First-Year Research in Engineering Education (FYRE) Group
Dr. Krista M. Kecskemety & Students in FYRE

ABOUT US
- We are an undergraduate and graduate research group in the EED under the advising of Dr. Krista Kecskemety
- We aim to connect research and practice in first-year engineering to improve teaching practices, student learning, and student experiences.

FYRE TEAM

Dr. Krista Kecskemety
Assistant Professor of Practice, EED

Dr. Meagan Ita
EED Ph.D. Candidate

Connor Jenkins
EECE Ph.D. Student

Richa Mahajan
Undergraduate Researcher

Sery Gunawardena
Ph.D. Dissertations

Michelle Fischer
EEEX. M.S. Student

Michael Wagner
Undergraduate Researcher

Jake Rose
Undergraduate Researcher

Josh Marino
Communications Lead

Connor Jenkins
Undergraduate Teaching Assistant Written Feedback: Analysis and Comparison

Motivation
- Current undergraduate teaching assistant training focuses primarily on scoring student work and not on written feedback methods

Goals
- Compare undergraduate teaching assistant written feedback to the written feedback left by technical writing experts and student work
- Understand experiences that inform undergraduate teaching assistant written feedback methods

Gender Differences in First-Year Engineering: Peer Support Networks in the time of COVID-19

Sery Gunawardena

Motivation
- Explore the differences in the social networks of male and female first-year students in online first-year engineering classes

Goals
- Understand the role of peer support on the persistence of first-year engineering students

Concept Mapping in Engineering Education

We are working as a part of a multi-institution study looking into the extent to which the Engineering Mindset (EM) is begin infused in coursework for undergraduate engineering educations. At various points in undergraduate learning, EM will be assessed through the completion of an EM concept map.

Research Questions
1. What gaps exist between students’ perception of entrepreneurial mindset and the “master” EM concept map?
2. How does a student’s engineering mindset change over the course of their engineering degree program?
3. How does student’s perception of engineering mindset change over the course of a semester?

Scoring Concept Maps
We adapted three primary concept map scoring methods (traditional, categorical, and holistic) to fit in concept map and then observed trends that arose in the scored results. Current results suggest that there is poor reliability across the methods in resulting scores, but iterations may help each method cater to specific circumstances

- The traditional method struggled to allow for a gradient of correctness but was particularly easy to implement
- The categorical method introduced punishment for breadth of categorization but is well suited for assessing highly interconnected topics
- The holistic method was resource intensive but may be a more generalizable scoring method

Introducing Concept Maps into Technical Curriculum
We are also testing how well concept mapping can be introduced into aerospace engineering and other technical curricula. Students in an aerospace structures course complete an unstructured concept map summarizing the whole class material and scored them using the three primary methods. Currently we are summarizing the results found in scoring across methods to understand how the various methods may assist instructors when implementing concept maps in their courses.

Research Questions
1. What role do Teaching Assistants play in undergraduate STEM courses?
2. How are personality traits currently recognized in the roles of Teaching Assistants in undergraduate STEM and first-year engineering courses?
3. How do personality behaviors of Teaching Assistants in the social context of interacting with students in first-year engineering be measured?