

# Reimagining Methodologies: Understanding Student Experiences Through Trauma-Informed and Intersectional Lenses

Yumi Aguilar  
Industrial & Manufacturing  
Engineering  
California Polytechnic State  
University  
San Luis Obispo, United States  
yuaguila@calpoly.edu

Victoria Siaumau  
line 2: dept. name of organization  
(of Affiliation)  
University of California San  
Diego  
San Diego, United States  
vsiaumau@ucsd.edu

Emily Flores  
Liberal Arts and Engineering  
Studies  
California Polytechnic State  
University  
San Luis Obispo, United States  
emilyfloresgaspar@gmail.com

Jane Lehr  
Ethnic Studies and Women's,  
Gender & Queer Studies  
California Polytechnic State  
University  
San Luis Obispo, United States  
jlehr@calpoly.edu

Lynne Slivovsky  
Computer Engineering  
California Polytechnic State University  
San Luis Obispo, United States  
lslivovs@calpoly.edu

**Abstract**— This is a work in progress paper focusing on student experiences. Ratios and statistics without context can mask issues such as the student experience within the department and persistence rates within the major. As we aspire to address these issues and others, we engage with students to formally characterize the current culture of our department by learning about student experiences within the department. The goal of this engagement is to understand if/how harm is perpetuated towards students, particularly marginalized students who do not fit normative social constructions of identities like gender, race, sexuality, socioeconomic class, and ability. While centering marginalized student voices is critical when enacting change, we as researchers wanted to also ensure that we were not perpetuating harm in the ways we conduct research and engage with students. To achieve this goal, we developed a new methodology to engage with students using an anti-racist, trauma-informed protocol. Understanding potential student trauma through an intersectional lens, as in relation to structural and systemic oppression, was the foundation of our protocol. This lens is particularly critical when marginalized peoples are disclosing their experiences. When thinking about research ethics, or the ethical principles and values that researchers commit to, we decided to base our methodology on the Design Justice Principles outlined by the Design Justice Network and incorporate the values of Participatory Action Research. These foundational values center the care and well-being of participants while still working towards institutional change. This work in progress paper discusses preliminary findings from interviews and focus groups with students about their experiences within the department utilizing our methodology. The data and analysis yielded from this protocol informs our department's effort in developing interventions and resources to better support students and create a culture and community of diversity and belonging.

**Keywords**— research ethics

## I. INTRODUCTION

This is a work in progress paper that reimagines how we conduct research and the ways in which we care for the well-being of our participants. Research methodologies that require participants to disclose personal experience often do not take into account the various traumas and violence those experiences may be connected to and how those disclosures can perpetuate harm towards participants [1]. Furthermore, many research methodologies and pedagogies regarding trauma tend to center the emotional response, discomfort, and guilt of white, cisgender, heterosexual people, simultaneously neglecting the emotions and discomfort of marginalized people, all while consuming their experiences to teach those of the dominant group lessons they can never experience [2-3]. Aware of the harm that is often perpetuated when conducting qualitative research, we want to minimize the harm experienced by individuals who hold marginalized identities from whom we are seeking to learn as part of research that aims to characterize the environment and culture of the Computer Engineering (CPE) department from the student perspective with the goal of creating a more inclusive, diverse, and equitable community. We prioritize student well-being in our methods, as generating new knowledge should never be at the cost of student well-being. The research methodology presented in this paper utilizes frameworks from Participatory Action Research [4] and the Design Justice Principles [5] to center the needs of participants, particularly those who hold marginalized identities. This paper is primarily focused on two aspects: background further explaining the need for this type of methodology and an in-depth description of what this methodology looks like. In addition, we briefly share preliminary findings from the initial study utilizing this methodology, next steps in how to continue to build this framework, and where the research is headed.

## II. BACKGROUND

Historically, engineering education has created and continues to create a culture of neglect of its students that stray outside the "norm" of a typical student. It prides itself on its difficult and intensive curriculums which prioritize rigor of the curriculum and aptitude of the students [6]. While educators and researchers are attempting to increase diversity, equity, and inclusion within engineering education, there has been a significant lack of attention to student trauma and distress, and the ways in which our research and institutional changes approaches can exacerbate. Trauma goes beyond the narrow definition published by the American Psychological Association, it is also structural, systemic, intersectional, and thus should be understood in relation to the systems of oppression operating within a U.S. context. We focus on trauma in relation to systems of oppression within engineering education environments and the various identity related vicarious traumas that individuals carry. Recognizing that these oppressive systems manifest differently in various environments, violence, and the trauma it causes can look multiple ways. Causes of trauma within engineering education can include but are not limited to: fragmenting one's identity to assimilate into their workplace [7]; engage in high-intensive, rigorous coursework which creates barriers for students [5]; and the alienation and hostile environments that many marginalized students experience at Predominantly White Institutions (PWI). Understanding the patterns and forms of oppression present in engineering education, our initial goal was to characterize the CPE department culture from the student perspective to create interventions that would build a more inclusive, equitable, just, and diverse community. While our intention was to intervene in the unjust cultures occurring within the department and university, we realized that the way we collected data could cause further harm towards students. In our previous paper (author citation), we argue that intentional research methodologies are needed that are intersectional, trauma-informed, and cognizant of how student/participant identities build unique experiences within engineering educational and professional fields.

Given these goals, we examined the literature to find models for this approach. However, we found that most practices center white guilt, discomfort, and emotional distress (Boler, 2010). Oftentimes, these practices also utilize marginalized peoples and their experiences as educational resources for privileged individuals to find a frame of reference and real-life application of the topics. This occurs with complete disregard for the discomfort and distress of marginalized students. We need research methodologies that do not expect marginalized people to disclose their painful and/or traumatic personal experiences for the gain of other students, the institution, and/or the researchers as this emotional labor (Kumashiro, 2002) is harmful and could potentially cause retraumatization. We need approaches that center the experiences and knowledge of people from marginalized groups that simultaneously mitigate harm.

To this end, our research group has made the following commitments:

### *1. Prioritize people over the research:*

Our first priority is to reduce harm caused to individuals as they participate in our research. This means that the well-being of the participant is prioritized over the results and goals of the research. Every decision made centers this idea.

### *2. Center care via the Design Justice Principles:*

Our second priority is to center care. We utilize the Design Justice Principles (Design Justice Network) as a guide:

1. Use design to sustain, heal, and empower communities as well as to seek liberation from exploitative and oppressive systems
2. Center the voices of those who are directly impacted by the outcomes of the design process
3. Prioritize design's impact on the community over the intentions of the designer
4. View change as emergent from an accountable, accessible, and collaborative process rather than as a point at the end of a process
5. The role of a designer as a facilitator rather than an expert
6. Everyone is an expert based on their own lived experience, and that we all have unique and brilliant contributions to bring to a design process
7. Share design knowledge and tools with our communities
8. Work towards sustainable, community-led, and controlled outcomes
9. Work towards non-exploitative solutions that reconnect us to the earth and to each other
10. Before seeking new design solutions, we look for what is already working at the community level. We honor and uplift traditional, Indigenous, and local knowledge and practices

While these principles were created for designers, they hold a lot of the values that we, as researchers, wanted to center in methodology creation. If the methodology is an ongoing, collaborative process with participants, these principles give us clear guidelines on how to prioritize care and avoid exploitation. For example, the \_\_\_ department and its interventions will directly affect students, meaning that their voices should be most loudly represented per principle 2 above.

### *3. Engage people who are research participants as collaborators*

We utilize frameworks from Participatory Action Research to challenge the concept that research is only performed by the researcher performed on the participant. Instead, research participants are research collaborators, and shape both our ongoing development of our research methodology and utilization of findings.

### *4. Make it explicit that research participants are not required to share details of personal experiences*

As we describe in more detail below, the way we are currently implementing our commitment to making it explicit that research participants are not required to share details of personal experiences is by designing focus groups and interviews that utilize a discussion of a reading on engineering education culture as the primary focus of data collection. The purpose of using a text is to prevent participants from being required to disclose uncomfortable or traumatic personal experiences. By having participants respond to a text rather than pull examples from their personal experiences, we seek to remove the expectation of participants to share about themselves. While some participants may still choose to share personal experiences, it is not required or necessary to the success of the study. As researchers, this methodology gives us information and data without requiring us to consume the experiences of our participants.

### OUR REIMAGINED METHODOLOGY

In this section, we provide a detailed overview of the methodology, shared for the first time in this work-in-progress paper, of our first implementation of a study guided by these four commitments.

#### *A. Students & Recent Alums as Interviewers*

Our research team is composed of undergraduate students, a recent alum who is now a staff researcher, and two faculty. All semi-structured interviews and focus groups with students are conducted by the 2 student researchers and 1 staff researcher to lessen potential power dynamics. Before transcripts are shared with the faculty researchers, the transcripts are de-identified.

#### *B. Affinity Group-based Focus Group Options*

When participants were sent a survey to sign-up for an interview or focus group, there were five different affinity/focus groups that students could sign-up for in addition to the individual interview option. The groups available for students to sign up for were BIPOC students, students with disabilities, LGBTQ2+ students, women-identified students, and general. While some researchers utilize these types of groups to get a representative voice of a specific group, the purpose of these groups for our study was to create a space where participants may feel safer because they're in a group of students who are more likely to have similar experiences to them and, therefore, be able to relate and connect. Additionally, because we recognize that some participants may hold more than one of these identities, participants were able to sign-up for more than one affinity group and pick which felt most important to them. While some identities may be more salient than others in a particular setting/environment, we wanted to empower the participants to pick the affinity/focus group that would make them feel most safe to participate in.

#### *C. Provide a reading on STEM education culture*

Participants were sent a PDF and a voice recording of "Snow Brown and the Seven Detergents" [8]. This is a narrative about a young woman named Snehalatha who goes to a far land to pursue an education in science. The narrative is written like a fairytale and follows Snehalatha, or Snow Brown, as she

tries to fit into her new environment and become a "true scientist." In the narrative, Snehalatha is advised to use "detergents" to wash away parts of herself to better fit into her environment and become a true scientist. Some of the detergents include ones that make her skin lighter, remove her accent, and change her name from Snehalatha to Snow Brown. This narrative discusses themes of assimilation and experiences of discrimination that women and individuals of color face.

#### *D. Ask questions about a reading on STEM education culture to make it explicit that research participants are not required to share details of personal experiences*

As noted above, focus group and interview questions are about the reading on STEM education culture so that participants can utilize the experience of Snehalatha/Snow Brown to describe the CPE department's culture rather than experiencing a requirement to share their personal experiences. Questions include:

1. Can someone start by summarizing some key parts of the story? What were some of the detergents that Sneha used?
2. What about the story stood out to you?
3. Are there themes or examples in the story that are similar or mirror the CPE department's culture?
4. Do you think that there are certain knowledges and/or skills that the College of Engineering and, more specifically, CPE Department, values? How would you define scientific truth?
5. There are three potential endings in the piece. Let's take 5 minutes to reread these endings and then we will discuss. Which ending do you think is most realistic? Which do you think is most representative of Cal Poly, College of Engineering, and/or CPE?
6. What changes/interventions could have been made to prevent what happened to Snehalatha (Snow Brown)? Which of these suggestions would also be useful for the CPE department?

#### *E. Send a follow-up email that includes a resource list and survey*

After the participants have completed their interview or focus group, they receive an email thanking them for their participation and instructions for how to access their gift card for their participation (\$25 at the campus bookstore). This email also contains a resource list and a survey rating participant distress through the interview/focus group process. The resource list contains on-campus and community resources to support students' needs, including resources that address basic needs like food, mental health needs like counseling services and safe spaces for different identities that participants may hold, resources to aid in finding jobs, and student organizations to build community. The purpose of sharing this list is to address any basic needs that might be a barrier for students that they may/may not have shared during the interview/focus group as we know that even if the student did not explicitly express these needs in the focus group or interview, it does not mean that these resources won't be useful or shared.

## CONCLUSION & NEXT STEPS

The survey sent in the follow up email is meant to assess the distress students felt during their interview/focus group. Aligned with participatory action research principles, the goal of this post interview/focus group survey is to have participants share their thoughts on our research methods, specifically if they felt the questions were distressing. Additionally, we wanted feedback from them about whether we were asking the right questions to achieve our goal of understanding the CPE department's culture and what questions they would suggest we add or explore more. Furthermore, this survey asks participants to measure their distress during their interview/focus group. Based on the Design Justice Principles, this acts to ensure that our impact on students is not harmful and is aligned with our intentions.

The primary goal of this work in progress paper was to provide an overview of our methodology with a focus on why and how it is designed to mitigate harm. While the work of many individuals in engineering education is making strides to diversify both educational and professional fields is fantastic, we must not cause more harm through these efforts. These improvements must start by understanding the opinions and perspectives of students who are learning and operating within that environment but should not be at the cost of student emotional labor and well-being. Our research methodologies must be aligned with our department change efforts and prioritize the care of student research participants. Below, we briefly share preliminary findings, next steps in how to continue to build this framework, and where the research is headed.

### PRELIMINARY FINDINGS

To date, eight students were recruited to participate in the specific study described above that reflects the four commitments we identified in the Background section of this paper. While there was interest in affinity group focus groups, all participants were individually interviewed due to logistics and affinity group selections. While initial findings suggest that participants don't feel that the CPE department is as unwelcoming as the environment found in the Snow Brown story, participants did indicate that more departmental and faculty support and community would be beneficial for students as whole. Some suggestions shared were starting a mentoring program for faculty to work more closely with students, as well as department wide events to build more of a CPE engineering identity and community. Some students noted that the College of Engineering and the CPE department value technical skills over other skills and knowledge, and do not sufficiently address inequities in student experiences in technical skill development prior to matriculation. One participant specifically noted that if they had not taken private coding lessons in high school, they would not feel prepared for the curriculum. The suggestion here was to create workshops or more specific support courses for these highly valued technical skills.

We hope that this initial iteration of our methodology not only mitigates harm but invites other researchers to reflect on their own practices. What does it look like to minimize harm and center the care and well-being of the participant over the goals and outcomes of the project? What does it look like when our priorities shift towards community centered solutions? Part of this work is to reflect on how we as researchers can work to avoid exploitative practices.

Next steps of our research include completing a more robust analysis of the interviews and focus groups we have conducted to find patterns and areas of the CPE department culture that can be improved. We will also utilize the post surveys to amend the questions asked in the interviews and focus groups based on the survey answers. This will allow our project to grow and evolve based on participant feedback and continue to reduce any harm and distress our questions may cause. Finally, after amending the questions we plan to start the process again and conduct more interviews and focus groups to collect more information while continuing to reduce participant harm.

### REFERENCES

- [1] "Reimagining Methodologies: Why We Center Marginalized Voices", in press.
- [2] M. Boler and M. Greene, *Feeling power: Emotions and education*. New York, New York: Routledge, 2009
- [3] K. K. Kumashiro, *Troubling education queer activism and anti-oppressive pedagogy*. New York, New York: Routledge, 2002.
- [4] R. Pain, G. Whitman, and D. Milledge, "Participatory Action Research Toolkit: An Introduction to Using PAR as an Approach to Learning, Research and Action," *Toolkits, Guides, and Case Studies*, 2012. [Online]. Available: <https://www.dur.ac.uk/resources/beacon/PARtoolkit.pdf>
- [5] "Design Justice Network Principles," Design Justice Network, Jun-2018. [Online]. Available: <https://designjustice.org/read-the-principles>.
- [6] Riley, "Rigor/US: Building boundaries and disciplining diversity with standards of merit," Taylor & Francis, 01-Dec-2017. [Online]. Available: <https://www.tandfonline.com/doi/abs/10.1080/19378629.2017.1408631?journalCode=test20>.
- [7] M. Ong, "Body Projects of Young Women of Color in Physics: Intersections of Gender, Race, and Science," *Academic.oup.com*, 30-Jul-2014. [Online]. Available: <https://academic.oup.com/socpro/articleabstract/52/4/593/1692803?redirectedFrom=fulltext>
- [8] B. Subramaniam, "Snow Brown and the Seven Detergents: A Metanarrative on Science and the Scientific Method." *Women's Studies Quarterly*, vol. 28, no. 1/2, 2000, pp. 296-304. *JSTOR*, <http://www.jstor.org/stable/40004461>.