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Practical student activation strategies and activities in engineering education

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ABSTRACT

Keywords - student activation, engagement, active learning, hands-on learning, e-learning

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I BACKGROUND

Bachelor-level engineering courses at the University of Southern Denmark typically consist of one, 3.5-hour class session per week. This format offers advantages and challenges: there is time to go deep into complex topics, but it can be difficult to keep students activated during the entire class period.

Research question: which practical student activation strategies and activities are most effective in maintaining student engagement throughout a 3.5-hour class session?

This research question has been tested in the context of various engineering courses, including: Composite Materials and Manufacturing, Materials and Processes 2, Product Development and Innovation 3.

II EXPLANATION

These strategies and activities are designed to contribute directly to active students. Several activities from *Activating Strategies for Use in the Classroom* (Lewis & Thompson, 2010) are utilized.

III SET-UP

Activation strategy means planning classroom activities so students will be engaged and stay engaged. Strategies tested included switching media types every 15 minutes (lecture, video clips, hands-on learning etc.), utilizing short in-class assignments ('think-pair-share'), and getting out of the classroom (visits to companies, as well as other organizations and faculties on-campus).

Activation activities tested included the use of video clips, hands-on learning, company visits, 'think-pair-share', the 'alphabet game', 'how do you...', and the 'illustration/cartoon' game.

IV OUTCOMES/RESULTS

All of the activation strategies have performed well, based on student feedback and student performance. The best activation activities are the use of video clips, company visits, and the 'think-pair-share' method for in-class assignments and discussions. In one class utilizing these techniques, 95% of students rated the course positive or highly positive, and had the following comments:

'...even though the classes last for four hours his teaching method is very dynamic so students don't lose focus on the lecture.'

'Good teaching, good videos that help understanding'

'I think the course is nicely divided into teaching and hands-on. I like the opportunity to visit companies and the way the course is structured so group work can be done in class time.'

REFERENCES

Lewis, Thompson (2010). *Activating Strategies for Use in the Classroom*.
http://www.gcasd.org/Downloads/Activating_Strategies.pdf