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Minority-Serving Institutions: America's Overlooked STEM Asset

Postsecondary institutions with an intentional focus on educating nontraditional students and students of color are a crucial part of solving the nation's STEM workforce supply problem.

Much has been written—including in this edition of *Issues*—about the STEM workforce needs of the future, both in the United States and globally. As the needs of modern business and industry become more complex, more jobs require at least some competency and literacy in science, technology, engineering, and mathematics—the STEM disciplines—and fields not traditionally defined as technical, such as design and law enforcement, have begun to shift into new STEM-related categories. Workforce projections anticipate that opportunities in STEM and related fields will continue to be in demand and will outpace the growth of other positions in the coming years.

Meanwhile, by the middle of this century, people of color will constitute roughly half of the US population, a transition toward a non-white majority that is all the more apparent when considering the demographic makeup of younger generations. In 2016, nearly half of the population 17 years of age or younger were people of color. By 2060, the proportion will be roughly two-thirds.

This convergence of labor market and demographic trends means that the educational outcomes and STEM readiness of African American, American Indian, Alaska Native, Hispanic, underrepresented Asian American, and other students of color will have direct implications for US economic growth, national security, and global prosperity.

As a standing principle, the nation has a responsibility to direct the necessary funding, attention, and support to the strategies that best advance the education and workforce preparation for the next generation. To fulfill that responsibility, it has become critical to understand how the nation's demographic profile is changing and what those changes mean for public policies and practices.

Today's higher education system evolved to serve the demographic profile of students enrolling in college two generations ago—mostly white, majority male. This profile is changing in part because of the rapid rise in the number of students of color graduating from US high schools. But it's also changing because more college students are nontraditional—independent, are parents, are single caregivers, lack a standard high school diploma, work full time, or attend school part time. Anyone who worries about the future of the STEM workforce should also be worrying about these trends, because today the nation's fastest-growing population groups, with the greatest employment potential, are also the most underrepresented across the entire STEM workforce.

And although the challenges tied to supporting the new profile of students in higher education are complex, including the need to reexamine every institution's current social, financial, educational, and cultural support systems, one obvious solution is to invest in institutions that already have an established record and focus on educating and training students who are underrepresented in STEM. Specifically, the nation should turn to its roughly 700 two- and four-year Minority-Serving Institutions (MSIs) and invest additional funding, attention, and support to help bolster the long-term success of the tens of millions of enrolled students. In support of this strategy, the National Academies of Sciences, Engineering, and Medicine in December 2018 issued the consensus study report *Minority-Serving Institutions: America's Underutilized Resource for Strengthening the STEM Workforce*.

Overlooked, underappreciated

Outside the education sector, many people seem to be unfamiliar with MSIs—what they are, who attends them, and when, why, and how they are designated as MSIs. Many education advocates believe that a lack of basic understanding about these long-established institutions is due in part to society's historical neglect of minority-related issues and challenges. Regardless of the reason, for years, MSIs' contributions to STEM education and efforts to train the nation's workforce have been largely overlooked and underappreciated.

Yet MSIs enroll nearly 30% of all undergraduates in the United States. In terms of their contributions to STEM education, more undergraduate students (from all backgrounds) are enrolled in STEM fields at four-year MSIs than at four-year non-MSIs, and when taken together, Historically Black Colleges and Universities, Hispanic-Serving Institutions, and Asian American and Native American Pacific Islander-Serving Institutions produce one-fifth of the nation's STEM bachelor's degrees. Moreover, the individual contributions of these institutions to STEM degree completions (measured as a proportion of all completions) are on par with non-MSIs. Perhaps even more impressive, students who graduate from MSIs do as well as, or even better than, those who attended non-MSIs in achieving upward income mobility, including in moving from the lowest to the highest income quintile by age 30.

Given the nation's urgent need for a well-trained, domestic STEM-capable workforce, and the strong equity-based argument for inclusion and diversity, MSIs are perhaps better poised than any sector within the US postsecondary education to solve the STEM workforce supply problem. As such, it is critical that policy-makers, education leaders, and STEM leaders alike more fully understand the needs of these institutions and their students—not only to better support current MSIs, but also to provide a welcoming landscape for the many MSIs that will continue to emerge in response to the nation's changing demographics. For example, in 2005 there were 245 Hispanic-serving institutions; in 2016 there were 492.

MSIs also play an important role in the two-year higher education sector. Two-year institutions are highly reflective of the nation's demographics and enroll a large portion of its students of color. Accordingly, in 2015, MSIs constituted almost 31% of all two-year institutions nationwide. Looked at another way, roughly 55% of all MSIs are community colleges. Still, these facts are often left out of the countless national conversations about STEM workforce, middle skills, multiple certificate programs, or the impact of free community college access. As such, there needs to be improved recognition and appreciation of the wide role that MSIs play in the nation's education system.

Despite their relative invisibility, MSIs have long served as important national resources for education, particularly STEM education. They will continue to be pillars of US higher education—but their importance and promise should no longer remain hidden. Indeed, MSIs are crucial resources for helping many students of color overcome historically entrenched obstacles to social and economic opportunity, and preparing MSI students for STEM careers can be a powerful catalyst for career success. Thus, in the interest of bolstering national achievements in STEM, enhancing the well-being of all US residents, and remaining competitive in a global economy, it is urgent that the nation determine

the most effective practices and strategies to strengthen the quality of STEM education, research, and workforce preparation for MSI students.

The right stuff

But identifying what works at MSIs is only half the battle. To effectively expand and diversify the nation's domestic STEM workforce, there is a clear and urgent demand for large-scale investments in the nation's two- and four-year MSIs from key higher education and STEM workforce stakeholders—including federal and state governments, tribal nations (particularly in the case of tribal colleges and universities), and the philanthropic and private sectors. And to ensure that these investments pay off, several principals must be recognized and followed.

First, MSI leadership matters—a lot. It is critical that institutional leaders at both established and emerging MSIs—presidents, provosts, deans, and trustees—create a campus culture grounded in devotion to students, so that directly addressing their goals and needs (even when not fully aligned with the goals of faculty, alumni, or donors) becomes the anchor for all instruction, curricula, research, and social support systems on campus.

Second, going it alone may no longer work. It seems essential, at least in some instances, for MSIs to establish formal partnerships with local businesses and industries, and even with nearby non-MSIs, so students at less-resourced MSIs get access to high-quality research and work experiences that ensure that they enter the workforce with many of the same experiences and skills as their peers at research-intensive universities.

Third, the federal government needs to invest more money in MSIs. Although the current administration's focus on private-sector investments in Historically Black Colleges and Universities and other MSIs is laudable, it's not enough. More and stronger partnerships between MSIs and private business and industry are essential. But private investments by themselves won't come close to what is needed to create stronger research labs, update the curricula, and increase internships and other work-based learning opportunities at MSIs. Historical inequities in funding have left the MSIs with less capacity than many comprehensive universities. There are innovative and exciting initiatives on many MSI campuses, but too often still not at the level or frequency of non-MSIs. Given the projection for continued MSI growth, more money is needed, and the federal government will have to be the primary source of support. In addition to developing stronger support mechanisms to assist MSIs in competing for large grants from the National Science Foundation and the National Institutes of Health, more needs to be done to help these institutions successfully bid on the large, $100 million-plus federal contracts that the National Aeronautics and Space Administration, the Department of Energy, and the Department of Defense, among others, usually award to the major universities. Congress has an obligation to invest in MSIs—and should be incentivized to do so because the return on investments to the students, the MSI communities, and the national STEM workforce will be assets for the nation's future.

Finally, institutional accountability matters—a lot. But it needs to measure the right stuff and do so in the context of the unique challenges facing MSIs and their students. Specifically, federal and state educational agencies, state legislatures, and others should use accountability measures and metrics that take into consideration institutional missions, student populations, student needs, and institutional resource constraints at MSIs. Most standard accountability metrics fail to take these factors into consideration and are therefore inadequate measures of MSI performance. There is a need to explore additional attributes that characterize student success, such as social mobility and advancements in personal development and interpersonal skills, and to reexamine the methods used to measure success rates (for example, by expanding the period over which students are tracked, particularly for students who begin at two-year institutions).

The historical contributions, current value, and future potential of MSIs are a crucial part of the nation's educational story—as is their relative neglect as key pillars of the educational enterprise. That MSIs are so little recognized and understood is an object lesson in the difficulties of expanding minority representation in STEM fields. But if demography is destiny, then US economic prospects can no longer be separated from the educational prospects of its increasingly diverse student population. A substantial, and potentially uncomfortable, shift in thinking about the potential strategies to expand and diversify the nation's STEM workforce is essential for every American's future.

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