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Elevating Community Visions of Equity, Culture, and Social Justice in Education (ECSJ) for Minoritized Students through Photovoice

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Elevating Community Visions of ECSJ through Photovoice

Introduction

Each year, the American Society of Engineering Education's (ASEE) Division on Equity, Culture, and Social Justice in Education (ECSJ) challenges the ASEE community to interrogate normative systems within engineering education. This year, in alignment with its mission, several pillars point to the need for introspection of constituents and how they engage with these systems to acknowledge, explore, and share how we contribute to the enactment of equity, culture, and social justice. Participatory action research (PAR) emphasizes the involvement of stakeholders throughout the research process to ensure both accuracy and relevance. By focusing on context-specific action, PAR provides a valuable way to elevate participants' voices during research and intervention development [1]. It also helps ensure that the perspectives of those directly engaged in the work are included in the analysis [1].

In this arts-based research paper, we explore the experiences of engineering student researchers through this lens. Recognizing that researchers played a pivotal role in enacting the mission of ECSJ to confront issues of race, power, privilege, and capitalist norms inherent to the practices traditionally used in engineering contexts. The goal of this paper, then, is to illuminate how engagement in a participatory action research (PAR) project that leveraged photovoice affected these emerging engineering education researchers.

Photovoice empowers individuals by capturing their experiences through photography and focus group discussions that are aimed at "Voicing Our Individual and Collective Experiences" (VOICE) [2]. Photovoice was developed in 1992 by Caroline C. Wang and Mary Ann Burris to bring the daily life experiences of village women in Yunnan Province, China, into decision-making for regional development. In their seminal work, Wang and Burris (1997) describe the photovoice method and how it was developed. They state photovoice has three primary goals, "(1) to enable people to record and reflect their community's strengths and concerns, (2) to promote critical dialogue and knowledge about important issues through large and small group discussion of photographs, and (3) to reach policymakers" (p. 370). The method has since been adopted across several disciplines, including engineering education, to allow participants to capture their experiences and communicate ways to change their circumstances. Photovoice is a critical methodology that centers the voice of the participants, allowing them to identify community needs and community-driven solutions [2-5]. It goes beyond documentary photography, a method rooted in systems of oppression, by providing participants the ability to narrate their own experiences and co-construct knowledge [6-9].

Related Work

Prior work by Waisome et al. explored the experiences of minoritized engineering undergraduate students at a predominantly white institution through photovoice. The work identified six

common themes among students: (1) finding comfort, (2) building community, (3) fitting in, (4) experiencing frustration, (5) overcoming imposter syndrome, and (6) valuing mentorship [10]. Prior work by Henderson et al. across several studies has examined engineering identity, as well as facilitators and barriers to student success, at a Hispanic-serving institution and during learning abroad experiences [9, 11-12]. Participants described financial constraints and stressful academic environments as barriers to their success. At the same time, social networks, finding and fighting for balance, and positive reassurance were determined to facilitate their success. Previous studies [13] also uncovered that learning abroad was (1) a transformative experience that helped students dispel myths about where they were visiting, (2) instrumental in students' cultural competence through cultural connections and grappling with realities, and (3) a powerful tool for strengthening students' beliefs about who they were as engineers and their motivation for pursuing engineering.

This prior work and existing literature, however, do not capture the experiences of the student researchers and how their trajectories shifted as a result of their involvement as researchers. Therefore, this work shifts the lens to focus on our student facilitators who engaged in photovoice research, creating a research-to-practice-to-research lifecycle of the work. This nascent study is a compelling testament to the significance of the intentional engagement of student researchers in PAR as a mechanism for identity formation, career interests, and empowerment in engineering education research.

Conceptual Framework

In designing this study, we had opportunities to draw from several frameworks that have been used in engineering and education research to promote the necessity of shifting from deficit to assets-based approaches to engaging communities of color and to push researchers, practitioners, and policymakers to expand beyond practices that broadly position Whiteness, maleness, and capitalism as the norm. For example, (a) Critical Race Theory [14], which explores the intersections of race, power, and privilege in engineering education; (b) Culturally Sustaining and Revitalizing Pedagogies for integrating cultural identities and linguistic practices in fostering inclusive educational environments [15]; Culturally responsive pedagogy [16,17]; or Reciprocity [18] which emphasizes mutual engagement and respect between institutions and communities they engage with to name a few. However, as we went about this work through our dynamic and non-prescriptive approach, we deliberately reflected on and leveraged the opportunity to integrate the ECSJ pillars into our process.

Five ECSJ themes (pillars) were shared in the 2025 ASEE Call for Papers [19] to engage the broader engineering community to catalyze ECSJ in education. We determined that several ESCJ pillars aligned with our approach to photovoice and would help illuminate participants' engineering education pathways, understandings, and beliefs. To situate this work in

conversation with the ECSJ community, we formed the core of our conceptual framework to include:

> "Spotlighting normalized violence: Projects interrogating and confronting institutional structures, perspectives, and practices that reproduce systemic, societally normalized violence as it connects to the impact of engineering on society, society on engineering, and the production and education of engineers are sought for this conference. Submissions may address various interlocking systems of oppression and fatal couplings of power and difference tied to social identities, including but not limited to: race/ethnicity, gender identity, sexual identity and orientation, socioeconomic status, dis/ability, religion, Indigeneity, culture, language, land relations, and localized context. Work can include both explicit and implicit devaluation of and within communities and the unique complexities of interlocking systems of oppressions. The purpose of these submissions will be to highlight under-considered and banal mechanisms undergirding engineering education.
>
> The classroom as a terrain of struggle and site of possibility: Work highlighting culturally relevant, culturally sustaining, social justice grounded, and anti-deficit classroom teaching practices. We particularly encourage engineering educators engaging in such teaching practice to publish about their practice and to discuss institutional resources and support they take advantage of or have been denied. This category includes curricula, pedagogy, and activities that assist classroom participants in cultivating relationships to social justice movements. These submissions should aid in transforming engineering education communities in becoming more grounded in liberatory struggles against empire.
>
> Grounding in movement and lineages of organizing: Beyond formalized structures of institutional research and teaching, there are opportunities for engineers and engineering educators to participate in organizations and movements building power towards equitable and socially just ends. These can include identity-based movements (e.g. Black power, queer liberation, disability justice), mutual aid networks, labor unions, cooperatives, environmental justice organizations, and encampments such as those supporting Palestinian Liberation, houseless people, and blocking engineering projects such as oil pipelines, prisons, and police training facilities. Submissions that address socially-just praxis and activism in and around the engineering learning experience, particularly counter to dominant, technical engineering as it is taught in the academy, are encouraged. Exploring and analyzing the impact and/or birth of social movements related to engineering learning, teaching and practice, particularly beyond formal engineering spaces, is welcome.
>
> Sovereignty and the speculative: Work forefronting the (often antagonistic) relationships engineering and engineering education hold with the interconnectedness of living beings and Indigenous sovereignty are welcome. These can include works running counter to Western academic research practices and forms of scientific knowledge. Generating

> knowledge is a social process and multiple perspectives of such knowledge should be considered. These submissions can leverage Black and Indigenous research practices, oral traditions, creativity, methodological activism, community-based research, and more. Works that engage creative forms of storytelling, such as speculative fiction, rewriting the roles of technology in ways that are life-affirming and world building, are particularly encouraged."

For example, we drew on these pillars to design the study's interview protocol and data analysis. We described "*spotlighting normalized violence*" as highlighting and challenging systems and beliefs that contribute to systemic harm in our participants' contexts, but in the context of the work (historical and today). This included the intersections of power and difference related to the social identities of our participants [20]. "*The classroom as a terrain of struggle and site of possibility*" was defined as physical and virtual academic spaces where students reckoned with people, practices, and resources in engineering. We operationalized *"sovereignty and the speculative*" as reflecting on how engineering can sometimes clash with how all living things are connected and considering ways PAR challenges traditional Western research methods, practices, and ways of knowing inside and outside academic halls. Last, we described "*grounding in movement and lineages of organizing*" as how participants continued engaging in socially just movements, organizations, or actions outside their PAR research experience as a practice of resistance, rest, and restoration.

Methods

This work was conducted using virtual interviews and a Qualtrics survey. This study was approved by the University of Florida's (UF) Institutional Review Board (IRB) under protocol #ET00044553 and the University of Houston's (UH) IRB under protocol STUDY00005201. The participants were current and former students at two universities in the southern United States (US). UF is a land-grant, space-grant, and sea-grant institution, with over 55,000 residential students enrolled over the last several years. It is classified as a very high research activity university [21]. In 2023, the composition of residential students was 9.81% Asian, 5.43% Black or African American, 20.95% Hispanic/Latino, 0.4% Native Hawaiian or Other Pacific Islander, 4.28% Two or more races, 48.37% White, 8.9% international students, and 0.08% American Indian or Alaska Native. According to the most recent data, 24% of the student body is Pell-eligible. UH is a large public doctoral university with very high research activity [22], enrolling over 45,000 residential students in the last several years. It is also designated as a Hispanic-Serving Institution and an Asian American and Native American Pacific Islander-Serving Institution (AANAPISI). According to the most recent institutional data, 40% of the UH student body qualifies for the Pell Grant. Racially, the UH undergraduate population includes 10.2% Black students, 23% Asian students, 36.5% Hispanic students, 3.8% international students, 21.2% White students, and 5.3% other.

Participants

We recruited participants from among students in our research groups who had led or participated in photovoice studies. Recruitment efforts yielded four participants. Table 1 highlights the participants, their pseudonyms, and their demographics. The participants included two current doctoral students who are men, and two former undergraduate students who are women currently working in the engineering industry.

Table 1. *Participant Demographic Table*

Pseudonym	**Race**	**Ethnicity**	**Gender**	**Degree(s) Completed**	**Discipline(s)**
Shabazz	Black or African American	Not Hispanic or Latino	Man	B.S., M.S.	Mechanical Engineering
LP	White	Hispanic or Latino	Woman	B.S.	Chemical Engineering
Zach	Black or African American	Not Hispanic or Latino	Man	B.S., M.S	Mechanical Engineering
Kenya	Black or African American	Not Hispanic or Latino	Woman	B.S.	Petroleum Engineering

Data Collection

Data collection included a reflective survey, in which we asked participants to provide demographic information and reflect on their perceptions of engineering education research and PAR methods. We also conducted semi-structured interviews with each participant. Participants were invited to 30-minute interviews conducted via Zoom. All interviews were audio recorded. We posed follow-up questions, as necessary, to obtain thorough and thoughtful responses [23].

Data Analysis

Each interview was transcribed verbatim. Both authors removed transcription errors and updated them [24]. Data analysis was guided by thematic analysis [25, 26]. Specifically, we engaged in six phases of thematic analysis, including (1) data familiarization, (2) generating codes, (3) constructing themes, (4) reviewing themes, (5) defining themes, and (6) writing up the results to guide data analysis. We executed our analysis by reading through each semi-structured interview transcript and open-ended survey response and then rereading to identify quotes of interest. Next, we engaged in two rounds of coding using our conceptual framework (e.g., the ECSJ pillars) as *a priori* codes. We used thematic analysis as a guide rather than a prescriptive method. Initial codes and transcript quotes were documented using a spreadsheet software program individually. Then, we discussed them through peer debriefing. After discussing, documenting, and reviewing codes, we deductively coded using our conceptual framework as a guide, as an approachable way

of categorizing data and communicating emerging findings with each other. This is consistent with our past approaches to data analysis (see related work).

Limitations

Some design and analysis decisions may have limited the study. First, since the study's goal was not generalizability, readers should carefully consider the transferability of findings to their context. Second, the work was limited to participants within the author's network, with whom they had a prior rapport, which may have influenced their participation. Though we knew the research participants, we challenged and interrogated each other to ensure that findings were grounded in data, not our pre-established understanding of ECSJ or prior relationships with participants. Additionally, the participants had all completed their work on each project, with some participants being 3 years removed from their photovoice research experience. Thus, the data is post-reflective and may not capture their perspectives immediately following the research experience.

Quality

We used Walther and colleagues' (2013) Qualifying qualitative research quality (Q3) framework to embed quality through this project. In using this framework, we were attentive to theoretical, procedural, communicative, pragmatic, and ethical validation during "*making*" and "*handling*" data [27, 28]. For example, in *making data,* we leaned into our established rapport with participants. They were eager to talk, which allowed researchers to engage in the interview process as a conversation and collaborative process, lowering the hierarchies between researchers and participants. As an example of communicative validation in making data, though we drew on ECSJ pillars as framing for our social reality under investigation [27], we did not use highly theoretical, i.e., "experience-distant"[29, 27] terms in the interview. In *handling data,* we spent considerable time with the data and repeatedly referred to and discussed our understanding of participants' interviews. We also requested insights from the participants when further clarification of their responses was necessary. Lastly, we collectively situated ourselves in this research by articulating a positionality statement highlighting aspects of our experiences that may influence the research process [30].

Positionality

We humbly approached this study in community with each other and participants, and with Black joy [31]. Despite sharing commonalities in research and educational philosophy, we possess unique identities that we celebrate, which enrich our study. To promote transparency, we provide insight into the intersection of our research and personal identities. Dr. Jeremy Waisome is an assistant professor in engineering and identifies as a Black woman with an invisible disability. Dr. Jerrod Henderson is an assistant professor in engineering and identifies as a Black man. Much of his research, teaching, and service centers on the experiences of Black men and

women in engineering to enhance their degree completion and representation in engineering and STEM broadly.

Findings

We saw evidence of each of the pillars that form the basis of our conceptual framework. Though we deliberately designed our protocol to ensure an even distribution of questions addressing each pillar within the conceptual framework, strikingly, participants spoke more extensively about *spotlighting normalized violence*. There was limited evidence of *the classroom as a terrain of struggle and a site of possibilit*y. It should also be noted that all interviews were conducted after the 2024 US Presidential Election and before the 2025 US Presidential Inauguration. In the following sections, we provide examples of participant experiences.

Spotlighting Normalized Violence

Participants shared multiple instances of how their facilitation of PAR and photovoice was interconnected with their identities as being minoritized and othered as engineering students. Several described this as feeling positionally aligned with the students involved in their photovoice projects. For example, Zach stated:

> "I saw myself in those students. They were Black engineering students at a PWI who had to find spaces for themselves where they could, you know, be their authentic selves, and be surrounded by community. That mirrored my experience exactly in undergrad. I also was a Black engineering student at a PWI, and had to navigate a lot of racism and things like that, and to find spaces where I felt like I belonged."

Having similar lived experiences to those of the participants in the photovoice studies they led allowed our study participants to empathize with them and transcend language and traditional communication barriers, as well as power dynamics between researchers and participants, a significant goal of Participatory Action Research (PAR).

The participants also described concerns about both psychological and physical safety that arose in their research. For example, LP said, "Then just some of the challenges that people face were like- I know one thing that I can't forget is just having friendship issues and how that affects your time in school." In spotlighting normalized violence, our study participants, as well as those they interviewed, also felt empowered to implement strategies to protect themselves. For example, LP stated, "I kind of heard some of the same things like mental health and taking care of your body." Though various forms of normalized violence were experienced, LP's focus on describing her participants' mentions of self-care and the importance of having strong friendships points to the action-based mindset that we often see in our work. Another example of normalized violence was described by an engineering classroom and academic culture. Kenya said:

> "That's when, also, in some cases, you get into the, they call them weed-out classes. So, it's really daunting not knowing what's the hold on the other side, whether you're going to pass the class or not. When the exams come in and you feel prepared, but at the same time, you don't know what to expect. The students that we interviewed also some of them went through that."

Kenya's weaving in and out of her own experiences and the experiences of those she had interviewed spotlight the ways the violence of "weed-out" culture is deeply ingrained in engineering academic settings and how it impacted her academic journey.

Lastly, not all of the experiences were negative. For example, at the end of his interview, Shabazz highlighted the tension between the power of the data collection process with the realities of normalized violence. For example, in describing the data collection process, he said:

> "I don't think I've said I enjoyed it… I enjoyed it. I enjoyed it! It made it feel I didn't feel as much like I was working during the research stage as much as I felt. I was working during the analysis stage, but during the research stage felt like, All right. This is nice, but during the analysis stage is when it kind of kicked in. And I was like, Oh, this isn't. This isn't just, you know. Answer a couple of questions. These people said these things like… No, there's real work to do here and our real methods that go with that. So it was an enjoyable experience. I don't think I said, that."

Though the data analysis stage further illuminated the realities of normalized violence. Participating in PAR provided him with a possibility for joy despite the systemic issues uncovered by his photovoice study. Shabbazz's epiphany further highlights the power of the SHOWeD method in photovoice studies, which asks "why does this strength/challenge/situation exist?" and "what can we do about it."

The Classroom as a Terrain of Struggle and Site of Possibility

This pillar was the least evident in participants' narratives, appearing in only four instances. Shabazz and Kenya provided specific examples of this. In Shabazz's example, we see how shifting away from "traditional" engineering research can be liberating:

> "I completely changed my department, and I completely changed my career trajectory. So, it was something that I felt, I'll use the word empowering. Again, I felt empowered to pursue something different. Engineering is very tech-centric and tech-heavy; like the focus is, you gotta have these technical skills. You need to have technical skills. And I feel like research, like, photovoice gets kind of cast to the side. And it's not really part of that focus when it happens. So to feel like I could do something that I had passion about already in my life. Not that I had to go find passion to pursue was really freeing, in a sense, and allowed me to pursue a new view for academics. I didn't even know it existed beforehand."

Shabazz's experience highlights how participating in the "classroom," although not in the traditional sense (in this case, the research setting), helped expand the possibilities of his identity as an engineer that align more with his interests.

Kenya's example is at the intersection of S*potlighting Normalized Violence* and *The Classroom as a Terrain of Struggle and Site of Possibility.* Demonstrating how these two pillars can overlap. She stated:

> "I got support. That was the first time that I walked into a place, and I realized that when I spoke to the other engineers and told them that I'm having trouble with this, they all started laughing. [Laughter] I was like, "Why are they laughing at me?" They were actually laughing because they also went through the same class and it was hard, but they're like, "Just keep focusing and you're going to get through it. That's how it is. That's just engineering… How it is... Like, it's not that you're stupid." I'm using the word stupid, but it's not hard. Yes. You don't know, but that's just how engineering is. You need to figure out how to get through it. You have to find a way to get through it. They also offered resources to help navigate the class, and actually, it was just mind blowing for me. I remember that night like it was yesterday. I'm really grateful for being a member of NSBE. That was really monumental."

Although there was again this acceptance from students that they must struggle —"That's just engineering" through her peers, Kenya discovered the "monumental" possibility of finding peers to support her journey. Her encounter with NSBE also proved to be a type of "classroom" that taught her to meet struggle head-on and develop an action plan to "figure out how to get through it."

Grounding in Movement and Lineages of Organizing

In this pillar, participants highlighted that PAR caused them to lean into organizations where they felt supported, and it inspired more inclusive approaches to engaging with communities of color. First, most frequently, and perhaps because of how PAR caused participants to reflect on normalized violence in engineering, they discussed seeking out and running to communities where they felt supported. For example, Shabazz mentioned his fraternity and the National Society of Black Engineers (NSBE). He said:

> "Identity-based movements... I would say, I have, since conducting photovoice, become active in my historically Black fraternity, and that, you know, has a lot to do with identity. I think it's helped kind of bring me closer to some of the brothers that otherwise wasn't in contact with as much. So that was nice."

Shabazz also stated:

> "I did get active in NSBE again, so that [NSBE] coming out as an important factor for so many people, and something that was mentioned by a lot of participants, kind of helped [me] realign like, Hey, this is important. The work that happens here, or just the connections that happen here, do have an effect on students and their sense of belonging and ability to move forward in these types of programs, especially in these types of environments."

Seeing the critical outcomes that resulted from the support of NSBE for his research participants led him to recall how meaningful participation in this organization was to his sense of belonging, and it motivated him to get back involved. Kenya described how she continues the work by mentoring in a friend's organization. She replied:

> "Yes. Right now, I really try to help not just really - because I've been involved in research also for middle school kids, I've touched a little bit on that, so the parents who have kids around that age, I usually try to mentor them also through a friend's non-governmental organization."

Kenya expounded by describing her motivation for mentoring. She said:

> "I sometimes talk to students about them to encourage them to choose STEM-related majors because we don't have a lot of representation of certain demographics. So, I try to also include that, and just encourage also the participants in general to get some interest into STEM projects in the hope that in the future they would choose to enter STEM-related careers."

Kenya now has a resolve to positively impact the community through mentoring, in hopes of a future with greater representation.

Next, participants describe how PAR impacted their approach to engaging the community. For example, LP shared:

> "I have more of a focus on surveying people and getting their opinions on certain topics. I went to Peru to do a project with Engineers Without Borders. So I think that it [PAR] helped me or at least made me more interested in doing like a questionnaire-based or – because the photovoice is not questionnaire-based, but getting people's experiences over certain questions, and taking that and doing an analysis on it because that's kind of what we did with photovoice. We recorded their responses and came up with themes or conclusions and that's kind of what I did in Peru is I surveyed people asking the same questions and then coming up with, "So how did this change their lives and how do they live?"

Participating in photovoice helped LP ground her future work in ways that amplify the voices, experiences, and desires of the communities she seeks to impact. This perspective offers a

counter-approach to what typically happens in traditional outreach or community-engaged work. LP also described a result of her work. She said, "*That brought up discussions of how can they make change for themselves.*" Here, LP describes how PAR prompted her to be inclusive of the voices of others and lead by empowering others through her organization. Shabazz described his hope for a ripple effect of engagement in lineages of organizing as a result of his work. He said:

> "I hope that increases rather than decreases as a result of the research and the recommendations that came from it and that these experiences trend positive. They trend upward to where students feel more and more encouraged to keep going, more and more, less alone, more encouraged, more empowered. This overall that it increases positively, and maybe it starts here at [REDACTED], and then it can spread to some other universities; as you know, things do when they have a positive outcome."

Shabazz believes in the exponential positive growth potential of his work because of the positive outcomes it has had on his campus. Unfortunately, Zach was not as hopeful. He said:

> "So when it comes to my research, I've kind of taken a step back from like the identity-based things, it doesn't feel like. It's a safe research space right now given some of the things that are happening. So I've kind of taken a step back and pivoted my work. So I guess that's also disappointing… There might be some negative consequences if I were to go down that route. So it's definitely made me shift some of the work that I'm doing. Don't get me wrong. I'm really excited about the work that I'm doing. I'm still passionate about it, but I don't feel comfortable doing the work that I thought I was gonna do based off the photovoice project."

Because of the focus of his identity-based work, being Black in engineering, Zach not only wants to hold off on engaging in work grounded in movement and lineages of organizing, but he also describes it as an unsafe space, for which there could be negative consequences. This is tremendous pressure and realization. As we have illustrated, these pillars are not always distinct and separate from one another. There is overlap, as Zach's experience is rooted in *Normalized Violence*. The normalized violence leaves one feeling unsafe while working on identity-based research.

Sovereignty and the Speculative

We found that each participant recognized how misaligned PAR is with their experience as engineering students. Zach stated:

> "I'd say, completely misaligned, I think like in traditional engineering training, we've kind of gotten away from thinking about people and their experiences. It's all about, how can we design something to make money or what's profitable. So doing a project that really focused on understanding what students were going through and then trying to find ways to make their experiences better was something completely outside of like or completely different from all the experiences I've had before with research."

He went on to share how this connects back to *Spotlighting Normalized Violence*:

> "Even the projects that claim to have, you know, really good intentions, I don't think, actually drill down to like a more personal level and understand really who this work is impacting. So it was really cool to be on a project that took that into account, and even sharing some similar qualities with the participants is really cool to just to further understand their experiences."

Zach highlights that engineering must not exist where we do not consider people. Human-centered approaches to research and application are essential to our field. Participating in PAR helped him see more clearly the value of voicing individual and collective experiences.

Discussion & Recommendations

Engagement in photovoice assisted in highlighting student engagement with several of the ECSJ pillars, including *Spotlighting normalized violence*, *Sovereignty and the speculative*, and *Grounding in movement and lineages of organizing*. Of particular concern is the copious experiences with violence. Often, the participants mentioned experiences of deep concern without the prompt's relation to the pillar of "*Spotlighting normalized violence*." These studies were conducted at large public institutions that may be characterized as historically white institutions. Engagement in these systems in any way can be seen as complicity with prior and current harms inflicted on minoritized students and communities. How the researcher chooses to leverage this positionality is an important consideration. We should make an additional effort to ensure there is acknowledgment of any prior interactions participants and researchers may have with these institutions.

Our work also suggests that photovoice and other PAR engagements may be an effective way for student researchers to find purpose in their research, aligning with minoritized communities' interest in pursuing careers in the helping professions (McGee & Bentley, 2017). Each participant shared how participating in photovoice shifted their behaviors and interests. This work inspired LP to paint more, Shabazz to engage in community service, and Shabazz and Zach to switch their disciplinary concentrations to better align with their interests in engineering education. Additionally, Kenya was encouraged to seek out mentors. Moreover, while they enjoyed participating in the projects, their engagement illuminated positive and negative experiences. Of particular note are the concerns around intent and impact. Photovoice is often seen as an opportunity to provide its participants with agency. But what agency does it provide for the researchers? When designing PAR studies, we should consider who gets to do the work. We should also consider how it might influence their future and well-being (Virella, P., & Woulfin, S., 2024). As such, this project seeks to address this objective.

Researchers should also investigate how changes envisioned by photovoice participants are actualized within their communities, treating these aspirations as actionable imperatives rather than merely guiding stars. The outcomes of the work matter not only to the community that co-constructed them, but to the researchers themselves. We, too, take ownership of these ideas and have the opportunity to change the world. However, we may not see the desired impacts if we do not begin with the proper intent or understanding of the systems at play. Those engaged in PAR should interrogate the system they are working within to know it deeply, and to be able to (de)construct it.

Photovoice is a promising practice. Participants in this study commented on the transformative power of PAR for the participants in the photovoice studies they led and on how photovoice empowered them. Leading PAR provided space for these participants to reflect on their worldviews and how their experiences aligned (or not) with their participants. Photovoice was important for participants to reckon with the joy and pain of normative engineering, educational, and societal challenges.

Conclusion

Research methods counter to the Westernized methods of inquiry and exploration prevalent in academic institutions are uncommon for engineering students to experience. By introducing students to methods rooted in "movements and lineages of organizing," we can shift perspectives and cause students to reckon with how and why things are explored in engineering. This reckoning is not without challenges. The status quo is difficult to push up against. But engineering should be disentangled from systems of oppression. ECSJ provides a space where we can envision a new, imaginative future of engineering for us, by us. We should cultivate interconnectedness, creativity, and affirmation in research and teaching practices. We should also understand how engaging in work, such as photovoice, can shift students' interests to better align with who they are and the change they want to make in the world through engineering. Through photovoice, we can establish a new vision of engineering education. Who defines what scholarly modes of knowledge generation are? And why can't we?

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