

Office of Diversity, Inclusion and Belonging Seed Grant for Innovative Approaches to
Enhancing Inclusive Excellence and Sense of Belonging

The experiences of disabled graduate students in STEM education

Senay Purzer (PI)
Kirsten Davis (co-PI)
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PROJECT SUMMARY

Our project seeks to initiate a new research agenda focusing on the experiences of disabled STEM graduate students. Existing educational policies related to accommodations primarily address the needs of undergraduate students, so the unique experiences of graduate students are not addressed effectively through these policies. The proposed project will focus on reviewing the literature on disabled graduate student experiences in depth and developing a conceptual model describing disabled graduate students' experiences seeking accommodations based on both the literature and interviews. We will use a systems perspective to explore how graduate students navigate different levels of the university environment in seeking accommodations within their courses, research, and teaching responsibilities. The findings of this project will inform educational policies and interventions to create a welcoming campus by enhancing the support offered to disabled graduate students.

Project Dates: May 15, 2023 – May 14, 2024

Total Budget requested: \$10K

Note: We intentionally use identity-first language (e.g., disabled student) to acknowledge the preference of our team members and recognize that disability is an individual experience. The identity-first language is used among scholars to affirm disabled identities rather than fix them and develop a shared positive consciousness (Waitoller & Thorius, 2022).

PROJECT DESCRIPTION

The experiences of disabled graduate students in STEM education

Problem statement

While there is limited research on the experiences of disabled graduate students in STEM, the existing research collectively points to limited institutional resources, persistent misconceptions, and negative experiences for the disabled graduate students. In addition, the number of students reporting disabilities is increasing in the US and other countries (Snyder, Brey, & Dillow, 2016). Hence, there is an urgent need for targeted research so mentoring, education, and policies can most effectively support disabled graduate students.

Disabled graduate students face three major challenges. First, the student has to decide whether to disclose their disability to their new institution or not (Mamboleo, Dong, & Fai, 2020). This decision is not easy as there are many myths and misconceptions highlighted in the literature with regards to disabled students (Sukhai, 2010). The student may also not be able to explain their disability or may not want to place additional burdens on their graduate mentors (Barnard-Brak, et al, 2010). Second, following a decision to disclose, the student must then learn to navigate the university procedures and the institutional disability support structures. This is an extra burden on the student. In addition, the accommodations the university provides may not be useful with respect to the experiential and spontaneous nature of graduate education or tailored towards the specific disability of the student (Jain, Potluri, & Sharif, 2020). Also, graduate students are able to request accommodations due to the Americans with Disabilities Act (ADA) (Pfieffer et al., 2020). The ADA only calls for “reasonable accommodation,” which can make it difficult for everyone involved to navigate accommodations (U.S. Department of Justice, Civil Rights Division, n.d.). Finally, even in situations where there is a strong institutional support and student-advisor relationship, there is the potential unintended consequences of accommodations such as the separation of the student from the mainstream group (Jain, Potluri, & Sharif, 2020). A comprehensive approach is necessary to address the specific challenges and diverse needs of disabled graduate students.

This project aims to develop a conceptual model/framework describing the experiences of disabled STEM graduate students seeking accommodations, based on a synthesis of existing research. The framework will then be refined by collecting additional data on the lived experiences of disabled graduate students.

Objectives and rationale

Higher education institutions have to support disabled students. The existing support systems typically consider testing accommodations, accessible technologies, and classroom layout. However, graduate students differ from undergraduate students in the research and teaching responsibilities that they may hold in addition to taking classes. As a result, these traditional forms of accommodations alone are unlikely to address their support needs. Therefore, we propose to consider the support mechanisms required for a more comprehensive model of support for disabled STEM graduate students.

Our research on disability in graduate school will take a systems perspective, where we explore individual student experiences in the larger context of the university. This perspective will enable us to zoom into the experiences of individual students, uncovering nuances in disabilities and tensions they may experience when requested accommodations. At the same time, we will zoom out to see how environmental and institutional factors at the research lab,

department, college, and university levels may influence the individual experience (See Figure 1). The research questions for our project are:

- What are the experiences of disabled STEM graduate students when seeking access to accommodations?
- How are these experiences similar or different when seeking accommodations in a classroom environment as compared to a research or teaching role?
- How do graduate students navigate the university environment, including advisors, instructors, and disability resources centers, as they advocate for their needs?

The long-term goal of this project is to develop a body of research on disabled STEM graduate students that can inform the development of policies to improve the graduate school experience for these students.

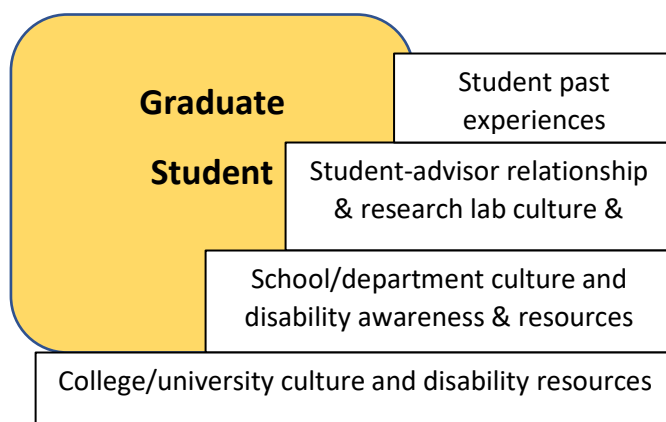


Figure 1. Systems view of different levels of the university environment that can influence the experiences of disabled STEM graduate students

Research methods

We seek to understand the depth of individual experiences and the breadth of processes, procedures, and experiences of students with disabilities at the graduate level. We plan to use a systems theory approach in order to include the voice and experience of individuals at many different levels of the institutional hierarchy, with our primary focus on graduate students who identify as having a disability, faculty who are active in their advocacy for disabled students, as well as staff who work closely with disabled students.

- Study stage #1: Our research plan includes a qualitative systematic literature review (Grant & Booth, 2009) that will focus on mapping the current state of literature focusing on the experiences of and accommodations for disabled graduate students. This study will especially target autoethnographic studies written by disabled graduate students. In addition to the published literature, we will also include contemporary sources of data such as podcasts with disabled graduate students (e.g., <https://anchor.fm/squarepegspod>). This stage will result in a preliminary conceptual model/framework describing the experiences of disabled STEM graduate students seeking accommodations.
- Study stage #2: We will also conduct semi-structured interviews of graduate students, faculty, and staff with the goal of eliciting the interviewees' understanding and interpretation of procedures to gain access to accommodations, their willingness to engage in these processes, experiences as they seek, offer, or facilitates accommodations according to their roles and responsibilities within the institution, and what beliefs they hold about disability.

To recruit participants, we will reach out to Disabled Student Union (DSU), DRC, and post flyers at select locations on campus. Our recruitment goal is to reach out to disabled students, proactive mentors, grad chairs, and disability support staff. The conceptual model/framework developed earlier will be refined as a result of the interview study.

Through a thematic analysis (Braun & Clarke, 2012), we will develop a conceptual model explaining graduate student experiences seeking accommodations starting with the individual within the wider educational system (research labs and the institutional structures).

Summary

With the seed funding we are requesting in this proposal, we plan to initiate a new research agenda focusing on the experiences of disabled STEM graduate students. The proposed project will focus on reviewing the literature in depth and developing a conceptual model based on both the literature and interviews. The findings of this project can inform educational policies and interventions related to the Office of Diversity, Inclusion, and Belonging's goal to create a welcoming campus by enhancing the support offered to disabled graduate students. Developing more nuanced policies related to graduate student accommodations will help these students to thrive at Purdue and beyond. The findings from this project will also inform the development of future grant proposals that we intend to submit to the National Science Foundation's Division of Graduate Education (DGE) within the STEM Education Directorate.

Metrics used to evaluate success

Our key research outcome is the conceptual model explaining disabled graduate students' experiences along with a set of recommendations that can be used by graduate educators. We expect to produce a conference paper during the project and a manuscript submitted to a research journal. We will also develop short papers that provide guidance to graduate mentors and grad chairs. Finally, we will seek ways we can participate in podcasts and interviews to disseminate our findings more broadly.

Anticipated Outcomes: We recognize that our expertise is not on disability; however, we promise to bring a new perspective to the topic. With the research evidence we generate through the seed grant, we will expand our collaborations to include disability experts in STEM education. Following this seed grant, we will pursue the following:

- Support graduate student, Sage Maul, on her dissertation research on disability and her NSF GRFP (her application is pending)
- Pursue new grants with the National Science Foundation's Division of Graduate Education (DGE) within the STEM Education Directorate.
 - NSF Innovations in Graduate Education (IGE) Program
 - EHR Core Research: Building Capacity in STEM Education Research (ECR: BCSER)

REFERENCES

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BUDGET JUSTIFICATION

Faculty salaries are requested to support key personnel for their engagement of research in summer. A larger portion of the budget is allocated to support the graduate student. The travel funds will support conference travel including paper charges, registration, and lodging. Funds are also requested for participant support when conducting interviews and for interview transcription services.

BUDGET

A	B	C	D	E
PI	Senay Purzer			
Project Title:	The experiences of disabled graduate students in STEM			
Sponsor:	Purdue Univeristy ODIB			
Project Type:	Research			
Project Period:	May 15, 2023 - May 14, 2024			
	Personnel	Position		Salary
1	Purzer	faculty		\$700
2	Davis	faculty		\$700
3	Wertz	faculty		\$700
4	Maul	Grad student		\$6,000
5	Fringes			\$600
	Travel			
5	Conference			\$750
	Data Collection			
6	Participant incentives			\$300
7	Interview transcription			\$250
	TOTAL			\$10,000

RESEARCH TEAM

Two-page CVs for each project PI/co-PI are attached.

Senay Purzer (Professor): Senay Purzer will be responsible for the overall direction of the project. As the graduate co-chair in the School of Engineering Education, College of Engineering, it is one of her responsibilities to support students and faculty advisors with regards to the question of disability accommodations. She is in a position to readily apply the recommendations of this research. She also has expertise in systematic literature reviews and framework development.

Kirsten Davis (Assistant Professor): Kirsten Davis is an expert on systems thinking research and a mentor to disabled graduate students. She will lead the systems perspective framing of the study. Kirsten is an assistant professor in the School of Engineering Education at Purdue University. Her research explores the intentional design and assessment of global engineering programs, student development through experiential learning, and approaches for teaching and assessing systems thinking skills.

Ruth Wertz (Visiting Assistant Professor): Ruth Wertz will lead the practical implications of the research and ways we can disseminate our outcomes to those who would benefit. Ruth is a visiting assistant professor in the School of Engineering Education at Purdue University. Her research explores the intersections of early engineering identity formation and cognitive development within informal learning environments, as well as the roles emotion, empathy, and social connection carry in contemporary learning theories and teaching practice.

Sage Maul (Graduate Student): Sage Maul will provide the student perspective to the study and lead the data collection and data analysis. This project is within the scope of Sage's dissertation research. She is a second-year PhD student in Purdue's School of Engineering Education, working under Kirsten Davis. Her research interests focus on disabled student participation in postsecondary engineering courses.