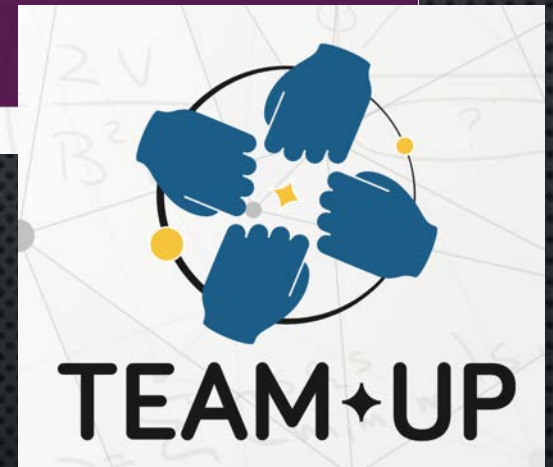


THE TIME IS NOW

Systemic Changes to Increase African
Americans with Bachelor's Degrees in
Physics and Astronomy

FACTOR 2: PHYSICS IDENTITY

DIVERSITY JOURNAL CLUB, 9/10/20



FIVE FACTORS FOR SUCCESS OR FAILURE

1. BELONGING
2. PHYSICS IDENTITY
3. ACADEMIC SUPPORT
4. PERSONAL SUPPORT
5. LEADERSHIP

6. CHANGE MANAGEMENT

FIVE FACTORS FOR SUCCESS OR FAILURE

1. BELONGING
2. **PHYSICS IDENTITY - "TO PERSIST, AFRICAN AMERICAN STUDENTS MUST PERCEIVE THEMSELVES, AND BE PERCEIVED BY OTHERS, AS FUTURE PHYSICISTS AND ASTRONOMERS."**
3. ACADEMIC SUPPORT
4. PERSONAL SUPPORT
5. LEADERSHIP
6. CHANGE MANAGEMENT

PHYSICS IDENTITY
HAS BEEN DEFINED
AS HOW STUDENTS
PERCEIVE
THEMSELVES WITH
RESPECT TO
PHYSICS

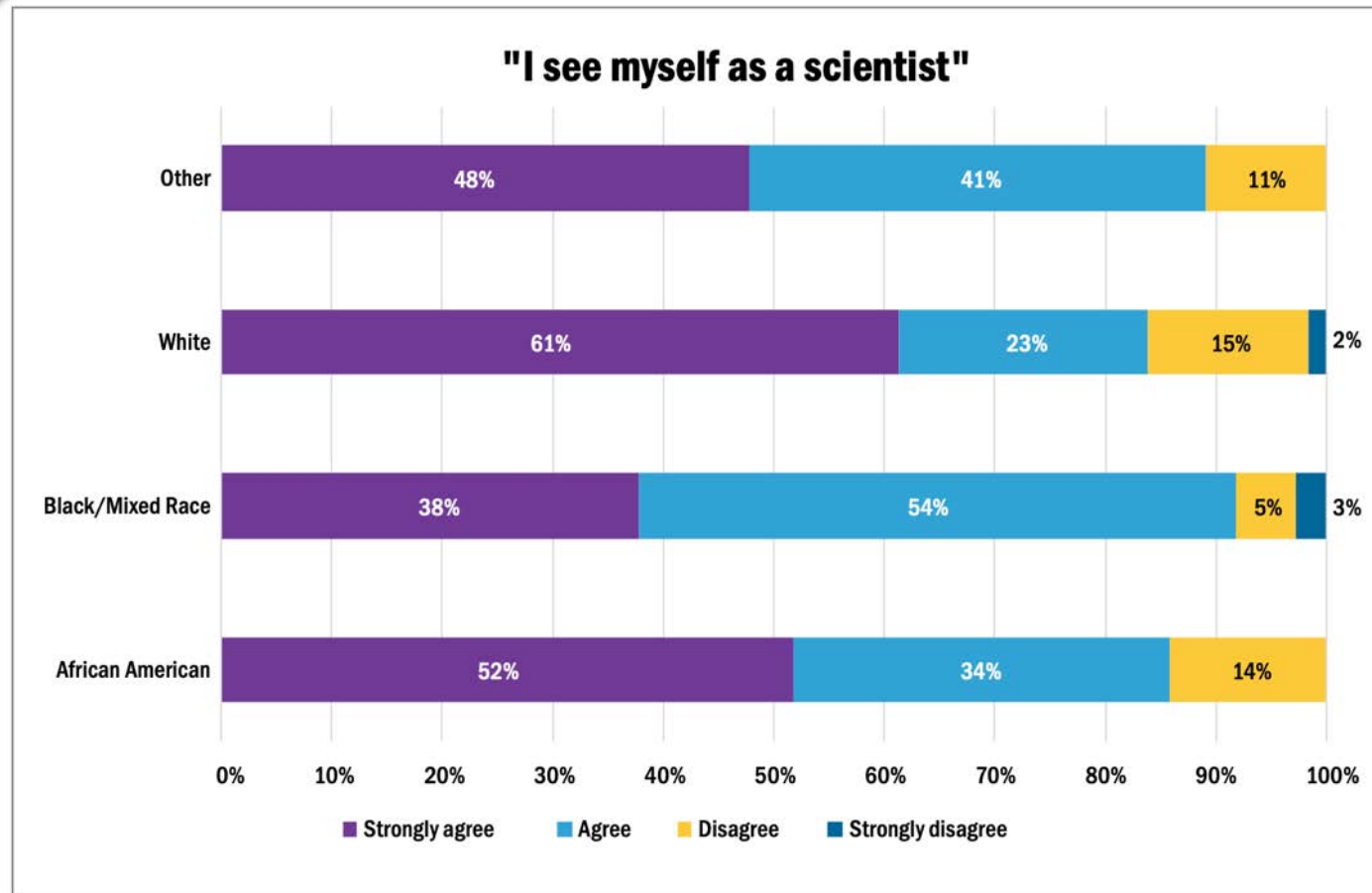


Figure 11: Students' perception of self as a scientist by race. White students more strongly perceive themselves as scientists than all others.

Source: TEAM-UP Student Survey

“I feel confident I could do an excellent job on my assignments in physics”

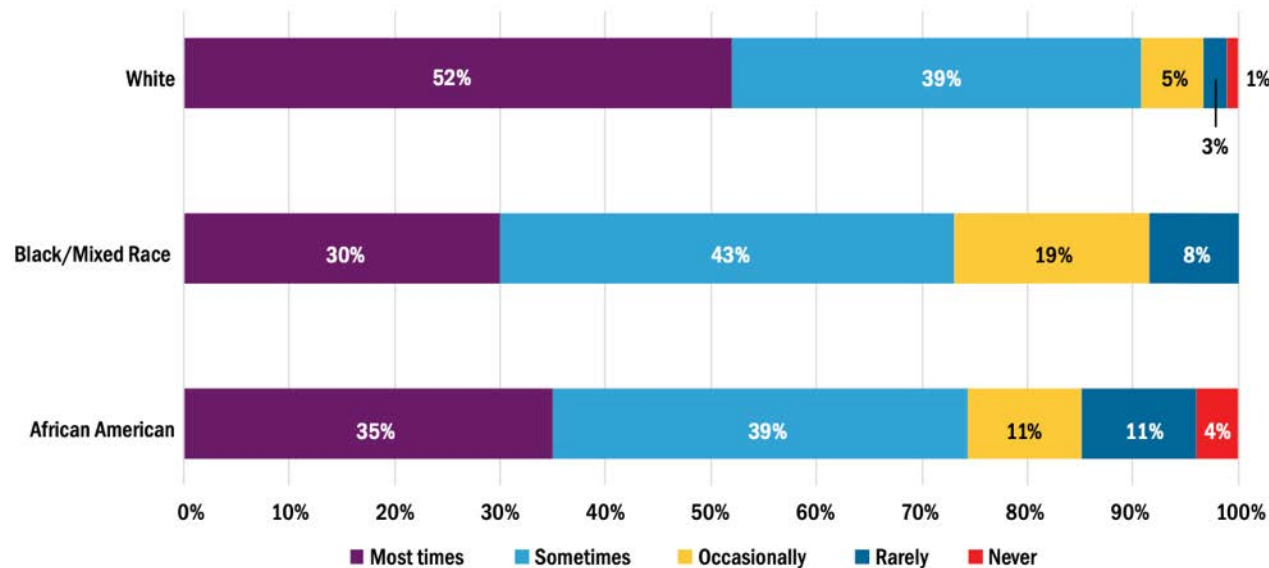


Figure 12: Student confidence on assignments in physics by race

Source: TEAM-UP Student Survey

“Many physicists assume that an early interest in physics, combined with determination, hard work, and some luck, provides the necessary and sufficient conditions to become a physicist, but this is not supported by research. Such an assumption renders invisible the very real cultural and social impacts that African American students feel and must navigate while also acquiring expertise in their chosen subject (Hyater-Adams et al. 2019). “

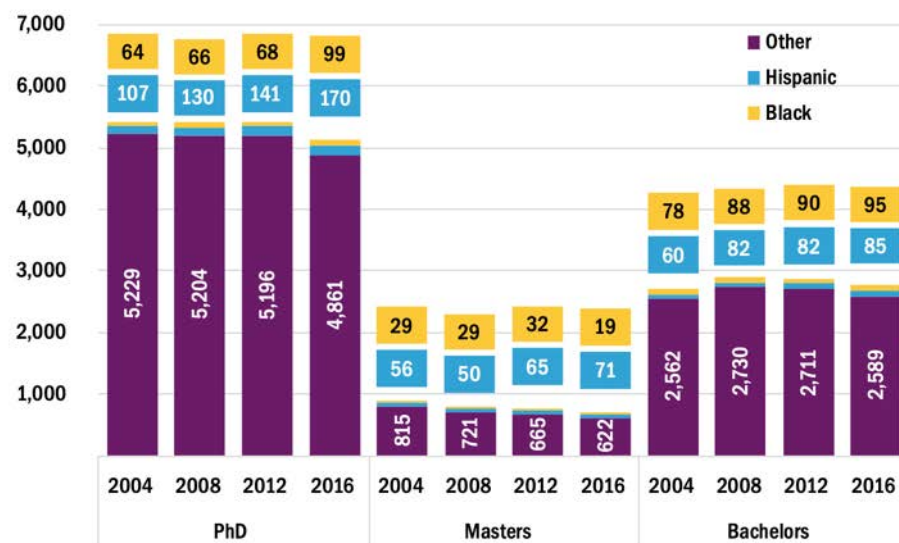
KEY FINDINGS

1. Faculty encouragement and recognition are key enablers of physics identity for African American students. Physics identity development increases with the number of faculty who encourage and recognize student success.
2. Participation in research, attendance and presentation at conferences, and working as a Learning Assistant all foster physics identity development.

KEY FINDINGS

3. Faculty of the same race and ethnicity provide helpful role models whose support is especially meaningful to African American students.
3. The connection of physics to activities that improve society or benefit one's community is especially important to African American students

Number of African American and Hispanic Physics Faculty Members by Highest Degree Offered by Department, 2004-2016



AIP | American Institute of Physics

aip.org/statistics

Figure 13: Physics Faculty by race and highest degree offered

TESTIMONY: "I haven't had a Black STEM professor yet. That's one thing that I envy [about] people that go to HBCUs, that they have that type of connection. Yesterday I was looking at the faculty and staff of my physics department and I didn't see any Black faculty on it. It's not necessarily discouraging, but it's like, 'Okay, I guess.' [You've] got to push through; but coming here to this conference, it honestly makes me happy to see this many Black people in physics and Black people in astronomy."

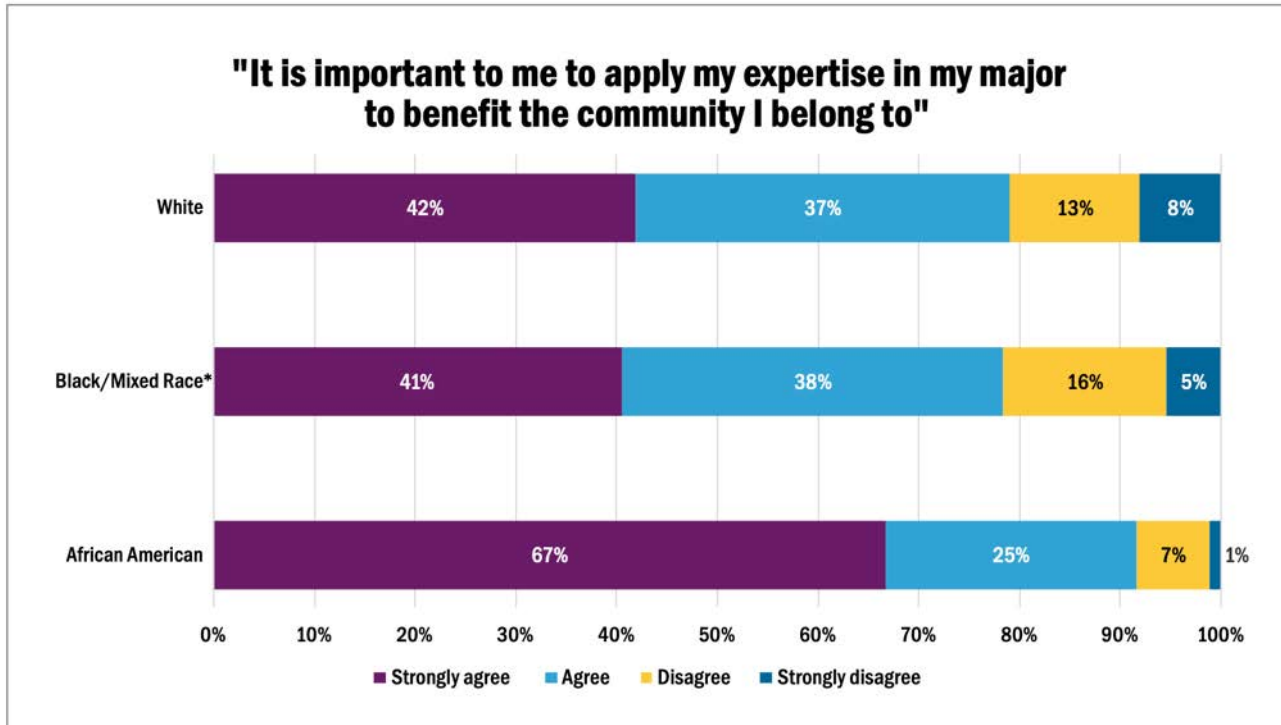


Figure 14: Students' motivation to benefit their community by race

Source: TEAM-UP Student Survey

RECOMMENDATIONS

1. Departments should invite speakers with demonstrated research expertise on physics identity development and should work with faculty on evidence-based ways to strengthen students' sense of physics identity, including encouragement and recognition.
2. Departments should examine whether their current activities foster physics identity, assess their efficacy across race/ethnicity/gender and other social identities, and modify such activities as necessary.

RECOMMENDATIONS

3. Departments should diversify their faculty with respect to race/ethnicity/gender and other social identities in such a way that support of underrepresented students is provided by multiple faculty of varying identities.
4. Departments should communicate the ways in which a physics degree empowers graduates to improve society and benefit their communities, for example by inviting alumni to speak to students about these issues.
5. Faculty should feature and discuss a broad range of career options with undergraduates, utilizing resources such as the AIP/SPS Careers Toolbox and the advice of African American alumni.

WHAT CAN WE DO AT STEWARD TO HELP WITH
THIS FACTOR OF “PHYSICS IDENTITY” ?