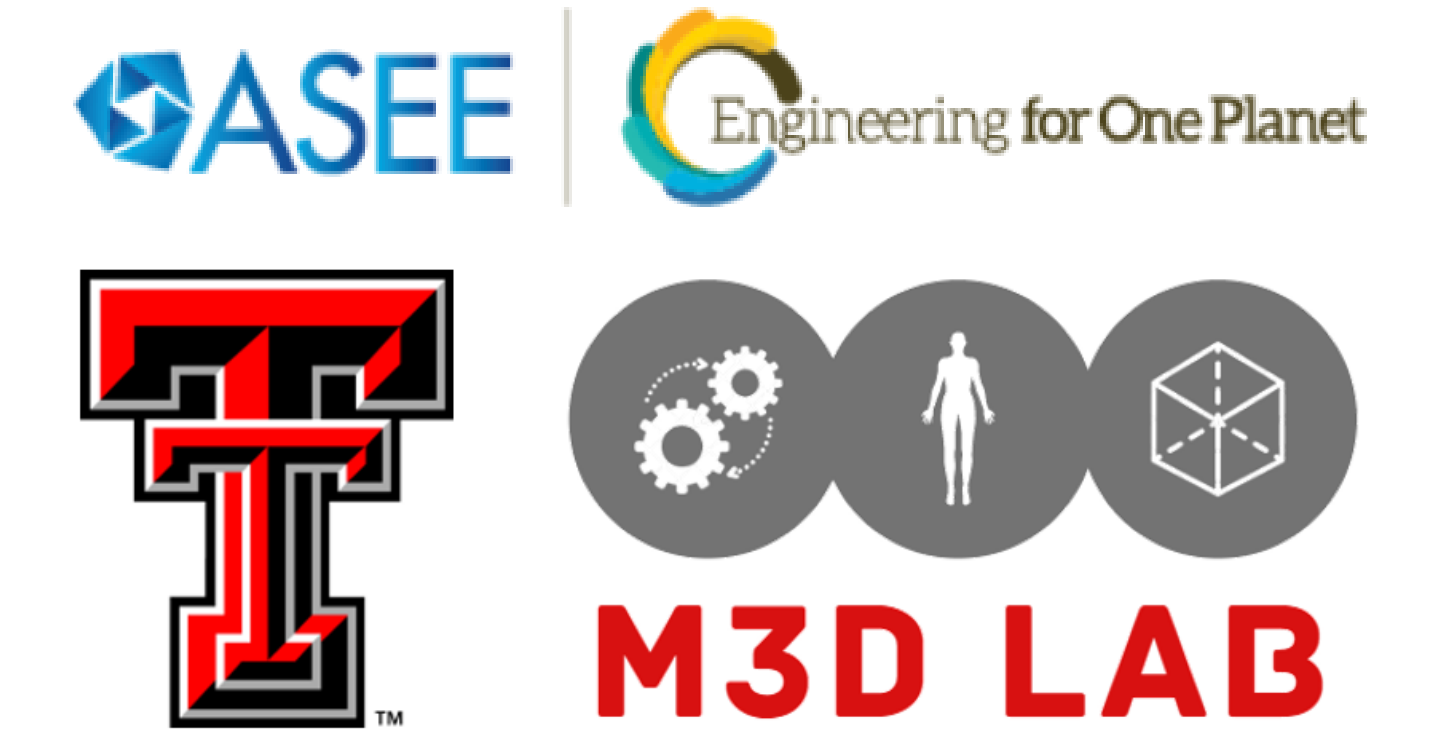


Sustainability in Curricula as a Paradigm for Future Engineers

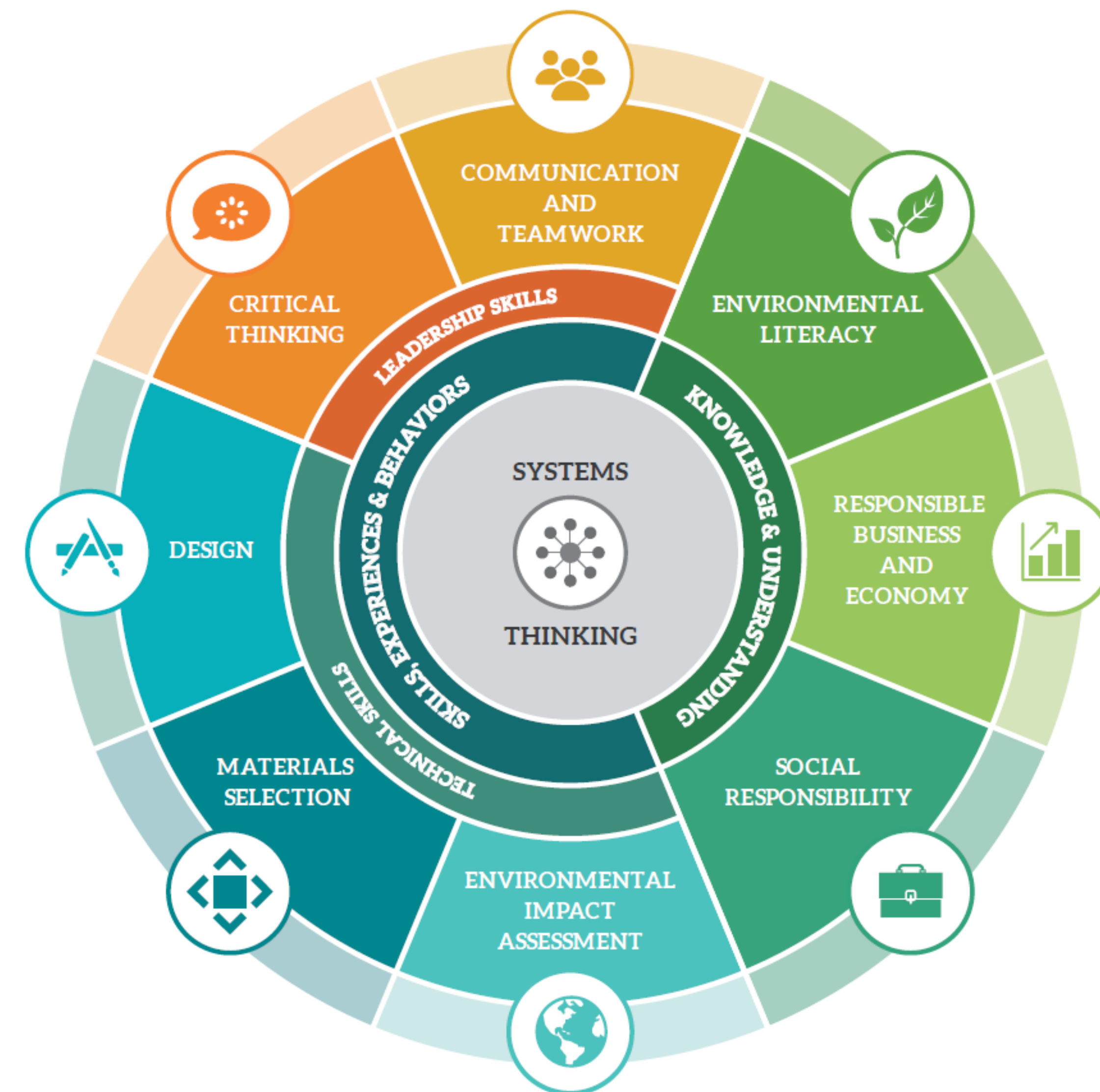
Paul Egan and Priya Gill

Whitacre College of Engineering
Texas Tech University



1 Introduction

- Paul Egan and Priya Gill were interested in learning the Engineering One Planet (EOP) framework to educate future engineers, entrepreneurs, and researchers.
- Egan incorporated EOP teachings in Medical Design and Entrepreneurship elective for Mechanical Engineering (N=26).
- Gill incorporated EOP teachings in Exposition of Technical Information (N=72), core class for Chemical Engineering.
- Leadership from the Dean's office for College of Engineering has agreed to help share course modules developed by Egan and Gill across all Engineering Departments.



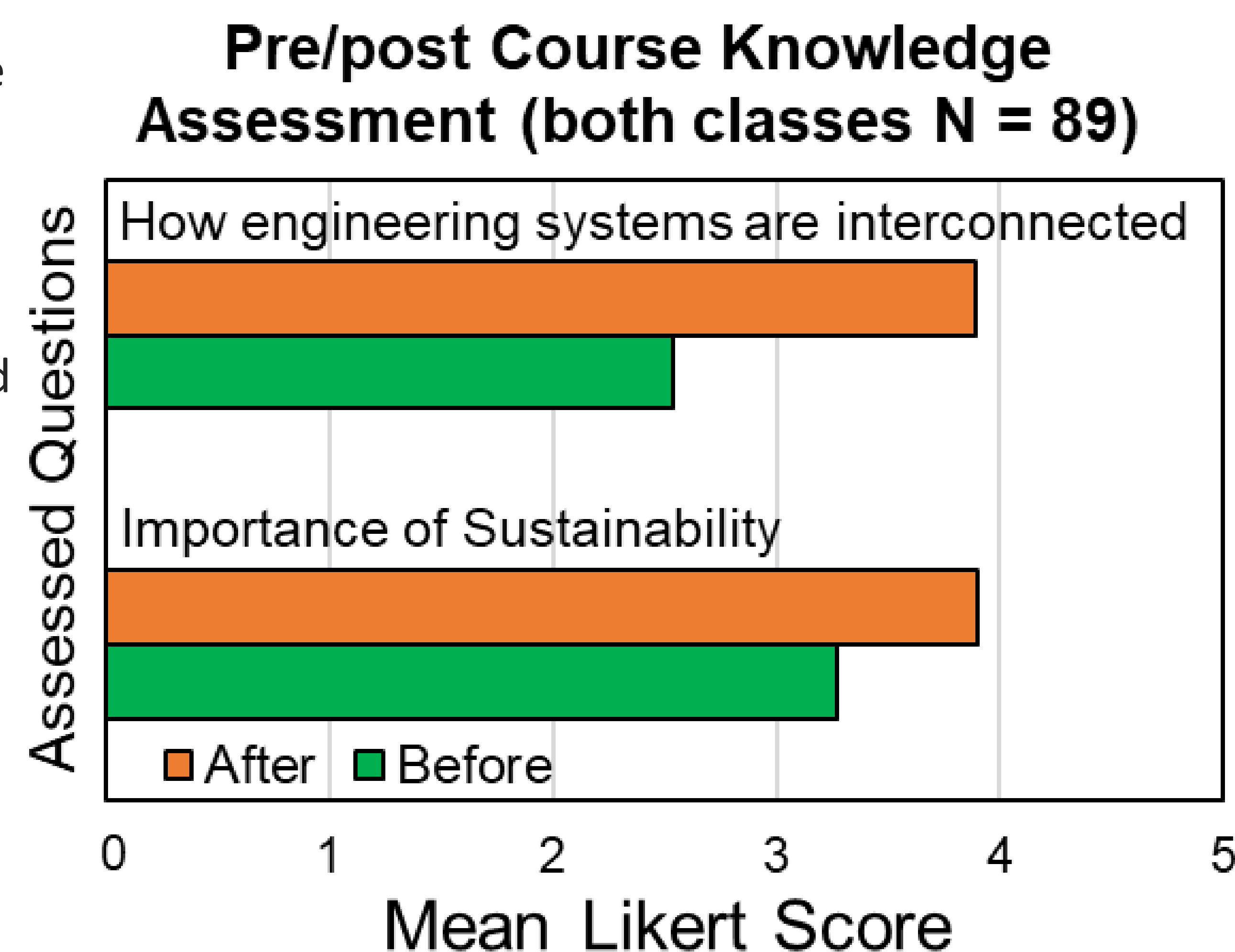
2 Methods

- The EOP framework was taught with systems thinking first, then specific modules.
- Students were asked to use the EOP framework to evaluate designs and companies. - 15 sustainable (as ranked by a third-party) companies were evaluated in Gill's course.
- Teams evaluated the companies on every element of the framework – concluding if the company followed the goals of each element.
- Egan and Gill shared content and analyses in each other's class to broaden knowledge.
- Student learning and motivation were measured in classes using pre/post surveys.



3 Impact

- Egan and Gill learned new concepts and strategies to teach the EOP framework to engineers
- Students were impacted by gaining specific skills and mindsets to incorporate in future projects and in the engineering industry.
- In both classes a pre/post survey assessment was conducted that demonstrated significant improvement in knowledge, strategical thinking, and motivation for students, especially regarding systems thinking and sustainability



4 Future

- Egan and Gill will work closely with TTU Innovation Hub to provide talks to disseminate EOP teachings for entrepreneurs.
- Egan will further develop curriculum and incorporate teachings in Advanced Engineering Design Graduate course in Spring 2024.
- Egan and Gill will work with College to promote teachings to other faculty, using evidence such as usefulness from Gill's results for systems thinking (panel figure), to encourage adoption and scaling.



Perceived Usefulness of EOP Framework in Future (Gill Class, N = 66)

