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A narrative study of food insecure students in engineering and computing

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A narrative study of food insecure students in engineering and computing

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Advancing Student Pathways through Inequality Research in Engineering

RowanUniversity
DEPARTMENT OF EXPERIENTIAL ENGINEERING EDUCATION

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Hunger is a serious issue among college students.

- ~24-30% of college students experience some level of food insecurity (Hope Center, 2020; Sackey et al., 2021; Birmingham, 2019).
- A majority of food insecure college students are female and non-White (Sackey et al., 2021; Birmingham, 2019).

Hunger is a serious issue amongst college students. The Hope Center and others find that approximately 24-30% of college students experience some level of food insecurity. Of those students, researchers have found that a majority are female and or non-White.

There is evidence of greater food insecurity in engineering.

- Our institution's rate of food insecurity was found to be ~70% in engineering in comparison to the rest of campus (~50%).
- Graduate students are more severely impacted (Ibarra, 2023).
- More time is required of engineering students.
- Engineering has a culture of not asking for help (Birmingham, 2019).

This presentation discusses work at our university. Recent efforts found that our institution's food insecurity rate was nearly 50%. Further, an evaluation of our campus found that engineering student food insecurity rate was nearly 70%. A graduate students' analysis found that graduate students were more severely impacted.

We know that engineering students spend more time on their studies and that engineering has a culture of not asking for help. Thus, we wanted to see how engineering students experiences played out when it comes to food insecurity. Specifically, we wondered why the rate for engineering students was higher than for the rest of campus.

We sought to explore narratives of food insecure amongst students at a mid-Atlantic institution.

- All students who use our food pantry or who identify as food insecure were invited to participate in a 60-120 minute narrative interview.
- Narrative interviews use an open protocol that ask participants to tell the researcher about a specific experience (Kellam et al., 2015).
- We provided participants a $50 gift card for their time plus $25 in member-checking incentives to check their transcripts and stories.

As part of a larger study, we sought to explore the narratives of food insecurity amongst students at our institution. We invited students who identified as “food insecure” and/or who used our campus food pantry to participate in a 60-120 minute narrative interview . Students were asked to tell us about their experiences with food insecurity including how it impacted their time at the institution. In return for their time, we provided students a $50 electronic gift card. Further, to further equity, we engaged students in member-checking opportunities that they were paid for as well.

This project is part of a larger project understanding and addressing food insecurity on one college campus.

- Grant:
  - Goal 1: Narrate the stories of food inequity on campus.
  - Goal 2: Identify issues that the campus can directly impact to make change.
  - Goal 3: Engage engineering students in engineering design projects to:
    - Project 1: Develop a check-in and check-out station for the campus food pantry.
    - Project 2: Develop an inventory system for the campus food pantry.
    - Project 3: Teach engineering students about narrative inequiry.

As I mentioned, this project was part of a larger grant initiative understanding and addressing food insecurity on our campus. Our grant had several goals:

- Goal 1: Narrate the stories of food inequity on campus.
- Goal 2: Identify issues that the campus can directly impact to make change.
- Goal 3: Engage engineering students in engineering design projects to:
  - Project 1: Develop a check-in and check-out station for the campus food pantry.
  - Project 2: Develop an inventory system for the campus food pantry.
  - Project 3: Teach engineering students about narrative inequiry.

This presentation explores the experiences of *n*=10 engineering (ENG) and computing (CS/IT) students specifically.

Name	Degree	Level	Gender	Race	International	Disability	Other
Alex	ENG	Doctoral	Male	Southeast Asian	Yes		
Anu	IT	Masters	Female	Southeast Asian	Yes		
Atara	CS	Masters	Female	Southeast Asian	Yes		
Damon	ENG	Doctoral	Male	Middle Eastern	Yes		
Gary	ENG	Masters	Male	White	No	Autism	
Karma	ENG	Doctoral	Female	White	No	Diabetes	
Kelsey	ENG	Doctoral	Female	Middle Eastern	Yes		
Mike	ENG	Doctoral	Male	Latin*	Yes		
Summer	ENG	Doctoral	Female	Latin*	Yes		Mother
Tricia	ENG	Undergraduate	Female	White	Yes	Autism	

We were surprised to find that many of the students we interviewed were engineering or computing – not something we planned. A subset of 10 fit this category and are the focus of our presentation. As you can see, we have 10 participants, mostly in engineering, mostly doctoral or masters. They identify across a number of gendered and racialized groups. Two also identified as having Autism and a single participant identified as having diabetes. Finally, one participant, Summer, identified as a mother of a small child.

Eligible students engaged in 60-120 minute narrative interviews to tell their stories.

- Prompt:
  - "Tell me the story of how your experiences with food insecurity have impacted your time at [this] University."
- We asked follow-up questions to develop a complete account of participant's stories.

As I mentioned, students engaged in 60-120 minute interviews. Students were asked to tell the story of how their experiences with food insecurity impacted their time at our university. We then followed up with questions and prompts of sorts to develop a more complete account of participants stories.

First-person, low-authorial distance, narrative inquiry was used to restory students accounts of their hunger.

- We sought to develop stories that focused on the participant from their point of view, leaving the researcher out.
- Interview audio was transcribed professionally via Rev.
- Stories were constructed by *n*=8 undergraduate researchers who were trained in narrative inquiry over a year.
- Finalized transcripts and stories were cross-checked by other members and the PI, and approved by participants.

To develop our narratives, we used first-person, low-authorial distance, narrative inquiry. We sought to develop stories that helped leave the researcher out and focus on the student.

Interview audio was transcribed professionally via Rev.

Stories were constructed by n=8 undergraduate researchers who were trained in narrative inquiry over the year.

Students checked each other's work and the PI approved the final narratives.

We used Thematic Analysis to conduct an Analysis of Narratives.

- Narrative Inquiry focuses on one story while Analysis of Narratives finds themes across multiple stories (Polkinghorne, 1992).
- Two undergraduate researchers coded each narrative and the team discussed the results as a whole.

Finally, we used thematic analysis to find themes across multiple stories. This was done by two summer interns and the team discussed the results as a whole in weekly meetings.

The time required to shop and cook is immense.

> "But I would say the most important factor in my eating habits is my time. So, uh, I used to work three jobs before I came here to get my PhD, and back then I didn't really cook, but I managed my schedule in a way that I did all three jobs. I had two full jobs and one part-time job, so I scheduled my day in a way that first I do this one, then I do that, then I do this, then I do that. And in that schedule I never had an opening for making food. So, uh, and then I came here, now I want to have the same type of schedule. But if I made my schedule like that, I would also have to plan it, "okay, now you make food," somewhere in there, which is a bit hard. Because I would have to stay at home to make food instead of going to my lab to work there, so there's so many compromises. I would have to think, "Okay, if I do this, I have to stay here for a little bit longer." That means like my other plan for my shift, it is like one hour to 30 minutes longer. And if I eat, do I then feel too lazy or sleepy to come out, to come go to the lab? Um, will I waste my time? Am I wasting my time making food?"
>
> (Damon, Middle Eastern PhD Student in Engineering)

Theme 1: The time required to shop and cook is immense.

We found that students' agreed that it wasn't that eating was difficult, but rather that dealing with everything surrounding feeding oneself was. Time was an important factor across this. We see this in Damon's story. [Read Excerpts]. Damon struggled to schedule time to make food. For him, it was time consuming – not just feeding himself but cooking, shopping, and planning meals. Damon was a graduate student too which siphoned his time. He was supposed to be in the lab more time than not, figuring out his next meal was the last of his priorities. This observation fits well with the next theme too.

Engineering and computing students' time on campus is already much higher than the rest of the student body.

"As a Ph.D. student, I could go home and rest if I had access to proper transportation, but I used to stay there during the night. If you ask people in the grad suite, they all know me for staying in and sleeping in the grad suite. I would bring my pillow and blanket, and I used to stay there and sleep there all night to study during the night. Again, if I had access to a proper transportation system, I could go to my home, to my room, sleep there, and again come back in the morning, but it was a waste of energy and time for me to walk 30 minutes to my home every day. So, I preferred to stay there and sleep there…. At night, I would stay, and then in the morning, around 10, I went home, I would go home, shower, get rest, and then come back in the afternoon around three-ish, four-ish, and stay 'til the following day."

(Kelsey, Middle Eastern PhD Student in Engineering)

For engineering and computing students, the time spent on campus is already higher than the rest of the student body. We saw this with Damon who was expected to be in the lab and needed to be to complete his work. We also see this from an excerpt of Kelsey – who we will return to at the end. Kelsey says [read excerpts]. As we see from Kelsey, her need to be on campus was unreasonable and unlike many non-engineering students. Kelsey stays on campus and leaves only to shower and eat.

The pressures of engineering require students to make hunger sacrifices.

"A lot of the heavy discipline-specific classes my junior and senior year was definitely affected by the fact that I'm like trying to learn how to be diabetic. I remember specifically one time I was in electromagnetics—the proudest C+ I have ever gotten. I was so proud of that C+. I tried so hard. Um, but it was like that semester, that first semester junior year is when I was diagnosed [with diabetes].

So I'm like sitting in class and I'm feeling myself going really low, but we're talking about something really important and I'm starting to go—like this is probably the closest I ever got to passing out from a [diabetic] low because I'm trying to pay attention. I'm like, 'This is important. If I leave right now, I'm going to miss this. And this could be like really, you know, a big deal.'

And I remember I have like, I like took a picture of it later 'cause I was like, 'I can't believe I like put myself in that position' because I could see as my notes were like going down the page that it's just all shaky from like half the, the page down. And like I like took a picture of it and I was like, 'Can you guess where I like started going low?' Um, and eventually I was like, 'I can't even hear anymore. Uh, I don't know like what's going on.' So I can't even get anything from this anymore even if I do wanna pay attention."

So eventually I had to get up and, and like leave. I grabbed my testing thing and, and like went into the bathroom or whatever and I tested at 41 and I think that wasn't the lowest that I ever tested."

(Karma, PhD Student in Engineering)

Engineering students are clearly under a lot of pressures, and as we see from students like Karma, the pressures require students to make sacrifices that involve their hunger. [Read Excerpts]. Karma put her grades in danger dealing with her hunger. We see how Kelsey and Damon put themselves in danger too. Engineering culture requires students to put themselves through the gauntlet to succeed with no regard to how it impacts them. In Karma's case, engineering culture caused her to mismanage her diabetes. She talked about how the professor used to call students out for eating and that she did not want to be called out, so she would avoid checking herself or eating. Karma put herself in danger.

Transportation makes it difficult to access food.

> "I don't have a car, but I have public transportation. So also trying to get used to the public transportation here's been a little bit of a challenge. It's better in [nearby metropolitan city], like I think in the city it's better because you have the bus, the metro, the trains, or the different options, but it's still sometimes, you have to make a lot of switching like two or three changes of bus or — and things are really far apart…Public transportation, [is] usually like twice the time. So that is still is one of the things—moving around is one of the challenges in a way too. The time you have to spend to be ready at this time for being at the bus, train, metro station at this time, so we can reach the place that we want to go on time."
>
> (Mike, PhD Student in Engineering)

Across stories, this idea of transportation was also an important component. For most students, Mike included, students did not have transportation to get food, or at least the food they wanted (more about that in a second. We see the following from Mike. [Read Excerpt]. Mike brings the conversation about time back into the picture. Transportation itself is difficult, but public transportation takes time. A few participants also discussed how difficult it is to bring things on the bus or train. One student even got told to leave because they thought they were homeless when in reality they were shopping for themselves.

There are additional difficulties for students with specific dietary needs.

"Since I don't have a car right now, I try to use Walmart delivery, so every year I'm paying, like, for their, uh, membership payment, and then, uh, they deliver it to my house. But the problem I have here is, like, I'm not going to any other supermarket, so in Walmart I have, like, these limited choices. Every time, I'm buying the same groceries and then, uh, having the same meal, because I don't have a lot of other options. Like, I'd love to go to some other markets like, uh, Chinatown or Indian market, but I don't have the option to go because of the lack of rides. So, yeah, like, I'm cooking the same meal every time. Smetimes, even if I have the time to cook, I choose not to cook, I'd rather go out to eat because when I eat out, I have a lot of other options, and at home it's always the same food. I just want, like, different options, like, I'm, when I'm cooking at home it's always the same food. Like, I don't mind food from different cultures, I'm okay with any food, but I just wanna have some varieties, uh, in my dishes, like, not the same thing over and over.."

(Alex, PhD Student in Engineering)

Relatedly, there are additional difficulties for students with specific dietary needs. By dietary needs I not only mean needs for gluten free or something similar, but also cultural needs such as Damon talked about. Alex here has a similar story, and you start to see where time, transportation, and pressures come together. [Read Excerpt]. Alex wanted to be connected to his home country through food – it gave him belonging – something we saw with many other students. Food brings people together. For Alex, not having this access led him to feel bored of eating, disconnected from the community, and alone feeling, as he talked about in his narrative.

There is a huge sense of cultural shame in asking for help.

"Because my father can afford my bills, it's not a big deal for him. But being a 23-year-old girl, refusing all these traditions and coming to this state, and if I go back to him and I ask for [more] money, I feel bad about it."

(Atara, Undergraduate in Computer Science)

For international students, there was also the fear of cultural shame in asking for help. Across all students, not just engineers, international students talked about the cultural pressures of not asking for help. For Atara, we see the following. [Read Excerpt]. For engineering students who were more likely to be international, there was the pressure to perform. This pressure included daily life as well as the pressures of engineering. There was no excuse for failure and no room to ask for help. The constant wording I got from students was "I just can't ask for help."

Kelsey's story illustrates the magnitude of these factors as a whole.

"I was in a dark jungle with no light": Kelsey's Story

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With our remaining time, I'd like to bring things together and read and excerpt of Kelsey's story, who we talked about earlier. Like other stories, Kelsey's story really brings into frame the importance of the themes and our discussion. You are also welcome to scan and read Kelsey's story on your own time.

Read Kelsey's Story – will be shared during presentation and an excerpt will be read: https://docs.google.com/document/d/1Jn0BkRcx6ijLg0t94lijnDl5NG5ikPerVwGoJC0nO7k/edit?usp=sharing

Hunger is about the complexities of hunger, not the food itself.

- Inequality on the basis of race/ethnicity, class, gender, disability, and more come into play when we start having conversations about hunger.
- Time and transportation are essential components to consider.
- There are additional pressures on engineering and computing students; especially graduate students.
- Understanding hunger requires addressing the complexities of feeding oneself, not just the food itself.

As we see from stories like Kelsey's and others. Hunger is not about the food itself, but the complexities. Sure we need to address food access, but there is more to it. When we start having conversations about hunger, inequality of different types also becomes part of the conversation.

Time and transportation are also issues that go hand in hand. Students need to be able to transport food, and they need to have the time to do it too. Time also comes forward when talking about cooking and eating.

Important in this work, we need to talk about how engineering pressures students, especially graduate students. Engineering culture is harmful to students in a number of ways, and this work shows that hunger needs to be a part of that conversation too.

We can help students by making food more accessible.

- Our campus has a food bank that is pursing change based on this research.
  - We are expanding our pre-existing shuttle program to ethnic and health-food stores.
  - We used grant funds to purchase cooking necessities that can be given to students.
  - We are working on ways to actively share these stories with our faculty.
  - We are actively working with our disability and neurodivergence centers on campus to get the word out about services and learning how we can better serve these populations.

We can help students by making food more accessible.

Our campus has a food bank that is pursuing change based on this research – in fact we just received another grant that will allow us to address the findings of this work.

- We are expanding our pre-existing shuttle program to ethnic and health-food stores.
- We used grant funds to purchase cooking necessities that can be given to students.
- We are working on ways to actively share these stories with our faculty.
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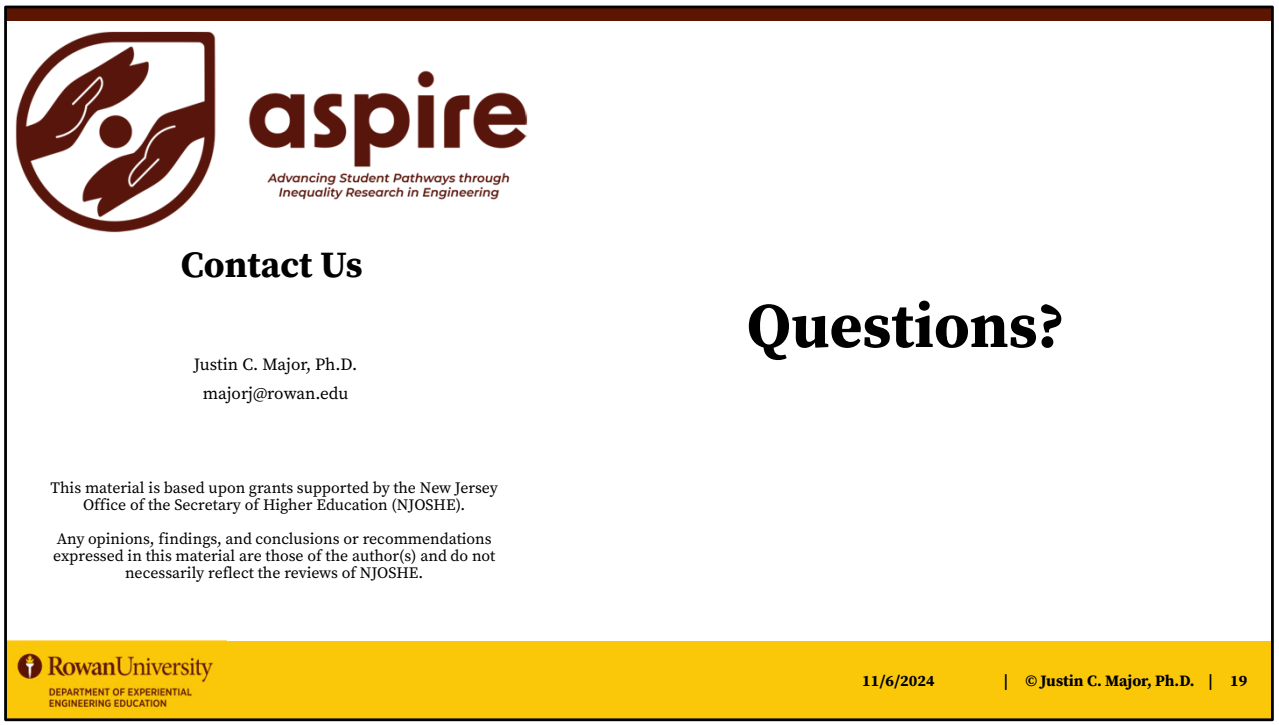

We invite you to do the same on your own campuses. Open a food bank, even a mini one, find transportation solutions for students that also provide access to specific dietary needs, and finally lower the pressures of engineering so students can eat. One finding we did not talk about and should also be addressed is that folks should provide instruction on cooking. We found many students did not know how to cook or what to cook and that that issue made planning a meal more strenuous. Provide cooking classes if your campus can manage.

That's the end of my presentation. Thank you. Questions?

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