Board 195: Amplifying Voices for Change: Exploring Faculty Insights on Student Audio Narratives Through Focus Group Discussions

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Abstract

The inclusive transformation of engineering culture stands as a central objective for ensuring the growth and sustainability of a diverse engineering workforce. Engineering faculty members play a critical role in this transformation by supporting and shaping the academic journeys and eventual careers of their students. However, despite their central role in workforce development, faculty members often lack the resources and training needed to gain a deeper understanding of the diverse experiences and identities their students bring to the engineering classroom. This is especially challenging for students with minoritized identities that are non-apparent or hidden and cannot be easily observed by faculty. As part of the on-going Audio for Inclusion (A4I) Project, this paper and poster discuss the initial findings from focus groups with nine engineering faculty members from three universities nationwide. We delve into the intricacies and logistics of developing, designing, and facilitating these focus groups and highlight significant alterations and overall recommendations shared by participants. These perspectives can serve as a valuable resource for engineering educators seeking to incorporate similar audio dissemination methods into their work and for those interested in implementing strategies for cultivating a more inclusive engineering education culture.

Introduction

Fostering an inclusive engineering culture is important for ensuring the growth and sustainability of a diverse engineering workforce. Faculty members play a critical role in influencing this inclusivity due to their prominent role in designing and facilitating the core learning experiences that ultimately shape students' academic journeys, eventual careers, and professional engineering identities [1], [2]. Unfortunately, many faculty members lack the necessary resources and training to enhance their knowledge, empathy, and understanding of the diverse experiences and identities that students bring to the engineering classroom [1], [3], [4], [5]. Gaining these understandings can be especially challenging for faculty who teach courses consisting of students with minoritized identities that are non-apparent or hidden. In such cases, these identities cannot be easily observed through daily faculty-student classroom interactions and often go unnoticed unless they are explicitly disclosed.

The absence of these resources has limited progress in fostering a more inclusive engineering education culture while also presenting a valuable and unique opportunity for engineering education researchers and faculty developers to make significant practical impact. However, seizing this opportunity has been difficult, and the development of an inclusive culture has continued to elude traditional educational research approaches. While quantitative methods can broadly identify the presence and prominence of marginalized inclusion, they often lack the depth needed to foster a comprehensive understanding of inclusion. In contrast, qualitative and narrative-based approaches offer rich accounts of marginalized experiences and perspectives but struggle to reach a broad faculty audience. Dissemination approaches for engineering education research typically include peer-reviewed journal and conference publications or books, which are characterized by extended publishing timelines and tailored to the readership of specific venues.

As a result, traditional publication procedures inadvertently perpetuate a cycle of addressing an already aligned and captured audience and limiting the potential impacts of the research.

In the Audio for Inclusion (A4I) Project, we address this issue by developing unique and novel audio resources that disrupt traditional forms of broadening participation research dissemination. We leverage advancements in media and communication technologies to ease the sharing of students' experiences and make research on hidden and non-apparent student identities more accessible to engineering faculty, especially to those not already involved in broadening participation research. In this paper and poster presentation, we discuss the initial findings of focus groups with engineering faculty to answer the question: how does hearing these narratives impact faculty perspectives of diversity and inclusion in engineering classrooms? At the same time, we are also seeking feedback from faculty regarding the utility, format, and quality of the audio resources as well as any other improvements that would facilitate engineering faculty engagement with the narratives to promote empathy and perspective-taking when interacting with students.

Prior Work: Creating audio narrative resources for dissemination

The A4I Project is currently in its third year with one more year until project completion. It was inspired by prior work of PIs Secules and McCall in which student stories served as powerful artifacts to contribute to an ongoing shift in engineering education culture toward increased inclusion. Prior phases of the A4I Project has focused on creating the audio narrative resources that would be disseminated to engineering faculty for feedback. The process for creating these audio dissemination resources is summarized in Figure 1.

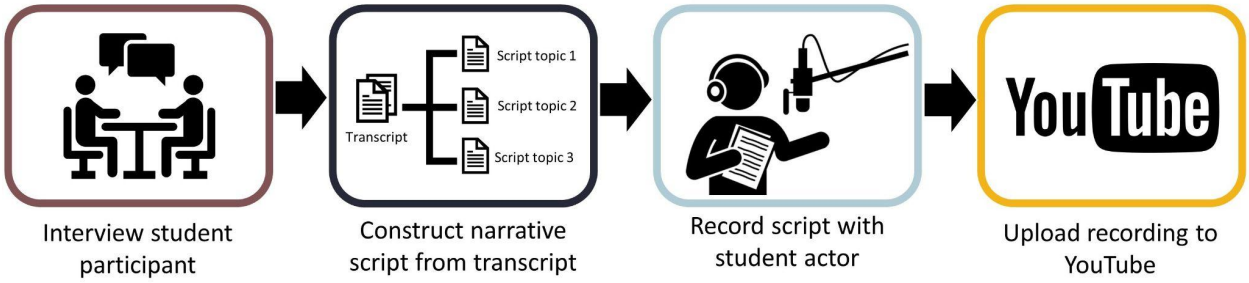

Figure 1: Overview of the audio resource creation process

To create these audio resources, the research team conducted semi-structured interviews with 21 undergraduate engineering students with minoritized identities at 11 institutions nationwide. Each interview lasted approximately 1 hour and were designed to address three overarching questions: (1) how do you identify personally and in engineering contexts, (2) what is one thing you would change about engineering education if you could, and (3) what would you tell your professor or what advice would you give to a student like you, if given the chance? Interview transcripts were analyzed using narrative methods [6], [7] to create scripts that were audio recorded by undergraduate and graduate student actors. Details regarding student participant recruitment, interview design, and narrative script construction and recording are provided in [1]. So far, 10 student narratives have been documented, recorded, and made accessible online at https://www.youtube.com/@A4I-audio.

Guiding Theory: Identity and agency in figured worlds

The overarching framework guiding the A4I Project is Identity and Agency in Figured Worlds. Holland and colleagues [8] introduced this conceptual framework to elucidate the intricate dynamics between social systems and individuals. They define it as the realized capacity of an individual to deliberately and reflectively engage in activities situated within "socially-produced, culturally-constructed" contexts (i.e., figured worlds, [8], p. 40-41). In this project, we use this framework to conceptualize engineering education as figured world in addition to others, such as race and gender, that overlap and influence students' experiences in their engineering programs. As students iteratively interact with engineering education, they derive meaning about themselves and construct their engineering identities. The choices they make regarding language, attire, and other aspects of navigating engineering education, serve as indicators of affiliation with engineering and the privileges and power associated with the field [8].

Within the context of constructing, designing, and facilitating faculty focus groups, this theory serves as a particularly useful lens because it centers discussions around the systems and power structures that shape if and how students disclose or present hidden identities to faculty in engineering classrooms. It also provides a frame to gain deeper understandings of how faculty relate and respond to concepts of equity and hidden identities within the power structures of the university system. For example, some faculty view that addressing equity and inclusion issues is outside the purview of their position, stating that the diversity of their classes is out of their control and is an issue that needs to be addressed at the institutional level [9]. These insights are particularly useful in identifying where diversification efforts grow stagnant and how faculty can be better supported in creating environments that are inclusive to all students and facilitate learning, regardless of whether particular identities are hidden or not.

Approach: A process of iterative design and implementation

This phase of the A4I Project is focused on gathering feedback and insights from engineering faculty regarding the audio resources developed in prior project phases (see Prior Work section of this paper as well as [1], [13]. Rather than stating the methods employed to conduct this work, we dedicate this section to describing the design of research tools for conducting faculty focus groups and highlighting key considerations and alterations during implementation.

Nationwide Recruitment

Design. Faculty focus group participants were recruited using a Qualtrics survey distributed via email through professional society listservs (e.g., American Society of Civil Engineers, American Society of Mechanical Engineers, American Institute of Chemical Engineer, etc.), project advisory board members, and the principal investigators' professional networks. The recruitment survey was used to gather general background and demographic information from faculty, establish a baseline understanding of their knowledge and perspectives of diversity, equity, and inclusion at their respective universities, and gauge their willingness to participate in a focus group on this topic. To facilitate purposive sampling for focus groups, Likert-scale items were created that prompted faculty to indicate their level of agreement (1 - strongly disagree; 7 - strongly agree) with 11 statements. These statements were adapted from those developed by Secules and colleagues [9], and example adaptations for two of the items are shown in Table 1.

Table 1: Example translations to develop recruitment survey prompts

Sample Topic	Original Item [9]	Adapted Recruitment Item
Agency	It is not my job to focus on diversity and inclusion.	Attending to diversity and inclusion issues is outside of my job responsibilities.
Identity awareness/action	In an ideal classroom, identity (e.g., race, gender, sexual orientation, etc.) does not come into play.	In an ideal classroom, identity (e.g., race, gender, sexual orientation, etc.) does not impact my teaching.

The initial recruitment survey was crafted with the aim of facilitating a purposeful sampling of faculty for focus group participation. A complete list of the recruitment survey items and their associated topics are shown in Table 2.

Table 2: List of recruitment survey items

Topic	Recruitment Survey Item Number and Statement
Knowledge	1. I am familiar with language and terminology associated with different identity groups (e.g., racial and ethnic groups, LGBTQ, disabled, etc.) 4. I am knowledgeable about my own students' backgrounds and experiences. 5. I know who to contact on my campus if I need assistance managing an issue relating to diversity and inclusion in my classroom. 6. I am familiar with the diversity and inclusion policies and initiatives at my institution.
Comfort	2. I am comfortable discussing the topic of diversity and inclusion with my engineering colleagues. 3. I am comfortable discussing the topic of diversity and inclusion with other (non-engineering) colleagues. 8. My institution provides me with sufficient resources and opportunities to learn about diversity and inclusion.
Empathy	7. I worry about what is happening in students' lives when they disengage from my class.
Agency	9. Attending to diversity and inclusion issues is outside of my job responsibilities.
Identifying awareness/action	10. In an ideal classroom, identity (e.g., race, gender, sexual orientation, etc.) does not impact my teaching.
Values	11. Diversity and inclusion is very important to me.

In prior work, reading (e.g., [10], [11]), and communicating with our advisory board members, we have become attuned to the problem of social desirability inherent to diversity and inclusion surveys. When a survey topic includes a component of social desirability, it can be challenging to know if participants are providing answers they anticipate are the socially 'right' answers that allow them to have a positive social standing and self-image; or if participants are responding in ways they agree with personally. We do not claim to have solved the social desirability problem here; however, we aimed to develop recruitment survey questions that would get past simplified agreement and social desirability indicators (e.g., "It is important to support diversity inclusion")

that may be common in other surveys on the topic, and we have adjusted these to more objective statements that differentiate our participants and help us understand their views.

Recruitment survey initial results. The prompts developed for sampling proved valuable and nuanced insights into faculty members' backgrounds and perspectives on their knowledge and comfort regarding diversity, equity, and inclusion topics. The results to date include the responses of seven faculty and are summarized in Figure 2. These data were not collected to make broad inferences through statistical significance but to provide us with contextualizing information about the faculty participating in the focus groups. Considering this, the goal of the survey was to understand faculty starting points for diversity and inclusion topics, in order to think about whether and how our resources may help them.

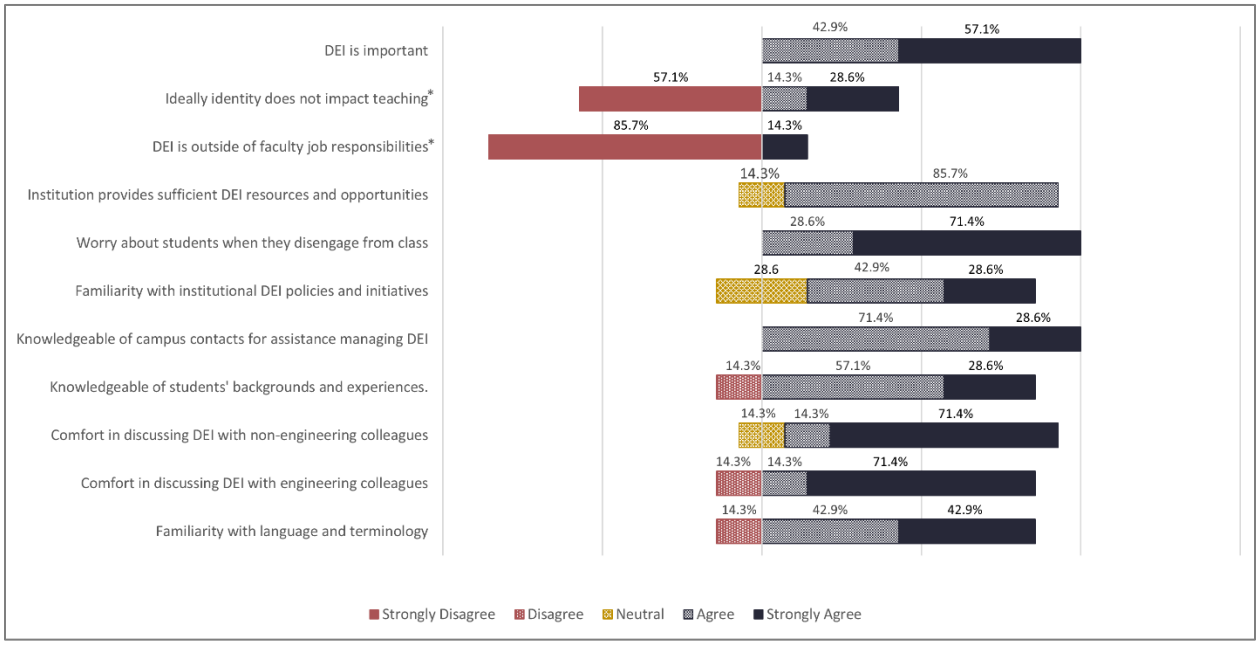

Figure 2: Responses to recruitment survey items (N=7, *indicates negatively worded items)

In examining the results, we see some evidence of success in differentiating our faculty participants in light of social desirability. Five out of fifteen statements show divergence between some participants who agree and some who disagree with them, while three other statements show some divergence between neutral responses and agreement. Thus, if there were societally 'right' answers on these statements, we at least have made it possible for some to express opposing views. Item 10 ("Ideally, identity does not impact teaching") had the most significantly divergent responses, and the reasons for this divergence may be complex. The first logical conclusion is that faculty members who strongly disagree with this item consider, integrate, and even embrace aspects of theirs and their students' identities into teaching, while those who agree do not consider identity in their teaching design and practice. Perhaps those who agree subscribe to a social/technical dualism and depersonalization that is often associated with engineering educational culture and embody a more traditional perspective that engineering courses should be solely focused on mathematical calculations and scientific principles [14]. However, in our prior work, we also found that some faculty view the absence or irrelevance of identity in the classroom as an indicator of truly inclusive teaching [9]. While we have succeeded in finding

some measures of divergence, further work to uncover the nuances behind these divergences will provide deeper insights into the perceptions that faculty bring with them both into our research activities and into their classrooms and professional lives.

Recruiting adjustments and lessons learned. We found that scheduling a focus group across three to five faculty members potentially located across three to four time zones to be quite challenging. To minimize this challenge, we added a section to the recruitment survey that provides a list of six options for pre-determined focus group dates and times. Faculty then select the focus group they wish to participate in and are sent an email confirming the selection date and time from a member of the research team. This strategy was implemented based on prior work by Secules as well as recommendations from potential faculty participants.

Focus group data collection

Design. To date, we have conducted three focus groups (i.e., two pilot, one full) with nine engineering faculty. Each focus group lasted approximately one hour and were conducted using a combination of in-person, virtual, and hybrid methods. Aligning with the research aim to gather feedback from and gain greater understandings of how such resources could be used by faculty, focus group discussions were guided using a semi-structured protocol consisting of three overarching topics: (1) participant introductions and benchmarking questions (2) audio dissemination reactions and takeaways, and (3) general feedback on the audio resource. Prior to the start of the focus group, the facilitator provided an overview of the research study, obtained consent, and discussed guidelines and rules to promote an open, safe, and confidential space for participant engagement. The semi-structured protocol for focus groups included the following questions:

(1) Introductions and Benchmarking Questions
   a) What is an identity that you have that others aren't typically aware of?
   b) In a typical semester, which demographic identities do you tend to become aware of?
   c) In a typical semester, how aware do you become about your students' lives, stresses, and experiences?

(2) Audio Dissemination Reactions and Takeaways
   a) What are your initial reactions to this student's story?
   b) What was your biggest takeaway from listening to this student's story?
   c) To your knowledge, have any of your students had this same or similar experience?
   d) As a faculty member, is there anything you might change about your interactions with students based on what you've heard from the audio?

(3) General Feedback on Audio Resources
   a) Would you share this resource with a colleague? Why or why not?
   b) What, if anything, would you change about the resource?
   c) How can we make this resource more useful to faculty?
   d) In your opinion, do you think listening to students in this format is more valuable or impactful than reading about these experiences in the literature?
   e) What is your biggest takeaway from participating in this focus group?

We also recognize that some engineering faculty members simply do not feel comfortable engaging in conversations due to their potentially political and personal nature, while others avoid the topic altogether. This recognition prompted us to pay careful attention to the wording of each focus group question to not imply that a person is inherently 'bad' based on their responses. Within the context of equity and inclusion research, especially in the current polarized and politically-charged cultural landscape, we were aware of the impacts of social desirability and recognized the loaded nature of many of these questions. As a result, we sought to make these prompts as acceptable and approachable as possible while maintaining face validity of our data collection tools.

Focus group initial findings. The most common reactions to students' audio narratives have been described by participants as "not surprising," yet "troubling" and "disheartening". The takeaways participants gleaned from listening to students' audio narratives centered around both individual and institutional practices for facilitating inclusion in engineering education and beyond. After listening to student narratives, participants shared practices they already implement to promote equitable and inclusive classrooms such as designing flexible attendance and deadline policies, guiding students through an in-class meditation session, and encouraging frequent interactions with faculty. Corresponding to the recommendations for faculty provided by Sophie in her narrative, participants described how their practices, policies, and behaviors impact student perceptions of equity and mental health in the classroom, "Students pick up on what really matters. It's not just what's said, but what's done. [. . . we] can model the kind of behavior that [we] want to see [in our students], and I'm not talking about academically. I'm talking about modeling good mental health practices." Participants also discussed the need to holistically consider the various aspects of students' lives and unique circumstances outside of the classroom by stating, "[We] need to consider other things that are going on [in students' lives] besides what's happening 'in this class,'" and "Faculty need to understand that you can't treat every case the same."

Participants also lamented exclusionary practices implemented by many of their colleagues. For example, one participant recounted when a colleague failed a student in a required course because the student showed up one hour late to the final exam. The participant described this colleague as "too rigid". When asked how to implement change in a way that would shift the exclusionary practices of faculty, such as the one described, participants discussed the need for universities to present a unified front for promoting equity and inclusion in the classroom and described this relationship using an analogy of parents in a family unit:

> Faculty can help facilitate, but it has to be a message across the board. It's kind of like when you're parents, and you have to have that unified front. . . If [the message] doesn't come from the parents, then it doesn't mean anything. [. . .] Because if [both parents] aren't saying the same thing, then the kids are going to fight.

Participants further connected this issue to strict institutional policy and practice, including evaluation and promotion requirements, as deterrents that discourage faculty from adopting new and more inclusive teaching approaches, "The universities need to start realizing that this is a whole different generation than we were five years ago, ten years ago, twenty years ago." They suggested that upper-level administrators, such as university provosts, can help deliver unified

messages of equitable and inclusive teaching to faculty, especially among those who are traditionally resistant to adopting more equitable and inclusive teaching practices. When asked if they would be willing to share this resource with colleagues, participants agreed and found these audio narratives as a valuable resource. However, they highlighted that listening to such accounts would be much more meaningful and impactful in settings such as workshops, or even focus groups, that employ guided listening strategies and allow the listeners to unpack each narrative after.

To date, focus groups have primarily consisted of faculty who are already knowledgeable, to varying degrees, of the need for and benefits of equitable and inclusive teaching practices (shown in Figure 2). As we continue to conduct focus groups, we will revisit survey responses with the goal of talking with faculty who may be less knowledgeable of equity and inclusion challenges in engineering education.

Focus group adjustments and lessons learned. Following published guidelines for conducting qualitative focus group research [12], we initially sought to recruit four to six participants for each focus group. Based on scheduling challenges, we conducted three focus groups that each varied in size; Group 1 included three participants, Group 2 included four participants, and Group 3 included two participants. This variation served as an unanticipated opportunity to observe differences in group dynamics as well as conversation duration and depth. After each focus group, the research team met to debrief on these differences, noting that while having a larger focus group of four participants allowed for more perspectives to be gathered at once, the group tended to take somewhat of a conference panel-style dynamic where each person took turns responding to questions with limited cross-conversation, with much of their responses situated within the policies and norms of the institution. In the small focus group consisting of two participants, the same panel-style dynamic emerged; however, it differed from the larger focus group in that participants connected their responses to other aspects of their lives beyond their faculty roles. For example, as highlighted in the previous section, participants in the small focus group connected many of their takeaways to their identities as parents. This shared identity thus bolstered conversation that participants used to build on and learn from each other. As a result, we plan to continue to keep focus groups small with a three-person target to allow participants ample time and space to meaningfully reflect on the audio and provide more in-depth feedback.

Next Steps

When considering focus group discussions within the framework of identity and agency in figured worlds, faculty members exhibited an agency to disrupt cultural norms within their own classrooms, but recognize the challenge that lies in recruiting other faculty to do the same. These findings will be further investigated as we continue to conduct more focus groups with engineering faculty, with the goal of conducting more focus groups to include the perspectives of approximately 20 faculty members. During continued focus groups, feedback will be further solicited regarding the ways that faculty can see themselves utilizing the audio narrative tools and how to reach faculty outside of the realm of equity and inclusion research.

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