

Achieving Diversity in AI-focused Graduate Research Traineeships

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ABSTRACT

Our AI-focused traineeships for graduate students integrate research and education components to contribute to diversifying the AI research workforce. We describe the program and introduce multiple strategies to achieve interdisciplinarity, diversity, equity, inclusion, and accessibility. Early evaluation results are included.

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1 INTRODUCTION

Increasing the diversity of the AI research workforce presents a challenge in research education. We discuss strategies used in a recently introduced extracurricular traineeship program for graduate students in STEM that operates under an interdisciplinary, team science-focused [8], and apprenticeship-based [2] framework. The program aims to bridge multiple disciplines and promote interdisciplinary research. Open to students from all backgrounds, it focuses on pathways for STEM graduate students who are women, African American, Latino/a American, or Native American (AALANA), and deaf or hard of hearing, with research training and career-advancing professional development in AI. Early results suggest success in opening diverse pathways into AI.

2 SELECT RELEVANT PRIOR WORK

Diverse Disciplines in AI. Rapid expansion of AI technologies and applications has made it clear that the associated challenges are not merely computational, but also psychological, sociological, ethical, societal, and political. Future developers of AI technologies must therefore be educated in diverse disciplines, or be able to function in

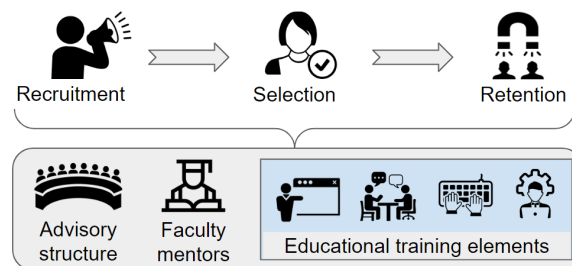


Figure 1: Procedural (top) and structural (bottom) diversification strategies.

diverse teams with domain experts representing several disciplines [9]. Disciplinary spread is necessary for responsible AI development [3], and researchers with interdisciplinary backgrounds can better contribute to collaboration across fields [5].

Boosting Access for Students with Disabilities. Recent innovation in AI risks leaving behind people with disabilities. Two autoethnographic analyses of AI systems revealed gaps in systems that rendered them inaccessible [7, 15]. Despite efforts to combat barriers to participation in STEM [16], few students with disabilities, and in particular, students who are deaf or hard of hearing, pursue doctoral degrees in STEM and computing disciplines [6]. Lack of success in graduating students with disabilities can be attributed to technical and institutional inaccessibility [14].

Inequality in AI. It is also key to attract more AALANA and women researchers to AI; these groups continue to experience inequalities [1]. African American and Latino/a decision-makers are underrepresented in relevant fields [11], and similar underrepresentation impacts women [4]. Inclusion is critical for team success [13].

3 STRATEGIES FOR DIVERSIFICATION

Figure 1 summarizes our strategies to achieve diversity, divided into *procedural* (top) and *structural* (bottom). In the program, students interact with mentors from multiple disciplines in four AI research areas and complete around a dozen educational training activities.

Recruitment, Selection, and Retention. To nurture diversity in the applicant pool, we use a multi-pronged approach with outreach to academic programs and virtual plus in-person open houses. The program has associated new graduate degree programs, enabling eligibility for students from many STEM programs, and it offers

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incentives for underrepresented students. The selection process uses pre-set diversity targets in its final stages and has introduced a new diversification initiative, holding some slots for incoming PhD students from underrepresented groups, enabling PhD directors to claim these slots to attract the students into their programs.

We track one-year retention as a short-term measure of students who have not graduated and remain in good standing from one year to the next. This enables us to immediately detect any retention issue. Initial results indicate 100% retention of participants from all target groups. Retention strategies include (1) peer-mentoring and cohort-building events, (2) a student council representing all trainees at monthly meetings with the program team, (3) maintained trainee status with encouragement to continue with program activities after the focus year until graduation, and (4) the possibility to earn a certificate of completion.

Educational Training Elements. The program offers diversity and inclusion competency workshops with expert facilitators on *Building a Foundation for Inclusive Research and Diversity Statements*, and it ensures that all students who need access services are provided with them. In addition, within a retreat, the program has worked with a group offering a session with video material and a theatrical improvisation about diversity. Moreover, several students have participated in *Visits to Minority-serving Institutions* (MSIs) that approximate a campus interview visit experience. These short visits aim to provide opportunities for participants to: (1) present to external audiences, (2) promote research among undergraduates at the hosting institution in AI-focused research, (3) demonstrate graduate school opportunities, and (4) experience meeting with administrators at the host institution. Student visits to MSIs across the US have included a research presentation, one-on-one meetings with faculty and administrators, group meetings with labs, lunches with students, and meals with faculty. Trainee feedback has been positive, indicating that the visits meet program objectives.

Advisory Structure and Mentor Team. Internal and external boards, which advise program leadership, include members from the underrepresented groups that the program especially seeks to reach. In addition, the composition of the mentoring team intentionally emphasizes disciplinary and demographic diversity, positive mentoring [12], and belonging to the scientific community [10].

4 EVALUATION EVIDENCE AND DISCUSSION

Finally, we report on evaluation, considering participants' survey or focus group data. From the respondents ($n=10$; some questions unanswered), and using a 5-point scale from *not at all inclusive* to *extremely inclusive*, 78% felt the program was *extremely inclusive*. One participant commented: "The events held as part of [the program] were interdisciplinary, inter-cultural and very inclusive. They taught me more about integrating cultural aspects into the research domain." This aligns with program-external evaluation, which also summatively reported that "trainees were positive about the NRT's diversity and inclusion emphasis [...] and NRT-funded trainees spoke positively about their visits to MSIs and the value they derived from this experience." A paired t-test indicated a significant pre-to-post change with a large effect size for *inclusive career strategies* ($p = 0.009$), and for *recognizing cultural differences in a research setting and navigating cultural differences in a research setting* ($p = 0.02$, respectively).

Additionally, survey respondents reported that they *attended workshops on diversity and inclusion*, and 80% noted that "it sufficed," while 10% "wanted more," or felt "it was too much," and 90% confirmed they *participated in inclusive networking events*, with 60% noting that "it sufficed," while 30% "wanted more." Also, while 46% of respondents reported they felt *moderately, very or extremely prepared for writing a diversity statement for a job application* in the pre-program survey, this grew to 80% in the post-program survey. Trainee survey responses also showed pre-to-post knowledge growth for both *inclusive career strategies* and *promoting real inclusivity in AI research*, which grew from 62% or 46%, respectively, to 90% and *how to navigate working in diverse teams* from 92% to 100%.

Finally, 63% of faculty ($n = 8$) noted a *large gain* or *very large gain* that the program *increased [their] opportunities to mentor diverse students*. All responding faculty felt that students were *very prepared* or *extremely prepared* for *discussing diverse viewpoints*.

The evidence points to a positive impact so far. Continued data collection will allow us to improve the program as it expands.

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