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Talking About Leaving: Why Undergraduates Leave The Sciences



Synopsis

This intriguing book explores the reasons that lead undergraduates of above-average ability to switch from science, mathematics, and engineering majors into nonscience majors. Based on a three-year, seven-campus study, the volume takes up the ongoing national debate about the quality of undergraduate education in these fields, offering explanations for net losses of students to non-science majors. Data show that approximately 40 percent of undergraduate students leave engineering programs, 50 percent leave the physical and biological sciences, and 60 percent leave mathematics. Concern about this waste of talent is heightened because these losses occur among the most highly qualified college entrants and are disproportionately greater among women and students of color, despite a serious national effort to improve their recruitment and retention. The authors' findings, culled from over 600 hours of ethnographic interviews and focus group discussions with undergraduates, explain the intended and unintended consequences of some traditional teaching practices and attitudes. Talking about Leaving is richly illustrated with students' accounts of their own experiences in the sciences. This is a landmark study; an essential source book for all those concerned with changing the ways that we teach science, mathematics, and engineering education, and with opening these fields to a more diverse student body.

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Customer Reviews

The authors interviewed hundreds of college students whose high-school SAT math scores were at

least 650 and who started their college careers in natural science, mathematics or engineering. The interviewees were selected randomly for the authors by the participating colleges and universities, from a much larger pool of students whose academic profiles matched the authors' research design. In accordance with this research design, approximately half of those interviewed had switched majors out of science-math-engineering (SME) programs by their senior years. The other half of those interviewed were still SME majors as seniors, and planned to graduate with a degree in natural science, mathematics or engineering. Both groups of students voiced serious criticism of the deliberately competitive, grade on a curve, "overwhelm them and weed them out" approach that is widely used in teaching freshman and sophomore courses in SME-track curricula, particularly calculus, physics and organic chemistry. The authors found it very difficult to predict which students had switched out of SME-track majors and which had stayed using any of the stay-vs-switch criteria commonly cited by SME faculty members, which include native ability, willingness to work hard, college grades, gender, ethnic background, and high-school preparation for college-level work in the sciences. Rather, they found that the chief distinguishing characteristic of those who did not switch was the individuals' willingness to put up with the mental and emotional abuse heaped upon them by this "drinking from a fire hose" approach to instruction in their freshman and sophomore years.

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