



THE SE3[≡] PROJECT

STRUCTURAL ENGINEERING ENGAGEMENT & EQUITY

**RACIAL EQUITY
TASK GROUP
2022-2023**

Civil/Structural Engineering Student Experience Survey

Exposure to Engineering Topic Brief

By the Structural Engineering, Engagement, and Equity Committee of the Structural Engineers Association of Northern California (SEAONC)

Exposure to Engineering Topic Brief

The Racial Equity Task Group of SEAONC SE3 Committee distributed a survey to civil engineering undergraduate students, via department chairs and student groups, at a number of colleges across the US from November 2020 through February 2021. A total of 271 undergraduate students responded to the survey. The survey is part of an ongoing effort to better understand the undergraduate civil engineering experience in American colleges.

The purpose of this brief is to give an overview regarding how respondents were first introduced to engineering as a profession or college major.

How were you first introduced to engineering?

The survey asked students to identify the sources that first introduced them to engineering – as a profession and as a field of study. Respondents were asked to pick options that applied from the list below, or they could write in their own answers. Respondents could select as many responses as they wanted for this question. For the purposes of brevity in this brief we present only the top five most commonly selected responses in each subset.

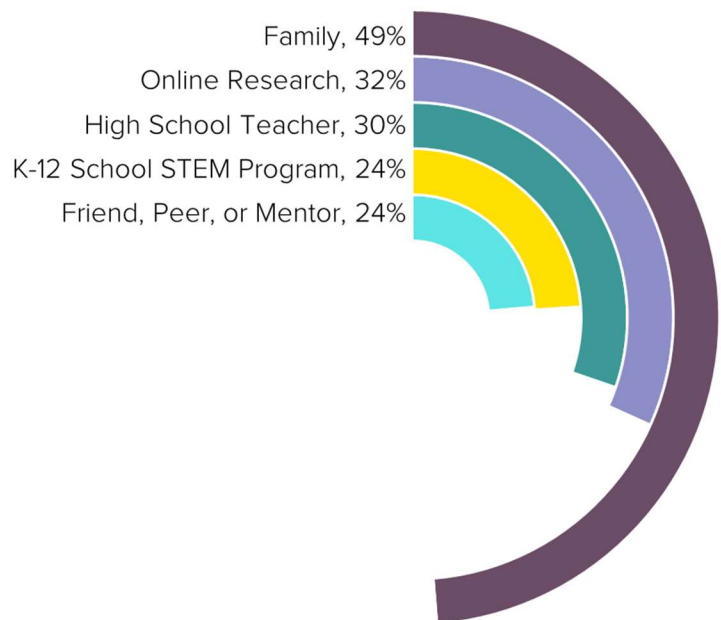
- Family
- Friend, Peer, or Mentor who studied Engineering
- University or College Outreach Program
- High School Guidance Counselor
- High School Teacher
- External Career Counselor or Coach
- Vocational Test
- Job or College Fair
- K-12 School STEM Program, Project, or Activity (ACE Mentorship, EAA, etc.)
- Online Research (Websites, Videos, Social Media, etc.)

All Respondents

Introduction by a family member was the most common response (49%). The next two most common ways students were introduced to engineering were through high school teachers (30%) and from online research (32%). A friend, peer, or mentor who studied engineering and K-12 STEM programs each were selected by about a quarter of survey respondents.

The remaining options not shown above include learning about engineering through a high school guidance counselor (9%), a university or college outreach program (8%), a vocational test (6%), a job or college fair (6%), an external career counselor or coach (1%), or other (4%).

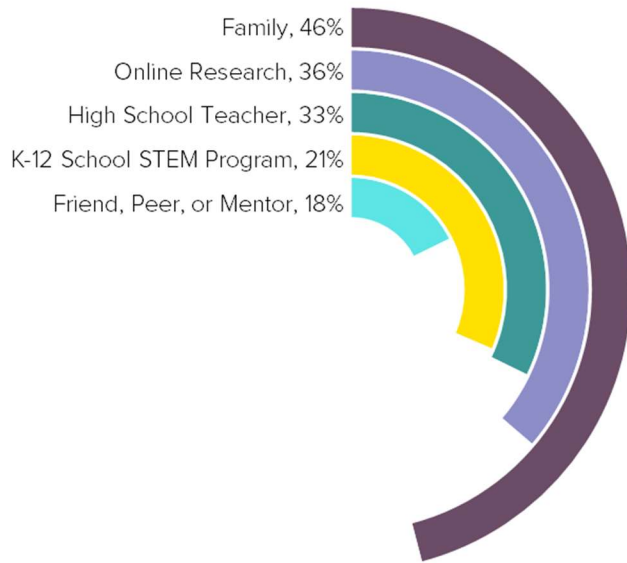
The remainder of this topic brief presents subsets of the above data, separated by demographic groups. For background information on the demographics of the survey respondents, see the Demographics Topic Brief associated with this survey on the SEAONC SE3 website.



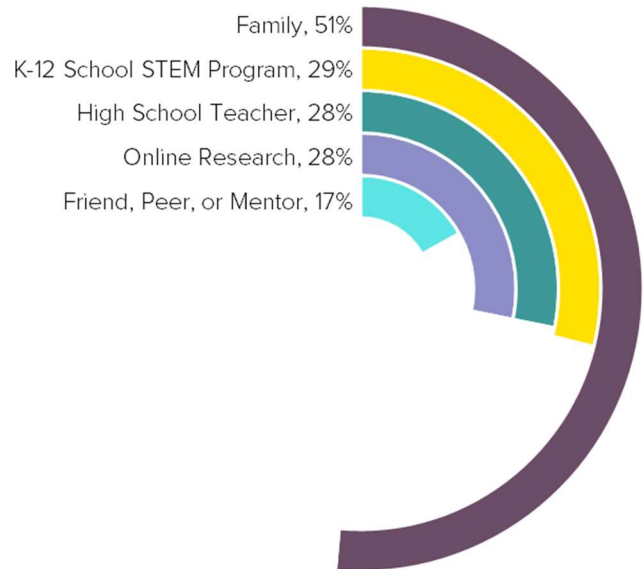
Gender

The top five categories were the same between men and women with the following noted differences. A larger percentage of women (29%) indicated that they learned about engineering from a K-12 STEM program versus men (21%). The sample size of non-binary respondents was too small to be statistically significant.

Male Respondents



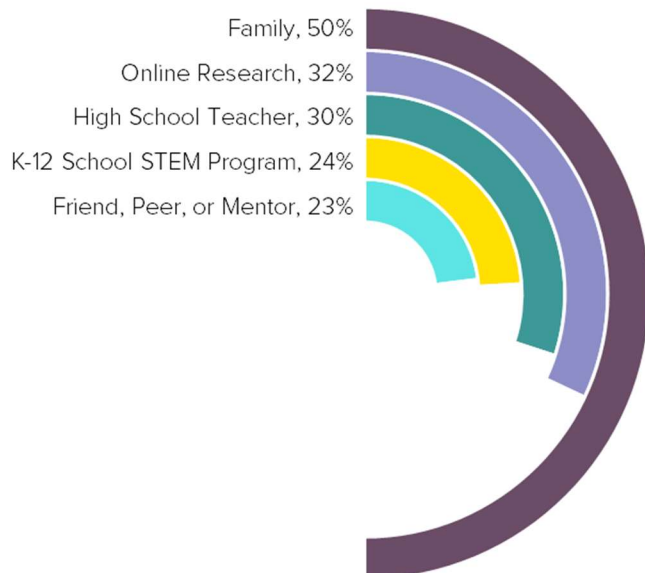
Female Respondents



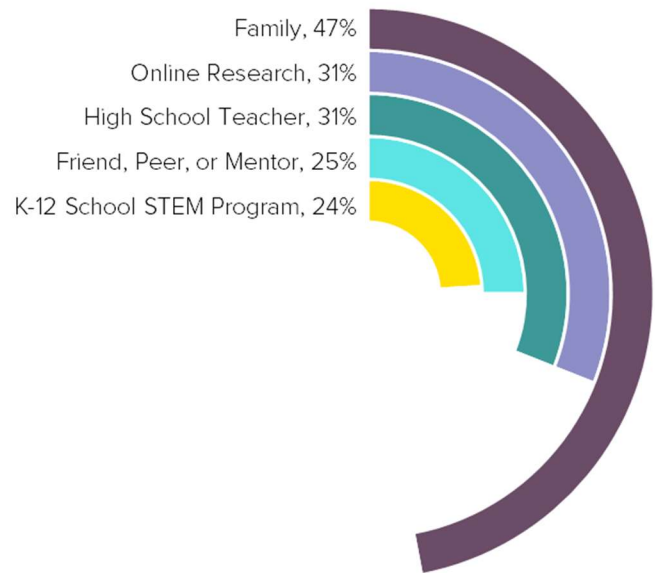
Race/Ethnicity

There was no significant difference between how white and non-white students first learned about engineering.

White Respondents



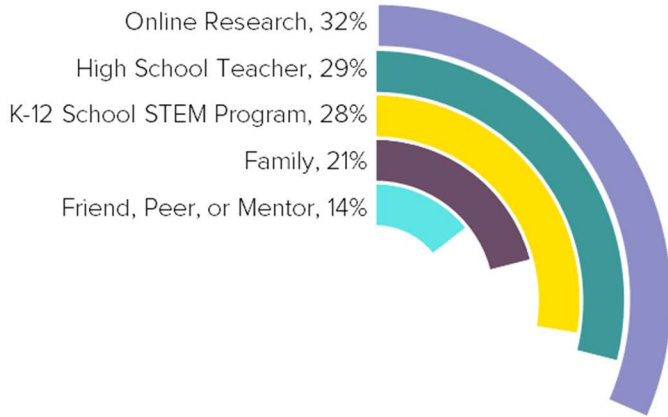
Non-White Respondents



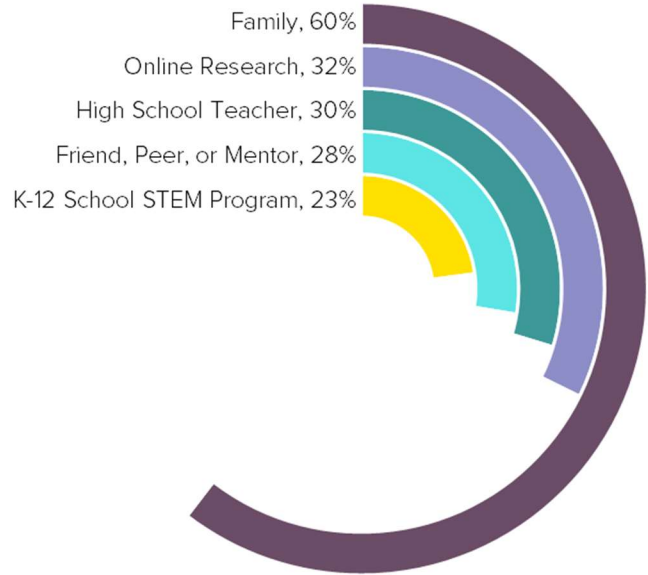
First Generation Status

First generation students were one-third as likely as non-first-generation students to hear about engineering from a family member (21% versus 60%) and half as likely to hear about engineering from a friend, peer, or mentor (14% versus 28%).

First Generation Respondents



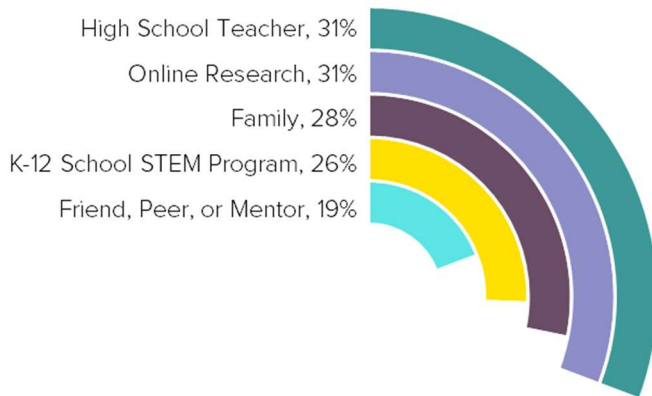
Non-First-Generation Respondents



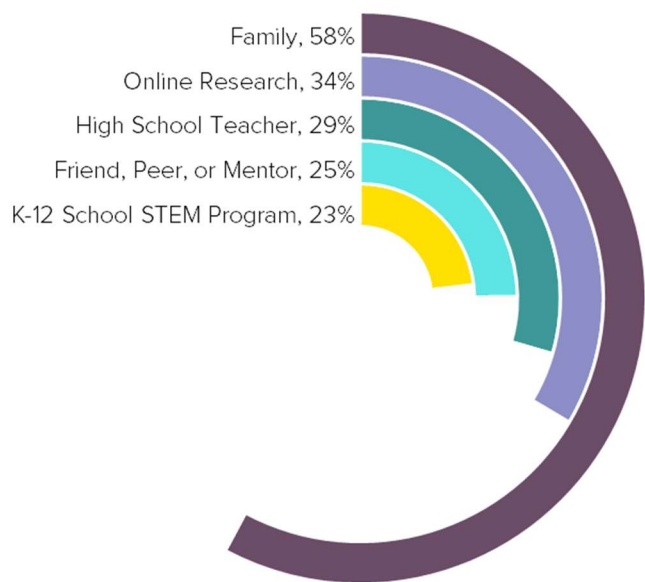
Pell Grant Eligibility

Pell Grant eligible respondents were half as likely to hear about engineering from a family member compared to non-Pell Grant eligible respondents (28% versus 58%) and less likely to hear about engineering from a friend, peer, or mentor who studied engineering (19% versus 25%).

Pell Grant Eligible Respondents



Non-Pell-Grant-Eligible Respondents



Pell Grant eligibility here is used as a proxy for students' socio-economic status. Pell Grant eligibility is need-based and is determined by a number of factors, but eligibility broadly indicates that a student is low- or lower-middle income.

Discussion Questions

We hope this topic brief provides the basis for further reflection and discussion with your colleagues. Below are some discussion questions to get you started.

1. How were you first introduced to engineering? How does your experience compare to the reported experience of these respondents?
2. Families are notably one of the most impactful sources of exposure to engineering. What are some ways that we can include families in STEM outreach programs?
3. K-12 STEM programs appear to reach all demographic groups but do so unequally. Does this surprise you? Does this align with the goals of your STEM outreach programs, if you participate in any?
4. Pell Grant eligible and first-generation students reported getting introduced to engineering at the highest rates from a high school teacher and online research. What are some ways we can leverage this information to expose these under-represented groups to structural engineering?

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SEAONC SE3

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