



Engineering and Science Education Seminar
Friday, October 17, 2008, 3:30 – 4:30 pm
422 Rhodes Engineering Research Center

Assessing Motivation of First Year Engineering Students

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Motivation to participate in a course of study fundamentally affects student retention. College programs would benefit from information on student motivation to inform program features, advising, and curricula. We have developed a survey based on the expectancy theory of motivation, which emphasizes the cognitive aspects of motivation. This theory conceptualizes motivation as the interaction of three elements: valence, instrumentality, and expectancy. Valence is the value placed on a behavior or goal; instrumentality (utility) is the perceived usefulness of the behavior in achieving the goal; expectancy (self-efficacy) is the perceived capability to achieve the goal. Our survey was designed to assess motivation to persist in an engineering discipline, with the understanding that this behavior leads to the goal of becoming an engineer. Four constructs were measured: value of participating in an engineering program, value of being an engineer, instrumentality of the program for attaining a career in engineering, and expectancy of success in the program. The 40-item survey was analyzed for reliability as a whole and within each construct, with a resulting reliability (coefficient alpha) of 0.883. This instrument was used to assess the effect on motivation of a pilot study in which first year engineering students developed outreach materials to introduce engineering concepts to high school students. Outcomes of the pilot study will be discussed, as well as the development of the survey and its value in identifying problem areas and determining targeted interventions for specific groups or even individual students.

Presenter Biography

Lisa Benson joined the Engineering and Science Education Department with a joint appointment in the Bioengineering Department at Clemson University in 2006. She teaches first year engineering, undergraduate research methods, and graduate engineering education courses. Her research interests include student-centered active learning, motivation effects on student learning, and orthopaedic biomechanics. She directs an NSF Research Experience for Teachers program, and through support from Hewlett Packard, she is researching the use of Tablet PCs in engineering and science education. She is a member of the American Society of Mechanical Engineers, American Society for Engineering Education, Sigma Xi, Orthopaedic Research Society, Society for Biomaterials, and Tau Beta Pi. Her education includes a B.S. in Bioengineering from the University of Vermont, and M.S. and Ph.D. degrees in Bioengineering from Clemson University.

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