Doubling completion rates: Impact of acceleration and intensification in early career STEM education for at-risk students

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Retention of academically at-risk students to major and degree in STEM fields is challenging for a number of reasons, most notably extensive pre-requisite course sequences necessary for entry into upper-level courses and difficulties in completing mathematics requirements. Here we describe the impact of an intense early-college STEM cohort experience on introductory STEM course sequence completion rates for academically at-risk STEM-intended first-year students, where at-risk is defined as placement into high-school level algebra and chemistry courses. Students in the cohort took introductory mathematics, chemistry and biology courses as co-requisites, participated in a professional development/academic support seminar, and had extensive access to senior faculty during their first year. In both quasi-experimental and limited randomization studies, students in the cohort completed introductory major-level course sequences in biology and chemistry at roughly double the rate of students in the control groups. This suggests that early career academic intensification and acceleration through co-requisite models may provide a means to keep more students in STEM majors.