

## Work in Progress: Evaluating Teaching Self-Advocacy to Historically Minoritized Graduate Students in STEM

### Introduction

Many historically minoritized graduate students, here defined as Women, Latinx and Black/African American students, in Science, Technology, Engineering and Math (STEM) experience unwelcome or even hostile ecosystems or environments. Many of the social expectations are that historically minoritized graduate students in STEM should assimilate or acclimate to the cultural, where assimilation/acclimation are defined as cultural conformation vs. social acceptance of a student authentic self/identity. They may also experience forms of continuous microaggressions and isolation. The effects of chronic external stressors, such as experiencing discrimination and social isolation, on increased mental health disorders and decreased physiological health is well known [1-3]. Yet, evidence-based practices of support systems specifically for graduate students from historically marginalized communities to reduce the effects of climates of intimidation are not common. Indeed, researchers have found that such students “would benefit if colleges and universities attempted to deconstruct climates of intimidation [4]” and it has also been shown that teaching underrepresented minority students empowerment skills can improve academic success [5].

Self-advocacy originates from the American Counseling Association (ACA) and the Learning Disabilities (LD) communities for effective counseling that promotes academic success and is based on a social justice framework [6]. The underlying principle of self-advocacy is that supporting skills and knowledge development in the three areas of self-advocacy leads to a student’s long term participation and ultimately academic success in areas such as post-secondary education and STEM. The pillars of the self-advocacy program are centered on (i) Empowerment, (ii) Promoting self-awareness and (iii) Social Justice and programming in the GRaduate Education for Academically Talented Students (GREATS) is aligned and repeated along these three pillars. The current professional development program is in its third year of implementation and to date twenty-seven students have participated in the program. This work in progress paper outlines the evaluation of a self-advocacy program for historically marginalized graduate students in STEM at the University of Illinois Chicago is a minority serving institution as both an Hispanic Serving Institution (HSI) and an Asian American Native American Pacific Islander Serving Institution (AANAPISI).

### Programming

The GREATS program offers different events and speakers throughout the academic year in the pillars of self advocacy. In year three of the program, students attended a seminar and discussion on social justice with Dr. James Holly Jr. on the impact of engineering on Black communities during distinct historical periods in the US. Students also attended a discussion with Dr. Terrell Morton on identity and social justice within STEM. We had two workshops focused on health and well being. The first workshop by Lindsay Marshall was focused on helping PhD students overcome barriers to writing their dissertation, which is a source of anxiety for PhD students and was a topic requested by members of the program. Students learned about methods to organize their writing and overcome writing blocks. Resources for PhD graduate students to support their thesis writing were also shared with the group. The second workshop was on time management for the busy student offered by the UIC Wellness Center. Finally, there was a seminar on leadership by Dr. Jarrad Hampton-Marcell on science and being competitive in

STEM. We had a seminar on how to prepare for the postdoctoral search and maximizing the experience as part of supporting their professional aspirations by Dr. Subramanian Sankaranarayanan, a Group Leader for the Center for Nanoscale Materials at Argonne National Laboratory. This seminar was requested by the students and addressed their concerns about not knowing how to pursue or leverage a Postdoctoral position as first generation and/or historically minoritized graduate students. Finally, we had a book club event in May on the topic of Leadership and Identity as scholars in STEM.

The students are invited to attend different modes of seminars and workshops. We offered them virtually and/or in person throughout the year. Events are held on various days and either at noon or early evening to make it as accessible to students to attend at least one event per semester. We also maintain a Slack channel for communication and outreach as well as send out regular e-mail messages to remind students of events.

### Defining Success

A holistic perspective is used in defining academic success of students that exceeds obtaining a PhD degree and expands the definition to include perseverance that does not come at the cost of health/well-being, loss of identity or authenticity and sustaining personal values such as serving community. We also realized that as part of the development on the concept of self-advocacy, we needed agreed upon definitions, one for agency and the second for self-advocacy and propose then a conceptual framework of self-advocacy for the students in the program. These two definitions helped in the refinement of the focus group questions. First, we introduce the definition of agency in graduate education by O'Meara et al., "By agency we mean the perspectives graduate students assume, and the actions graduate students take to pursue goals that matter to them (O'Meara et al., p. 156) [7]. We then define self-advocacy to distinguish the effect it has on agency of an individual. Self-Advocacy is the development of skills and knowledge that helps support an individual's agency, with a primary characteristic of decision making centered on their personal goals, values and well-being. The distinction between self-advocacy and exercising agency alone is that to practice self-advocacy, an individual has knowledge on policies and support systems that are relevant to their goals or decisions. An individual also has an understanding of their positionality (i.e. the social context of their experiences) and uses this knowledge to develop skills that support their sense of belonging and well-being, while maintaining their sense of authenticity. To be agentic only requires a person to feel they can make a decision and that they exercise decision making towards their goals. However, if they do not have skills in self-advocacy, then the individual may make decisions that are poorly informed, or contrary to their values and/or well-being, or with a loss of sense of self or identity.

As a result, self-advocacy may also mean that a student may elect to change programs because they are making decisions that prioritize who they are and what they value. Thus, we define self-advocacy as the development of skills/knowledge and attributes that helps support an individual's agency, with a primary characteristic of decision making centered on their personal goals, values and well-being. The distinction between self-advocacy and exercising agency alone is that to practice self-advocacy, an individual has knowledge on policies and support systems that are relevant to their goals or decisions. An individual also has an understanding of their positionality (i.e. the social context of their experiences) and uses this knowledge to develop

skills that support their sense of belonging and well-being, while maintaining their sense of authenticity.

## Methods

For this work-in-progress, we present the development of the focus group questions. Table 1 lists the focus group questions that were developed based on the initial evaluation by the external evaluator last year and this year. The questions are intended to measure how students navigate their experiences within their graduate programs and research laboratories, how self-advocacy is utilized, and the impact of social justice on a student's perspective as academic professionals. We also expanded the research to include how advisors support student's accumulation of social capital in the survey. Social capital probes were added after external feedback from the engineering education research community as a possible salient factor in the academic supports of graduate students from historically minoritized groups. Both the survey questions that were used to study emerging themes of self-advocacy in the graduate students, and focus group questions have been presented to the engineering education research community at conferences and one-on-one meetings to get feedback from the broader community on the themes of self advocacy and the questions. The focus groups will be conducted in Summer 2023 and all students in the GREATS program will be invited to participate.

Table 1. Focus group questions

|                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| <b>Question 1: Background, Motivation, and Trajectory</b> | <p>Q.1 Can you describe your graduate-program trajectory story? Why did you choose to pursue a graduate degree in science/engineering? Why did you choose and/or apply to the [University Name] graduate program that you are currently in?</p> <p>Additional probes: Can you describe how your professional or career goals have informed your progress in your graduate program? What other factors may have influenced your academic-professional trajectory? What kinds of supports have you had access to—or felt that you needed access to and didn't have?</p> <p>Q.2 Can you describe the culture and environment for your program and laboratory. How do you interact professionally with your advisor or peers in the laboratory?</p> <p>Additional probes: Do you feel that you can act in an authentic manner? Do you feel you can make decisions that center your values and well-being?</p> |
| <b>Question 2: Agency and Self-Advocacy</b>               | <p>Q.1 Please describe any barriers that you may have encountered in relation to pursuing your academic-professional goals as a graduate students <i>within your research, classes, or even the GREATS program.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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|                                   | <p>Additional Probes: Within this or similar situations, did you feel that you had the ability to advocate for yourself? Did you feel empowered to advocate for yourself within your program or lab setting? Did you feel that there was support for you to advocate for yourself? What techniques/strategies did you use to advocate for yourself/exercise agency for yourself?</p> <p>Additional Probes: How did you navigate the barrier/obstacle? What resources or supports did you require? Did you feel that you had to advocate for yourself to others?</p> |
| <b>Question 3: Social Justice</b> | <p>As you navigate your graduate program, do you have any thoughts on how social justice issues intersect with your academic and professional experiences?</p> <p>Additional Probes: To what extent do you think that scientists/engineers in your field should consider how their professional work intersects with issues of social justice?</p>                                                                                                                                                                                                                  |
| <b>Question 4: Social Capital</b> | <p>How would you describe the network(s) that you use to access professional resources and opportunities?</p> <p>Follow-up: Who has helped you to access those professional networks? How has your research supervisor helped you in building your professional network?</p>                                                                                                                                                                                                                                                                                        |

## Discussion

Although the focus groups are pending, we had 17 participants for the survey this year. These 17 students will be invited to participate in the focus groups to be held by the external evaluator. The focus groups will be virtual and approximately one hour in length. Participation is purely voluntary and students are not compensated for their time. We are currently processing the evaluative feedback and participant data from our external evaluator—including responses to the Prematriculation-adapted survey items and will do so after the focus groups are completed this summer [8]. Our aim is to continue refining upcoming programmatic activities as well as to inform the external evaluation process and collection of additional evaluative data from participants and program activities. Additionally, we are continuing to develop and refine the working conceptual framework for self-advocacy based on the themes that emerge from analyzing the focus group responses this summer.

Early survey findings support the focus group themes of sense of belonging as shown in Figure 1. As seen, student may have a stronger sense of belonging in their research group and laboratory, but feel less so to the broader graduate student community. Even within the GREATS program, because of the many locations students are located on campus, there can be a sense of sub-groups forming in the program as stated by one student in an open ended question

of the survey. This is an important result that has prompted us to modify Question 2 in Table 1 on Agency and Self-Advocacy as noted by the italicized text. We are more broadly asking what barriers students feel in building community and also actively try to mitigate this feeling of sub-groups by doing more active community building exercises, such as ice breakers and more social activities. Finally, it is also noted that 16 of 17 respondents all agreed that “my research supervisor supports me in developing professional networks” and thus the focus group question is designed to look more deeply at how faculty help mentor students on building their networks. As can be seen, the second survey has provided useful inputs to the themes that should be included in the focus groups and added an important question on who to increase community even within the GREATS program so that everyone feels included.

In summary, the overview of some key survey outcomes was used to develop the focus group questions and help look more deeply at how the program and self-advocacy supports graduate STEM students from historically marginalized communities.

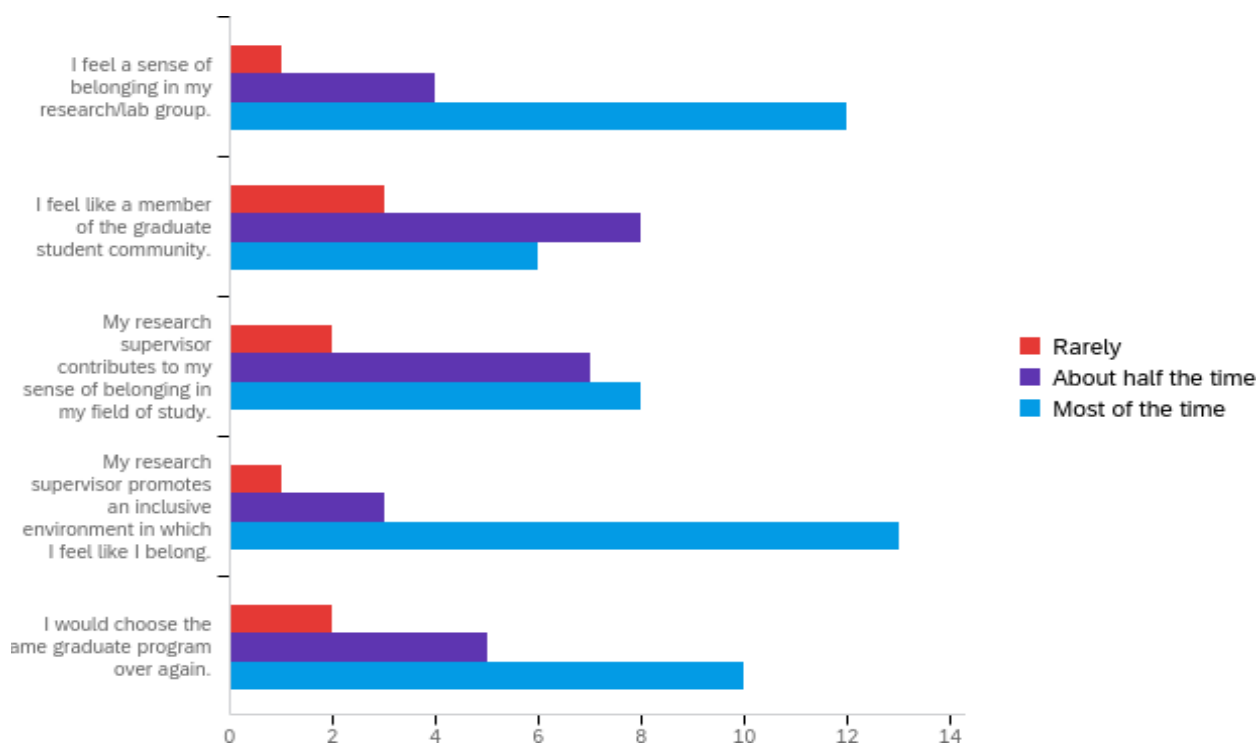


Figure 1. Sense of Belonging Measures

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