Correlates of Persistence in Engineering Education: Preliminary Results from the Academic Pathways Study

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Academic Pathways Study (APS)
The Academic Pathways Study is a component of the Center for the Advancement of Engineering Education, with the goal of establishing a research base on engineering student learning.

Longitudinal study design: The subjects entered the study in their first semester in college and participated through their senior year.

Mixed-methods approach: Quantitative and qualitative methods, including surveys, interviews, design and thinking tasks, and ethnographies.

Multiple study sites: Four different US engineering schools, including a comprehensive state university, a comprehensive private university, a technical college, and an historically black institution.

Persistence in Engineering (PIE) Survey
The PIE survey, a component of the APS, is designed to identify and explore correlates of persistence in engineering education. This includes academic persistence (an intention to major in engineering) and professional persistence (an intention to practice engineering for at least three years after receipt of a bachelor’s degree).

An online survey was administered to participating students twice a year during their first three years in college, and at the end of their fourth year.

Some students start engineering school at risk.
The students who left engineering after their first year (NP-FR2) report a lower initial likelihood of persistence than the persisters (p<0.005). There was no initial difference between the scores for persisters and those who left later.

About these graphs:
The persisters are the students who remained enrolled in engineering programs (n=108). The nonpersisters are students who left engineering. They exited at different times with significant differences tests. Data are presented as mean SEM.

Statistical analyses included repeated measures ANOVAs with post hoc pairwise least significant differences tests. Data are presented as mean SEM.

Motivation to Study Engineering
Persisters intend to persist.
The persisters report a consistently high level of intention to complete their engineering degree. After the first administration, their score is higher than that for the nonpersisters at all time points (p<0.05, except P vs NP-SO1 at FR2, p<0.1).

Students can predict their nonpersistence.
The semester before they leave, each group of nonpersisters has a significantly lower score than the other students. For example, at FR2, the scores for students who are about to leave (NP-FR2) are lower than all the other groups (P, NP-FR1 and FR2, NP-SO1, and NP-SO2; p<0.05).

Academic disengagement (engineering-related): Students can predict their disengagement.
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Knowledge of the Engineering Profession
NP-FR2 NP-FR1 NP-SO2 NP-SO1 Persisters (P)

Academic pathways study

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These are just a few of our preliminary findings.
Statistical analyses of data from the Persistence in Engineering Survey and from the Academic Pathways Study are ongoing. This work is also serving as a foundation for the large-scale APPLES survey, to be deployed at engineering schools across the US in early 2008. Please contact the authors for more information.

This work is supported by the National Science Foundation under Grant No. 0227558, which funds the Center for the Advancement of Engineering Education (CAEE). Any opinions, findings and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.