**Attrition and Attraction in STEM:**

**Gender and demographic flows in and out of college majors**

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The “leaky pipeline” is the metaphor commonly used to describe STEM majors, particularly when accounting for the underrepresentation of women. But does the evidence support this characterization of students “leaving STEM”? To examine STEM pathways, we use NCES’s Beginning Postsecondary Students longitudinal survey of a nationally representative cohort of four-year college graduates and interviews with students and faculty at several universities. We find that the STEM graduating cohort is slightly larger than the entering STEM cohort, even though a third or more of entering STEM students leave their initial STEM major. Within a cohort of STEM baccalaureates, a large share of students did not initially declare a STEM major: about one-third of the “late declarants” in STEM first begin as non-STEM majors. Unsurprisingly, college students are more likely to change directions during college than to start and finish in the same major, and STEM pathways reflect these bidirectional flows. Rather than a “leaking pipeline” of only attrition, STEM disciplines are two-way streets, with many students attracted into STEM fields during college.

“STEM” is an amalgam of disparate disciplinary fields with quite different patterns of gender representation and gendered pathways. At the bachelor’s level, women have been at parity in mathematics for half a century, and the majority in life sciences for nearly as long; in computer science and most fields of engineering, however, they are a consistently small share of graduates. But, surprisingly, although a third or more of women leave these majors, they are also late entrants in greater numbers and thus increase their share in the graduating cohort of computer science and engineering majors. Moreover, gender alone does not appear to explain differential patterns of exiting and entering the STEM fields.In terms of policy, the evidence suggests educators and policymakers should focus as much, if not more, on attracting students into STEM fields during college rather than exclusively focusing on retention.