

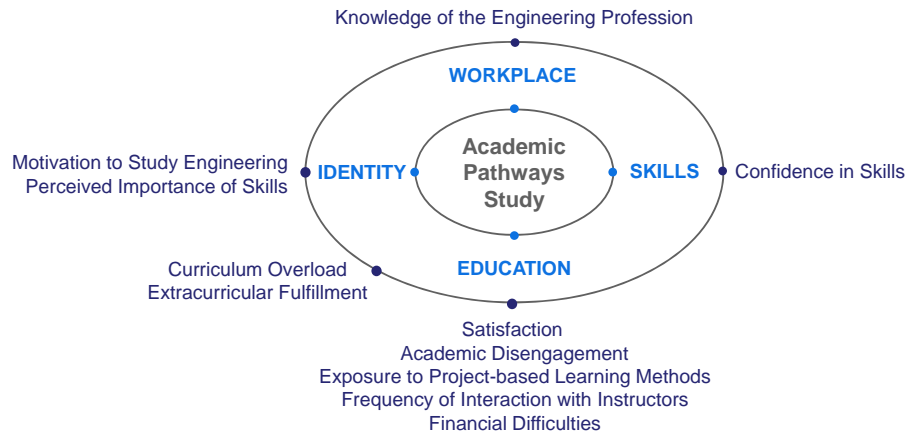
Correlates of Persistence in Engineering Education: Preliminary Results from the Academic Pathways Study



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Mapping of PIE Survey Constructs onto APS Research Dimensions



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.

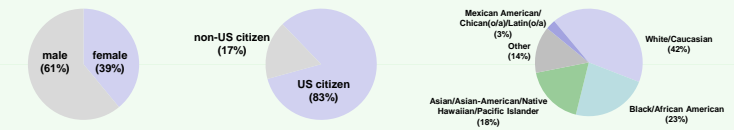
Persistence in Engineering (PIE) Survey

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.

Student subjects

Self-selected participants, with an interest in studying engineering, enrolled in the APS at the start of their first year (Fall 2003). Women are oversampled.

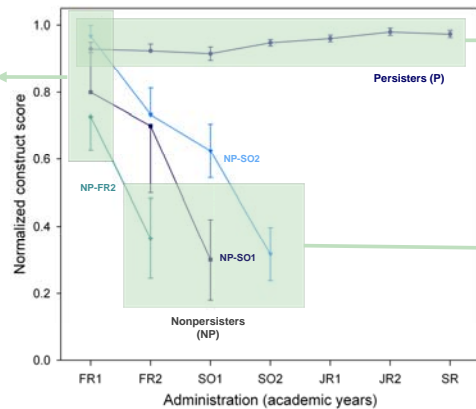


Academic persistence:

Do you intend to complete a major in engineering?

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.



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 , $NP-SO1$, and $NP-SO2$; $p < 0.05$).

About these graphs:

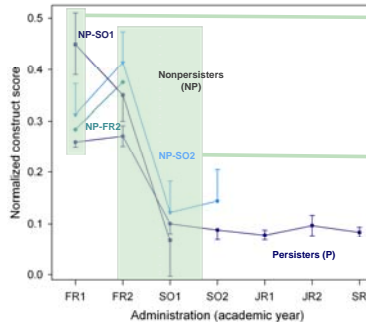
The **persisters** are the students who remained enrolled in engineering programs ($n=108$). The **nonpersisters** are students who left engineering. They exited at different times...

NP-FR2: ...after the 2nd survey of the first year ($n=11$)
NP-SO1: ...after the 1st survey of the sophomore year ($n=5$)
NP-SO2: ...after the 2nd survey of the sophomore year ($n=16$)

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

What motivates you to study engineering?

Influence of one's family in choosing to study engineering.



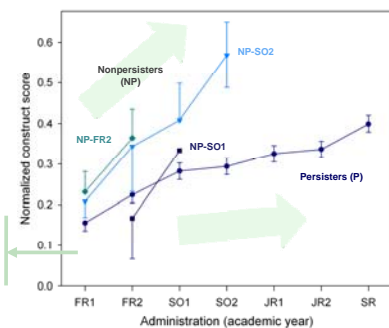
There is some statistical evidence that students who leave early are more likely to be influenced to study engineering by their family (various differences between non-persisters and persisters at $FR1$ and $FR2$).

For all students, the reported level of family influence drops sharply after their first year of college.

It appears that the level of academic disengagement rises more sharply for nonpersisters than for persisters (statistical analysis in progress).

Academic disengagement (engineering-related):

Frequency of events signaling disengagement from engineering-related courses.



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.

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