Assessing Students’ Prior Knowledge about Engineering and Scientific Concepts

Session Goals and/or ABET Criterion (Criteria) Addressed

This session will introduce the use of concept inventories as a tool to assess students’ prior knowledge and misconceptions in engineering and science courses. Our goals for the session will be to:

♦ Introduce the importance of measuring students’ prior knowledge for course and program assessment
♦ Discuss available concept inventory tools for assessing students’ prior knowledge in science and engineering topics (e.g. physics, chemistry, biology, engineering science)
♦ Allow participants to consider ways to use concept inventory data for classroom and program assessment

This session will address ABET EC 2000 criteria 3a (an ability to apply knowledge of mathematics, science, and engineering), and 3e (an ability to identify, formulate, and solve engineering problems).

Presentation Format

This session will be conducted in a highly interactive format with frequent small group exercises and discussion time. The participants will have the opportunity to complete a short concept inventory and discuss how assessment instruments of this type might be used in their institutional context.

Session Summary

In this presentation we will describe some of the assessment tools (often called concept inventories) available to assess students’ prior knowledge in courses such as physics, chemistry, and thermodynamics. We will administer to the participants a modest concept inventory and discuss how the results of such tests can be used to improve teaching and learning in science and engineering classrooms. The session will be highly interactive and, we believe, interesting as well as informative.

Key Words

prior knowledge; student misconceptions; use of concept inventories; classroom and program assessment
Bibliography


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