



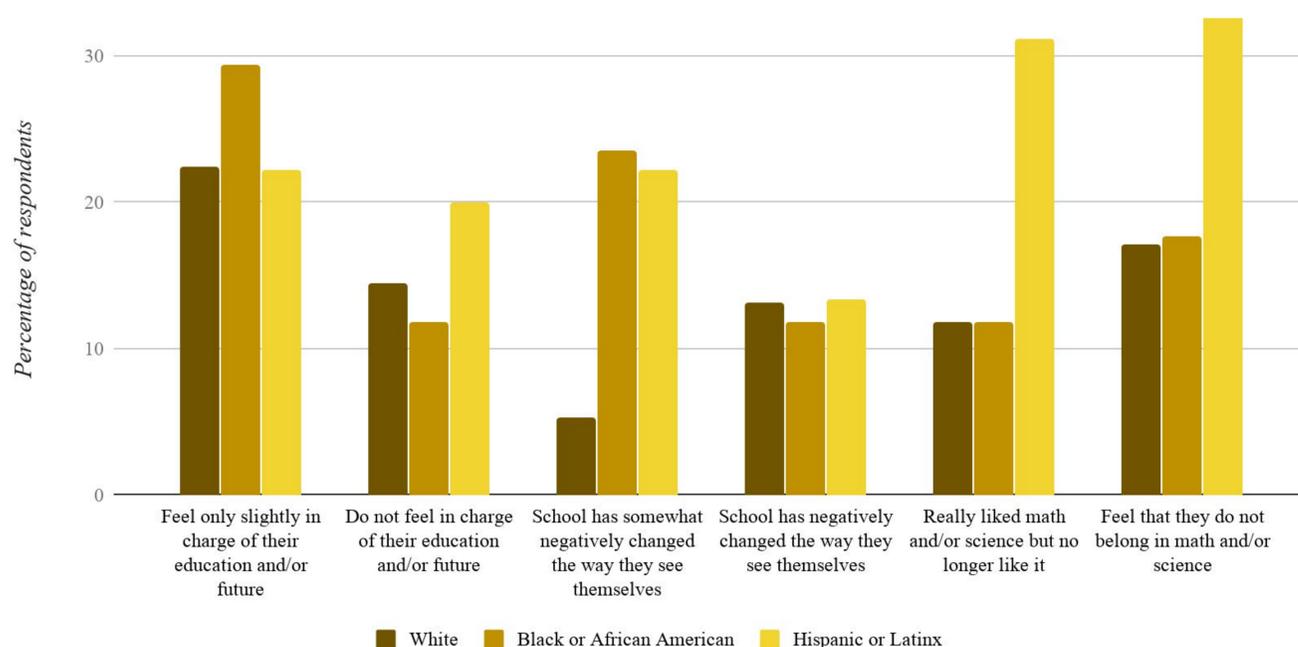
Gaps and Attrition

- 23% of college first-years declare a STEM major.¹
- Up to 50% of bachelor degree students who enter STEM leave the field by graduation.²
- One third of all undergraduates (30.2% of White students, 45.3% of Black students, and 61.2% of Hispanic students) reported feeling unprepared to concentrate in STEM fields upon entering Brown.³

Incoming Perceptions

Issues of retention are not unique to higher education alone-- studies show that students lose interest in science as early as fourth grade.⁴

We asked high school students whether they felt in charge of their education, whether school had impacted the way they saw themselves, and whether they felt they belonged in / liked STEM; below is a graphic of their interpreted responses.



University

- Should provide resources to professors and lecturers for educational training.
- Should require and provide diversity and inclusion training for faculty and staff.
- Should make demographic data more accessible to administrators.
- Should hold departments accountable for gathering and retaining data to help guide new initiatives.
- Should require departments to publish outreach and hiring practices.

Professors

- Should provide students with clear work and prerequisite knowledge expectations.
- Should help every student start with the same foundation by providing resources to gain or review prerequisite knowledge.
- Should be open and receptive to student feedback and should adjust teaching style accordingly.
- Should make course material relevant to students and their everyday lives.

Undergraduates

- Should work toward creating a collaborative, rather than competitive, community in their departments.
- Should ask about and make use of resources available early in their college careers.
- Should hold faculty and other concentrators accountable by providing honest and critical feedback.
- Should talk to professors early if they feel unprepared for their courses.

Departments

- Should provide resources for mentorship.
- Should include students in conversations regarding new initiatives.
- Should conduct surveys to understand community concerns:
 - Annual climate surveys
 - Exit surveys for students switching concentrations, dropping courses, graduating, or otherwise leaving the department.

References

- 1 "Secretary Arne Duncan's Remarks to the President's Council of Advisors on Science and Technology." *U.S. Department of Education*.
- 2 Chen, Xianglei. "STEM Attrition among High-performing College Students: Scope and Potential Causes." *Journal of Technology and Science Education* 5.1. *National Center for Education Statistics*.
- 3 Heck, Isobel. "Lacking Foundation, Minorities Struggle in STEM Fields." *Brown Daily Herald*.
- 4 Sivertsen, Mary Lewis. *State of the Art: Transforming Ideas for Teaching and Learning Science: A Guide for Elementary Science Education*. Washington, D.C.: U.S. Dept. of Education, Office of Educational Research and Improvement, Office of Research.