

Integrating Advanced Courses and Cohorts into Introductory Engineering Courses: a Method to Improve Student Career Self-Efficacy and Retention



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Educational Objectives

In this innovation, a discipline's introductory course is integrated with the rest of the discipline's curriculum. Within the introductory course, a variety of student activities will be done in concert with students in upper level engineering courses. Each activity will be designed to be beneficial to both cohorts.

The objective of the innovation is to increase student reported career self-efficacy of the students enrolled in the introductory engineering course.

This fall, the Introduction to Industrial Engineering course is being paired with the Industrial Ergonomics course. Selected student learning outcomes:

- Students will provide examples of real-life applications of ergonomics.
- Students will be able to apply the basic principles of ergonomics to improve the design of a hand tool.
- Students will interact with students in the advanced course and gain a deeper understanding of the department curriculum and what is expected of students.
- Students will identify a need for ergonomics within a chosen industrial engineering career field.

Learning Activities and Materials

Activity Details	Flash Training	Hand tool Design
Topic motivation	Flash training serves as an effective ergonomic intervention that can be used for companies that do not have the time or resources for full ergonomics programs.	Hand tools that are designed correctly reduce the incidence of work related musculoskeletal disorders for employees and improve productivity.
Intro student role and activity	<i>Employee:</i> Participate in the training exercise as an employee. Evaluate each team's performance and select the most effective training exercise.	<i>Designer/ergonomist:</i> Participate in an activity using the tool. Redesign the tool for improved comfort and productivity. Revise the design based on feedback.
Advanced student role and activity	<i>Training designer/ergonomist:</i> Develop a 15-30 second "ergo brief" flash training exercise to teach workers about an important ergonomic intervention in the workplace.	<i>Design consultant:</i> Evaluate the initial tool design. Provide feedback, including ergonomic justifications, to the intro student team for a design revision.
Materials	Instructor overview, student guidelines, instructor evaluation matrix, student judging forms, and design feedback forms	

Course Execution

