

article:1070

Assessment in Engineering Education: Evolution, Approaches and Future Collaborations

This article examines the current state of assessment in engineering education in the United States as reflected in the *Journal of Engineering Education* (JEE). We begin this discussion with a brief review of recent developments in the assessment of engineering education and the events that have inspired change. This includes the accountability mandates of the 1980s, the curriculum reforms of the 1990s, the revision of the criteria of the Accreditation Board for Engineering and Technology in the late 1990's , and recent efforts of the U.S. Department of Education to name the "Random Control Design" as the "gold standard" for educational research.

Next, we explore assessment methodologies that have been used repeatedly in the evaluation of engineering courses, curricula and research investigations as well as some methods that have not been used extensively but are likely to be informative. A distinction is made within this article between methodologies that have commonly been used for descriptive research, such as Surveys, Interviews, Focus Groups, Conversational Analysis, Observations, Ethnographic Studies, and Meta Analysis, and those that are used for experimental research including Randomized Controlled Trails, Matching, Baseline Data, Post Test Only Design, and Longitudinal Design. Examples that illustrate each of these methods are drawn directly from articles that appeared in JEE over the last ten years. Two tables that describe the benefits and drawbacks of each methodology are included.

This article concludes with a discussion of the importance of establishing collaborations between researchers in engineering education and educational research. Educational research and the issues that surround it, such as methodology, measurement, evaluation, and cognition, represent an entire field of study with many sub-disciplines. The research that has already been completed in education provides a potential framework that the engineering education community may adapt to guide its own assessment and evaluation efforts. By combining the expertise that is available within the broad educational research community with the expertise that is available within engineering education, engineering education is currently positioned to take great strides forward with increasingly rigorous assessment instruments.

Throughout this paper, sound and rigorous assessments practices that are currently being used in engineering education are highlighted. Considered as a whole, this article supports the assertion that engineering educators are using rigorous assessment practices in the evaluation of their courses, curricula and research investigations. Even with these successes, there is work to be done. Collaborations with educational researchers offer the possibility of even greater and more rapid advancements in the assessment of engineering education. A constant concern within engineering education assessment (or any type of evaluation) should be the improvement of student learning. This begins with setting objectives and renews itself with each assessment activity. In other words, assessment is an integrated and important component that should be considered throughout the research design and educational process.

Author 1: Barbara M. Olds email: bolds@mines.edu

Author 2: Barbara M. Moskal email: bmoskal@mines.edu

Author 3: Ronald L. Miller email: rlmiller@mines.edu

Article Link:

http://www.asee.org/about/publications/jee/PAPERS/display.cfm?pdf=04-EE023-04-4100_13-25.pdf

[: Back to Fall 2005 Issue Vol. 1, No. 2](#)

[: Back to List of Issues](#)

[: Back to Table of Contents](#)