

LGBQ students less likely to stay in STEM majors

April 5 2018, by Anne Cantrell

For years, researchers have known that it is hard to attract and keep women and some minorities in science, technology, engineering and math - or STEM - fields. Now, a Montana State University researcher has found that the same problem applies to sexual minorities.

Many have suspected the findings, but MSU professor Bryce Hughes' study, "Coming Out in STEM: factors affecting retention of sexual minority STEM students," published in the March 14 issue of *Science Advances*, was the first to provide quantitative evidence, he said.

Hughes, an assistant professor of adult and higher education in the College of Education, Health and Human Development, found students who identified as lesbian, gay, bisexual or queer were 7 percent less likely than their heterosexual peers to complete their STEM degree.

Hughes analyzed data from a national survey given to university students in their first and fourth years in school to see whether first-year students who identified as LGBQ and planned to pursue a STEM major were still enrolled in a STEM major by their fourth year. The Higher Education Research Institute at UCLA collected the data in 2011 and 2015 from more than 4,000 students at 78 institutions across the U.S. Hughes said because of statistical limitations with the data collected, he did not specifically look at experiences of transgender and gender non-conforming students, but plans to in future work.

Overall, Hughes found that 71 percent of heterosexual students and 64 percent of LGBQ students persisted in STEM. After Hughes controlled

for variables such as academic performance in high school and participation in undergraduate research, which are known to contribute to academic persistence in STEM, he found that heterosexual men were 17 percent more likely to stay in STEM than LGBTQ males. However, LGBTQ women were 18 percent more likely than heterosexual women to stay in STEM, which he attributed to gender stereotyping of sexual minority women as masculine and sexual minority men as feminine. Overall, though, Hughes noted that the probabilities for both groups of men staying in STEM were still higher than for both groups of women.

Interestingly, Hughes also found that nearly 50 percent of LGBTQ undergraduates reported working in a lab or doing fieldwork, compared with 41 percent of heterosexual students. Previous research suggests that participating in research programs increases students' chances of completing their STEM studies. Hughes attributes the higher percentage of LGBTQ undergraduates working in a lab or doing fieldwork to both their expectation of adversity and commitment to the field. Had lab and fieldwork participation not been so high for LGBTQ students, the retention gap could have been even wider, he noted.

"We kind of assumed that if you go into a field anticipating that it might not be the most welcoming climate, you're probably more committed and likely to seek out experiences that you know will make a positive difference," he said.

Hughes' study did not determine the reasons for the disparity in retention, although he is interested in conducting qualitative research that investigates that question in the future. Some have speculated that the cultural climate surrounding the STEM fields may reinforce traditional gender role stereotypes and be less welcoming to sexual minority students, he said.

A colleague of Hughes' who is familiar with his work said his research is

evidence that challenges do exist. It also helps broaden the view of underrepresentation, she said.

"We can easily see that a classroom has only a few women or is mostly white students," said Jessi L. Smith, MSU psychology professor. "Dr. Hughes' study is so important because it shines a light on an invisible minority group who are at risk for leaving STEM fields."

Alison Harmon, dean of the College of Education, Health and Human Development, said Hughes' research provides valuable insights for [higher education](#) administrators working to improve the college experience. She noted that providing a welcoming and inclusive environment for all students is a priority of the College of Education, Health and Human Development, as evidenced by a recent diversity and inclusion plan it adopted.

"Our plan states that our college is committed to an environment that fosters diversity and inclusion of all individuals in our college and the MSU community," Harmon said. "We believe that each [student](#), staff and faculty member should feel welcomed and valued for their contributions to the educational process in all areas of teaching and learning, research and service in the MSU community and beyond."

Hughes said one of the biggest takeaways from the research is the importance of expanding the conversation around diversity.

"What we're seeing is broader patterns of exclusion in STEM fields," he said. "When we think about diversity within the STEM context, there's this perception that science is science no matter who is doing the science. What we've learned from work addressing racial and gender gaps and as we expand this conversation to [sexual minority](#) students is that there is some kind of subjectivity at play here. There is some way that different people are being pushed out of these fields."

And, he said, there is tremendous value to diversity in science.

"It's important to recognize that a wider, more diverse array of experiences in the field will only improve the outcomes," Hughes said. "People from different backgrounds may have a different way of approaching problems - which will often result in better solutions."

More information: Bryce E. Hughes, Coming out in STEM: Factors affecting retention of sexual minority STEM students, *Science Advances* (2018). [DOI: 10.1126/sciadv.aao6373](https://doi.org/10.1126/sciadv.aao6373)

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