Quantitative Analysis of Mechatronics and Student Motivation in a First-Year Applied Engineering Course: Preliminary Results

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Abstract
Summary: Limited empirical evidence has been found in current literature to support the use of mechatronics in first-year engineering and technology courses to motivate students. In response, this study lays a quantitative evidence base for the use of mechatronic projects in first-year courses and how they impact student motivation, albeit to different degrees for different students.

Disciplines
Agricultural Education | Agriculture | Bioresource and Agricultural Engineering | Engineering Education

Comments

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Need: Mechatronic experiences have been reported to positively motivate students in first-year engineering and technology courses. However, limited empirical evidence has been found in the literature to support this notion. Furthermore, the impact of contextual, demographic, or experiential factors on student motivation is unknown. Therefore, analyzing how mechatronic experiences motivate students, and how different students report different levels of motivation, can advance understanding of this topic.

Overview: This paper will analyze the level of students’ motivation in the classroom after engaging in a half-semester mechatronic project. A sample of more than 70 students will be surveyed using the self-reporting Motivated Strategies for Learning Questionnaire to understand the level of student motivation when participating in a mechatronics project and how different students are motivated differently. A description of the mechatronic experience, implemented in a large first-year applied engineering course at a mid-west university, will also be presented.

Major Points:
- Mechatronics can motivate applied engineering students in first-year courses
- Different student subpopulations exhibit different levels of motivation related to mechatronic experiences
- Results lay an empirical foundation for understanding how this technology impacts student motivation

Summary: Limited empirical evidence has been found in current literature to support the use of mechatronics in first-year engineering and technology courses to motivate students. In response, this study lays a quantitative evidence base for the use of mechatronic projects in first-year courses and how they impact student motivation, albeit to different degrees for different students.