

Teaching Engineering Students to Self-Transform: Parallelisms between Product Innovation and Student Career Path Planning.

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Focus/Problem Statement

Freshman engineering students can have a hard time transitioning to college. The freshman year is critical to the students' academic success; in this year they learn basic skills and establish essential networks with other students, faculty, and resources. How can we help these freshman engineering students in this transition?

Theoretical or Conceptual Framework

We propose that freshman students can learn from the engineering design innovation process and apply it by analogy to the design of their academic pathways. There are multiple similarities between product innovation (i.e., technology) and the continuous academic challenges faced by the student. Engineers as designers and innovators have a vast and rich repository of techniques, tools, and approaches to develop new technologies, and a parallelism can be drawn between the design and innovation of a technology (e.g., redesign of a kitchen appliance), and the "design" of the students' academic career pathways.

Methodology/Design of the Study or Organization

The pilot for the Spring 2023 semester will have Intro to Mechanical Engineering (MECE 1101) students work in teams in a semester-long product innovation project to redesign a simple kitchen appliance. Students will learn theory and methodology of the design process (e.g., creative exploration of solutions, decision making, multi objective evaluation, etc.). These same students will concurrently take UNIV 1301 (Learning Frameworks) where they will have a semester-long project to define their career pathways. Both projects, product innovation and career pathways, will follow the Challenge Based Instruction (CBI) approach. Periodically, a connection will be established between the projects to show the students how to use the lessons from product innovation by analogy and reflection in their career pathways project. The authors believe that the MECE 1101 project initiates a process for students to become innovators and entrepreneurs, while the UNIV 1301 project prepares students as self-innovators for future academic, personal, and professional challenges.

Findings/Conclusions

In this session, the authors will share their experiences and plan of implementation as well as details from recent NSF IUSE HSI funding for this purpose. The authors expect audience engagement to receive suggestions and ideas to improve freshman student success.