Looking Deeply at Journey Points and Disciplinary Discourse Practices in Support of Graduate Education

Elizabeth Kline
University of Arizona Libraries, USA

Introduction

Anyone pursuing graduate education is focused on attaining their greatest intellectual achievement—the PhD doctorate—which at the end of their education signals that individuals are deemed independent scholars capable of contributing research and scholarship in their chosen disciplinary area. Training for this significant achievement is costly in terms of time, energy, and money, so successful completion is a major concern for aspiring scholars, faculty, administrators, and universities. The average completion time for different PhD programs varies by discipline. According to data from the Survey of Earned Doctorates conducted by the National Science Foundation, an approximate median range to attain a degree is between 6.2 years for the Physical and Earth Sciences fields and up to 12 years for the field of Education.[1]

Since the first PhD in the US was conferred by Yale University in 1861,[2] the research doctorate has become inclusive to applied and professional degrees. Despite many having successfully attained the award, the research literacies that signal doctorate achievement remain mysterious and bewildering. No clear or general criteria exist that characterizes a doctorate. Even in recent years, scholars have attempted to arrive at a clear conceptual definition for "doctorateness."[3] Locally, programs do their best to convey graduation requirements and expectations to graduate students by providing up-to-date student handbooks and flexibly responding to academic trends by making necessary adjustments to requirements. In spite of these efforts, the fact remains that the essence of the process is ill-defined for many. This leaves students struggling to make sense of how their strengths and weaknesses will play out in forming their scholarly identity. Feedback gathered from faculty at the University of Arizona through a series of semi-structured interviews illustrated the challenge departments have to effectively communicate what it takes to get through graduate education. A statement by one faculty participant sums it up:

> We make an effort to communicate this, and yet I find that it's not infrequently that we find students complaining of being surprised. Somehow, many students don't get the message. So we need to improve in some way. I still don't know which, because these are the steps. The steps are written down and they have access to them and we have a professionalization course in their first year in which we tell them not only how to become scholars in the field, but how to be successful in the program. Maybe they're not paying attention or we don't know how to teach it but, yeah... I'm involved in other PhD programs as well in GIDP's—Graduate Interdisciplinary Programs—and it's kind of the same.

All prospective graduate students are carefully screened prior to admittance by academic faculty, which indicates that intellectual capacity to earn a doctorate degree is not the issue. Faculty make their best determination on who will succeed based on measurable metrics such as GPA or GRE, but intangible personal characteristics, such as resilience and the ability to manage high levels of abstraction, are just as critical for success and not as easily assessed during the application process. One faculty member attributed courage as an unquantifiable metric in success:

> I think it's courage, right. Because you don't really know what you're getting into. You are by definition doing work that you don't know whether or not it's going to be

> successful or not and you then have to stand up in front of people and say why you know more than they do about a subject. And so I think the students who have the confidence to do that, I mean everybody here is smart that's not the issue, but the students who struggle often times have a confidence issue with that.

Graduate administrators—per the nature of their duties—focus largely on completion and failure rates. For many years, national failure rates have hovered around 40–50%, gravely alarming the graduate education community and sparking investigations such as The PhD Completion Project.[4] Academic mentors experience first-hand the struggles plaguing aspiring scholars. Mental health officials report rising concern due to stress in this student population. Data collected in a national survey from the American College Health Association (ACHA) indicates a combined scoring range of 73.4% for moderate to high levels of stress amongst graduate students during the last twelve months.[5] Medical experts caution that sustained levels of stress cause chronic stress to develop and are often associated with depression.[6] Increasing studies demonstrate there is a high prevalence of stress and anxiety amid the graduate student population.[7] For students seeking an advanced research degree, a marked investment of innumerable years in apprenticeship training with associated and continuous high stress and anxiety levels is reason for concern. This concern exists not only for the trainee's mental wellbeing but also for the financial investment to the graduate education enterprise made by academics policy makers, and society.

This data makes it clear that more can be done to support students as they endeavor to gain mastery in their chosen fields. For a population with many apportioned responsibilities, it is not easy to identify the factors that put them in peril of not successfully completing their degrees. Academic faculty are sounding the alarm and calling for universities to recognize the need to support graduate students and offer intervention strategies to help students cope and manage stress.[8]

Libraries are attempting to match faculty attempts to support graduate students by developing and promoting new and innovative services that connect to the research lifecycle.[9] Disappointingly, these efforts often do not successfully reach graduate students who remain largely unaware of services, leaving librarians to wonder how to engage with this population.[10] The unfortunate dilemma might possibly be caused by a difference in language between library users and librarians.

One of six major program factors examined by The PhD Completion Project, the program environment, was particularly distinctive for its focus on the factors that influence integration or alienation between the student and the graduate school, department, and discipline.[11] The program environment can be more fully characterized as disciplinary discourse practices which exemplify the attitudes, behaviors, tools and activities, and cultures that shape and represent a discipline and enable effective engagement with others in that community.[12] In the context of graduate education, disciplinary discourse practices are analogous to the socialization that happens along the path to professionalism within the discipline. Discourse practices differ between disciplines such as sciences, social sciences, and the humanities. For that reason, logically teasing out the socialization that happens in particular disciplines can provide ideas for alleviating struggles encountered by students in order to help them get to the professionalism necessary to become independent scholars.

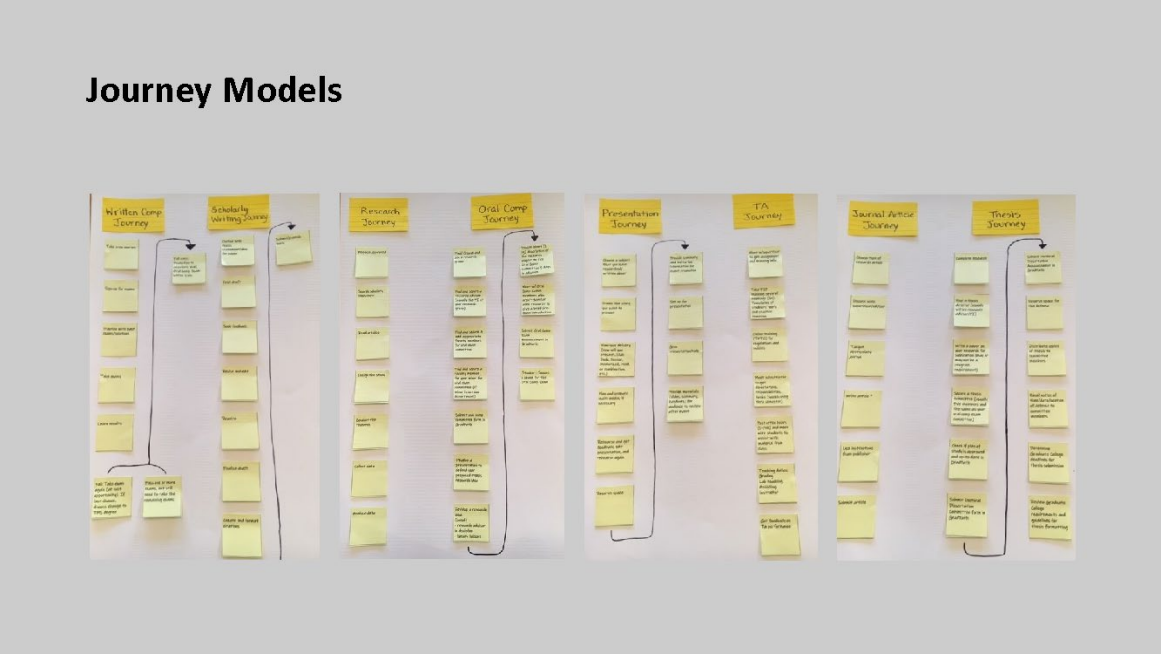
This study takes a different approach from previous studies in its framing of discussions with academic faculty. The data gathered was used to compile a detailed map of the processes and requirements that make up graduate education. In addition, the data was used to explore distinct disciplinary discourse practices that shape a graduate students' research identity. This approach to the data helped to identify what faculty perceive as the greatest struggles for graduate students and provides evidence of the key places within the intellectual journeys of graduate students in order to pinpoint worthwhile areas for librarians to focus their efforts to establish additional support structures.

Design and Methodology Approach

Faculty recruitment for this study occurred via email invitations. The main criteria for participation consisted of knowledge of graduate curriculum and requirements, as well as experience mentoring graduate students through their graduate training. Twenty-two faculty from a variety of disciplines ranging from sciences, social sciences, and humanities agreed to participate in semi-structured, one-on-one, hour-long interviews. Research suggests that this sample size is suitable for valid themes to arise through saturation.[13] Interviews were audio-recorded and transcribed followed by an applied thematic analysis technique.[14] Two researchers independently engaged in an iterative process of reading the transcripts and generating codes, then met to discuss and come to agreement on the coding. Coding led to themes that provided a deeper dive and clearer picture of graduate education. The qualitative data formed stories, which contextually positioned the graduate student in disciplinary environments, providing specific information about stakeholders, roles, behaviors, and struggles. NVivo,[15] a qualitative data analysis tool, aided in the work.

The research design purposely avoided surveying users about needs as well as querying about library services. Instead, this study utilized journey maps, a practice adopted from user research, which concentrates on placing a lens on a user's interactions in order to understand the totality of the graduate educational experience.[16] Journey models also served as communication tools to flowchart interactions that students carry out (Figure 1). The construct of these came from extensive liaison experience serving a diverse graduate student base, as well as a basic familiarity with academic requirements. The schemas helped faculty visualize the graduate processes (such as the written comprehensive journey, scholarly writing journey, and thesis journey) and served to guide discussion during interviews. The movability of the charts allowed faculty to remove, rearrange, edit, or add missing journeys or activities. This approach allowed the researchers to assemble an enhanced picture of the myriad dealings and experiences of graduate students and helped to crystalize a deeper understanding of the oft-assumed roles by graduates. In addition, this approach clarified the perceived successes and challenges that take place throughout a graduate student's academic training.

Figure 1. Visual flowchart of various graduate student journey models



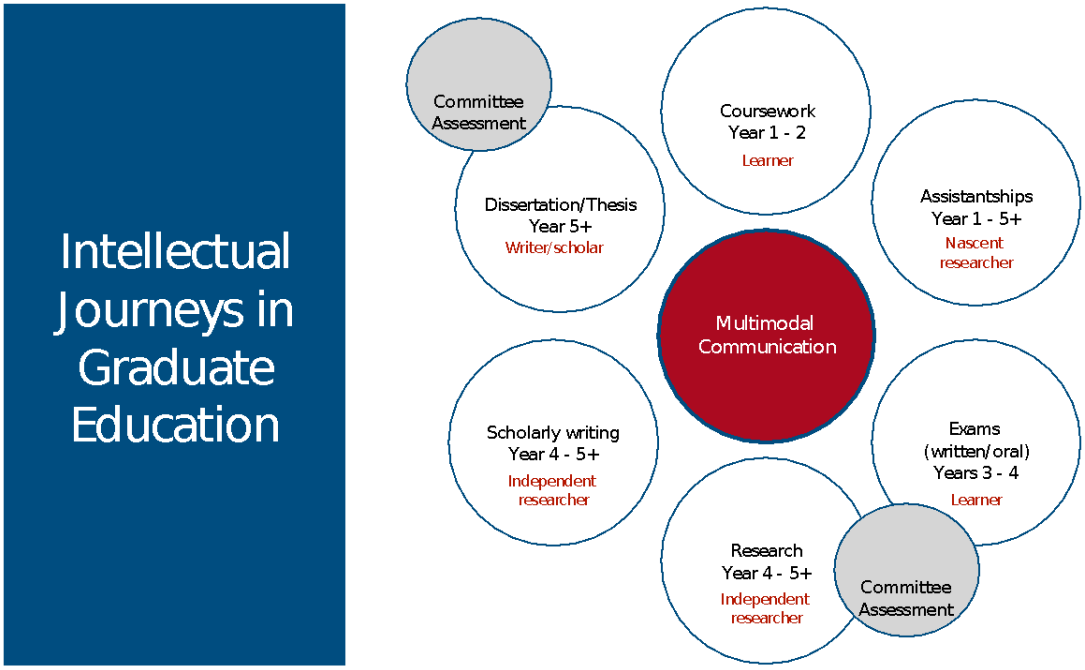
Findings

Intellectual Journeys in Graduate Education

The graduate educational landscape within the academe moves along a commonly structured path from acceptance to graduation. In the simplest terms, for the majority of programs and professional degrees, the academic conditions for granting a higher education degree confirm students successfully progress through some or all of the following educational stages: coursework, exams, research, and thesis.

Interviews served to uncover the numerous intellectual journeys encountered by graduate students. Looking at those journeys through the lens of personas throughout the educational stages provides the emergence of a complex concept map detailing the typical graduate educational landscape (Figure 2). These varied identities reveal the sophisticated professional skills-based activities necessary to accomplish intellectual tasks at different time points.

Figure 2. Graduate student intellectual journeys detailing roles, common timeline, and main assessment points



Clockwise, at the start of their journeys, post-admissions graduate students begin their **Coursework** assuming the role of a **learner**. Often, this is a familiar role since many graduate students have recently finished undergraduate education. Typically, students feel comfortable and extremely confident in their learning abilities and strategies. Next in that pathway, individuals soon add to their load and start **Graduate Assistantships**. In this role they are either **teachers** (Teaching Assistants, TAs) or **nascent researchers** (Research Assistants, RAs) supporting research-based teams. As TAs they start in a supportive role, often grading or running discussion groups. As they gain experience and seniority, they are given more responsibility, ultimately shouldering the full responsibility of a course. In research assistantships, graduate students are assigned or sometimes given the ability to negotiate responsibilities that contribute to large team-based projects. The individual research contributions are often based on the specific expertise these aspiring researchers hope to develop. After the completion of their coursework students are able to advance to **Exams.** Most comprehensive examinations are written and are followed by an oral exam. A committee formally reviews both of these exams. During the exam phase, students take on the roles of **learner** and **nascent researcher**. They must demonstrate theoretical knowledge and the ability to sustain a scientific argument in their discipline. After the successful completion of those requirements, students gain approval from their committee to begin independent **Research**, and it is at this stage that students begin to demonstrate **independence**. **Scholarly Writing** is different based on the program. In this phase, graduate students are independent researchers and begin to assume a **writer/scholar** identity. In some programs, writing occurs during the course of an RAship and in other programs, writing occurs after the completion of a graduate student's research. Finally, the **Thesis/Dissertation** stage is described by faculty as the stage when students "*put it all together.*" It is the point when students formalize the documentation of the thesis and the last requirement that must be completed and approved by committee members before a student can graduate.

At the very center of the graduate training experience lies **Multimodal Communication,** which is a meta-competency and includes communication skills in written or oral form. Multimodal communication can occur in a traditional medium like writing or in a non-traditional medium, such as a podcast or video

presentation. Multimodal communication is positioned centrally because it takes place at every stage of the journey. At every stage, the students' communication skills evolve as they have opportunities to practice speaking and presenting via the delivery of papers, class presentations, leading research meeting discussions or journal club readings, to ultimately delivering a presentation at a professional conference.

Besides gaining awareness of the realm of professional skills-based activities expected of students, what is also crucial to observe is when these journeys appear within the timeline of graduate education and the extent of their existence. Some journeys start and finish at specific points, while others overlap or continue for years. The coursework journey begins after acceptance and lasts up to year two, at which point this stage is completed. Assistantships journeys occur from the first year to five and beyond. The exam journey normally occurs after the coursework journey is completed, commonly during years three-four. This journey ends upon the completion of the written and oral exams. The research journey commences as early as year one for research assistants, while the scholarly writing journey often takes place during years two to five. Thesis writing is the final journey and, depending on the program, happens at year five and beyond. Presentations occur throughout the educational experience.

Areas of Greatest Struggle for Students

According to faculty, graduate students encounter a number of non-academic struggles during their training. One example that surfaced is the challenge that graduate students face when things take longer than expected or go wrong. Many faculty also noted the need for graduate students to possess resiliency in the face of these challenges. When it comes to intellectual challenges the top issues noted by faculty included preparing for exams, ideation and committing to a research topic, transitioning from student to independent researcher, and finally writing.

Exams

Participants indicated that students often experience anxiety when it came to the examination period of their journey. There is a tendency for students to get overwhelmed by the sheer volume of readings to master, thus taxing the learner, and resulting in a tendency to delay taking exams. The postponement is understandable as this phase marks the initial point where students can fail.

A big revelation during the interviews was the varying methodologies that exist across departments for preparing for exams. Some departments indicated that committees specifically call the literature to the students' attention, others shared that testing material came from classes students took, or that material for exams might be chosen jointly by committee and student. Analysis of the interviews exposed distinct terminology for the practice of engaging with disciplinary literature to prepare for exams. It was common for faculty to refer to this exam related literature as Reading Lists. Comments shared by faculty explained they themselves do not conduct database searches, much less train students in searching for literature, and yet somehow also expect students to take initiative to discover content on their own.

> I am myself not trained in doing searches in those databases. So I cannot train them to do those things... in all of my experience here, the literature comes from citations from things we point out. It's unlikely to come from database searches.

> The one thing I think they are weak on is doing that search themselves. One thing that I've noticed, with my students anyway, I wish they were coming to me a little more with I found this article, is this relevant? Self-directed literature search. I feel they kind of depend too much. I understand that it's challenging to do... it's a little bit challenging to search things down.

The examination phase is laden with assessment points. Besides composing essays for the written component, students must demonstrate their knowledge of the field and the graduate student's committee thoroughly questions students, making sure they are able to communicate and defend scientific arguments. During this period, the committee gets a glimpse of the students' intended research focus and the student has an opportunity to introduce and position their research topic within the scholarly landscape of their discipline.

Lost productivity was mentioned as a common occurrence in students, impacting more than one journey. A number of faculty expressed frustration about the process when students "go away to study" for comps indicating it was "a big slow down" in their department. Faculty discussed how it could often take students a year or more to prepare for their comprehensive exams. According to interviewees, students exhibit such a habitual prolonging behavior during the comprehensive exam piece of the student journey that some programs instituted timelines requiring students to take exams no later than their fourth year. All programs have different completion timelines, but if students can get moved through this period faster, it would improve time to degree. This is a significant phase because committee members consider it foundational for the ideation step and leads directly to the graduate students' dissertation. If students fail to work through this part of the journey efficiently, they not only add time to completing their degree but also have a higher chance of adding to their stress levels.

Ideation / Committing to a Research Topic

Equally daunting is the point in time when students must commit to a topic for their dissertation. A faculty member indicated how crucial this step is for graduate education stating,

> Really I think a PhD student, if they have a lot of trouble coming up with ideas, they probably shouldn't be a PhD student. Because that is sort of your job is to find out, What's missing? What's interesting?"

Another participant confirmed the ideation stage as a decisive moment for students in that it is often at this point where students either continue on or leave the program.

> "The student is really almost never told what to do, and they have to really come up with an idea… So we used to lose a lot of students because they couldn't focus formulating a thesis topic."

Committee members are keenly looking for development in the form of independent ideas and in most programs faculty also serve as reviewers during the oral presentation of the research proposal. For the nascent researcher it is the first big assessment of their promise and potential. This intellectual journey is closely connected to and simultaneously takes place with the examination period. Often the oral component corresponds to a discussion of their selected research interest. It is why the aforementioned step is essential in helping students explore and hone a research direction. In programs that follow strict timelines this period happens about year four, unless prolonged by students. This is the time point when these young scholars feel confused, scared, and exhausted and often consider dropping out.

Transition from Student to Independent Researcher

Successful students that make it past those phases face another unnerving experience during the transition from student to independent researcher. A faculty member recalling it was a tough changeover for her said,

> That's the hardest thing, I think. That was the hardest thing for me. I think that's the hardest thing for my students. And I imagine the hardest for anything (sic) is the transition from doing classwork to doing your own work. The independent stuff, and to find theoretical frameworks that are going to inform your work and all that.

During this stage, no structure exists, the student is expected to self-manage and take the lead in research, solve problems, and execute the approved work. Students, regardless of disciplinary area, all experience a major sense of isolation as they transition into the role of an independent researcher and become fully responsible for the entirety of a project. Issues never faced before arise that test their resolve as they experience frequent failures often associated with research.

Interestingly, participants provided strategies for student success at all journeys, except during the independent researcher phase. At this point, the committee takes a step back so that the student begins to take autonomy. An interviewee framed it as a "dress-rehearsal" of sorts,

> "Now once they finish their prospectus then they really are on their own, I mean… that's you're now an adult in this world and so the students are working on their PhD's and actually collecting and analyzing data, writing out their results. They work more on their own because we feel that's the way it's going to be when you graduate."

Proving it is a major isolating experience where students are expected to know or figure out disciplinary discourse practices and research skills out on their own without much training. The research journey is fruitful ground for further exploration and a major opportunity for libraries to offer much needed support.

Writing

The issue most cited as a struggle by all disciplinary faculty for students is the craft of writing. This intellectual journey comprises a variety of many advanced professional research literacies including technical writing, structuring ideas, making a clear and succinct argument and supporting it with data, and equally important, writing for the right audience. Curricular writing assignments such as lab reports, critical essays, or research papers are not on par with the scholarly writing skills expected in the discipline as indicated by a faculty member,

> Ok that's good writing for this now let's take those good basic writing skills and transfer them to this genre, this discipline. And that's something in the journal article journey, you know, that's yet another whole other level. Because the way you write for class is going to be different than how you write for an audience there. That's taught primarily, so at the doctoral level, primarily through the individual doctoral mentors.

Of all the journeys the writing literacies were mentioned as requiring the most time-intensive mentor activity.

> …the writing is a real challenge. The writing is usually very poor. It's quite disturbing actually. It's poor on multiple axes as well. It's poor in the sense of how do I craft a scientific argument, the understanding of how that's done is usually... that's something we have to mentor them very strongly... So crafting an argument and then making it succinct and clear is usually a significant struggle.

Faculty are well aware of writing resources around campus yet are hesitant to offer PhD students a referral to the Writing Center, citing an unsuitable service model often only allowing one hour assistance as well as lacking technical assistance necessary for "a 200-page dissertation."

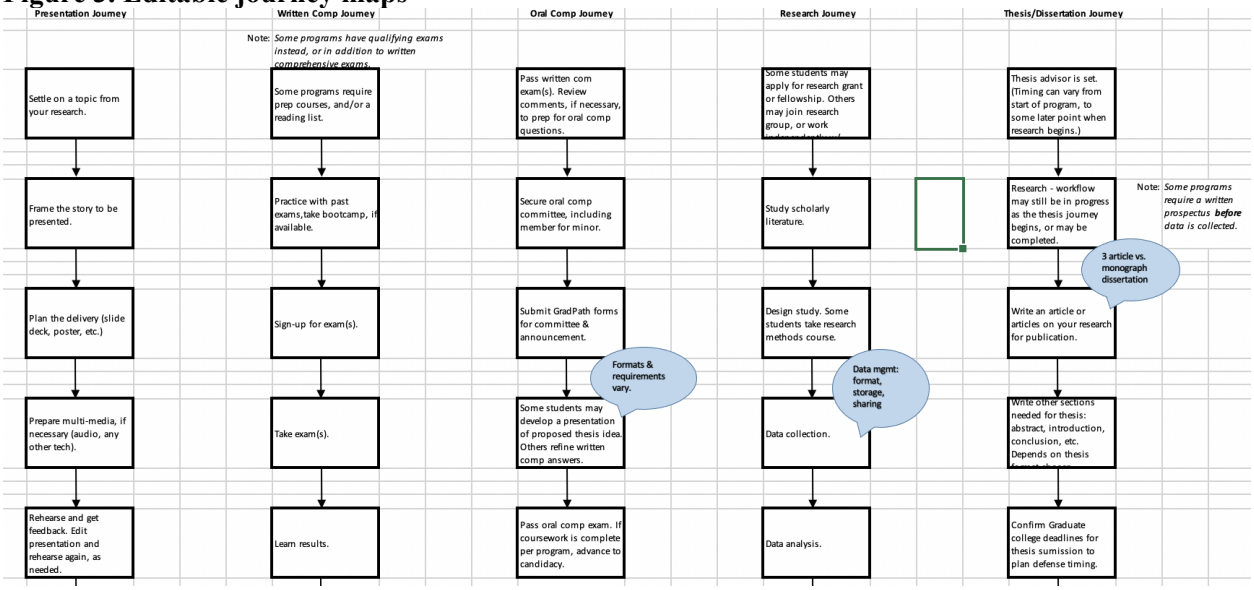
Faculty provided a hint as to why writing was such a concern. Writing is a major activity for scholars as explained by a participant,

> I think that it is at the very, very center of the field. I think it's maybe, I think it might just be at the center of every academic discipline really... And I think it's somewhat of a surprise, right. Our students might have been science majors in college and they might have gotten away without doing a whole lot of writing but it's really about writing. My job, it's all about writing. I'm in the lab sometimes but often I'm not writing papers, but I'm writing emails or I'm writing you know, writing grants or I'm whatever... I think it's the hardest thing for students to get their head around.

Discussion

Faculty who are well versed in the graduate education enterprise proved extremely valuable in this exercise with journey maps. The journey maps served as a communication mechanism that visually captured the processes common in the graduate educational enterprise, provided a holistic view of the graduate student's activities, and helped to expose high and low experiences. Focus on the latter can serve as opportunities to develop support structures that lessen the low points and improve the journey interactions. The benefit of this approach was illuminating because it revealed not only similarities in disciplinary discourse practices and requirements, but also—more importantly—the differences. This is one extremely critical point for libraries to consider because it differentiates programs and their needs and services, and shapes decisions for customized versus one-size fits all models. Scalable services are invaluable because they help address staffing and resource shortages but fail when they do not meet or match disciplinary needs. One valuable product that libraries can use to organize services is the mockup of editable final journey maps that will help safeguard against overlooked needs and potential services (Figure 3).

Figure 3. Editable journey maps



Most journeys appear to overlap and take place simultaneously over multiple years. A graduate students' busiest workload occurs during years two to five because there are up to three journeys happening at the very same time. During this period, students are often finishing coursework, working through a TA'ship, beginning research, and studying for comps all at once. These students' attention and time is very limited so it is no surprise to learn that there is a lack of awareness of library services. Normally libraries aim to reach graduate students during orientation. Although this is not a bad approach, it is not ideal since students do not tend to utilize research services until later in their journeys. Since there is a high likelihood that students will not remember all of the support that libraries make available to them, orientations may not be the best time to provide graduate students with information on library services. Given the pressures that graduate students face, most are simply thinking about the current or next immediate stage in their journey, not looking months or years down the road. Therefore, it would be wise for libraries to invest time in considering *when* the appropriate time is to approach graduate students with information and services that support their academic activities within the various intellectual journeys. Generating a timeline for the occurrence of key disciplinary journeys will better prepare librarians to offer assistance at the right time, when students experience most typical hardships in their critical development stages.

Once libraries determine the best time to reach users, appropriate and recognizable language must be used to ensure the uptake of services. Interview data confirmed lack of faculty familiarity with library services such as reference or one-on-one help, information literacy, or data management plans. In recent years promotion of library services by libraries have consisted of strategies to connect to the research life cycle. It is advantageous to use language that ties to the intellectual journeys of the graduate educational enterprise, which will have a higher chance of resonating with intended users.

By aligning services to journey points where students struggle, libraries can build missing support structures that will help graduate students successfully navigate their academic disciplines. The identified areas where most students struggle requires advanced research literacies and epistemological growth. In other words, they are comprised of professional skills-based activities where significant development occurs. It is during the first three journeys that the graduate student is under careful evaluation by their committee. These activities and experiences are all new to these students, thus requiring that individuals place a lot of trust in the direction and advice given by these mentors. One untapped strategy for libraries would be to connect directly with dissertation committees to promote library services. The scholars that make up the graduate committee rest at the center of critical stages and form the official academic authority with responsibility to assess the knowledge and induct the novice scholar into a discipline. Committees tend to exert more intense scrutiny at the start of the educational journeys and loosen and transfer control to the student through the progression of their training. Each individual dissertation committee holds full authority in how they operate. Not all committees operate similarly, even within a single department, so librarians should explore the practices in their areas.

Along with providing a clear map of disciplinary practices, these models can serve as visual communication and negotiation tools by mentors in their training with graduate students. During the interviews one faculty member immediately noticed the value of this visual tool for both stakeholders, stating,

> "This is so great. I've actually been thinking about this a lot lately because I do interdisciplinary work with colleagues from completely different disciplines and as we think about how we mentor students together, it turns out our students may have really different paths through these programs."

For the student, the maps can provide a useful guide to identify tasks and act as a tool to calculate and input deadlines. These maps can also empower nascent scholars with topics to bring to their mentors or committees to assess progress, identify barriers, and resolutions that will advance their research.

It is important for librarians to be familiar with graduate student journeys in their disciplines. Though the educational stages are mostly the same, not all disciplines conduct research in the same way. Certain important considerations must be made by librarians prior to the provision and promotion of research services. Thoughtful design, support, and delivery of services is necessary for those disciplines whose disciplinary discourse practices do not produce scholarly works and instead require professional licensure or the passing of a standardized exam. Librarians can use the editable journeys to figure out what support is needed and design services accordingly.

Support Structure during Exams Journey

Often students do not have a structure to follow as they navigate the ambiguity of the comprehensive examination. Panic and confusion looms over them when they realize the large amount of material they will need to master to succeed during this portion of their journey. Students do not have systems in place to compile, organize, or make notes. They often struggle with how to keep track of the literature, how to approach the content, and what information they should be focusing on. They lack sophisticated methodologies to synthesize readings and approach writing practice essays. One participant recalling her time in graduate school mentioned a series of courses that prepared her for the exams. She then lamented that such a helpful structure is missing in her program and sympathized with the hardship that students experience. Librarians have the skills to put together a structure to help students get through exams. Students can benefit from having librarians develop some type of pedagogically-based guide to assist students in their studying.

Support Structure During Ideation / Committing to a Research Topic Journey

Another viable opportunity for librarians to establish support structures is from coursework to pre-exam period. Faculty often commented that students should be using their courses as starting points to identify an area of interest.

> Plus, [students] write essays related to three big questions that they have agreed with faculty, one in their primary area and two in their secondary areas. The hope is that at least one of them will end up being part of their dissertation. It doesn't have to be but it would be a waste of time if it doesn't. So usually what we want is they have to read a body of literature and synthesize it or say something about this part of your literature. And many times this could be part of the beginning of their dissertation.

Topics discussed in classes should eventually move from term papers to major essays, to comprehensive exams, and finally into dissertation topics. Several times faculty suggested that students take advantage of the exams phase to get started on their dissertation. Faculty expressed that readings during the comprehensive preparation phase should serve as groundwork for ideation and topic formulation. Given that several faculty commented that students still struggled and often drop out of their graduate programs at this point, it is assumed that the faculty message is not getting through to students. Faculty recognize this as an indispensable opportunity to maximize the utility of one exercise towards another as well as impact time to completion. Therefore, it is advantageous to make the importance of this activity more explicit as well as offer some support to students.

The importance of research skills, including literature searching and topic development, is not new to librarians. However, by thinking about how these topics match up to the graduate education life cycle and

adding critical services, libraries can better build support structures during key developmental phases and not only positively impact the time to completion but also retention.

Support Structure during Independent Research Journey

Libraries can provide some structure by teasing out common disciplinary research practices and promoting appropriate services, which students can use as a guide to make progress and gather input from advisor or committee. This is when students need to ensure their question is right-sized, that their resources are secured, and that they have identified appropriate theories and frameworks that support their research. This is also where they must apply appropriate research methodologies and analyze their research data.

Discussions revealed that faculty are quite hands-off during the research journey. They also believe support to help shape the graduate students' research identity is missing or non-existent in some curricular program offerings, yet there is still an inherent expectation for students to figure out how to navigate the nuances of behaviors, expectations, language, and culture often assumed by scholars in different disciplines. The journey of transitioning from student to independent researcher really puts all research literacies to the test. Yet no participant went into full detail about the research experience and the issues that challenge students, making this a prime area for in-depth research.

Support Structure during Writing Journey

Libraries are not writing centers with writing experts on staff, but there are some possible ways that librarians can help faculty who are mentoring graduate students through their journeys. Faculty are burdened with stress, too, when students procrastinate on their writing. A faculty member shared a common story about her frustration,

> So I'm put in a situation where I could make him lose his job or I could just totally stress about him trying to get this done. He's a good example of somebody where, it would have been better to have six months ago have a structured program with, or maybe either I need to be meaner or there needs to be somebody other than me that has a deadline, maybe that class should be there, I'm not sure what the solution to that is. But I'm sure that's not a unique story.

One strategy is to reach out to mentors for collaboration, and with a focus on disciplinary discourse practices, start with discussions to learn more about writing conventions in disciplines, understand the types of writing issues that take up most of a mentor's time and help devise some exercises that will ease the burden on the mentor. Librarians have a unique skill set and can use this to create a compilation of toolkits for the writing journey, whether they are workshops or Libguides with resources, exercises such as providing activities to learn about key journals, author instructions, how to structure articles in a particular discipline, and small writing cadence exercises with deadlines, etc. to support faculty in their role as advisors through various writing activities. For ABD (All But Dissertation) students, a workshop on putting it together scheduled one to three months pre-graduation would be useful, or simply a structured step-by-step guide that includes dates and deadlines on how to assemble the final thesis would help students make progress.

Conclusion

The graduate education experience is one that is well documented, yet it continues to be emotionally laden and particularly challenging for some students. For that reason, further research investigating the student perspective is necessary so that researchers can uncover the actions, thoughts, and emotions that tend to distress those willing to stretch their minds to advance their knowledge. To further capture a

different viewpoint, it would be beneficial to also explore a journey map that captures the perspective from faculty in their advisor roles.

Endnotes

[1] National Science Foundation, National Center for Science and Engineering Statistics (NCES), Doctorate recipients from US universities: 2017, Special report NSF 19-301, Alexandria, VA, 2018, https://ncses.nsf.gov/pubs/nsf19301/; https://ncses.nsf.gov/pubs/nsf19301/data, Tables 31 & 32.

[2] Yale University, "Traditions & History: Landmarks in Yale's History," accessed November 18, 2020, https://www.yale.edu/about-yale/traditions-history.

[3] Shahram Yazdani and Foroozan Shokooh, "Defining Doctorateness: A Concept Analysis," *International Journal of Doctoral Studies* 13 (2018): 31–48, https://doi.org/10.28945/3939.

[4] Council of Graduate Schools, Ph.D. Completion and Attrition: Analysis of Baseline Demographic Data from the Ph.D. Completion Project, Washington, DC: Council of Graduate Schools (2008), https://cgsnet.org/publication-pdf/2526/phd_completion_and_attrition_analysis_of_baseline_demographic_data.pdf.

[5] American College Health Association, American College Health Association-National College Health Assessment III: Graduate/Professional Student Reference Group Executive Summary Spring 2020, Silver Spring, MD: American College Health Association (2020), https://www.acha.org/documents/ncha/NCHA-III_Spring_2020_Graduate_Reference_Group_Executive_Summary.pdf.

[6] Eberhard Fuch and Gabriele Flügge, "Chronic Stress and Depression," in *Blackwell Handbooks of Behavioral Neuroscience: The Handbook of Stress—Neuropsychological Effects on the Brain*, ed. C. D. Conrad (Wiley, 2011), Credo Reference: http://ezproxy.library.arizona.edu/login?url=https://search.credoreference.com/content/entry/wileyhstre/chronic_stress_and_depression/0?institutionId=6437.

[7] T. M. Evans, L. Bira, J. B. Gastelum, L. T. Weiss, and N. L. Vanderford, "Evidence for a Mental Health Crisis in Graduate Education," *Nature Biotechnology* 36, no. 3 (2018): 282; C. Liu, L. Wang, R. Qi, W. Wang, S. Ji., D. Shang, Y. Shao, M. Yu, X. Zhu, S. Yan, Q. Chang., Y. Zhao, "Prevalence and Associated Factors of Depression and Anxiety Among Doctoral Students: The Mediating Effect of Mentoring Relationships on the Association Between Research Self-efficacy and Depression/Anxiety. *Psychology Research and Behavior Management* 12 (2019): 195–208.

[8] Evans et al.

[9] Lucinda Covert-Vail and Scott Collard, *New Roles for New Times: Research Library Services for Graduate Students*, Report prepared for the Association of Research Libraries, 2012, http://www.arl.org/rtl/plan/nrnt/.

[10] H. Barton, J. Cheng, L. Clougherty, J. Forys, T. Lyles, D.M. Persson, C. Walters, C. Washington-Hoagland, "Identifying the Resource and Service Needs of Graduate and Professional Students," *portal: Libraries and the Academy* 2 no. 1 (2002): 125–43, doi:10.1353/pla.2002.0014; D. Gibbs, J. Boettcher, J. Hollingsworth and H. Slania, "Assessing the Research Needs of Graduate Students at Georgetown University," *The Journal of Academic Librarianship* 38, no 5 (2012): 268–276; P. Kuruppu & A.M. Gruber, "Understanding the Information Needs of Academic Scholars in Agricultural and Biological Sciences," *The Journal of Academic Librarianship* 32, no. 6 (2006): 609–623.

[11] Council of Graduate Schools, *Ph.D. Completion and Attrition: Findings from Exit Surveys of Ph.D. Completers* (Washington, DC: Council of Graduate Schools, 2009), https://cgsnet.org/publication-pdf/2520/PhD_Findings_from_Exit_Surveys.pdf.

[12] John Airey and Cedric Linder, "A Disciplinary Discourse Perspective on University Science Learning: Achieving Fluency in a Critical Constellation of Modes," *Journal of Research in Science Teaching* 46, no. 1 (2009): 27–49; T. Becher, "Disciplinary Discourse," *Studies in Higher Education* 12, no. 3 (1987): 261–274.

[13] Greg Guest, Arwen Bunce, and Laura Johnson, "How Many Interviews Are Enough?," *Field Methods* 18, no. 1 (2006): 59–82.

[14] Greg Guest, Kathleen M. MacQueen, and Emily E. Namey, *Applied thematic analysis*, 2012; Marc Vinyard, Colleen Mullally, and Jaimie Beth Colvin, "Why do Students Seek Help in an Age of DIY? Using a Qualitative Approach to Look Beyond Statistics," *Reference & User Services Quarterly* 56, no. 4 (2017): 257–267, http://ezproxy.library.arizona.edu/login?url=https://search.proquest.com/docview/1916977929?accountid=8360.

[15] QSR International, NVivo Qualitative Data Analysis Software [version 12], 1999. https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/try-nvivo.

[16] Sarah Gibbons, "Journey Mapping 101," Nielsen Norman Group, December 9, 2018, https://www.nngroup.com/articles/journey-mapping-101/.