Incorporating Feminist Theory and Community Centered Methods in a Study on Gender in Engineering Education: Protocol Design and Preliminary Themes

Andrea Haverkamp, Oregon State University

Andrea Haverkamp is a PhD candidate in Environmental Engineering with a Queer Studies PhD minor at Oregon State University. Her dissertation research explores the support systems and community resiliency of transgender and gender nonconforming undergraduate students in undergraduate engineering education. She holds a B.S. in Chemical Engineering from the University of Kansas and an M.Eng in Environmental Engineering from Oregon State University.

Michelle Kay Bothwell, Oregon State University

Michelle Bothwell is a Professor of Bioengineering at Oregon State University. Her teaching and research bridge ethics, social justice and engineering with the aim of cultivating an inclusive and socially just engineering profession.

Dr. Devlin Montfort, Oregon State University

Dr. Montfort is an Assistant Professor in the School of Chemical, Biological and Environmental Engineering at Oregon State University

Dr. Qwo-Li Driskill,

Qwo-Li Driskill is an Associate Professor and Director of Graduate Studies in Women, Gender, and Sexuality Studies at Oregon State University. They hold a PhD in Rhetoric & Writing from Michigan State University.

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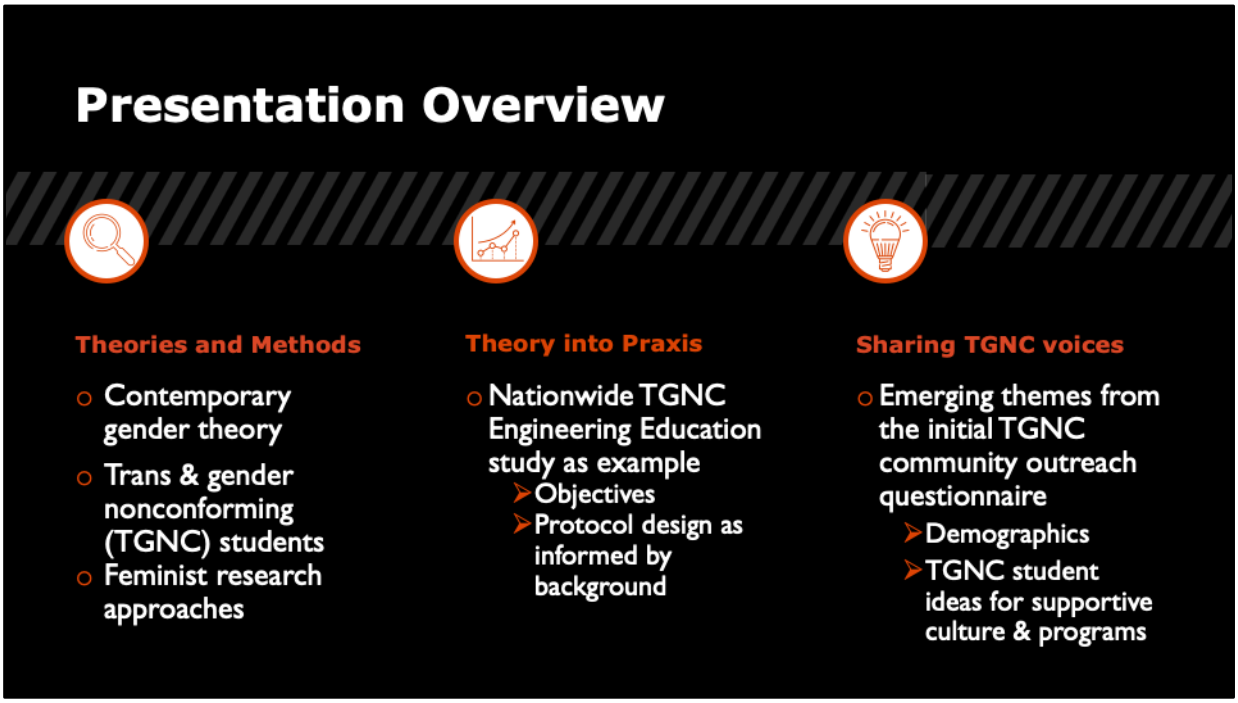
Andrea Haverkamp, PhD Candidate
Environmental Engineering
Michelle Bothwell, Professor
Bioengineering
Qwo-Li Driskill, Assistant Professor
Women, Gender, and Sexuality Studies
Devlin Montfort, Associate Professor
Environmental Engineering



This presentation will discuss gender theory, feminist community centered research methods, and use our nationwide study of TGNC student experiences in engineering education as an example of how these theories and methods can be integrated into engineering education research. This is a brief overview of the presentation.

We wish to be clear that this is not a results centered presentation from a completed study. This is designed to introduce gender theory and feminist research methods to the audience and describe how they can be integrated for a transdisciplinary research approach, using our trans & gender nonconforming (TGNC) resiliency study as an example.

The background will first introduce the audience to conceptualizations of gender informed by contemporary queer theory which defines gender as a fluid and dynamic social system beyond biological binaries. Next, we will introduce feminist research methodologies that place the subject community as the experts on their lived experiences.

Next, we will introduce our study's protocol and design as an example of how these theories and research methods can be integrated into a transdisciplinary engineering

education study on gender.

We end by sharing the most densely coded themes from the 300 national participants in our initial community outreach questionnaire. This final portion provides ideas offered by the undergraduate engineering TGNC population on how to build a more supportive and inclusive environment for their success. We'll by sharing how this process and this portion of the data is informing the future steps of our larger study.

This background section will introduce contemporary gender theory and compelling feminist research methods. I will also note at the beginning of this presentation that all artwork attributions are in the slide deck notes, and all artists are TGNC artists.

Gender in STEM Discourse

- Gender in STEM discourse is said to often rely on a simplistic gender binary
- Reductive framing may re-assert Victorian-era ideas of "natural difference" in ability, further entrenching gender stereotypes [1]
- Frames gender as physical and immutable instead of culturally and socially constructed

The study of gender in engineering continues to be highly relevant due to the persistence of the field's domination by men and masculinity. Mainstream discourse on gender in STEM, however, has been kept in a "black box" for decades according to Allison Phipps [1]. She states that the reliance on a simplistic gender binary unaccompanied by racial, cultural, or sexual identity nuances may be undermining its own political aims of gender equity. One large gap in our existing body of gender research and discourse is how the highly gendered landscape of engineering education is experienced by those who are transgender or gender nonconforming (TGNC).

[1] A. Phipps. (2007). Re-inscibing gender binaries: Deconstructing the dominant discourse around women's equality in science, engineering, and technology, The Sociological Review, vol. 55, no. 4, pp. 768-787, 2007.

Social constructionist framework

- Gender is co-created and replicated daily through countless socio-cultural interactions which create a feedback loop of recognition and validation by others [2,3]
- "A process of storytelling through which one's identity is communicated to others" - Jay Prosser
- No single chromosomal, hormonal, or psychological factor has been found to directly determine gender identity or expression [4]
- Cisgender or gender normative individuals themselves express a multiplicity of gender unmappable to a rigid binary [5]

Gender is presently understood across a multitude of fields as a socially constructed process, system, and structure. Gender is not just a letter on a drivers' license, nor just an internalized "identity." Gender is an ever-changing tapestry over most aspects of life. It is co-created and replicated daily through countless socio-cultural interactions, consisting of a social feedback loop of recognition and validation by others [2,3]. This includes what is expected by others, what is expected of us, how we categorize others' behaviors and bodies, and how these become regulated by norms and institutions in our society. Gender is a shifting phenomenon across era and region, intersecting with race, ethnicity, religion, age, and other identities. This social nature is important to underscore as no single chromosomal, hormonal, or psychological factor has been found to be a direct determinant in one's gender identity or expression. Psychological research finds that humans have conceptualizations and expressions of gender which are fluid and unmappable to fixed biological binary, even for cisgender subjects [4]. Instead, the "human brain mosaic" represents fluidity and multiplicity across all humans [5]. Investigating gender in engineering should reflect this nuanced complexity. Studying gender becomes almost academically dishonest when it is reduced to a binary variable which overlooks the identity of nonbinary genders and nuances for trans individuals.

Jay Prosser notes in S*econd Skin* that “trans embodiment is a process of storytelling through which one’s identity is communicated to others”, and that trans does not necessarily mean “queer/subversive" in relation to a “natural” cis grounding. This is another way to frame what gender is as defined by a trans studies scholar.

[2] Butler, J. (1990). Gender Trouble: Feminism and the Subversion of Identity. Abingdon, UK: Routledge.

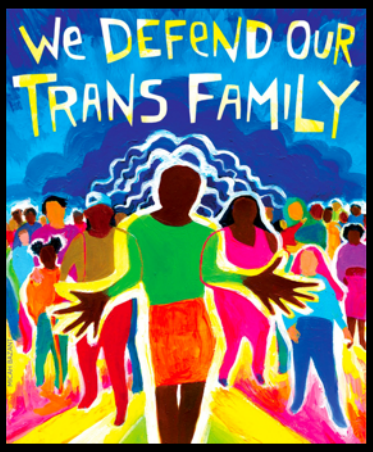
[3] Langer, S.J. (2016). Trans Bodies and the Failure of Mirrors. Studies in Gender and Sexuality, vol. 17(4), pp. 306-316

[4] Joel, D., Tarrasch, R., Berman, Z., Mukamel, M., Ziv, M. (2014). Queering Gender: studying gender on gender-normative individuals, Psychology & Sexuality, vol. 5, no. 4, pp. 291-321.

[5] Joel, D., Berman, Z., Tavor, I., et. al. (2015). Sex beyond the genitalia: The human brain mosaic. PNAS, 112(50), pp. 15468-15473.

Art: Divine Love,' by Fei Hernandez, part of the 'Transgender Day of Resilience Art Project,' at the Episcopal Church of the Redeemer in Morristown.

Social constructionist framework

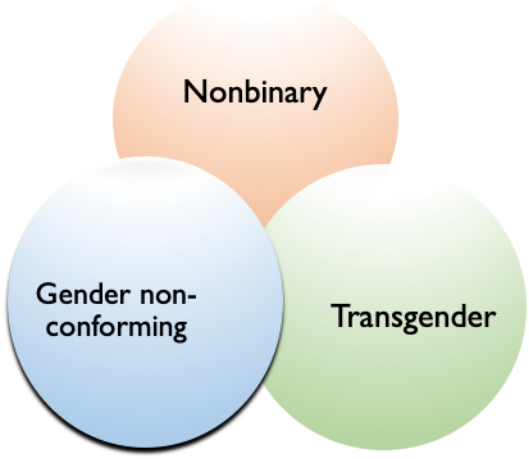


Centering the experiences of transgender and gender nonconforming students made invisible by hegemonic "binary gender" framings may reveal social and cultural dynamics in engineering which have prior remained unknown, and unchallenged by our research community.

Another way to reframe gender in engineering research is by centralizing the experiences and perspectives of those who navigate some of the most rigid aspects of the dominant gender binary every day, which may be transgender and gender nonconforming people.

TGNC terminology

- **TGNC** – Transgender and Gender nonconforming
- Experiences differ from lesbian, gay, bisexual cisgender or gender conforming peers
- Includes a multitude of identifications, overlapping at times, and some identify outside these terms altogether



This is a definition of the TGNC acronym.

TGNC students

- Cultural, economic, and educational marginalization is systematic across society and institutions, including higher ed [6]
- Oppression interlocks with race, citizenship status, (dis)ability, others
- TGNC communities are vibrant with a multitude of support strategies to resist systemic oppressions

TGNC individuals have gender relations to others, themselves, and society that are markedly different than cisgender, binary identified, or gender conforming peers. Transgender and gender nonconforming individuals in the United States live under significant political, cultural, societal, economic, legal, and educational marginalization as described in the 2015 US National Trans Survey [6]. This landmark study found systemic marginalization across nearly every institution including higher education. Additionally, the study found poorer health care access and life outcomes for TGNC people of color and with disabilities. We can reasonably hypothesize that these trends extend into engineering undergraduates' lives. By studying the way that those with experiences of invisibility or marginalization navigate engineering we may uncover fundamental insight into how gender shapes culture and climate.

Art: Art Twink (Long Beach, CA) Poem: "Prayer" by xoài phạm (Brooklyn, NY)

[6] James, S., Herman, J., Rankin, S., Keisling, M., Mottet, L., and Anafi, M. (2016). The Report of the 2015 U.S. Transgender Survey, National Center for Transgender Equality, Washington D.C. Report.

Feminist Research Approaches

- Feminist research recognizes the many ways that oppression and power operate in an individual's life, and seeks equity in the research process for all involved
- Feminist research can be informed by a "queer politic based on analyses of power, rather than fraught sense of shared identity" – Cathy Cohen
- The numerous aspects of an individual's identity is their *complex personhood* [7]
- It is not possible to create a ubiquitous narrative for an identity group due to individual's complex personhood, a limitation of quantitative methods

We are going to shift from discussing gender and TGNC students to discussing feminist research methods and feminist research approaches.

Central to feminist research method literature is that a feminist research approach directly implicates power and oppression in society. Feminist approaches emerged primarily to engage with gender based oppression, but due to the intersections and interlockings of gender with race, ability, and sexuality, feminist research praxis has extended to encompass these many aspects of participants' lives. Cathy Cohen describes that feminist research in a critical queer studies framework as an "analysis of power" rather than focusing on supposed commonalities or universalities in experience. This is what she largely implies by the phrase "fraught sense of shared identity."

Feminist research strives to recognize the complex ways that oppression operates in individual's life. Myself, as the presenter, share (description of identities and experiences of presenter). It is not possible to create a narrative of ubiquitous experiences for women in engineering due to the intersections of sexuality, class, race, and disability for example. The numerous aspects of an individual's identity is what Avery Gordon calls "complex personhood" [7]. There may be dominant

commonalities of shared experience, but we we will not be able to find a uniform and essentialized trans experience just as there is no uniform and essentialized experience of any identity.

[7] Guishard, M. (2009). “The false paths, the endless labors, the turns now this way and now that”: Participatory action research, mutual vulnerability, and the politics of inquiry.
Urban Review, 41(1), 85–105.

Art – Micah Bazant

Feminist Standpoint and Positionality

- Researcher as subjective lens
  - We carry implicit bias and hold differences in identity / experience
- Implement *reflexivity* – iterative cycle of self-analysis and change [8]
- Communities being researched are foremost experts on their lives [9]
- Bringing community into the research process shifts project away from researcher assumptions and towards community understanding

Feminist research approaches challenge positivist notions of scientific objectivity when investigating identity, power, and affective experiences of belonging, safety, and success. Feminist standpoint theory understands that our perceptions and interpretations are subjective and shaped by our own life experiences and identity. This implicates the researcher as a subjective instrument and limited interpreter of data. All humans carry implicit bias, including the researcher. The positionality of the researcher's identity, class, and role in the academy can be acknowledged and reflected upon throughout the research process to help mitigate implicit biases and better analyze experiences different than their own. This forms "reflexivity" in the research process, an iterative cycle of self-analysis and change in the research protocol as the research phases move forward [8]. Feminist standpoint theory has been applied in prior engineering education research to demonstrate that the experiences to be studied are best understood by the participants themselves [9]. Standpoint theory places the research participant as the subject matter expert on their own lives. For reflexive research that recognizes the subjective researchers' positionality, feminist researchers often bring the research participant to the research table.

[8] Borrego, M., Douglas, E., Amelink, C. (2009). Quantitative, Qualitative, and Mixed Research Methods in Engineering Education. Journal of Engineering Education, 98(1), 53-66.

[9] A. Pawley, A. (2013). Learning from small numbers" of underrepresented students' stories: Discussing a method to learn about institutional structure through narrative," 120th American Society for Engineering Education Annual Conference & Exposition, Paper ID# 6639..

Community Collaborative Methods

- Community collaborative research involves the subject community at each step of the process [10]
  - Designing project aims and scope
  - Community identified needs
  - Data analysis and final products
- Research Justice movement advocates for distributing agency in the research process to participants, and for equitable and mutual benefits [11]
  - Fair and just compensation
  - Place at the table when their community is being discussed or dissected by others

As mentioned, giving the subject community a role in the research process is a way to address any implicit bias or misunderstandings a researcher may have about a community that is not their own. Community collaborative research methods are a compelling way to create feminist research which reduces inequity in the research process.

Involving the research subjects as part of the research team has been demonstrated to be effective in gender research in higher education by Z Nicolazzo in their research with undergraduate trans-identified students [10]. Their research closely partnered the researcher alongside TGNC students at a university for over a year, letting students meet regularly with them to tell their stories. It has been applied globally to create research that is “by and for” the subject community. These methods involve the subject community as much as possible at every phase of the research, from data collection to collaborative analysis to informing mutually beneficial end products.

Research Justice as an academic activist movement is growing in the feminist research community. It seeks to ensure that participants are able to review and obtain data about themselves, receive fair and just compensation for their time and effort throughout the research, gain legitimacy as credible producers of results, and

are given collective control over how their data is presented. The goal one where research moves away from the “transactional” model of unidirectional flow of data from a marginalized group, towards a more conversational and equitable model.

[10] Nicolazzo, Z. (2017). Trans* in College: Transgender Students’ Strategies for Navigating Campus Life and the Institutional Politics of Inclusion. Sterling, VA: Stylus Publishing.

[11] Jolivette, A. (2015). *Research Justice: Methodologies for Social Change*. Policy Press, University of Bristol.

Image: Sylvia Rivera and Marsha P Johnson marching

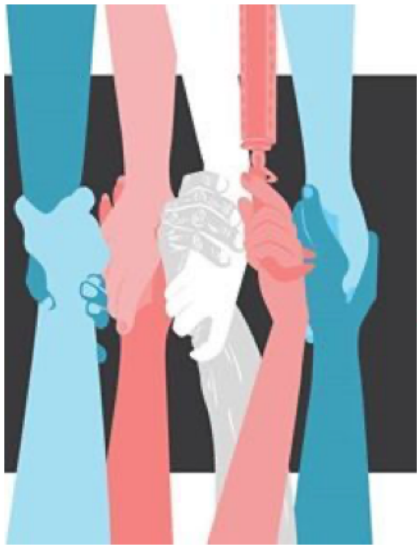
Resiliency Framework

- **Deficiency / damage centered**

  frames an underrepresented or marginalized community in terms of *needing assistance, needing help*, or focusing on their *trauma* or *discrimination*, or *burdens to be accommodated* [12]

- **Resiliency / desire centered**

  highlights the community's *success, strengths, aspirations, unique skills* as well as group *belonging, affirmation, goals*, and *support*

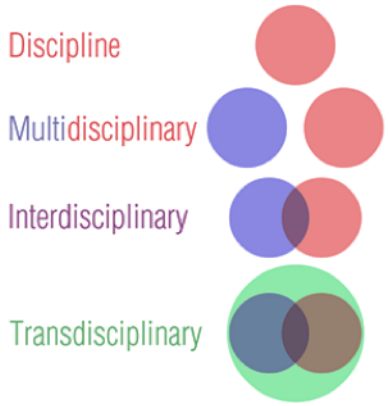


Resiliency framing can be used in study design as opposed to the more mainstream deficit model. Deficit framing of underrepresented groups explore, ask about, and identify negative experiences or supposed shortcomings of subordinated groups. Eve Tuck calls this trend "Damage Centered Research" which results in further defining historically marginalized groups by hurt and pain, not by their desires or accomplishments [12]. A resiliency framework seeks to investigate strategies of support, success, and daily acts of navigating campus life. The central premise is that when you know what helps students succeed and navigate towards success you can institutionally and culturally center and strengthen those programs or structures.

[12] Tuck, E. (2009). Suspending Damage: A Letter to Communities. Harvard Educational Review, vol. 79(3), pp. 409-427.

Transdisciplinary Approach

- To study gender and incorporate contemporary theory, we may need to **bring together** and synthesize gender studies, queer theory, feminist research, social justice, engineering education
- Seek to ***trans*cend, *trans*gress, *trans*form** boundaries
- PIs from across STEM and Humanities (e.g. gender studies, queer studies)



Finally, transdisciplinarity is used in many feminist research approaches. This is used within feminist research in fields outside of the humanities to integrate, synthesize, and re-frame research across disciplines. It differs from interdisciplinary frameworks in that it does not assert that disciplinary boundaries should be reified as an a priori assumption. Transdisciplinary research aims to exist outside of disciplinary boundaries to become a unique and holistic endeavor. This can be an end result where the afore mentioned theory and methodologies become entwined with gender in engineering research to form a new research paradigm all together. This may require recruitment and partnership with PIs from fields such as gender studies and queer studies who primarily theorize and research gender.

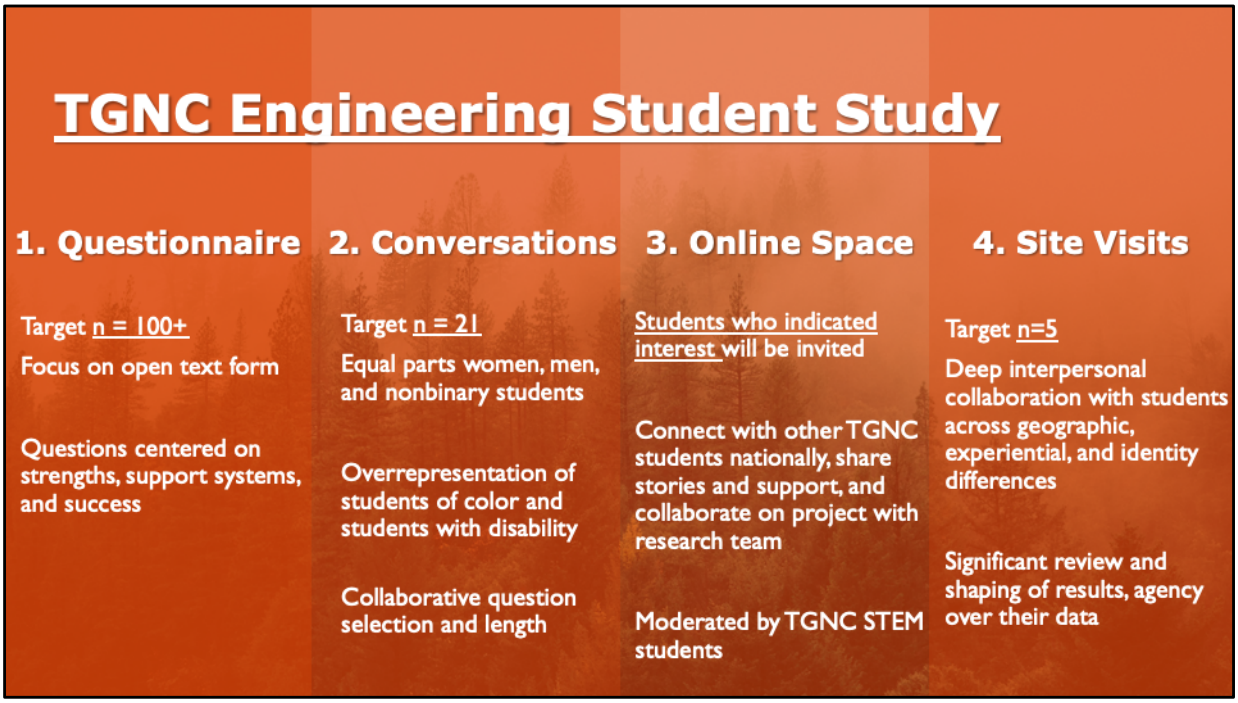

Theory into
Praxis

We will use our current NSF supported study as an example of how feminist theory and methods can be integrated into engineering education to form a transdisciplinary study. Our study design is informed by contemporary gender theory, queer theory, feminist theories of knowing, community-centered research design, and resiliency frameworks.

Art: Raphael Perez

Our research project, "Invisible Gender Experiences: Transgender and Gender Nonconforming Experiences in Engineering Education" contains three key objectives. The first is to infuse queer studies and feminist research methodologies into engineering education research practice which this presentation will cover. The second is to record, examine, and share the wide range of experiences from TGNC engineering students to our research community. Lastly, we seek to collaborate with the student community to inform the research products.

Art: Edxie Betts (Los Angeles, CA Poem: "The Limits of Language" by Benji Hart (Chicago, IL)



We will review each part of the research design and discuss how the theories and methods discussed in this presentation have been integrated. At the onset, we have had TGNC individuals involved in the writing of the NSF proposal, crafting of initial research goals and objectives, design of the study instruments, and analysis of the data. This helped to position our ”standpoint” more in line with the TGNC community, instead of relying upon cisgender assumptions.

The phases are designed to start with large sample size (n>100), which provides limited depth of information, with subsequent phases “zooming in” with smaller sample sizes such as n=21 interviews and n=5 ethnographic site visits. The latter phases allow for a richer collaboration with TGNC students. The latter phases provide opportunity to record detailed experiences and understandings of complex personhood, and to problematize the ability to create a universal narrative. We hope to capture a broad range of diverse experiences and perspectives and to reflect this diversity in the study outcomes while also sharing common themes.

The first phase is an initial outreach questionnaire that contained open box responses to a series of questions regarding support, skill, success, and resiliency. This instrument was co-created with undergraduate TGNC students at our institution. We

placed the greatest importance on answers to the open box questions combined with inquiries into multiple identities to recognize complex personhood, center individual narratives, and offer self identification of gender, race, and disability. Allowing for self identification through an open text box was the most inclusive way to ask for gender. Our initial outreach questionnaire contained 7 open ended questions along with 15 likert scale questions which were all framed from a standpoint of resiliency, support, and success. We distributed the outreach questionnaire nationally to department chairs and deans at ABET-accredited engineering programs and engineering LGBTQ organizations. We aimed for over 100 responses to give us a diverse picture which is not possible at a single institutional study.

The themes that emerged from the outreach questionnaire informed the design of the follow-up personal interview schedules, which is a part of a feminist reflexive research approach. We did not believe that feminist praxis in this protocol design would allow for pre-supposing questions to ask. We used themes present in the questionnaire, as well as further TGNC student input, to help form the ”conversation schedule”. A subset of students who responded to the questionnaire were interviewed with demographics providing an “overrepresentation” of students of color and students with disabilities to counter higher education researchers’ tendency to focus on narratives from white able-bodied students. Alongside these demographics the interviewees were selected such that 1/3 were men, 1/3 were women, and 1/3 were not on the binary. This will give unique insight into complex personhood in TGNC experiences. The interview questions were sent to be reviewed and assessed by the participants beforehand. Participant review of the questions gives them the ability to think and reflect on the questions beforehand – transferring agency to the participant and increasing their control in the research process. The participants were also given the choice of how long the interview continued and were able to select additional questions. The interviews were a minimum of 60 minutes and could be continued up to 120 minutes, with most participants choosing 120 minutes. We feel it is important to move away from the “clinical” model of asking participants surprise questions and instead allow for to reflect and prepare a response. This approach increased collaboration and subject agency while minimizing the totality of control that researchers often carry.

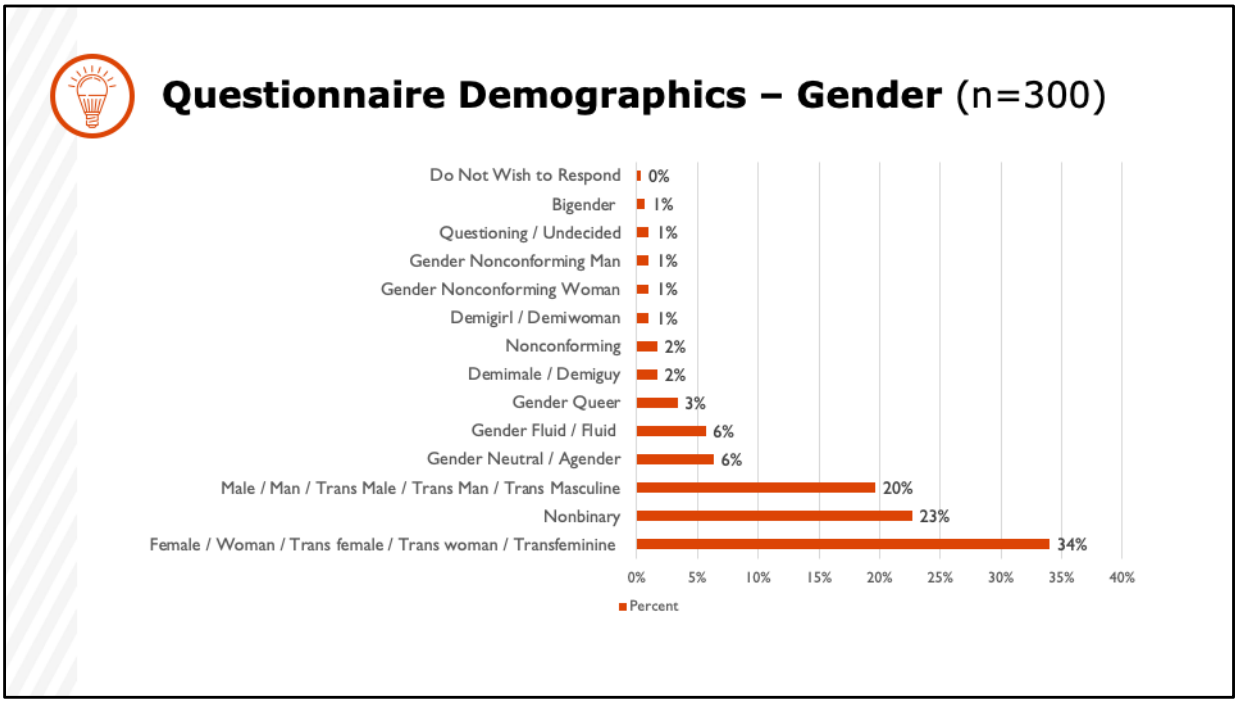
Finally, there will be a site visit phase for recording ethnographic data and deep interpersonal collaboration on identifying the support structures encountered by and resiliency tactics engaged by TGNC undergraduates. We aim to work together with each student selected for site visitation for four days to observe and discuss their experiences in engineering and obtain deep, rich, and useful information on what support structures best foster their success. We will offer article co-authorship to students who express interest in this deep level of collaboration. Students will be able to control the activities that they partake with the researcher, provide the researcher

a holistic view of TGNC student life and support systems, and substantially shape the research outcome from this phase.

Alongside the site visits will be an online community where students can discuss topics of their choice, as well as review emerging products from this research project. The online community will be a place for us to “crowd source” our research collaboration with TGNC engineering undergraduate student participants. There is a potential for dozens of students to be able to help shape the narrative and ensure validity in relaying thoughts, suggestions, and experiences. The function of this online community will be driven by student participation and ownership of the space. We believe this crowd sourcing of data analysis and feedback gives the community a significant role in the research process. There were over 180 students who indicated interest in this phase who will be invited.

We are currently completed with data collection for phases 1 and 2, and are beginning to analyze the transcribed conversations.


Sharing TGNC
Voices



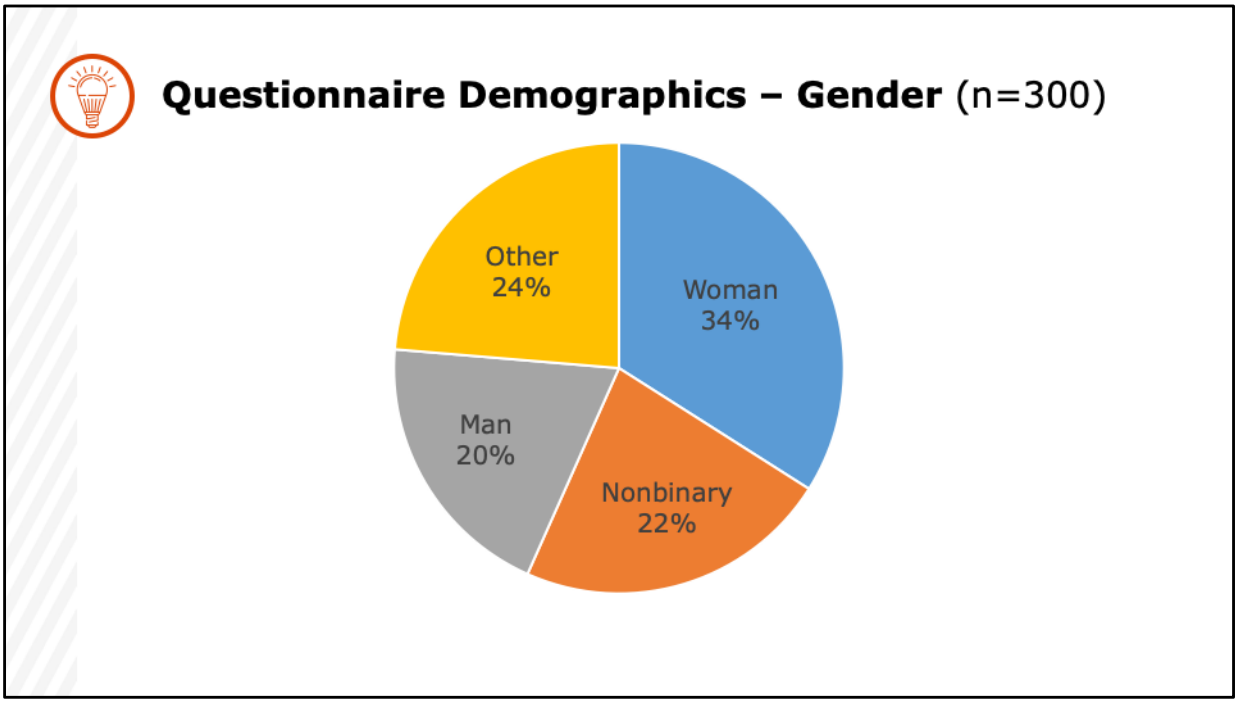
Before digging into the themes from the question prompt, we want to share some demographics of "who showed up" and the various personhoods and identities present. Showing overall demographics frames the data – who it represents, who is not represented, and give a glimpse at the respondents we are drawing from.

After cleaning the data for incomplete or erroneous responses there were 300 responses. These 300 respondents have genders that range from man, woman, trans man, trans woman, demi-girl, demi-boy, agender, nonbinary, genderqueer, genderfluid and a few that were still questioning or cisgender and gender nonconforming. The responses came from across the US, and respondents were diverse in terms of race, ethnicity and disability status.

These gender demographics are important to show, as it helps to position who the 300 students are. It shows the level of balance in the data between different genders, and demonstrates the great diversity of our transgender and gender nonconforming undergraduate engineering student population. These 14 categories are how we grouped the genders in the questionnaire for demographic reasons. There is a tension in data for TGNC community to present the information in several ways – one is authentic and true to the words of the participant. The other is to create a more

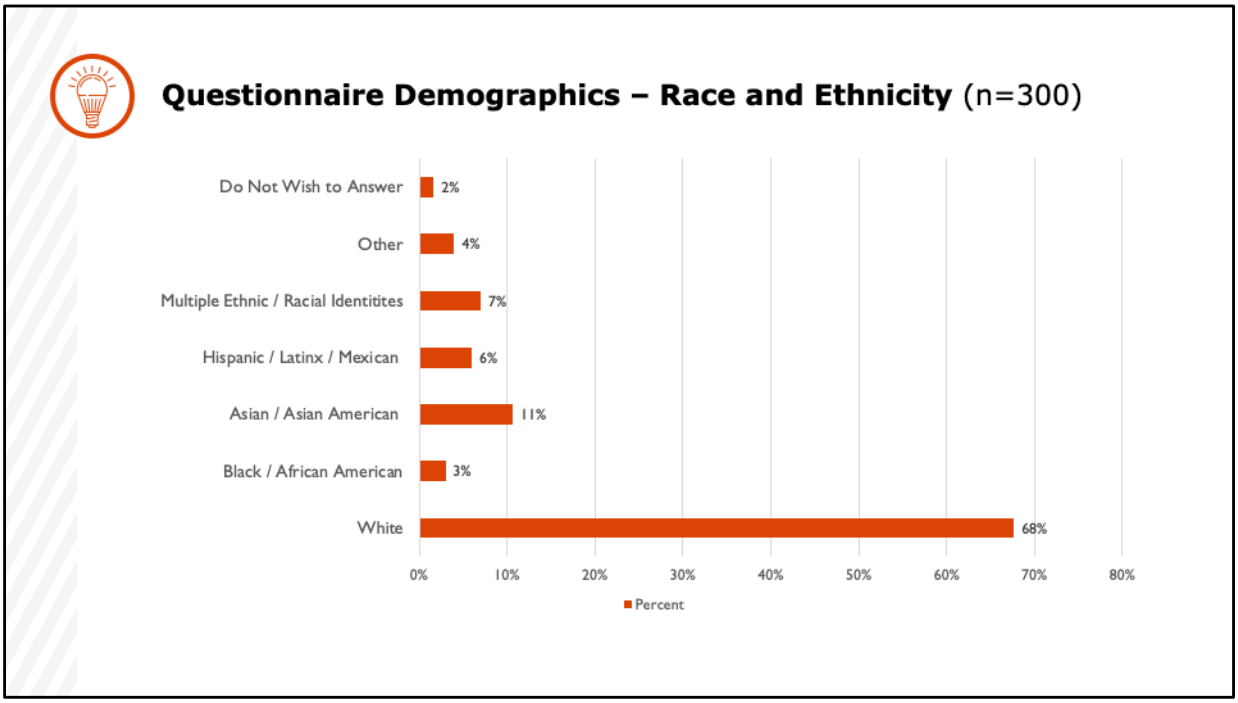
reduced number of categories for analysis. For example, the US National Trans Survey 2015 referenced earlier had over 300+ gender categories for their 30,000+ participants [6]

[6] James, S., Herman, J., Rankin, S., Keisling, M., Mottet, L., and Anafi, M. (2016). The Report of the 2015 U.S. Transgender Survey, National Center for Transgender Equality, Washington D.C. Report.

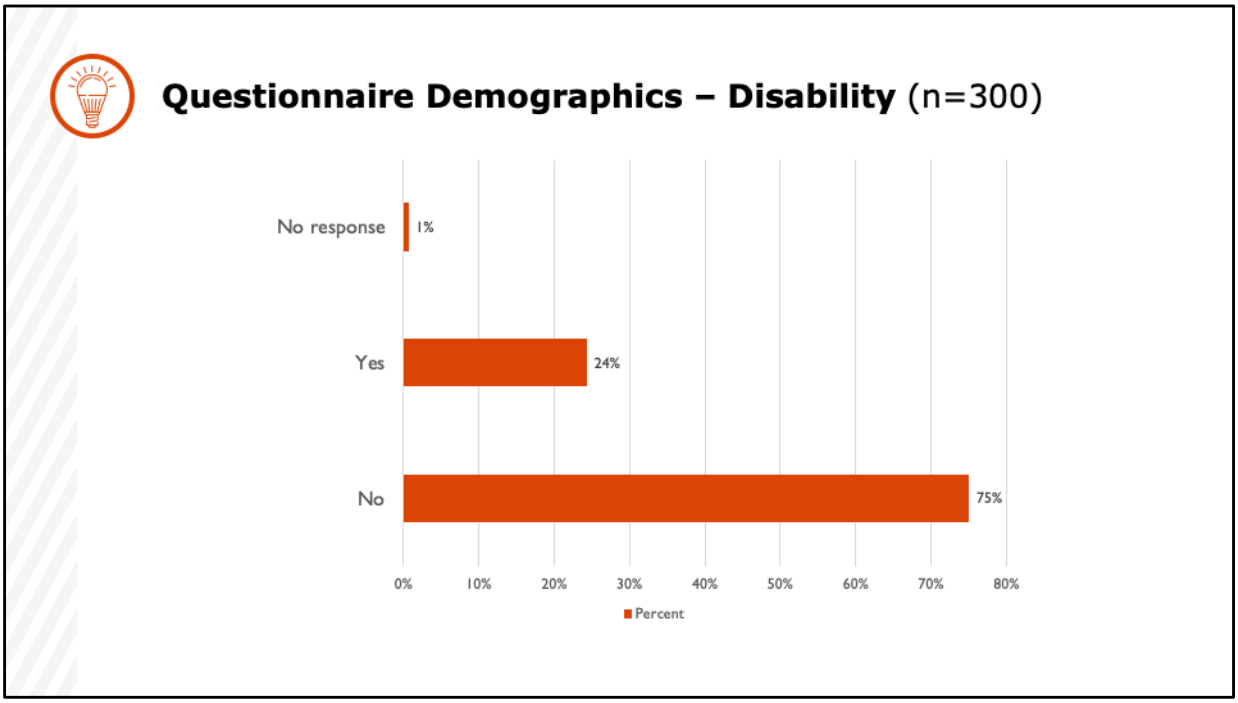


These gender demographics can sometimes be shown in a pie chart with categories which are reduced to four or three categories. This chart might communicate gender demographics with additional clarity for some.

Binary identified students (i.e. man or woman identified in some way) made up just over half of the responses (54%), with nonbinary and other genders shown earlier comprising 46% of our student respondents.

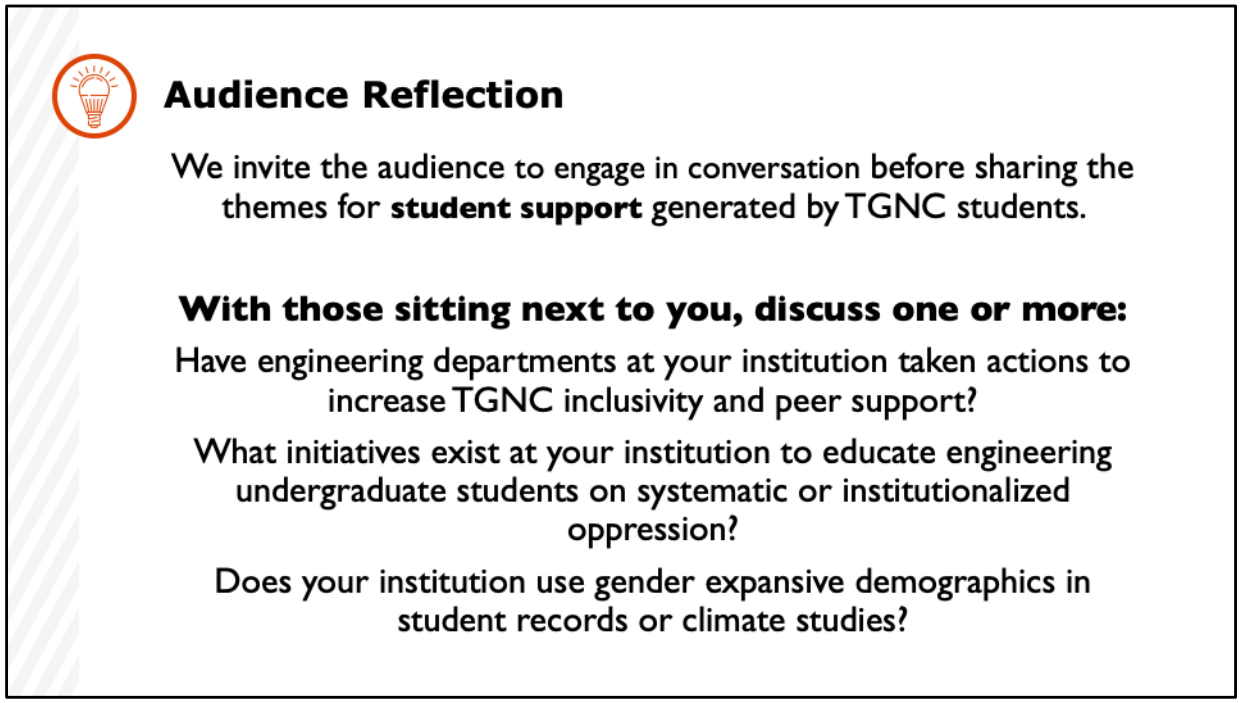


Engineering or other higher education programs can often be overrepresented by white students at many institutions nationally. This slide may represent that this racial disparity exists within TGNC undergraduate engineering students as well. Or, it might also relate to 'study fatigue' that occurs from constant studies and outreach programs spotlighting both students of color and trans students. Regardless, this chart displays "who showed up" in this study across racial lines. 68% were white. The "Other" category has a plethora of identities, such as distinct identifications such as Tunisian or Jewish. There were no Native American participants, which may be reflective of an ongoing inequity in higher education as it relates to legacies of colonization.

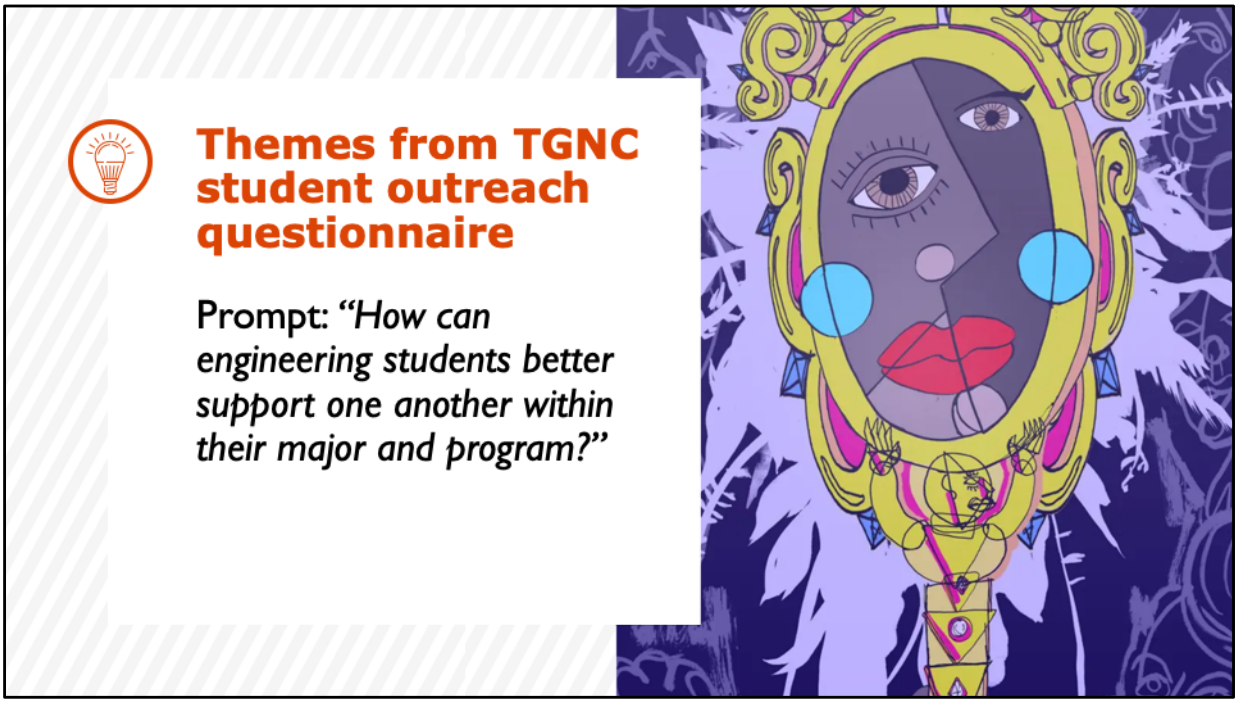


The questionnaire also was able to obtain a large number of students with a diversity of dis/ability status. The participants in the study represent disability status demographics roughly similar to 2017 statistics by the National Center for Education Statistics, which for most groups hovers at around 20%.

https://nces.ed.gov/fastfacts/display.asp?id=60



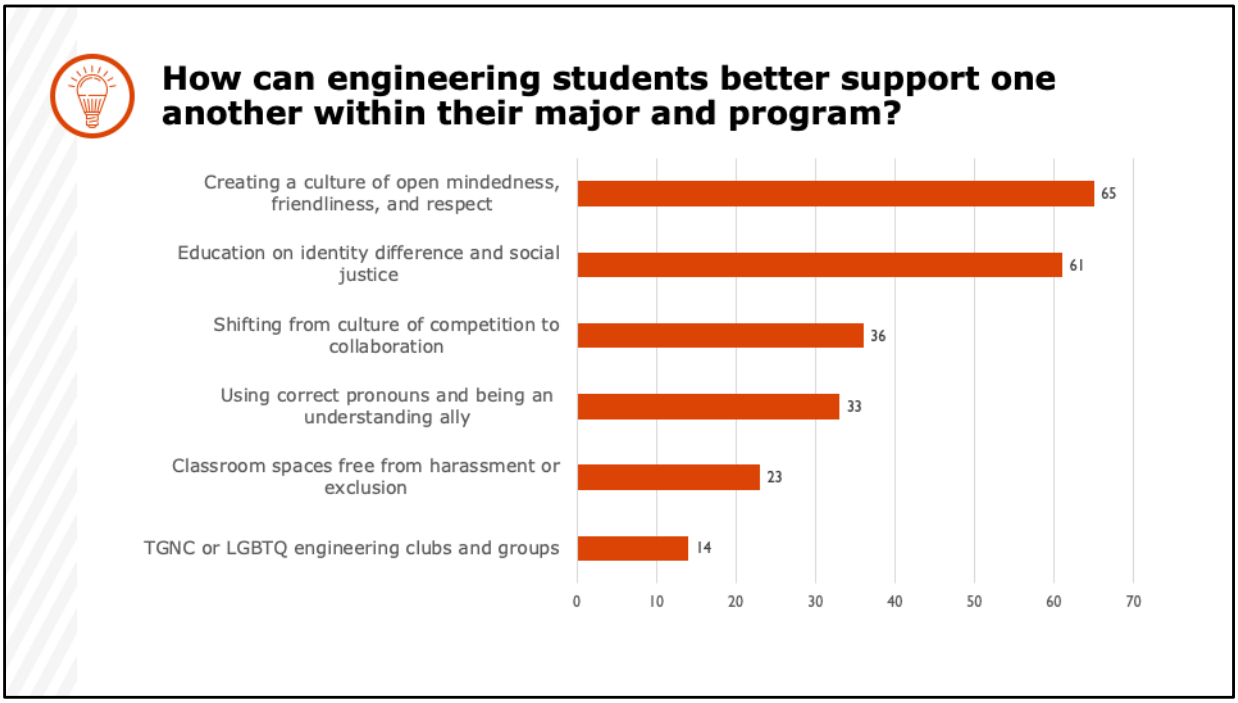
Now might be a good time to take a break in the presentation and to have conversation. We'd like you to discuss the following questions amongst yourselves or reflect individually. After about 5 minutes, we will come together and hear what you have shared with one another. This is to help us all get a baseline understanding for where we are in engineering education in understanding and implementing support structures for transgender and gender nonconforming students.



While the outreach questionnaire covered several topics, for this presentation we will focus on one prompt from the outreach questionnaire: "how can engineering students better support one another within their major and their program?" We felt that this would be the most useful theme to communicate to the CoNECD audience. The responses are rich with ideas as these students best know how their own experiences can be improved and how engineering undergraduate student culture can be more inclusive for them. The suggestions, which arose from the TGNC community, are a critical early glimpse into the ways researchers and educators can improve our programs.

Because of the long-term multi-phase nature of this project, we did not want to wait until the end of the multi-year project to share what TGNC students are communicating through the collaborative research process.

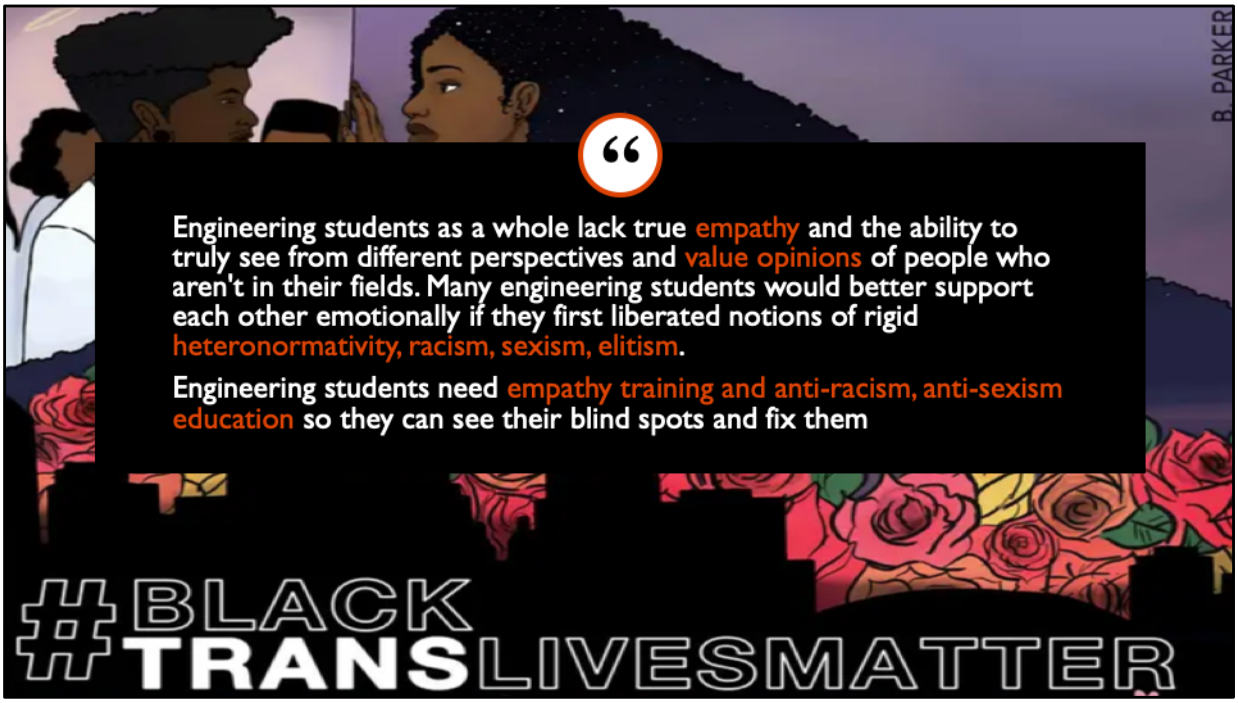
Art: Ebin Lee



The following are the most dense codes assigned to responses for the question "how can engineering students better support one another within their major and program?" The theme with the highest density was creating a culture of open mindedness, friendliness, and respect. This seemed fundamental to their understanding of peer support as TGNC students. Education on identities – gender, race, disability – and how they relate to social justice was mentioned nearly as often. These responses stressed that this is needed in engineering education. Another cultural shift mentioned was moving from a paradigm of competition between students and towards collaboration. Pronouns and understanding trans identity were further down the list, as were TGNC or LGBTQ engineering clubs or groups.

Other responses not shown are codes for responses which simply detailed that they have had only negative experiences (39), communicate a need for mental health support, share that family and friends outside engineering are their only support, or display a need for study groups which are inclusive (outside of classroom spaces)

We will share a few quotes which relate to these themes – we will state how they were coded. This is to demonstrate the type of responses which exist and to share TGNC engineering student insight to this audience.



The next few slides will show a few example responses that relate to these themes out of the 301 responses we collected. The emphasis was added for this presentation.

This response was coded for the two most common codes - “creating a culture of open-mindedness” and “education”.

This is a quote from a student on their perceptions and how they have understood their experience in engineering education. This is a powerful example of how a long form text box for underrepresented students which asks for their knowledge can provide deep engagement from the participant. Information in this response could not easily be obtained through numerical survey methods. It noted a need for empathy and open mindedness and respect, and also noted that they felt it was linked to social justice education.

Similarly, in line with the background gender theories outlined prior, this response notes the connectedness of many identities with gender.

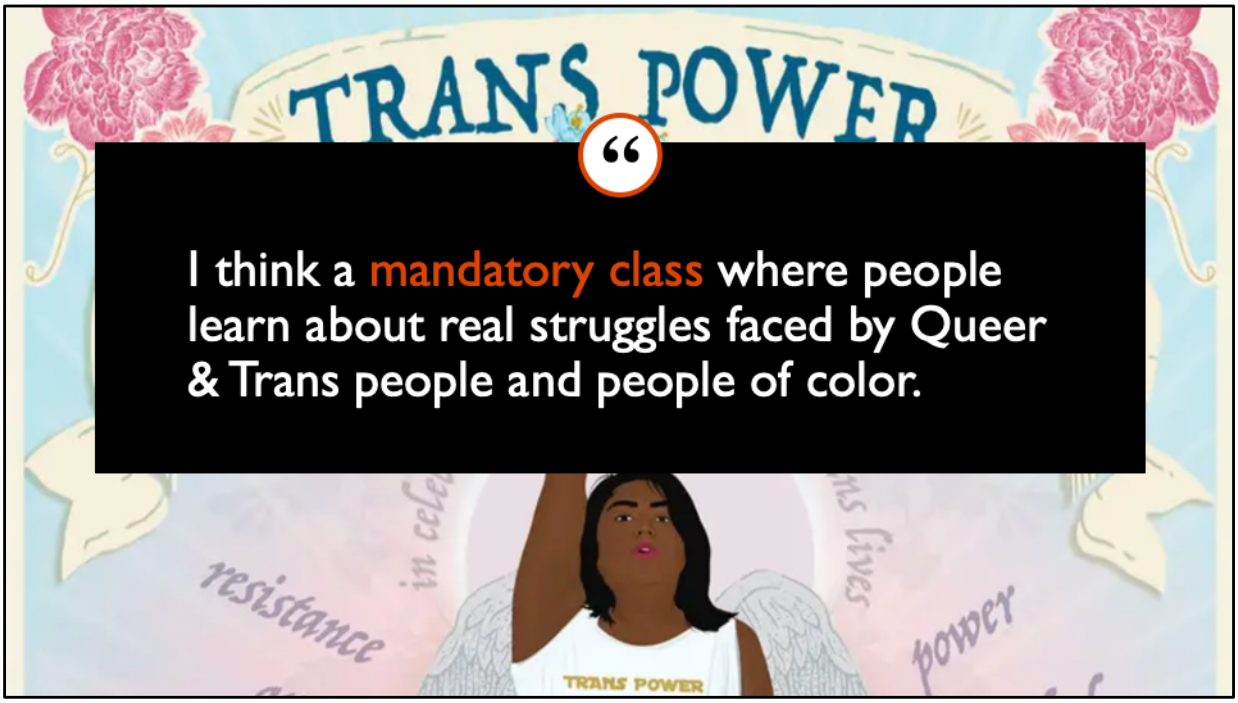
B. Parker for BreakOUT! of New Orleans, LA

We would like to share a few responses from the most prevalent theme in the responses – “creating a culture of friendliness, open mindedness, and respect.”

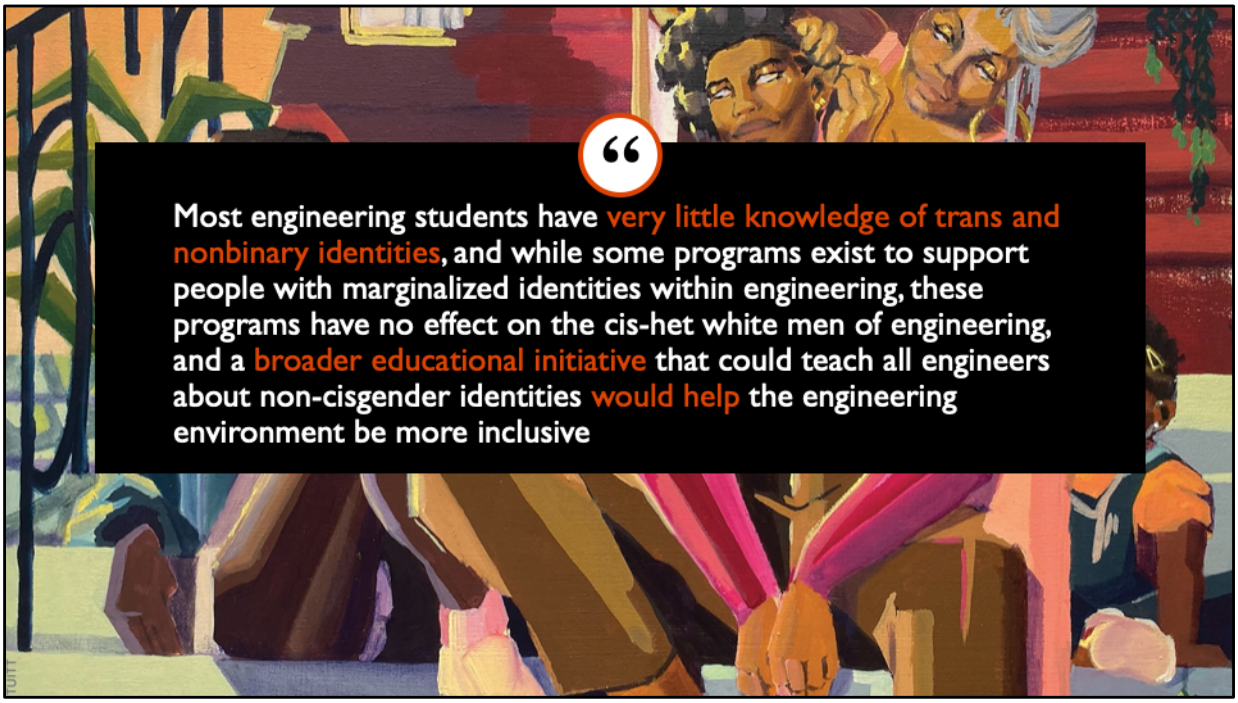
Everyday Heroes by Shea Coco

This response is another example of the “culture of open-mindedness, friendliness, and respect” theme.

Art: Raphael Perez
https://www.artdoxa.com/raphaelperez/large?page=5



This is an example of a response which was coded for the 2nd most common theme, “education on identity difference and social justice.”
Rommy Torrico for TransLatina Coalition

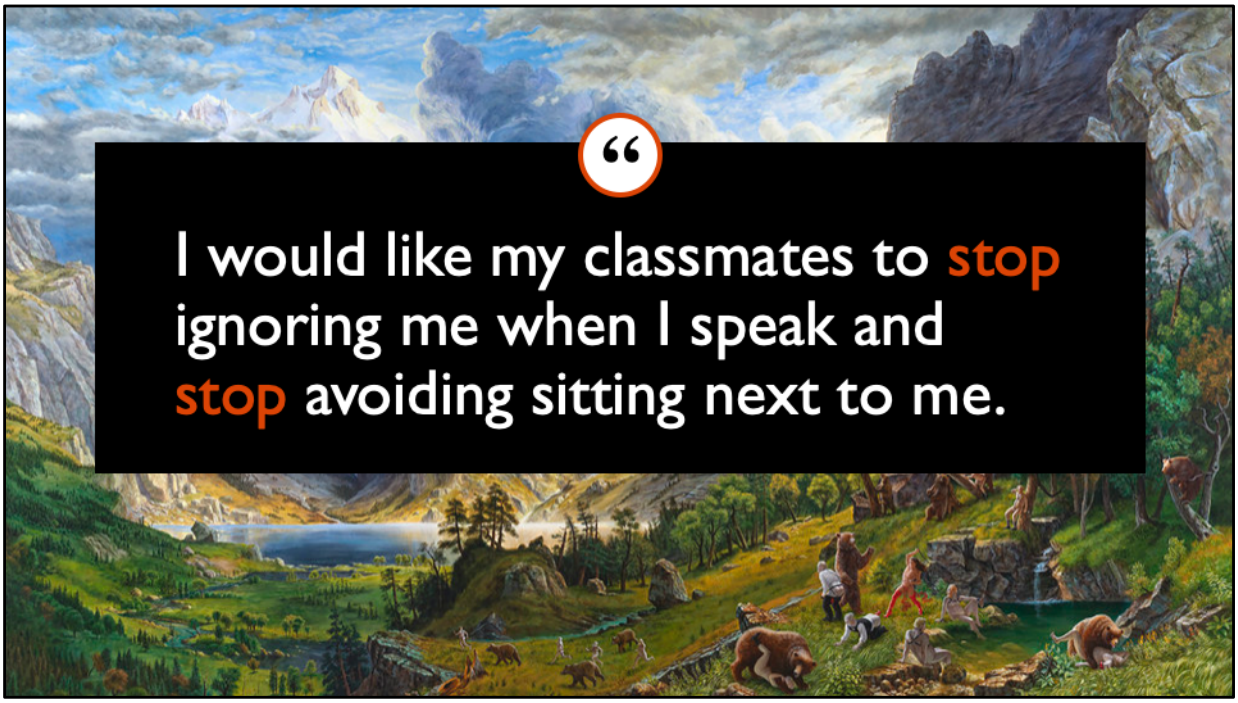


A close second for the most prevalent code was a “direct call for education” to foster a more supportive environment. These answers specifically mentioned a need to advance knowledge.

We Have Never Asked For Permission by Glori Tuitt

33 students listed “pronouns and understanding TGNC identity” in some way – such as this student response. This is an example of responses which fit that code. This was the 4th most common out of the 6 that were described earlier.

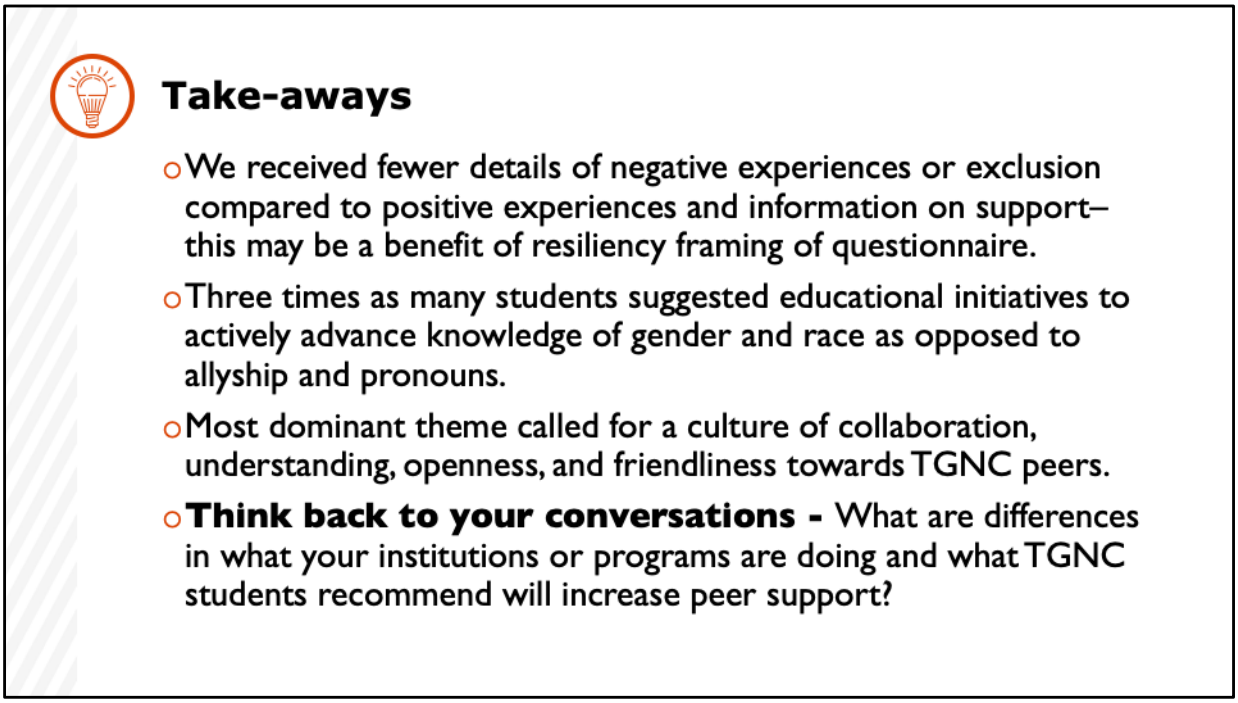
B. Parker for BreakOUT! of New Orleans, LA



This is an example of a response which was coded within the theme of creating “classroom spaces free from harassment or exclusion” – students in this theme noted that they felt left out, or verbally insulted by peers, and wished for this to end.

Below this was the 6th most common theme, which was the promotion of LGBTQ+ or TGNC related clubs in their engineering program.

Art: The Bears of Confederation, Kent Monkman
2016
https://www.kentmonkman.com/painting/2017/1/9/the-bears-of-confederation



To reiterate and summarize - The most prevalent themes were cultivating friendliness, respect, open-mindedness, replacing competition with collaboration, and developing healthy interpersonal communication. Many noted that engineers were not equipped with education or a culture that fostered awareness of trans identities or LGBTQ issues, corresponding to response themes for educators to create social awareness through education, to create safer and more inclusive physical spaces, and to have their peers educated on pronouns and trans identities. A number of responses described negative experiences or a sense that engineering and computer science undergraduate student culture needs a dramatic change. Respondents frequently noted that they had to argue the validity of trans peoples' existence or heard "jokes" which diminished LGBTQ+ people. The students' other identities such as disability and race were mentioned alongside gender as they wrote about experiences of ableism, classism, and racism. Several students wrote that they wished their peers would perform bystander intervention when misgendering and discrimination was occurring. A few went further to specifically describe a culture of toxic masculinity which hurt all gender minorities.

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Queer & Trans Artists

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