To improve STEM diversity, fix higher education, scholar says

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To achieve diversity in the US's STEM workforce, policymakers and educators must ameliorate the higher education environment and address barriers that marginalize minority students, according to research by education policy professor Lorenzo Baber. Credit: L. Brian Stauffer

The U.S. will make little progress toward changing the predominately white-male face of its science and technology workforce until higher education addresses the attitudes, behaviors and structural practices that undermine minority students' access and success at college, a new study suggests.

Protecting national economic prosperity has been federal officials'

rationale for implementing programs to increase the numbers of U.S. youth preparing for careers in the science, technology, engineering and mathematics sectors.

However, underrepresented students will remain a trickle in the STEM-fields pipeline until postsecondary educators' and policymakers' motivation changes from economics to ensuring equal opportunity, according to the study's author, education policy professor Lorenzo D. Baber of the University of Illinois.

"In the 1950s when Sputnik happened, and the federal government made the decision to invest more in research and utilizing universities, our higher education structure was very segregated," Baber said. "Students of color weren't able to participate in the development of STEM fields. The economic rationale is important, and obviously brings more people to the table, but we also need to recognize that increasing diversity in STEM is a social justice issue. We need to think about remedying past discrimination in STEM fields along with the economic rationale. I don't think we have to choose between them; we can have both."

Baber interviewed 32 administrators of diversity programs at 10 public research universities in the U.S. - predominately white institutions that award nearly 10 percent of all bachelor degrees in STEM fields conferred by four-year publics nationwide, as well as about 4.5 percent of STEM degrees earned by minorities.

According to these administrators, executive officers at their universities focus primarily on building compositional diversity - recruiting targeted numbers of minority students - for their STEM programs, rather than tackling the complex challenges of changing systemic inequalities and marginalizing attitudes, Baber said.

While amassing critical numbers of underrepresented students is

important, achieving enrollment targets does little to improve the problems in the campus culture that affect students and contribute to their noncompletion of degrees, Baber said.

"You can have compositional diversity without necessarily having a diverse community or culture," Baber said. "The focus on diversity in STEM education has been very much at the level of individual access for underrepresented populations. While programs focused on individual students provide some access, they don't address the structural factors - like admissions policies, teaching practices and faculty-student relationships - that shape students' experiences and influence patterns of inequality."

When recruitment goals are not achieved, or minority students fail academically, these outcomes are attributed to individual lack of merit or interest by underrepresented populations, rather than marginalizing practices and attitudes, Baber wrote.

During campus visits, the research team "found little evidence of a consistent, longitudinal investment in equity initiatives that addressed structural barriers, such as department climate and/or faculty awareness of diversity issues in STEM education," according to the paper, published in *The Review of Higher Education*.

Program directors expressed frustration with the cost-benefit approach taken by executive officers, who expect measurable benefits, such as increased enrollment and improved persistence to degree, to justify investments in diversity initiatives.

Directors described struggling to piece together budgets while their superiors blocked their access to external funding sources that were supportive of diversity activities. Frequently underfunded and disproportionately targeted for elimination, diversity programs received

top-level administrators' support only if these initiatives did not interfere with institutional policies and the overall revenue-generating efforts of academic units, program directors told the researchers.

Beyond small core groups of faculty members from underrepresented groups, program directors perceived a general lack of support from many faculty and staff members, unless prompted by agencies such as the National Science Foundation.

Underrepresented faculty members often experience a "cultural tax" - disproportionate pressure to engage with diversity programs and represent their departments as the outcomes of these initiatives. However, faculty engagement is often viewed as "trivial" or as "charity," and needs to be attached to traditional rewards and incentives, such as tenure and promotion decisions, to prompt broader faculty participation, Baber said.

Data for Baber's analyses were drawn from the STEM Trends in Enrollment and Persistence for Underrepresented Populations (STEP-UP) research project at the U. of I., which was funded by the Alfred P. Sloan Foundation and the NSF.

  More information: The paper, "Considering the Interest-Convergence Dilemma in STEM Education" is available online muse.jhu.edu/journals/review_o … v038/38.2.baber.html

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