

## **Academic Pathways Study: Processes and Realities**

**Authors:** Mia Clark, Sheri Sheppard, Cindy Atman, Lorraine Fleming, Ron Miller, Reed Stevens, Ruth Streveler, Karl Smith

**Source:** Proceedings of 2008 American Society for Engineering Education Conference

This paper describes the evolution and implementation of the Academic Pathways Study (APS), a five year, multi-institution study that addresses questions about the education and persistence of undergraduates in engineering. The APS is the largest element of the Center for the Advancement of Engineering Education (CAEE), funded by NSF for the advancement of engineering learning and teaching.

Parts of this paper address questions that engineering education researchers may have about the organizational and technical infrastructure that supported this project, or about its overall implementation (e.g. subject recruitment, data collection methods, and participation rates). Other parts of the paper address questions that researchers and engineering faculty and administrators might have regarding how to explore the findings and insights that are emerging from this extensive longitudinal and cross-sectional study of students' pathways through engineering. In addition, the paper serves as a good starting point for researchers who might be interested in doing additional analysis using APS data.

Specific topics include: research team and leadership; research design and methodology; the four study cohorts and their respective contributions; some of the challenges and solutions; and implications for engineering education and future research.

### **APS Background**

The APS is an in-depth, mixed methods exploration of the undergraduate student experience and the graduate's transition into professional practice. The APS addresses the following research questions:

**Besides setting the groundwork for future research efforts, the APS is a valuable case study for teaching research methods in the classroom.**

1. How do students' engineering **skills and knowledge** develop and/or change over time?
2. How does one's **identity** as an engineer evolve?
3. What elements of engineering **education** contribute to the students' skills/knowledge and identity? What elements contribute to students' persistence in an engineering major and persistence in the engineering profession?
4. What skills do early career engineers need as they enter the **workplace**?

Given the scale of the APS investigation with multiple schools and student populations, the answers to these questions will allow us to identify factors that contribute to students persisting and thriving in engineering, and implications for academic practices.

### **Implications of APS on Engineering Education Research**

The APS experience using qualitative and quantitative research methods (surveys, structured and semi-structured interviews, field observations, and engineering design tasks) applied longitudinally and cross-sectionally is itself a study in conducting mixed methods research. Besides setting the groundwork for future research efforts, the APS is a valuable case study for teaching research methods in the classroom. It is anticipated that the APS dataset and data collection instruments will be made available to a broader range of researchers in the near future. The full paper, including detailed descriptions of the research cohorts and methods, can be viewed [here](#) following publication in the ASEE 2008 Proceedings.

[www.engr.washington.edu/caee](http://www.engr.washington.edu/caee)

June 2008