁷ Additionally, mentoring graduate students through the publishing process can represent significant, “invisible” academic labor for faculty supervisors that is not recognized in traditional academic reward systems.⁸

Student Needs

The question of how to provide learning opportunities to graduate students around the broad topic of scholarly communication has been discussed in a number of contexts in the library and information science literature. Because graduate students take fewer courses, there is less opportunity to integrate library instruction into the curriculum, and many instruction efforts have focused on developing co-curricular, non-credit programs that meet a variety of information needs particular to graduate students. A large survey of academic librarians published in 2015 revealed that while most academic libraries have developed instruction specifically targeting graduate students, only 18 percent of respondents offered workshops on the publication process.⁹ Other librarians have worked to incorporate scholarly communications training into existing graduate student tasks, such as depositing their dissertation into the institutional repository.¹⁰ Samantha McClellan, Robert Detmering, George Martinez, and Anna Marie Johnson offer a useful overview of “professional skills” programming for graduate students, many of which included scholarly communications topics.¹¹ Most of these are stand-alone, optional in-person or online workshops and many are delivered by collaborative teams of librarians (e.g., liaison librarians together with functional specialists), or integrate expertise from outside the library, including the research office, the teaching and learning office, graduate student government,

writing centers, university presses, and/or individual faculty members.¹² A collaborative approach can also help diversify the career stage, gender, race, and other relevant characteristics of instructors and organizers, allowing the course to reflect the experiences and needs of a wider group of students.¹³ The collaborative nature of these initiatives stands in contrast to the ones described by faculty mentors, which focus on programming developed and delivered solely by disciplinary faculty.

Some studies have asked students to express a preference for teaching modality or have assessed the impact and reach of chosen modalities. The ability to reach a larger group of busy, geographically diverse learners has been cited as a clear advantage of online offerings, particularly those that are delivered asynchronously.¹⁴ Some studies asked students their preferred delivery modality and have found either a strong or slight preference for online delivery.¹⁵ Instruction delivered during the COVID-19 pandemic moved online due to necessity, and in some cases this resulted in higher registration and engagement.¹⁶ It is difficult to predict how these shifts will influence student needs, preferences, and behaviors in the long term.

Notably absent from most initiatives to teach graduate students about academic publishing is a robust assessment of student learning needs in advance of the design of an educational intervention. The reality of much library programming is that library staff must quickly respond to emerging campus needs, making detailed pre-assessments difficult to complete. Barbara Alvarez, Jennifer Bonnet, and Meredith Kahn briefly discuss surveying students in one department to assess information needs around a workshop about the publishing process, while Kristin Hoffman, Fred Antwi-Nish, Vivian Feng, and Meagan Stanley conducted a more formal survey of students in STEM disciplines, as well as focus groups with students and faculty mentors, to assess their needs for information literacy topics, including scholarly communication.¹⁷ When surveyed, graduate students indicate more interest in learning about

scholarly publishing, when compared to other related topics such as copyright and measuring impact.¹⁸ However, most work published on this topic relies on the knowledge and expertise of librarians, anecdotal evidence gathered from students and faculty, and tools such as the Association for College and Research Libraries (ACRL) Framework to design workshops, tutorials, research guides, or seminars. Educational interventions are often adjusted or re-worked in response to feedback provided through post-workshop evaluations.¹⁹

Methodology

This study was conducted at the University of Calgary, a Canadian public research university with approximately 6,000 graduate students and a broad range of graduate programs, as well as a medical school. The target population for this study was graduate students in any field of study, in any level of study from beginning master's students to senior doctoral students, as well as faculty who supervise graduate students, also from any discipline. Study participants were recruited through a variety of targeted techniques, primarily using e-mail messages. For students, an invitation to participate in the study was sent via several institution-wide newsletters operated by the Graduate Student Union and the Faculty of Graduate Studies, as well as via a number of departmental mailing lists and relevant student clubs/associations. Faculty members were recruited primarily via personal contacts of the study team, which is composed of a scholarly communications librarian as well as liaison librarians representing a wide variety of disciplines. Prospective participants were directed to an online form where they could indicate time preferences for participating in the study and complete a digital consent form; this technique worked well for scheduling and streamlined the study's administration considerably. Prospective participants were offered a gift card or a donation to the campus food bank as incentive for participating in the study.

A total of seventeen students (ten doctoral students, seven master's students) and sixteen faculty mentors agreed to participate in the study, and six focus groups were held with between four and seven participants over the course of an eight-week period. Separate focus groups were held for students and faculty members. Although this study did not aim to draw conclusions based on discipline, progression in degree, or degree type, the introductory icebreaker portion of the focus groups revealed subject focus diversity in our participants. Students from Science, Technology, Engineering, and Medicine (STEM) disciplines dominated with twelve participants, followed by four students from social science disciplines and one from the humanities. Among faculty, focus groups also included a diversity of disciplines and career statuses. The focus groups had participation from five faculty from STEM disciplines, seven from social sciences, and four from humanistic disciplines.

After approval from the University of Calgary's Conjoint Human Research Ethics Board, focus groups (guide in Appendix A) began. The research team selected focus groups as the study's methodology because they allow for generative discussion between research participants and permit the researchers to probe participants' responses. Because the study's overarching research question was designed to probe graduate student experiences in learning about publishing as part of the process of academic socialization, this format was deemed more appropriate than a survey or questionnaire, which would allow for limited probing and discussion. The focus groups were designed to be open-ended, with only three formal questions to guide the discussion. In order to promote discussion and a safe environment, several ground rules around confidentiality and etiquette were introduced by the moderator, followed by an icebreaker where participants introduced themselves to the group. The moderator then began with questions asking students how they had learned about publishing, focusing on what has been easy to learn, what has been

difficult to learn, and what learning modalities have been helpful. The research team developed several probes and follow-up questions to invigorate and guide discussion where necessary. The structure and questions were similar for the faculty focus groups, although questions directed at students probed how they *learn* about scholarly publishing, while questions directed at faculty probed *teaching* about this topic (again focusing on what is easy and what is difficult). Focus groups were designed to last for 90 minutes, and to accommodate between three and ten participants.

The research team hosted the focus groups on the Zoom meeting platform, as the data collection occurred during the COVID-19 pandemic where in-person gatherings were not possible. Based on recommendations from the methodological literature, the online focus groups had a minimum of three members of the research team occupying a role: one as moderator, another as a back-up moderator, and a third providing technical support.²⁰ This structure was helpful in mitigating the inevitable connectivity and technological disruptions associated with online meetings. The focus groups were recorded and then transcribed.

A line-by-line analysis of focus group transcripts was performed following the descriptive coding process outlined by Juliet Corbin and Anselm Strauss.²¹ The research team used open coding to identify possible concepts based on the transcripts. Concepts were then analyzed and re-grouped as necessary into similar, or higher-level concepts, and relationships between codes were identified using axial coding. The research team coded the data in the software program NVivo 12, with each member of the team coding a transcript using thematic codes developed in a shared codebook. A second coder was then assigned to the transcripts where intercoder reliability was reviewed to ensure a Cohen's Kappa coefficient of a minimum of $K > 0.40$ was met.²² Transcripts which did not meet this Kappa coefficient benchmark were assessed by the

research team to decide whether to keep or remove given coded data. Appendix B identifies the themes in the shared codebook.

Results and Discussion

The literature regarding online focus groups suggests that in-person focus groups will produce more storytelling, whereas online focus groups provide more self-disclosure and direct responses to questions.²³ This research found a mix of this with storytelling by both faculty and graduate students, but also self-disclosure statements found in faculty focus groups. As such, respondents provided data that responded to the research questions, but also surfaced themes and topics that the research team did not expect. While most themes were discussed by both students and faculty, there were some themes that were developed by only one group or the other.

Enablers of Learning

Mentorship relationships

One-on-one mentorship was by far the most important source of learning about academic publishing mentioned in the focus groups. Both students and faculty recognized that the type of mentorship provided to students varies based on the mentorship style, career stage, and disciplinary norms of faculty mentors. For example, pre-tenure faculty members in disciplines where co-authorship is the norm may be extremely motivated to mentor graduate students through the publishing process, whereas more senior faculty, or those in disciplines where co-authorship is less accepted, may be less motivated to take a hands-on role. In these cases, students discussed the importance of having a mentorship network, which may include supervisors from previous degrees, other members of their supervisory committee, librarians, or senior students or post-doctoral fellows in the same research area.

Students also expressed value in learning through peer mentorship and conversations, whether facilitated by the university or informally within their departments and faculties. However, students also discussed the potential dangers of peer mentorship in what is perceived to be a high-stakes activity:

I feel like I'm always telling my peers, my friends, what my mentor told me. I've had some really good tips from some of my peers. But in general, it's been like, "Oh, your mentor doesn't do this with you. Like they didn't tell you about this? Oh, do you know about this resource?" And they're like, "No, I don't know." I'm like, "Ask your supervisor about it." And it seems like everyone is feeling lost and that if it's like, it'd be like the blind leading the blind.

Graduate student participant

Experiential learning

Experiential learning was a very important theme in the focus group data from both graduate students and faculty mentors. Many faculty members discussed their endeavors to provide high-quality experiential learning opportunities for mentees, including co-authoring a paper together (either on the student's own research or on a related project led by the faculty member), providing opportunities for students to assist with peer review, or having students start writing with short pieces that can be built into longer works as they move through their degree. Some faculty members also discussed how the learning process can be scaffolded through a variety of activities, such as course-based writing and peer review activities, journal clubs, conferences, lab meetings, and seminars. Faculty noted that there are both benefits and costs for mentors in collaborating with students. The benefits include the fresh ideas and perspectives that graduate students bring to the writing process, while the costs include time, as well as potential reputational or career impacts in disciplines where co-authorship is not the norm. Faculty also acknowledged the importance of having open conversations with students about the ethical

issues, power dynamics, and career impacts involved in co-publishing:

I want them to have this opportunity to engage in writing a manuscript for publication. So, negotiating that also takes a very careful attention to the relationships, and the ethics, and integrity of that relationship, and acknowledging, and being open.

Faculty participant

Some faculty members discussed how to mitigate some of these risks by developing tools like authorship policies or publishing rubrics.

Students echoed many of the themes about experiential learning mentioned by faculty: many students reported positive learning experiences including co-authoring a paper, acting as a peer reviewer, or being given opportunities to publish a lower-stakes item, such as a review, together with a faculty mentor. One student discussed how being asked to participate in peer review helped them build their confidence:

It did take me way longer than I think it's supposed to, (laughing) to do those first couple of reviews. But it felt really good and I don't know, and I feel like in the academic sphere where there's often times things that are not giving us a lot of confidence, I feel like that's one area where you get a little boost of someone thinking you're smart and worthy of reviewing.

Graduate student participant

However, students also reported very negative experiential learning experiences where they found themselves navigating the publishing process alone, which sometimes got them into situations that they could not interpret. One student recounted being reprimanded by a faculty mentor for getting the order of authors “wrong” because they were not aware of disciplinary conventions, while another reported the challenges of dealing with negotiating permissions requests for third-party materials incorporated into a manuscript. For graduate students without a support system to guide them through the publishing process, the process of “learning by doing”

can be stressful. As one student noted, different supervisory styles impact students' experiential learning experiences:

So I think in one way, it's really helpful to have mentors who can support graduate students through the publication process. And on the other hand, that does leave it kind of up to chance as to whether a mentor is actually going to be there, and whether they're actually going to be supportive and willing and able to actually have the capacity to tell a grad student how it works.

Graduate student participant

Curricular and optional learning opportunities

Most but not all graduate programs represented by participants in the focus groups discussed academic publishing as part of the formal curriculum, often in the context of a professional skills seminar. Both students and faculty spoke about these classes as being helpful, but students noted that the content is often delivered at the beginning of a graduate program, before they are ready to absorb it. Faculty also discussed how some class assignments are scaffolded to replicate some of the processes of writing for publication, including peer review and rounds of revision. Some students and faculty also mentioned optional learning opportunities offered by the university, such as sessions run by the library or teaching center and faculty-specific workshops, as well as resources offered by the Faculty of Graduate Studies that cover topics relevant to academic publishing and the supervisory relationship, including authorship and intellectual property. In general, while these opportunities were appreciated, they were much less important to students' learning than the direct relationships they have with mentors.

Informal Learning Opportunities

Students discussed seeking out information and support about academic publishing from a variety of sources outside of the formal learning environment, including social media and other

web-based resources. Many students mentioned that sites like Twitter, ResearchGate, Google Scholar, or LinkedIn can help demystify the publishing process because some scholars on social media are very transparent in documenting the sometimes rocky road to publication, while following scholars on various platforms can be helpful for learning about which topics and publishing venues are popular, controversial, or prestigious.

As one student noted:

[I]n my field, there are so many journals, that you can't even subscribe to one journal or set [an] alert for one journal, because your mailbox will be full. There's so many things that get published. So, what I did was the people I admire are the people that I know are very big names in my field, I created a Twitter account just to follow them.

Graduate student participant

Other students mentioned seeking out videos, webinars, podcasts, and blogs for helping them learn about specific topics, such as predatory publishers. They did this for resources both local and external to their institution. A number of faculty members recommended specific books about learning to write for publication and noted that they often recommend these resources to their mentees.

Learning Gaps

Tacit Knowledge

When students and faculty spoke about what is difficult to learn or teach about in the context of academic publishing, the overarching theme in their responses was the concept of tacit knowledge, which is “subjective, experiential, context-specific, internalized, often hard to teach, and involves a lot of interpretation to apprehend.”²⁴ Since new academic authors expressed that they primarily learn about publishing through long-term, one-on-one mentorship relationships

and through experiential learning, this definition resonates. Students have difficulties when they recognize their ignorance but are not sure how to gain the knowledge they need. As one student explained,

[E]ven going to my supervisor and saying, “Hey, I’m interested in XYZ publishing,” and [them] going, “Well okay, that’s great. What do you want to do?” And it’s kind of that first question of actually do I know what I don’t know, and don’t I know what I know, and a lot of, I guess, guesswork that way. So kind of in this weird liminal space of knowing lots but not being able to apply it properly.

Graduate student participant

In the student focus groups, students talked about learning key facts and skills for navigating the publishing process as they experienced them, or as they had conversations with mentors. For students, even knowing what questions to ask a mentor can be empowering.

In faculty focus groups, participants articulated another key component of tacit knowledge, which is that “[o]ften the holder of this knowledge is not consciously aware they have this knowledge, as they take it for granted.”²⁵ One faculty mentor stated that:

...[S]tudents are sometimes surprisingly ignorant of the norms in the field [...]. So, norms like how or who to publish with, what position to be put in, what it means to be in a various position, that sort of stuff for sciences, and for the arts, and humanities, I’m guessing. Things like journal rank and prestige journal topic areas, etiquette of critique.

Faculty participant

More experienced academic authors have gained the context-specific, experiential knowledge needed to successfully publish in their discipline through years of practice. As such, they may take it for granted and have difficulties transmitting that knowledge to mentees without extensive contact and dialogue with learners.

Student Readiness and Confidence

Building an adequate level of confidence and “readiness” to publish were concepts that surfaced frequently in both student and faculty discussions, although the two groups defined these concepts slightly differently. Students mentioned the importance of discrete skills, such as learning how to extract “publishable units” from a thesis or dissertation project, developing an appropriate writing style for a publication (a theme emphasized by English as an additional language students), understanding how to format a paper for publication, and becoming comfortable with the publishing options—and how they often operate as a hierarchy—in a particular discipline. However, even with awareness or knowledge of some of these skills, students expressed a great deal of struggle to develop the confidence to submit works for publication, describing the process using words like “scary,” “mystifying,” “negative,” and “out of my depth.” Every student who participated in this research discussed this difficulty, summarized well by one participant:

[Publishing] seems like just a mountain of negativity. You know, “You’re going to be rejected. Get used to it.” All that sort of thing. Yet on the other hand, it’s, “Oh, you have to publish. You’ve gone through all this work. You’ve done all this research, so absolutely you have to do it. Make a commitment to do it.” So it seems like two ends of the spectrum here. Yes, I would like to do it, however, is it even physically possible by the sounds of what people say about it?
Graduate student participant

Faculty members also spoke to these issues in students, but through a slightly different lens. They spoke about the importance of building mentees’ confidence over time, by being supportive and providing constructive feedback throughout graduate school so that students are prepared for a more formal publication process. Faculty offered different methods for building student confidence, including being transparent with students about their own struggles in publishing, encouraging students to pursue manuscript-based theses, forwarding relevant calls for papers,

sharing tools like tables to more easily manage peer review feedback, and emphasizing their students' expertise in their research area. Faculty also noted that not every graduate student has a goal to publish in the peer reviewed literature, which must be respected, and that some may wish to but are not ready to commit to the rigors of the process. However, some faculty also expressed surprise that students lack confidence, or seem unwilling to take opportunities to publish in their disciplines:

The big thing for me is the lack of confidence that blows my mind. Y'know, why wouldn't you try? Like, let's go! [...] So, trying to help students come in with an attitude of, "I've got this, or I can do it." Or a more positive outlook on the learning that occurs.

Faculty participant

Students recognize that mentors sometimes forget their own learning process:

[O]nce you become [a] supervisor, you forget that when you [were a] regular student, this simple thing, just to put your idea on the paper in the beginning, would be such a challenging thing.

Graduate student participant

A very prevalent theme in the student focus group data was the mental health and wellness impacts of learning about academic publishing. Students used the focus groups to share stories about their learning journeys, and there was visible relief and affirmation at being able to share similar experiences and struggles with peers. While faculty certainly recognized that publishing can be difficult and stressful for students to learn about, they focused mainly on the idea of student confidence, while students foregrounded emotions such as imposter syndrome, fear of rejection, and despair. They emphasized the importance of supportive communities and integrating discussions of the mental health and wellness impacts of learning into the learning activities themselves.

Publishing Etiquette and Timelines

Students reported many challenging experiences learning about the norms of publishing in their discipline. These included understanding how co-authorship and author order works, how to select a journal to submit to, how to evaluate a journal for its reputability and/or prestige, and how to respond to peer review. Skills and knowledge of discrete components of the publishing system contribute to low student confidence.

In addition, students repeatedly discussed how surprised they were by the timeline of academic publishing; namely, how long it takes. Learning about how to manage what many described as a “pipeline” of outputs such that new works would be coming out at times that were most advantageous to their academic careers was a recurring theme in both student and faculty focus groups.

It sometimes feels unmanageable because, yeah, like everyone's saying, it's this long process and I feel like we have to balance milestones in our degree as well as building our professional development skills as well as publishing at the same time.

Graduate student participant

Writing Skills

Faculty members focused much more on the development of strong academic writing skills than students did. Although the focus groups were framed as an inquiry into publishing knowledge, not writing, the two concepts are deeply intertwined, and faculty discussed this concept much more than students. They discussed strategies for teaching students key skills such as how to develop an appropriate style and tone, to write concisely, and to express their ideas persuasively. Faculty members currently use strategies such as assigning books on writing, using metaphors to explain key writing skills, and bringing in invited speakers to discuss the variety of approaches to writing. At the same time, they also expressed a desire for more formal or in-depth resources for their students on this topic.

Preferred Learning Topics and Modalities

Although students mentioned often taking a course that introduced scholarly communications topics, they suggested that the courses were often rushed or at the beginnings of their programs and not timed at the point of need. Outside of these courses, interactions with supervisors, and experiential learning, many students took their own initiative to build knowledge to support their emerging skills.

I would just say, for me personally, it was self-directed. That would incorporate all the means that I explored, whether it's the sessions that I attended. Whether it was some journal clubs I did. But it's your own journey.

Graduate student participant

When seeking information and learning resources, students specifically expressed a desire to learn about a number of key topic areas:

- Timing: Students expressed surprise at how long the publishing process takes.
- Peer review: Students preferred to learn about what to expect in this process before experiencing it for the first time.
- Journal quality/prestige: Students picked up clues about desirable journal choices but wanted a more formalized way of being able to determine this.
- Predatory publishers: Students expressed being fearful about unknowingly getting involved in a predatory journal.
- Publishing costs (e.g., open access or color figures): Students often learned about this when they were confronted with a fee, and assumed costs would be covered by the department, which was often not the case.
- Writing (e.g., abstract, paper formatting): Students expressed desire for a community or peer group to assist each other with writing and formatting norms in their discipline.

- Disciplinary norms: Specific to their program or faculty.

Perhaps influenced by the fact that the focus groups were conducted during a period of intensive online learning due to the COVID-19 pandemic, and students were doing much of their self-directed learning online, a number of students suggested they would benefit from a series of online videos or modules that could be accessed at a point of need. Students also expressed that they appreciated video recordings with transcripts and additional functionality such as speed adjustments and video “chapters” organized by topic.

Yeah, like a video like that would be perfect, because then I could just do it on my own. I mean, I like listening to people. But it'd [be] nice if I could just listen at 1.5 the speed or something.

...if the videos can be about four to five minutes of length, that would be ideal.

...so I think similarly if they had like little videos online with maybe a list of resources for afterwards that would be very helpful.

Graduate student participants

Students expressed that to complement online modules or videos, they would appreciate periodic sessions or workshops addressing these topics, such as during Block Week (when students can take select, full-credit courses or non-credit workshops the week before a semester begins).

These could be run by the department, the library, teaching and learning centers, or student associations. Formats such as journal clubs or peer writing groups were also mentioned. Clear in the focus group data was a desire for both an on-demand set of learning modules and informal opportunities for peer and community learning.

Faculty members mostly commented on which topics they would like graduate students to learn, but also that they felt department and library workshops and sessions being offered were valuable.

I'm not sure if this is already out there or not, but I'm just wondering if there's a LibGuide or something that students could go through kind of in a self-directed pace and access resources to help through the writing and publishing process, and maybe there already is and I'm just not aware of it. But I would, find that REALLY helpful, I can say, in addition to already the seminars and existing workshops that do take place, both within our faculties and offered through the library.

Faculty participant

Discussion and Conclusion

These findings show that students see the relationship with their mentor as the most important factor in learning about publishing, because this relationship is the gateway to most of the positive learning experiences expressed by students including experiential learning opportunities, scaffolding of the writing process, acquisition of disciplinary norms and publishing “etiquette” knowledge, and more. This sentiment, expressed by students, is echoed by empirical findings on how supervisor support equates to more publishing by doctoral students.²⁶ At the same time, the findings also reinforce previous research asserting that the variability and unevenness of mentors’ approach to teaching about academic publishing leaves some students without adequate support. Focus group participants also reflected on the effectiveness of existing curricular and optional learning supports for this topic, indicating that they are useful, but not always delivered at the point of need. As such, students often sought information elsewhere, including from peers and social media. The information that students found most difficult to learn about—for example, the correct way to order co-authors on a given publication or which journals are well-regarded in their research area—is often extremely discipline- or context-specific, and therefore cannot be authoritatively answered by a general resource or workshop. This is another example where mentorship relationships are central to student learning.

The results also foreground students’ desire to have mental health and wellness considerations woven into the education they receive about academic publishing. While some students reported

very supportive mentorship relationships that did center their well-being, this was not universal, and previous pedagogical interventions reported in the library and information science literature do not discuss this aspect of student learning, with only one study highlighting the importance of a cohort model for students to build trusting learning relationships.²⁷ Reflecting on a decade of teaching graduate students about writing for publication, Wendy Belcher also notes the importance of developing trust, relationships, and an environment where students feel safe to share their emotions and support their peers in their scholarly publishing journey.²⁸ It is likely that the isolation and disruption brought on by the COVID-19 pandemic only heightened these emotions, in line with research more specifically investigating this phenomenon.²⁹

The results of this study reinforce Marianne Buehler and Anne Zald's assertion that the role of a librarian is to "complement, not intervene, where there are productive mentor-protégé relationships among faculty and students."³⁰ However, it also illuminates areas where librarians can proactively complement these relationships by providing students with a baseline of knowledge that they can supplement through conversations with disciplinary experts. The results did foreground certain topics that students wanted information on—such as how to choose a publication venue, how peer review works, what is a predatory publisher, and how to understand publication metrics—that librarians can provide meaningful instruction on. Librarian instruction on these topics may not be able to address all the disciplinary nuances associated with these learning needs, but they can at least help students more confidently probe their mentor's tacit knowledge base, and to address the question of "do I know what I don't know," to use the words of one of the participants.

Results from the faculty focus groups showing that mentors are more concerned about developing their students' writing skills than students themselves are, is echoed by ongoing research by Martha Stuit and colleagues.³¹ The results suggest that students' view of writing for

publication is more instrumental and mechanical than that of faculty, who took a much more holistic and high-level approach to the topic. This is to be expected, given their higher degree of socialization into the academy and their greater experience in publishing. It also foregrounds the importance of considering pedagogical approaches within a broad and comprehensive framework of graduate education. Although students discussed the pressure to publish, this study did not observe an overwhelming “publish or perish” narrative from students such as has been reported in other contexts, and any library instruction must be careful not to promote (or further entrench) this narrative.³² As Barbara Kamler notes in a paper promoting publishing instruction in doctoral programs, interventions “should be linked to the broader project of reinvigorating and rethinking doctoral pedagogies, and not just offer a set of tips and tricks to increase output in narrow and short-term ways.”³³ Students in this study also expressed significant interest in learning about disseminating their work in “non-traditional” venues such as blogs, preprint servers, and mass media, suggesting that academic publishing is not their only goal.

It is not the intention of this study to generalize results to all graduate students, or to develop clear distinctions between students or mentors in different degree programs or disciplines, as the data do not allow it. In general, the study observed that PhD students were more knowledgeable and had more opportunities to learn about and practice publishing than master’s students, but this was not universal. Because participants self-selected to participate in this study, it is also likely that some bias toward students with particularly negative or positive experiences, for example, or faculty members with a particular interest in publishing, was introduced into the results.

The overall results of this study provide librarians with avenues to explore when providing instruction to graduate students on academic publishing topics. For example, the research team is using the results to develop a blended learning approach to this topic. First, the team has developed and assessed a multimedia research guide that addresses topics and questions

frequently mentioned by students and highlights resources and expertise from faculty mentors and librarians. 34 The guide uses short videos to illuminate key concepts, features a publishing timeline, acknowledges the mental health implications of publishing throughout, and includes pages dedicated to campus writing and wellness supports. Four short videos addressing knowledge gaps including choosing a publication venue, avoiding predatory publishers, understanding peer review, and journal metrics anchor the guide; these are supplemented by frequently asked questions and links to additional resources. Discipline-specific information could not always be included in the guide, but in these cases the research team attempted to provide a baseline of information with prompts to ask more specific questions of disciplinary experts. The guide has been evaluated by two groups of students: first, a subset of the focus group participants assessed it; second, a larger group from the general graduate student population. Both groups reported high levels of satisfaction with the guide and provided helpful critiques and comments to improve it.

Second, the team is pursuing opportunities to integrate discussions about academic publishing into existing graduate writing communities together with campus partners including the writing center. This multi-pronged approach follows the feedback provided by student participants, as well as suggestions from other LIS practitioners to embrace “compassionate pedagogies” that combine synchronous and asynchronous modalities and establish a sense of community.³⁵ Ensuring that graduate students are supported in reaching their academic publishing goals while respecting existing mentorship relationships, as well as the holistic nature of graduate education, is an important and rich terrain for practitioners to explore.

This study used focus groups to explore strengths and gaps in current mentoring and learning practices about academic publishing, and to uncover opportunities for further educational interventions. The methodology illuminated not only learning needs but also gave the research

team insight into the complex nature of academic publishing from both the student and faculty point of view. The web-based research guide has been well received and work on further support mechanisms will continue.

Acknowledgements

The authors wish to acknowledge funding from the **University of Calgary**'s Teaching and Learning Grants program, as well as **Jenna Kardal**, research assistant and video producer.

Appendix A: Focus Group Guide

Graduate student focus group questions/guide	
Icebreaker	Go around the virtual circle and introduce yourself by name and program that you're in and share with us in a few words about where you are at in your academic journey.
Discussion starter question	In your role as a graduate student, please take a few moments to think about how you are learning how to publish as an author in your discipline. What has been helpful for you in learning about submitting, revising, and publishing your academic outputs and what has been difficult?
Experiences in learning how to publish question	<p>Tell us about your experience in learning about submitting, revising, and publishing your academic outputs.</p> <p>Probes: What has been easy to learn about? What has been difficult? What parts of the experience have left you wishing for additional or different learning opportunities? Have you had any particularly positive or negative experiences relating to this topic?</p>

Learning process in academic publishing question	<p>How do you learn about submitting, revising, and publishing papers for academic publications?</p> <p>Probe: Through credit classes or co-curricular workshops? Via casual conversations with mentors or peers? Via reading about it in various media? Or are you learning by doing?</p> <p>Probe: What topics have been covered in your learning experiences? (If not mentioned, the moderator probed further learnings around: Financial models of publishing, predatory publishers, learning about what are “high impact” journals in a particular field, models of authorship/collaboration, copyright/authors rights, how peer review works, format/style requirements of various journals, etc.)</p> <p>Probe: Ideally, how would you like to learn about this topic? (Can probe further about timing, content, format, and delivery mechanism as needed).</p>
Faculty focus group questions/guide	
Icebreaker	Go around the circle and introduce yourself by name and department, and share with us in a few words about what your role as an academic supervisor looks like right now.
Discussion starter question	In your role as a faculty advisor, please take a few moments to think about how you are teaching students about publishing as an author in their discipline. What has been helpful for you in teaching about submitting, revising, and publishing academic outputs and what has been difficult?
Student queries question	<p>Do your students ever ask for guidance related to scholarly publishing that you find surprising? Why or why not?</p> <p>Probe: Have you had any particularly positive or negative experiences relating to teaching or mentoring around this topic?</p>

<p>Department/Discipline teaching-specific question</p>	<p>in your department or discipline, how do students typically learn about these topics, in your view?</p> <p>Probe: Asked if publishing is covered in a professional skills type seminar, or via less formal mechanisms such as lab meetings, etc.?</p>
<p>How faculty are teaching students about publishing question</p>	<p>What topics have you been teaching your students about in terms of submitting, revising, and publishing their academic outputs? That is, what <i>content</i> do you cover?</p> <p>Probe: (If not mentioned, the moderator probed further teaching around: financial models of publishing, predatory publishers, learning about what are “high impact” journals in a particular field, models of authorship/collaboration, copyright/authors rights, how peer review works, format/style requirements of various journals, etc.)</p> <p>Probe: What has been easy to teach your students about? What has been difficult? How have you been teaching students about these topics (format, medium, etc.)?</p>

Appendix B: Codebook

Codebook Nodes
<ul style="list-style-type: none">• Academic culture• Ad hoc support• COVID-19• Direct publishing mentorship• Experiential learning• Left out of opportunities• Library• Non-traditional mentorship resources• Non-traditional scholarship• Peer support• Perceived pressure• Power• Preferred learning topics• Prestige• Prior research experience• Publishing as ethical practice• Publishing etiquette• Readiness to publish• Scaffolding• Scholarly articles in the pipe• Self-teaching• Structural supports• Student confidence• Student queries• Tacit knowledge

Notes

- 1 Marianne A Buehler and Anne E Zald, "At the Nexus of Scholarly Communication and Information Literacy," in *Common Ground at the Nexus of Information Literacy and Scholarly Communication* (Chicago: Association of College and Research Libraries, 2013), 215–35.
- 2 Denise Jackson, "Completing a PhD by Publication: A Review of Australian Policy and Implications for Practice," *Higher Education Research & Development* 32, no. 3 (June 1, 2013): 355–68, <https://doi.org/10.1080/07294360.2012.692666>.
- 3 Lori Townsend, Korey Brunetti, and Amy R. Hofer, "Threshold Concepts and Information Literacy," *Portal: Libraries and the Academy* 11, no. 3 (2011): 853–69, <https://doi.org/10.1353/pla.2011.0030>.
- 4 Association of College and Research Libraries, "Framework for Information Literacy for Higher Education," Text (Chicago: Association of College and Research Libraries, 2016), <https://www.ala.org/acrl/standards/ilframework>.
- 5 Laura O'Hara, Leeann Lower-Hoppe, and Thalia Mulvihill, "Mentoring Graduate Students in the Publishing Process: Making It Manageable and Meaningful for Academics," *International Journal of Teaching and Learning in Higher Education* 31, no. 2 (2019): 323–31.
- 6 Ann E Austin, "Preparing the Next Generation of Faculty: Graduate School as Socialization to the Academic Career," *The Journal of Higher Education* 73, no. 1 (2002): 94–122, <https://doi.org/10.1353/jhe.2002.0001>.
- 7 Bonnie L. Fong et al., "Assessing and Serving the Workshop Needs of Graduate Students," *The Journal of Academic Librarianship* 42, no. 5 (September 1, 2016): 569–80, <https://doi.org/10.1016/j.acalib.2016.06.003>.
- 8 O'Hara, Lower-Hoppe, and Mulvihill, "Mentoring Graduate Students in the Publishing Process: Making It Manageable and Meaningful for Academics."
- 9 Andrea Baruzzi and Theresa Calcagno, "Academic Librarians and Graduate Students: An Exploratory Study," *Portal: Libraries and the Academy* 15, no. 3 (2015): 393–407, <https://doi.org/10.1353/pla.2015.0034>.
- 10 Jill Cirasella and Polly Thistlethwaite, "CUNY Academic Works Open Access and the Graduate Author: A Dissertation Anxiety Manual Open Access and the Graduate Author," City University of New York (CUNY), n.d., http://academicworks.cuny.edu/gc_pubs.
- 11 Samantha McClellan et al., "Raising the Library's Impact Factor: A Case Study in Scholarly Publishing Literacy for Graduate Students," *Portal: Libraries and the Academy* 17, no. 3 (2017): 543–68, <https://doi.org/10.1353/pla.2017.0034>.
- 12 McClellan et al., "Raising the Library's Impact Factor"; Teresa Auch Schultz et al., "Manuscript Accepted!: Collaborating on a Scholarly Publishing Symposium for Graduate Students and Early Career Academic Faculty," *Journal of Librarianship and Scholarly Communication* 9, no. 1 (May 5, 2021), <https://doi.org/10.7710/2162-3309.2385>; Bonnie L. Fong, "Boot Camps for Graduate Student Success: A Collaborative Initiative," *Journal of Library Administration* 59, no. 4 (May 19, 2019): 373–94, <https://doi.org/10.1080/01930826.2019.1593710>.

- 13 Lidiya Grote, Alexandra Howard, Latisha Reynolds, and Renesha Chandler, "Diversifying the Publishing Academy: Increasing Access to Scholarly Publishing Education for Graduate Students," *Journal of Librarianship and Scholarly Communication* 11, no. 1 (February 3, 2023), <https://doi.org/10.31274/jlsc.15661>; Schultz et al., "Manuscript Accepted!"
- 14 Christopher Chan, "Bringing Them up to Speed: Teaching Scholarly Communication to New Graduate Students" *LOEX Quarterly* 45, no. 4 (2019): 4; Jennifer E Knievel, "Instruction to Faculty and Graduate Students: A Tutorial to Teach Publication Strategies," *Portal: Libraries and the Academy* 8, no. 2 (2008): 175–86, <https://doi.org/10.1353/pla.2008.0020>.
- 15 Esther White and Lizette King, "Shaping Scholarly Communication Guidance Channels to Meet the Research Needs and Skills of Doctoral Students at Kwame Nkrumah University of Science and Technology," *The Journal of Academic Librarianship* 46, no. 1 (January 1, 2020): 102081, <https://doi.org/10.1016/j.acalib.2019.102081>; Erin Elizabeth Owens and Tyler Manolovitz, "Scholarly Communication Outside the R1: Measuring Faculty and Graduate Student Knowledge and Interest at a Doctoral/Professional University," *Journal of Librarianship and Scholarly Communication* 9, no. 1 (May 20, 2021), <https://doi.org/10.7710/2162-3309.2413>; Fong, "Boot Camps for Graduate Student Success."
- 16 Grote et al., "Diversifying the Publishing Academy: Increasing Access to Scholarly Publishing Education for Graduate Students,"
- 17 Barbara Alvarez, Jennifer L. Bonnet, and Meredith Kahn, "Publish, Not Perish: Supporting Graduate Students as Aspiring Authors," *Journal of Librarianship and Scholarly Communication* 2, no. 3 (August 1, 2014), <https://doi.org/10.7710/2162-3309.1141>; Kristin Hoffman et al., "Library Research Skills: A Needs Assessment for Graduate Student Workshops," 2008, <https://doi.org/10.5062/F48P5XFC>.
- 18 Owens and Manolovitz, "Scholarly Communication Outside the R1"; Fong et al., "Assessing and Serving the Workshop Needs of Graduate Students."
- 19 Alvarez, Bonnet, and Kahn, "Publish, Not Perish"; McClellan et al., "Raising the Library's Impact Factor."
- 20 Sue Ann Sharma, Wendy C. Kasten, and Lynn A. Smolen, *Online Focus Groups: Investigating Diversity Training Issues in Literacy Teacher Education* (1 Oliver's Yard, 55 City Road, London EC1Y 1SP United Kingdom: SAGE Publications Ltd, 2017), <https://doi.org/10.4135/9781473958937>.
- 21 Juliet Corbin and Anselm Strauss, *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, 3rd ed. (SAGE Publications, Inc., 2008), <https://doi.org/10.4135/9781452230153>.
- 22 Salabeddin Mabmud, "Cohen's Kappa," in *Encyclopedia of Research Design*, ed. Neil Salkind (2455 Teller Road, Thousand Oaks California 91320 United States: SAGE Publications, Inc., 2010), <https://doi.org/10.4135/9781412961288.n60>.
- 23 Cory R. Woodyatt, Catherine A. Finneran, and Rob Stephenson, "In-Person Versus Online Focus Group Discussions: A Comparative Analysis of Data Quality," *Qualitative Health Research* 26, no. 6 (May 2016): 741–49, <https://doi.org/10.1177/1049732316631510>; Sharma, Kasten, and Smolen, *Online Focus Groups*.

- 24 Emma Jeanes, "Tacit Knowledge," in *A Dictionary of Organizational Behaviour* (Oxford University Press, 2019),
<http://www.oxfordreference.com/view/10.1093/acref/9780191843273.001.0001/acref-9780191843273-e-289>.
- 25 Jeanes, "Tacit Knowledge."
- 26 Stephen Dinham and Catherine Scott, "The Experience of Disseminating the Results of Doctoral Research," *Journal of Further and Higher Education* 25, no. 1 (February 1, 2001): 45–55, <https://doi.org/10.1080/03098770020030498>.
- 27 McClellan et al., "Raising the Library's Impact Factor."
- 28 Wendy Laura Belcher, "Reflections on Ten Years of Teaching Writing for Publication to Graduate Students and Junior Faculty," *Journal of Scholarly Publishing* 40, no. 2 (2009): 184–99, <https://doi.org/10.1353/scp.0.0036>.
- 29 Basil Cahusac de Caux, "Doctoral Candidates' Academic Writing Output and Strategies: Navigating the Challenges of Academic Writing During a Global Health Crisis," *International Journal of Doctoral Studies* 16 (2021): 291–317, <https://doi.org/10.28945/4755>; Nikki Forrester, "Mental Health of Graduate Students Sorely Overlooked," *Nature* 595, no. 7865 (June 28, 2021): 135–37, <https://doi.org/10.1038/d41586-021-01751-z>.
- 30 Buehler and Zald, "At the Nexus of Scholarly Communication and Information Literacy."
- 31 Martha Stuit, "Making the Publishing Process More Transparent: Identifying a Baseline for Publishing Support through Researching Gaps between Graduate Students and Their Faculty Advisors' Support," *Transforming Libraries to Serve Graduate Students*, online, February 24, 2022), <https://digitalcommons.kennesaw.edu/gradlibconf/2022/Posters/3>.
- 32 Hugo Horta and Huan Li, "When Publishing Becomes the Sole Focus of PhD Programmes Academia Suffers," *Impact of Social Sciences* (blog), December 5, 2022, <https://blogs.lse.ac.uk/impactofsocialsciences/2022/12/05/when-publishing-becomes-the-sole-focus-of-phd-programmes-academia-suffers/>.
- 33 Barbara Kamler, "Rethinking Doctoral Publication Practices: Writing from and beyond the Thesis," *Studies in Higher Education* 33, 3 (June 1, 2008): 283–94, <https://doi.org/10.1080/03075070802049236>.
- 34 Christie Hurrell et al., "Library: Academic Publishing Demystified: Home," University of Calgary: Libraries and Cultural Resources, 2022, <https://libguides.ucalgary.ca/publishing/home>.
- 35 Elisabeth B. White, "A Compassionate Approach to IL Instruction: What We Can Learn from the COVID-19 Pandemic," *portal: Libraries and the Academy* 22, 1 (2022): 151–75, <https://doi.org/10.1353/pla.2022.0004>.