# E4USA's Impact on Early Student Engineering

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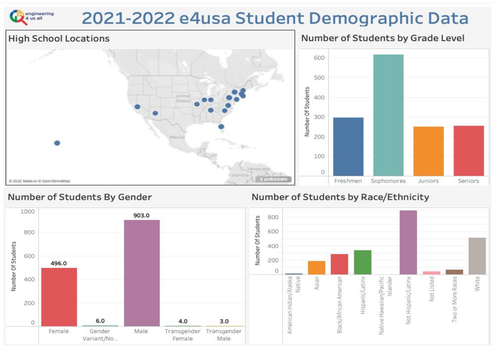
engineering 4 us all

## Introduction

In this project, we analyzed the effectiveness of the e4usa high school program in developing student interests in the engineering field. this can be helpful in identifying how someone's marginalized identity can affect their career choices and interests. With all this data we used the Social Cognitive Career Theory to help explain our data and support our results and conclusions.

## What is E4USA?

e4usa is this collaborative project removes the barrier between existing programs in order to explore scalable and sustainable ways to work together and meet the demand for highly trained engineering professionals.




## Data Collection

Our data consisted of transcripted interviews of high school students being interviewed how they felt about the e4usa program. These questions also went into detail in what they believe an engineer was and what skills and techniques could an engineer need to do their job successfully.

## Data Analysis

With all this data we used the Social Cognitive Career Theory to help explain our data and support our results and conclusions. Combining the team's codes for the Analysis was a lengthy process and gave us a glimpse of just how the same transcript can be viewed at two different perspectives.With my mentor, we were able to combine our code list together and create codebook that captures all, if not, most of the ideas that can be used in our research. A second review of the transcripts allowed us to create new codes with a better idea of what students had learn in the program.

## Data Analysis

Drawing connections to the SCCT, I annotated a few selected articles and coded them manually. Themes were found across the different transcripts which ranged from "Contributors to Students Confidence" to "Student Perceptions of Engineers".

The 2021-2022 Student Demographic Dashboard which was constructed through a software called Tableau included data that showed the inclusion of all demographics participating in their program. There was disproportionate set of students from each demographic. An example of this is where the ratio between males and females is 2:1. This gives us insight on the obstacles females may face obtaining an education in engineering. This could be seen as a guide to include more students from different demographics.

## Results

From our Qualitative Analysis we can conclude that the e4usa program has successfully prepared their students with the critical knowledge and skills they could need in the engineering field. The e4usa high school program gave students a curriculum that allowed them to gain new insight on what engineering was about. It was effective at giving students the opportunity to get an overview which helped students know whether engineering is a right fit for them.

| Themes | Examples of Emergent Codes |
|---|---|
| Knowledge, skills, or perceptions acquired | Communicating ideas, seeing oneself as an engineer, engineering design process |
| Contributors to student confidence | Personal challenge, hands-on projects, project outcome |
| Contributors to student learning | Reflection on learning, collaborating with peers, hands-on projects |
| Previous perceptions of engineers | Building and fixing things, no previous knowledge about engineering |
| Student perceptions of engineers | Engineers improve society, engineers are problem solvers, engineers are inventive |
| Influencers of student's perceptions of engineers | From family members, class discussions, hands-on projects |

## Implications for Future Work

In the E4USA program, we can find ways to include a wider audience from varying backgrounds.

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