Student to student teaching in a robot electronics course

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ABSTRACT (Poster)
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I Background

The Masters program in Robotic Systems at the University of Southern Denmark accepts students with bachelor degrees in different engineering areas. This inherently causes problems concerning the varying academic levels. Almost half the students admitted for the robot electronics course fall 2016 were missing the prerequisites in physics, programmable electronic or classic electronics, to follow the course. Therefore, the challenge was in forming the lectures for the students to reach same academic level by the end of the course, without losing students for not being challenged nor for being over challenged.

II Explanation

Instead of having to teach the prerequisites for the course in addition to the course topics, it was chosen to utilize that more than half the students already fulfilled the prerequisites. Only theory from the course topics and the lab assignments were covered during the lecture presentation, so students needed to obtain the prerequisite knowledge elsewhere. To motivate student to student teaching, the lectures were based on laboratory assignments carried out in 3-4 person teams. The assignment descriptions intentionally provided only a lab setup howto and what to measure, it was left for the students to combine the assignment with the theoretical topic. This should serve as a subject for discussion in the teams but also to give a higher level of understanding of the theory in a physical system. Feedback for the journals along with a grading was provided by two of the other teams and a teacher. Reading journals from other teams supported the reader in understand the theory because of their similar skills in electronics. The grade was a symbolic indication for the students to know if a higher effort was required to understand the topic.

III Set-up

The students received a document every week, which typically contained a description of the topic, mandatory- and supporting reading materials. The supporting reading material presented the prerequisites to learn the curriculum. It was stated that the documents should not be studied into details but browsed through to get an overview, so they could be used as reference books. The lectures started in the classroom with discussing the evaluations for the journals from the week before, a short presentation of the new topic and an introduction to the laboratory assignment. The class continued in the lab where the teachers would answer questions and debating the assignment with the students. The students got half a week to hand in the journal and half af week to evaluate and grade the journals from two other teams.

IV Results

The quality of the journals increased dramatically during the 3 first assignments, after which they leveled out at a very satisfactory level. It was decided to cease the peer reviews of journals after the 5. Journal, in order to allocate more student resources to the lab work and their projects. The journals written by the teams represents hardly the weakest students in a subject, but the results from the exam should give a better success indication of the student to student teaching.
Feedback from some students said that the teaching form was time consuming, but they understood the content of the course and that they were confident prior to the exam.