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LAST WORD

OPINION BY JAMES E. MOORE II AND LOUISE YATES

Silver Bullets of Retention

Build a community, and pay attention to data.

A flood of recent headlines focused on the problems of retaining and graduating sufficient numbers of engineering students to meet national needs. Nearly drowned in the deluge, however, is a key truth: We are making progress. Programs have become more engaging. Retention rates are increasing. And many of the "scattered interventions" identified in the National Academy of Engineering's 2005 report on engineering education have taken root at institutions as diverse as Notre Dame, Worcester Polytechnic Institute, Olin College, Northwestern University, and the University of Southern California.

At USC's Viterbi School of Engineering, for example, graduation rates have always exceeded national norms — though, until recently, not by much. Since 2005, however, the share of Viterbi freshmen returning to continue their sophomore year in engineering has been well above 90 percent, and the rate continues to rise. For international undergraduates, the return rate has hit 100 percent some years. The six-year graduation rate for USC undergraduates starting in the Viterbi School stands at 88 percent and is on track to surpass the university's 90 percent rate.

It helps that the Viterbi School has access to the best students in a very strong pool of USC undergraduates. One of our past mistakes was to assume that this necessary condition was also sufficient to ensure undergraduate success among engineering students. It is not.

Viterbi students now begin their USC careers in Freshman Academies — hands-on, topical, substantive, project-oriented, team-based experiences that engage students while providing an immediate, macro-level- view of engineering. The instructors are all tenure-track faculty, and half are female — a factor that resonates with all students, not just the 28 percent who are Viterbi women. Upper-division undergraduates serve as course mentors. The key element of the first-year experience, however, involves building a community around engineering. Doing so creates a genuine cohort, which can develop coping skills that individuals cannot. This is particularly important in a complex metropolitan environment like Los Angeles as well as on our campus, where 55 percent of Viterbi freshmen arrive from outside California and 13 percent from abroad.

Nationwide, the jury is in on first-year experience programs. Such programs must be in place to help new undergraduates simultaneously adjust and perform. The Viterbi School's Freshman Year Excellence program includes, among other features, a series of "spotlight" presentations on the engineering professions in which young alumni explain what graduates need to understand about their fields. Undergraduates are encouraged to "explore, succeed, and connect." We are in the process of extending the experience to the sophomore year.

The same social changes that motivate helicopter parents have created freshmen who are uniquely open to advising. Viterbi freshmen are monitored and advised relentlessly. Enabling this effort is a key university-wide undergraduate advisement database that the Viterbi School uses aggressively with its own students. Faculty members are strongly urged to report midterm grades for undergraduates, and most do. Early detection of performance problems draws an advisement response from staff members who are specifically dedicated to retention. Students are made to understand that unwillingness to accept minor, early adjustments often leads to larger problems later and that a capacity to adjust is a form of competitive advantage.

Some interventions are external, such as providing supplemental instruction. In many foundational, traditionally difficult courses, Viterbi upper-division undergraduates are hired to sit in on lectures and then lead weekly, voluntary discussions. The mathematics, biology, and chemistry departments have followed suit, which has been very helpful. Physics is the next target.

If there is a magic bullet or condition for colleges to reach their desired retention rates, it may lie in using data to drive decisions about students, faculty, and curricula. Developing the means to compile the right data, learning to analyze information in a timely way, and deciding on a course of action necessitate investing in systems and people. It is money well spent.

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