

## Exploring threshold concepts in electronics engineering

Round table discussion

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This paper reports on a collaborative project between a lecturer of electronics engineering and two education researchers. The project arose from the lecturer's concerns about the retention of students across years 1 and 2 in electronics engineering. On learning about threshold concepts (Land & Meyer, 2006) his proposition was that the first year course was 'threshold concept heavy' and this might explain why students found it challenging. Entwistle, Nisbet and Bromage (2004) identified electronics as a difficult area (see also Tsvividis, 2009) and noted industry concerns about a lack of graduates. These researchers did not however take the step of identifying particular concepts as threshold. Baillie, Goodhew and Skryabina (2006) have investigated the perceptions of students who appeared to have passed through the threshold, and those who had not, but did not explore the teaching students had experienced. This aim of this study is to generate an account of the threshold concepts in an engineering course from the lecturer and student point of view whilst at the same time exploring the impact of a teaching approach that seeks to make these more explicit as a strategy to help students pass over the threshold.

The research process involved the lecturer's reflection to identify potential threshold concepts using the characteristics described by Meyer and Land followed by his revisiting his teaching approach to emphasize and elaborate on these concepts. At the time of writing, data are being collected during lectures and laboratory sessions focused on the identified threshold concepts. The full paper will bring together this data with data from a survey of student perceptions of the relative difficulty and their understanding of the concepts in the course and an analysis of student interviews about which ideas they find challenging/pivotal and why, and what has helped them understand those concepts identified as threshold. The relationships between student grades and student perceptions of the challenge of those concepts identified, as threshold will be conducted. The paper will also explore the relationships, if any, between student grades, their decision to continue with electronic engineering and their view of the identified threshold concepts.

### References:

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