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Reimagining STEM I&E by Centering **Diversity, Equity, and Inclusion**

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Executive Summary

The Reimagining STEM I&E by Centering Diversity, Equity, and Inclusion project, funded by the National Science Foundation (NSF), amplifies the voices and lived experiences of individuals historically excluded from science, technology, engineering, and math (STEM) innovation and entrepreneurship (I&E). By using iterative design and ideation, 35 participants from these underrepresented groups co-created a vision for a fully inclusive I&E ecosystem, where bright, inventive minds from any background can explore, contribute, and succeed. VentureWell, a national organization whose mission is to cultivate a pipeline of inventors, innovators, and entrepreneurs driven to solve the world's biggest challenges and to create lasting impact, is the NSF grantee and convener of the project.

This innovative initiative provides critical guidance to leaders and decision-makers in the STEM I&E field by offering actionable steps to engage individuals who identify as Black, Latinx, Indigenous, women, and low-income in all aspects of STEM ecosystems. It addresses the specific needs of these communities and provides insights on how to achieve and measure diversity, equity, and inclusion (DEI) in STEM I&E, despite the historical barriers that have limited inclusive participation. The project was led by diverse leaders in STEM I&E ecosystems through a three-phase process: (1) a facilitated, invitation-only visioning workshop to identify key areas for exploration, (2) virtual meetings of small working groups to further develop the new vision and strategic recommendations, and (3) an in-person culminating workshop to share, refine, and coordinate their findings and recommendations.

Traditional and mainstream approaches to fostering inclusion have often fallen short due to systemic inequalities and the limited involvement of underrepresented groups in designing and implementing solutions supported by policies and budgets that address these challenges. What's needed are actionable agendas led by experts who understand how to showcase impact from ideation to execution. These agendas should aim to level the playing field for inventors and innovators in STEM by aligning recommendations with state and federal policies that advance inclusion. By empowering underrepresented groups within the I&E ecosystem, organizations can accelerate progress toward inclusion while actively creating equitable spaces and interdisciplinary learning opportunities for those historically excluded from the innovation landscape.

LaTanya White, Noe Vargas Hernandez, and Monica Dean

The Reimagining STEM I&E project was purposefully designed to address these and related challenges by centering the perspectives of diverse groups and empowering them to map out their vision for more inclusive innovation ecosystems. This was achieved by leveraging the interdisciplinary expertise of over 35 STEM professionals committed to advancing DEI, representing higher education, policy, civil society, industry, and academia. Together, they identified five key subject areas that serve as critical levers for driving meaningful change:

- **Strengthen the K-12 talent pipeline to enhance higher education STEM ecosystems**: Develop initiatives that actively cultivate and support diverse pathways into STEM careers, from early education through college, to ensure sustained engagement and support.

- **Enhance communications and storytelling to showcase diverse innovators**: Implement strategies that amplify the voices and narratives of diverse innovators in STEM, engaging and educating broader audiences about this national talent pipeline.

- **Foster community and a sense of belonging to reduce STEM attrition**: Create inclusive environments that encourage collaboration and support among underrepresented groups in STEM, ensuring that everyone feels valued and connected.

- **Align research with policy-making to drive change**: Leverage data-driven insights to advocate for policies that promote equity and inclusivity within STEM ecosystems.

- **Increase access to capital and new markets to strengthen STEM ecosystems**: Establish funding opportunities and resources that empower diverse innovators and entrepreneurs to succeed in emerging STEM industries.

MARCH 2023 WORKSHOP PARTICIPANT

"I love that we have the opportunity to discuss the critical nuances of DEI that are often glossed over. It's such a complex issue, it's hard to dive into the subtleties and divergent experiences within underrepresented groups in shorter meetings."

Participants were organized into five interdisciplinary working groups, each dedicated to exploring these topics in depth. They examined the associated challenges and solutions while co-creating strategies for building a truly inclusive sector.

Using an asset-based model, this project distinguishes itself from traditional DEI programs by focusing on the strengths and potential of diverse STEM I&E leaders rather than merely highlighting the challenges they face. Conventional approaches often emphasize barriers, which can inadvertently amplify the negative perceptions surrounding underrepresented communities in STEM. In contrast, this project seeks to cultivate a positive narrative that celebrates the talent and innovation present within these diverse ecosystems. By drawing insights and solutions from the lived experiences of participating leaders, the initiative promotes a vision that acknowledges the existing strengths in these communities, ultimately driving meaningful change. As a result, four key themes emerged across the five working groups that warrant amplification.

1. Seemingly separate topics are deeply interdependent

The topics explored by each working group were found to be more interdependent than anticipated. For instance, how we catalyze the K-12 talent pipeline will ultimately influence their reception in higher education institutions. Additionally, public policies and funding are critical to ensuring the sustainability of these resources. Overarching, coordinated messaging is essential and should empower communities to take control of their futures. Traditional approaches that compartmentalize these components within the broader context of STEM I&E programs may hinder progress, especially when students are not viewed as whole individuals and communities in their journey into STEM fields.

2. Representation in participation matters

The composition of those involved in developing the values, programs, and interventions is crucial for creating inclusive STEM I&E ecosystems. Moderators of the working groups expressed a refreshing experience collaborating in interdisciplinary teams with individuals from underrepresented groups. Participants noted their limited opportunities to engage in cross-disciplinary, cross-sector dialogues with peers, often finding themselves as the few leaders tasked with championing DEI initiatives in response to a lack of diversity in their programs or institutions.

3. Psychological safety is vital

Psychological safety is vital for authentically engaging with individuals who have been undervalued, underestimated, and overlooked. Genuine inclusion requires expanding safe spaces that foster a strong sense of belonging. Belonging is a deeply rooted aspiration within communities of color, influencing how they interact and invest in their beliefs. The way diverse individuals present themselves to each other—and in more mainstream settings—matters. Participants observed that with a sense of belonging, the loneliness and isolation often experienced in STEM I&E fields are significantly reduced.

4. Promoting inclusion is essential

Finally, while systemic barriers remain challenging to overcome, prioritizing and promoting inclusion is essential and must be supported by long-term investments. Members of the working groups recognized that sustained commitment of experiential and financial resources is fundamental to closing gaps in participation in high-tech and high-growth occupations, enterprises, and innovations. The new economy is in desperate need of fresh ideas and qualified talent. Overlooking diverse populations represents a loss not only to society at large but also to those who are positioned to effectively support and encourage their engagement.

This report presents the methods and findings from the iterative design and ideation model, including four initial recommendations from each working group. It documents the inception of the group's shared vision and goals, detailing their evolution into more concrete recommendations. While the report provides a series of preliminary suggestions, including those prioritized by the group for immediate action, it also allows for future gatherings to support the development of an actionable agenda and to advance this work.

VentureWell anticipates that project participants will continue to convene, potentially forming a more independent community coalition. **We encourage readers to further explore and implement the recommendations most relevant to their campus or community contexts.** Additionally, VentureWell acknowledges that since the project began, some participants and readers have been directly or indirectly affected by recent statewide efforts to roll back programmatic initiatives that promote DEI. Many higher education institutions are currently facing significant challenges, marking one of the most formidable obstacles since the passage of the 1965 Civil Rights Act.[1] The efforts of those seeking to reverse the intent and progress of DEI will not diminish the critical need for more inclusive learning and work environments, especially in fields that are vital to enhancing American competitiveness.[2]

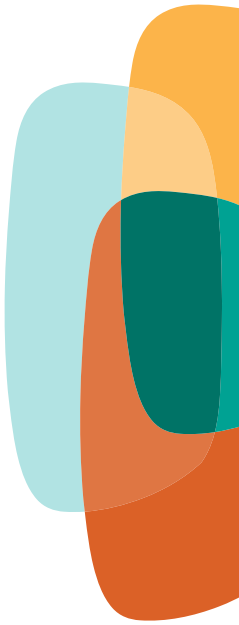
[1] "Civil Rights Act (1964)," National Archives and Records Administration, 2022, https://www.archives.gov/milestone-documents/civil-rights-act
[2] Nicholas Confessore, "'America Is Under Attack': Inside the Anti-D.E.I. Crusade," The New York Times, January 20, 2024, https://www.nytimes.com/interactive/2024/01/20/us/dei-woke-claremont-institute.html

I. Project Background and Methods

From 2023 to 2024, the Reimagining STEM I&E project evolved over three phases, starting with an inaugural workshop as part of VentureWell's OPEN conference in March 2023 in Washington, DC, where primarily higher education professionals from Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), and other Minority Serving Institutions (MSIs), as well as members of the LGBTQ and disability communities gathered to identify the systemic barriers, and brainstorm ideas for upending existing models (see Appendix 1: 2023 Workshop Participant List). Together, they leveraged both their lived experiences and empathy for how diverse groups have been impacted by systems of inequality in these fields, while sharing transformational ideas to better establish their visibility and success in STEM I&E sectors.

Five working groups emerged from the inaugural pre-conference workshop and were expanded to include participants from other disciplines. They leaned into the following focus areas:

- **Strengthen the K-12 talent pipeline to enhance higher education STEM ecosystems;**
- **Enhance communications and storytelling to showcase diverse innovators;**
- **Foster community and a sense of belonging to reduce STEM attrition;**
- **Align research with policy-making to drive change;**
- **Increase access to capital and new markets to strengthen STEM ecosystems.**



From August to December 2023, participants from the March conference met regularly in working groups to develop goals and objectives for their assigned areas (see Appendix 2: Working Group Participant List). Each working group also offered strategic recommendations on how to realize the stated goals. In March 2024, the working groups reconvened in San Diego, California for the NSF INCLUDES Workshop as part of VentureWell's OPEN 2024 conference to review their recommendations through the lens of timeliness, relevance, and prioritization (see Appendix 3: 2024 Workshop Participant List).

II. Framing Barriers to Inclusion

How historically marginalized leaders explore and assert their own solutions in these fields is both critical and timely. Deeply rooted systemic inequities have denied people of color access to the burgeoning opportunities available in STEM I&E. Research from the National Science Board (NSB) estimates that women must double, Black Americans must more than double, and Hispanics must triple their current presence in the science and engineering workforce by 2030 to be adequately represented.[3] But this will not happen by singular strategies alone, or even the same strategies that are on constant rotation by leaders and institutions working to address these gaps.

In addition to extraordinary disparities in support, training, mentoring, patenting, and investment for women and people of color founders compared to their majority white colleagues, historical and current trends surface why existing programs and funding resources have not cracked the code on the inequities present in STEM and related fields. Indeed, traditional approaches to closing the gaps have focused on grant programs and institutional approaches at the K-12 levels, including academies and elective courses. But these tend to be more "top-down" or less available to certain schools and districts. HBCUs, HSIs, and MSIs ultimately carry the mantle for inclusion themselves and struggle to access updated and robust research and best practices—despite being the closest to understanding the problems and barriers that their students face. People and communities who tend to be in the background of the STEM I&E ecosystem must lead the engagement process, and they must craft metrics that represent their own lived experiences and those of their constituents.

The general climate of the academic and professional environments in which diverse students pursuing STEM fields find themselves is critical. In her research on the safety and wellness of Black and Hispanic students in STEM, Ebony O. McGee pursued how they experienced the classroom, and professional settings that were predominantly white.[4] Her findings suggest that the lack of 'belongingness' for them was evidenced by their perceptions of isolation, loneliness, stereotyping, and ridicule by their white colleagues. Consequently, these feelings often led to their early departure from STEM studies at twice the rate of white students.[5] Research

3. "National Science Board: Vision 2030," National Science Foundation, 2020, https://www.nsf.gov/nsb/publications/2020/nsb202015.pdf
4. Rebecca Colina Neri, Maritza Lozano, and Louis M. Gomez, "(Re)Framing Resistance to Culturally Relevant Education as a Multilevel Learning Problem," Review of Research in Education 43, no. 1 (March 2019): 197–226, https://doi.org/10.3102/0091732x18821120

5. David A. Niemeyer, Neema H. Nodoust, and Jaclyn Castelar, "New California Law Requires Diversity Reporting for Venture Capital and Private Equity Firms," Reuters, November 27, 2023, https://www.reuters.com/legal/legalindustry/new-california-law-requires-diversity-reporting-venture-capital-private-equity-2023-11-27

on the high attrition rate of Black and Hispanic students by the American Enterprise Institute saw similar outcomes for students in STEM and early professionals in high-tech careers, who experienced constant explicit and unconscious racial biases.[6] Additionally, when people of color are traditionally underrepresented in these programs, they must individually navigate racially oppressive educational and work environments.[7] This is particularly true for women of color, who face the intersecting impacts of racial and gender inequalities in STEM I&E.

These and other reasons are why the STEM field requires a transformational shift to ensure inclusiveness, one that begins with creating safe and welcoming spaces for diverse students, and continues with professional development, placement, and patents for their scientific and technical discoveries. Further, who sits at the table during the design and deployment of fast-moving products and services, especially those catering to high-growth industries like semiconductors, is also critical to a more resilient global economy.

III. An Overview of Working Group Recommendations

The project's five focus areas were each explored by a working group, with members encouraged to think transformatively about their respective topics. Below, we detail summaries of the discussions held by each group from August 2023 to December 2023, along with their findings and the preliminary recommendations proposed by each group.

IIIa. Strengthen the K-12 talent pipeline to enhance higher education STEM ecosystems

Research has largely settled on the need to cultivate interests in STEM at early ages to ensure students' smooth transition into higher education and future professional opportunities. But equally known are the incongruencies that exist among schools with different resources to develop teachers around innovative teaching styles and motivate students whose backgrounds, including language barriers, could impede foundational knowledge formation.[8] Members of this working group debated both the opportunities and challenges for engaging students around STEM and its core learning competencies. (However, they also found that without a meta-analysis of the available K-12 programs, it is difficult to discover where they overlap or have evident gaps.)

The working group also recognized that educational institutions have not been effective in transitioning students from primary to secondary levels with expressed interests in STEM, and, in many instances, lag when making connections into higher education. Many STEM programs tend to be considered as electives in high school, and therefore, certain students may never be exposed to the field at any point in their schooling. Further, the concept of STEM is not widely

6. Neri, Rebecca Colina, Maritza Lozano, and Louis M. Gomez. "(Re)Framing Resistance to Culturally Relevant Education as a Multilevel Learning Problem." *Review of Research in Education* 43, no. 1 (March 2019): 197–226. https://doi.org/10.3102/0091732x18821120
7. "About SBIR and STTR," America's Seed Fund, accessed March 7, 2024, https://www.sbir.gov/about
8. Neri et al., "(Re)Framing Resistance.", https://doi.org/10.3102/0091732x18821120

integrated into the other courses that elementary and secondary students take during their tenure. Here is where opportunities exist for additional research on how K-12 students interact with STEM I&E content, for impact studies to help existing programs and curricula scale, and for guidance on how to use advanced technologies and learning tools, like artificial intelligence (AI) and augmented/virtual realities, to make these areas more accessible to underrepresented students, their schools, and their communities.

The working group attributed some of this lack of exposure to the limited availability of mentors, especially STEM mentors, in the early educational lives of students. Mentorship is a critical part of the exposure for students at these levels, and when absent from the household and community, diverse students are impacted. The working group identified resources and associations like the National Society of Black Engineers (NSBE), Society of Hispanic Professional Engineers (SHPE), American Indian Science and Engineering Society (AISES), and similarly focused organizations, that are often unknown to parents and even some educators in these grades—despite being largely free and available. These organizations expose young people to STEM, and their programs, including mentorship opportunities, and could be tapped more broadly for their resources.

To ensure the accessibility of resources available in the K-12 space, this working group expressed interest in a comprehensive resource directory, which could be accessed by teachers and guidance counselors. The group also suggested that this information be made available to K-12 populations to enable awareness and involvement at all stages of their education. The group noted that the current K-12 ecosystem can be fragmented and highly competitive, with limited incentives for collaboration as organizations vie for the same attention and resources. The environments of primary and secondary schools are often subjected to excessive reliance on other requirements, like standardized testing and assessments, which further discourage teachers from engaging in extra work to bolster more general STEM interest, especially among students of color.

While much of the focus has been on pedagogy and integrating culturally inclusive STEM applications into curricula, there is also a need for collaboration among primary, secondary, and higher education institutions to strengthen the transitions students experience as they progress. Increased funding is essential to directly address these challenges, with a particular emphasis on building "bridges"—not just "paths"—to STEM I&E careers.

MARCH 2023 WORKSHOP ATTENDEE

"I appreciated the shift to HOW to address inclusion in I&E and WHAT we should do—not just WHO is impacted and why it's essential."

In alignment with their discussions, the working group proposed the following preliminary, strategic recommendations:

1. **Design K-12 STEM I&E programs to ensure both technical proficiency and social development,** while providing diverse students with continuous exposure throughout their educational careers.

2. **Make STEM in high school a grounded learning competency** at all stages of students' learning with consistent exposure to its related careers.

3. **Compile a national resource of K-12 STEM and STEM I&E programs** to facilitate national and regional access.

4. **Develop a national marketing campaign** that weaves a compelling narrative to educate K-12 students about STEM I&E career opportunities, showcasing this field as a sustainable and emerging discipline.

These preliminary recommendations were designed to remove the likelihood that students from underrepresented backgrounds may not see or partake in and benefit from STEM fields and to incorporate the process of tech transfer as these students explore higher education.

IIIb. Enhance communications and storytelling to showcase diverse innovators

This working group concentrated on communications and storytelling to elevate the narratives of emerging, diverse STEM I&E leaders and highlight their role in strengthening American competitiveness. This focus on representation also supports the other key areas identified in the project. The framing and sharing of DEI stories about diverse populations are crucial, as is who controls these narratives, which influences their credibility and impact. The group emphasized addressing these realities, as well as exploring how to shift from deficit-based to asset-driven approaches in articulating the vision, programs, and future of STEM I&E.

To more effectively articulate narratives that reflect the lived experiences of groups historically marginalized in STEM, this working group emphasized the need to define and reach a shared understanding of terms commonly used in STEM I&E—such as "ecosystems," "inclusiveness," "equity," and "parity"—and to clarify their meaning for intended audiences. These terms are often used ambiguously, creating barriers to mutual understanding. Meeting people where they are in the broad STEM I&E landscape is essential. Stories are shaped by the language available, and as individuals evolve within these spaces, so too should the language that

describes their contributions as innovators and inventors. Additionally, the tone of language should be "affirming" and "inviting," especially when messaging is directed at underestimated populations who are often targeted with paternalistic or deficit-driven narratives.

Another significant takeaway from this working group was how communications and stories must showcase the *aspirational goals* of communities of color, which can possibly shift the practices and programs that are being established to address systemic gaps in representation. Centering the values of diverse communities is also significant in the construction of such communications, and ensuring diversity in modalities (e.g., text, video, audio media), is equally important.

In addition to being purposeful, affirming, and using substantive calls to action, messaging by and for diverse populations must project a positive trajectory for the future. The working group generally agreed that concepts around patents, intellectual property, and even a greater understanding of what constitutes high-growth industries are not well understood by students and educators—sometimes largely due to the disconnects with the evolving and emerging needs of industry partners. The working group proposed a communications infrastructure to be developed and implemented collaboratively with the other working groups and other partners, who may want to drive messaging around their expertise.

In alignment with their discussions, the working group proposed the following preliminary, strategic recommendations:

1. **Incorporate the language of diverse communities** into the crafting and sharing of their authentic stories to reflect their current and future experiences and aspirations.

2. **Ensure that communications and storytelling are collaboratively developed** with intentions to empower, affirm, and activate breakthroughs in STEM I&E fields.

3. **Encourage messaging that is asset-based,** and ensure that different modalities (e.g., text, video, audio, etc.) are used to bring people closer to the messages around inclusion.

4. **Develop and share stories and profiles that promote the pathways into STEM I&E for K-12 populations and early professionals.** These stories can come from partners and should also be the framework for sharing among the entire STEM I&E community.

The way these stories are conveyed can shift focus away from merely highlighting the challenges students face in STEM fields, instead emphasizing pathways and possibilities in their educational and career journeys.

IIIc. Foster community and a sense of belonging to reduce STEM attrition

This working group used an interactive, iterative process to guide their discussions and arrive at their proposed recommendations. This is important as every member came into the conversation with their own understanding and values around what constitutes community, and what constitutes *belongingness*. Research on the concept of belongingness has referred to the extent to which people feel a human and emotional connection to the community in which they are. As was suggested by the moderator of this working group, "Humans are spatial beings, and we know who we are in a space. But we tend to be just data points, and we are [unaware] of the constellation of things that exist in that layer."[9] Along this rationale, the working group brainstormed the attributes for the types of people that are often present in conversations about community and belongingness and suggested that their varied communications and leadership styles be acknowledged, as well as appreciated.

What this means is that efforts to dismantle DEI programs need not diminish inclusion and belongingness. The latter is a feeling, or an aspiration deeply rooted in how communities of color interact, and vest their assets around what they believe in. For this working group, inclusive innovation does not comprise a series of short-term activities. Rather, it is a series of more collaborative formal and informal partnerships, which become part of the DNA of existing and future activities.

Fostering belongingness is also rooted in consistent communication and interaction between individuals and groups to get work done. It encompasses empathy because not everyone at the table will be at the same phase of understanding or have the same perceived commitment to the work in front of them. For example, this working group had several people who were thrust into the throes of recalibrating their own programs to omit any references to DEI during the project's schedule, but despite that added stress, they actively participated in the monthly meetings because they were provided with safe and welcoming spaces. This suggests that trust is critical to all community-building efforts, which are much more behaviorally driven than measured by the long list of institutional and programmatic priorities. The working group also found that community-building is motivated by assets, and not by deficits.

WORKING GROUP PARTICIPANT

"We had a wonderful, engaging, and thoughtful group of changemakers!"

[9] Quote attributed to Rubén Cantú (he/him), former Executive Director, Office of Inclusive Innovation and Entrepreneurship, Assistant Professor, College of Education, Assistant Professor, LBJ School of Public Affairs, University of Texas at Austin.

How people from underrepresented groups show up for each other, and within mainstream settings, makes a difference—especially when, with a strong sense of belonging, they don't have to endure the loneliness and isolation that often accompanies studying or working in STEM I&E fields.

The final takeaway from the working group was their understanding of which stakeholders comprise the community of experts and learners in STEM I&E. They wondered how the group might consider the involvement of more grassroots organizations. What are the criteria for becoming part of the community, or are limited engagements available to solve problems, or nurture timely opportunities? The suggestion that the project has to evolve into the hands of the leaders with closer lived experiences to diverse students was raised, and they wondered whether such a community-based coalition could be supported by VentureWell.

In alignment with their discussions, the working group proposed the following preliminary, strategic recommendations:

1. **Establish clear expectations of belonging and acceptance from early education through the transition to higher education.** Extend it into spaces of reciprocity and empathy for one another.

2. **Identify and overcome the barriers that hinder diverse organizations' participation in policy and programmatic conversations.** Invite these organizations in, and in particular, cultivate cross-functional collaboration on integrating I&E principles into STEM education.

3. **Create strategies to establish strong commitments for fostering partnerships centered on DEI.** Create a more actionable and urgent environment for change.

4. **Establish mentorship programs that connect seasoned I&E professionals with emerging talent from underserved communities.** Provide resources to these networks to ensure sustained and effective relationships.

Achieving a sense of belonging in the STEM I&E community necessitates a neutral space, potentially supported by an independent entity to ensure its sustainability. A combined digital and in-person platform could facilitate organic network growth. However, realizing this goal poses challenges in the current national climate, as certain state laws are beginning to dismantle DEI initiatives and inclusive programming on college campuses. The concluding section of the report explores actionable strategies to better support leaders striving for greater representation in these fields.

IIId. Align research with policy-making to drive change

Similar to previous groups, this working group recognized that creating inclusive ecosystems is an evolving process along a continuum. They emphasized that classroom experiences significantly influence workforce and entrepreneurial outcomes. In a field primarily debated by educators, research focused on the transfer of knowledge throughout this continuum, along with global public policies that support post-degree inventors and innovators, is essential.

Furthermore, the group found that discussions among higher education professionals often overlook the implications of certain public policies. Evidence-based policies can drive structural changes that promote equity and inclusion while providing sustainable support for inventors and entrepreneurs. For example, California recently introduced legislation requiring venture capital (VC) and private equity firms to report diversity data on the "founding team members" of the companies in which they invest.[10] Starting in 2025, VC firms will undergo an annual survey about the companies in their portfolios, reporting data on the race, ethnicity, disability status, and gender identity of the founders they back.[11] If investors are noncompliant, they will be fined. While transparency will be a significant step in revealing gaps, the law is state-specific and may not uncover some of the explicit and implicit investor biases. Another example is related to federal and local policies focused on closing the digital divide. As people of color are more likely to be challenged by the lack of digital equity, tapping into the range of federal and state resources, including funding, can expedite access to high-speed broadband and internet-enabled devices, which will be critical to the participation of individuals and communities in STEM I&E.

The extent to which federal and state resources are widely known among underrepresented communities must be improved. This working group pointed out the limited awareness about federal programs and grants, including the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs, also known as America's Seed Fund, and State Small Business Credit Initiative (SSBCI) which can catalyze research and development

WORKING GROUP PARTICIPANT

"With energetic group members, diverse experiences and expertise, ideas built on one another [...] I learned so much, and I think we all learned from each other! I love being a part of an active community of practice and I'm looking forward to connecting with my group in person."

[10] Niemeyer, et al., "Diversity Reporting." https://www.reuters.com/legal/legalindustry/new-california-law-requires-diversity-reporting-venture-capital-private-equity-2023-11-27

[11] Niemeyer, et al., "Diversity Reporting." https://www.reuters.com/legal/legalindustry/new-california-law-requires-diversity-reporting-venture-capital-private-equity-2023-11-27

for inventors and innovators of color.[12] These programs aim to support innovation through federal investments to strengthen and diversify the innovation economy. Additionally, the International Consortium for Organizational Resilience (ICOR), a nonprofit education and credentialing organization, evaluates the resiliency of organizations through a variety of factors, including diversity.[13] More general awareness of these and other funding opportunities were points of interest for this working group.

Amid the ongoing attacks and challenges to DEI frameworks, emphasizing the role of research and public policy can help solidify future initiatives, making them less vulnerable to shifting political agendas. Additionally, efforts to reimagine DEI in STEM fields must include assurances for long-term sustainability.

In alignment with their discussions, the working group proposed the following preliminary, strategic recommendations:

1. **Conduct research to enable more people of color to see themselves in the STEM I&E space**. Engage adjacent affinity groups, like the National Society of Black Engineers, Society of Hispanic Professional Engineers, and similarly focused groups, to help in supporting and disseminating findings.

2. **Identify and prioritize public policies and funding opportunities** that facilitate greater support and sustainability for groups engaging in this work, including those not directly targeted to higher education.

3. **Advocate for federal and state agencies to establish guidelines promoting inclusive participation** in innovation and high-growth sectors as imperative. Call for Congressional appropriations in large federal funding programs to provide additional financial support or increased federal funding for grants benefiting inventors and innovators of color.

4. **Ensure that broadband access is available, affordable, and accessible at all colleges and universities**, and within communities where students and entrepreneurs of color are located for greater enablement of their participation in high-tech, high-growth industries.

In addition to these activities, the working group also suggested that more STEM I&E partners need to know more about the information flowing from government agencies, including the U.S. Department of Commerce's Minority Business Development Agency (MBDA) and others, who are committed to funding these sectors and providing the needed technical assistance.

12. "About SBIR and STTR," America's Seed Fund. https://www.sbir.gov/about
13. "ICOR," The International Consortium For Organizational Resilience, accessed March 7, 2024, https://www.build-resilience.org/

IIIe. Increase access to capital and new markets to strengthen STEM ecosystems

In a departure from typical STEM I&E discussions, this project intentionally assembled a diverse group comprising faculty, private equity leaders, and policymakers. This working group was focused on addressing the systemic inequities that have historically placed founders of color, particularly women, at a disadvantage in accessing equity funding. Their mission was to understand the root causes of this disparity and to develop a robust set of ideas aimed at inspiring underrepresented students interested in entrepreneurship and innovation in these fields. It is well-documented that diverse tech founders, especially women and people of color, encounter heightened scrutiny at all stages of capital development.

Moreover, diverse founders may not know how to effectively navigate the angel investing space, which presents areas of opportunities for innovation and entrepreneurship centers. Just as direct and early exposure to STEM is beneficial, direct and early exposure to information about investment and financing options will demystify this important area so that when founders are ready to seek capital, they understand the process.

An additional nuance that emerged from the working group is the extent to which public policies are created or advocated for that change the trajectories of venture capital for diverse communities. Part of the problem with the current landscape is the paternalism that comes with access to markets and capital. That is, lenders typically give to people with whom they have familiarity because they trust them or have done business with them before. They understand their track record, which makes the transaction more seamless. Public policies can serve to change that course by exposing the systemic inequities, or by raising awareness about this earlier for diverse communities, and more attention can be paid to cultivating that trust even before graduation. Higher education leaders and students beginning relationships with an assortment of venture capitalists can, at minimum, make known the ideas emanating from local communities. However, this does not solve the more troubling problem around the lack of a robust network of minority-run funds to partner with leaders in STEM I&E who are prepping the next generation of leaders. With the expansion of high-growth sectors, and their support through government agencies, it is important that the conversation be extended into areas that guarantee industry stakes, including patents and copyrights for attributable products and services.

Here is where the working group acknowledged the role of government funding to be used for research and development, and perhaps more soft capital to fund and structure ideas emerging from diverse founders. Understanding federal and state resources, including emerging governmental initiatives such as the CHIPS and Science Act, can help in the early stages of idea development for entrepreneurs.

Access to equitable capital is still a barrier in efforts to convince students that this is a less risky pathway to social and economic mobility. Many students of color are indoctrinated to get a 'good job' to realize the American Dream. Working group members leaned into the concept of 'inclusive ecosystem building' to construct relationships between students and entrepreneurs and innovators, who together can deconstruct many of the systemic and traditional barriers to entry.

In alignment with their discussions, the working group proposed the following preliminary, strategic recommendations:

1. **Diversify the government, industry, and philanthropic experts addressing systemic barriers to funding.** Those who work within and understand the innovation marketplace have insights that higher education leaders may not possess.

2. **Encourage students and early-stage entrepreneurs to work together to realize their goals, and to tackle the barriers that come with traditional access to equity.** For example, they could work to improve tech transfer from higher education to the market via patents for diverse founders.

3. **Promote more accelerators, particularly those catering to diverse groups.** These accelerators can be helpful in guiding entrepreneurs through the various stages of investment, and where possible, explore options with soft capital from federal resources.

4. **Establish connections among startup networks, investors, and entrepreneurial communities.** Securing capital is a collaborative endeavor, highlighting the importance for colleges and universities to enhance early exposure opportunities for diverse founders and inventors.

This working group noted that there are myriad historical and systemic barriers impeding progress toward greater equity in access to capital and new markets. However, the STEM I&E sector can at least connect communities to ensure more talent in the pipeline when it comes to early professionals of color and their exemplary ideas.

IV. Discussion of the Preliminary Recommendations

The preliminary explorations and findings of the working groups served as the basis for the full-day discussion held during the March convening at VentureWell's OPEN 2024. This pre-conference workshop brought working group members to San Diego, California to share and discuss their initial recommendations with each other, and to identify the first actionable items to collaboratively explore. During the convening, the working group moderators provided their own insights into the work done to date. In addition, two topics were deeply discussed, as they affect the evolving nature of STEM I&E—the fate of DEI across the country, and the growing challenges with access to capital for diverse founders. These topic discussions were incorporated into the pre-conference with the aim of equipping leaders with the needed tools to operationalize a reimagined DEI agenda at their respective schools and/or communities. Further, two of the projects' participants facilitated a group exercise around belongingness, which helped to solidify the tight-knit community with similar goals and robust reciprocity in leaning into systemic change.

There is a level of embedded trust in VentureWell's ability to get the work done, as demonstrated by their project team's leadership as well as through organization-wide DEI initiatives in grantmaking, accelerators, vendor sourcing, and hiring. As mentioned earlier, VentureWell's President and CEO, Phil Weilerstein, along with some members of his senior leadership team, participated in both convenings, alongside some of the organization's Board members and funders. The display of support for the project was significant and the perspectives of the advisory group members were highly credible. This project speaks to the critical significance of belongingness in the STEM I&E community when it comes to both input and implementation—all of which are noticeably absent in other debates around DEI in STEM.

Charleston Bell and Grace Mukupa engage in a meaningful discussion at OPEN 2024, centered on fostering inclusivity within STEM ecosystems.

The March 2024 pre-conference convening showcased a behavioral shift, where the group agreed on the need for a common language to facilitate a more inclusive STEM I&E ecosystem, especially the distinctions between affirming versus deflating references, as well as the intended audiences for the work. The entire group also took a poll to determine which of the recommendations from each working group should be prioritized into a more cohesive and collaborative agenda to effectuate change in the STEM I&E ecosystem, and how the recommendations could be operationalized. Another takeaway was focused on available and necessary resources to undertake this bold and courageous work. Finally, it was very important in the last convening for project partners to examine their own commitment to DEI and STEM I&E—exploring the extent to which they trusted one another's intentions in the space, and how they could cultivate their own sense of community.

Of the more than 20 recommendations from the earlier work of the working groups, the following five received the most votes as the ones this group would like to pursue. In small groups during the March 2024 meeting, participants addressed the scope of each of these recommendations and developed preliminary action agendas for implementation.

1. Design programs for both technical proficiency and social development

Design K-12 STEM I&E programs to ensure both technical proficiency and social development, while providing diverse students with continuous exposure throughout their educational careers.

Action: The promotion of the K-12 spectrum was encouraged by participants to advance DEI in these spaces. In addition, a comprehensive, national guide was recommended as a next step to better inform primary and secondary school educators as to the benefits of STEM I&E, and help students aspire to be innovators and inventors in their higher education pursuits. It was noted that these efforts would require both time and resources to actualize.

2. Incorporate the language of diverse communities

Incorporate the language of diverse communities into the crafting and sharing of their authentic stories to reflect their current and future experiences and aspirations.

Action: The movement toward more equity-centered and equity-minded conversations will be uplifted and sustained through a communications infrastructure. Among the full advisory, it was generally agreed that it was imperative to have both a common language and series of widely accessible and authentic stories. Using multimedia assets from VentureWell and partner organizations was suggested a means to achieve these goals, as well as convening a subgroup to dive into what words, stories, and concepts will shift the narratives among other diverse partners, as well as the mainstream audience. The group acknowledged that this is a starting point, and one that should bring in broader and more diverse audiences to the field.

3. Promote more accelerators

Promote more accelerators, particularly those catering to diverse groups. These accelerators can be helpful in guiding entrepreneurs through the various stages of investment, and where possible, explore options with soft capital from federal resources.

Action: The identification and expansion of inclusive accelerators was named as a critical recommendation to raise awareness about STEM I&E fields for diverse populations and to prepare them for entrepreneurial success and access. Locating more accelerators at HBCUs, HSIs, and MSIs was encouraged to train students on the expected behaviors and practices in STEM I&E, and help them better understand how to enter into nontraditional careers and occupations, especially as entrepreneurs and inventors. Accelerators can also prepare cohorts of students for engagement, and bring in a wide range of resources and mentors.

4. Identify policies that support inclusive STEM I&E

Identify and elevate public policies that support inclusive STEM I&E ecosystems. Ensure that policymakers have continued interest in funding, connecting, and empowering HBCUs, HSIs, and tribal land colleges and universities to support and continue these efforts.

Action: Match the public policymaking landscape with the objectives of more inclusive innovation ecosystems—whether through understanding how to best support policies that advance funding for impacted communities, or awareness of public policies that can stifle progress when it comes to DEI. Here, the group shared the need to have a more formal mechanism to disseminate timely and urgent calls to actions and opportunities for funding, much like the Request for Proposals (RFPs) coming out of federal agencies. Without compromising their organization's strict political advocacy requirements, the leaders desire to be changemakers and influencers to ensure that inclusive innovation systems are well accounted for in emerging policies and government-led funding.

5. Establish connections among communities

Establish connections among startup networks, investors, and entrepreneurial communities. Securing capital is a collaborative endeavor, highlighting the importance for colleges and universities to enhance early exposure opportunities for diverse founders and inventors.

Action: This recommendation was perfectly suited to complement all the above proposals with the emphasis on access to financial capital and post-college outcomes. One of the takeaways from the day-long discussion more generally was the lack of exposure and knowledge of what venture capitalists seek in early-stage funding, especially among innovators of color who may not have a direct connection or understanding of the equity process. Planting seeds early in both the norms and practices of equity investors will be critical to the transition from student to early entrepreneurship and will lessen the time to pitch and market innovative products and services. The group identified the need to start identifying private equity leaders willing to spend time with students from HBCUs, HSIs, and MSIs as a way of establishing a pipeline of ready and prepared innovators and inventors, and equipping them with the tools to break through some of the historical barriers to capital access for entrepreneurs of color.

Participants also discussed current attacks on DEI programs across the country, and shared strategies for navigating this climate. It was not anticipated at the start of this project that certain states would begin to roll back their long-standing commitments to DEI programs, and some of the project stakeholders would be negatively affected. While some argue that this has been an overreach of the interpretation of the U.S. Supreme Court decision around race being used in college admissions, the threat to inclusive innovation centers not only has been real for some of the project partners, but actualized in cases where state support for individual programs have been pulled, resulting in massive layoffs.[14] States including Texas and Florida have been particularly adamant about enforcing such anti-DEI laws, and consequently, place higher education in the position of re-evaluating how the work is carried out at their respective universities.[15] Clearly, this statewide policy, which has the potential to become federally mandated, threatens the essence of this work, and is disadvantageous to the ultimate goals

[14] Amy Howe, "Supreme Court Strikes down Affirmative Action Programs in College Admissions," SCOTUSblog, July 27, 2023, https://www.scotusblog.com//2023/06/supreme-court0strikes-down-affirmative-action-programs-in-college-admissions

[15] Andrew Atterbury, "UF Becomes the Latest Florida School to Gut DEI Programs," POLITICO, March 1, 2024, https://www.politico/news/2024/03/01/uf-florida-diversity-equity-inclusion-programs-00144480.
See also Acacia Coronado, "Texas' Diversity, Equity and Inclusion Ban Has Led to More than 100 Job Cuts at State Universities," AP News, April 13, 2024, https://apnews.com/article/dei-texas-university-job-cuts-939b334d85108e498c0f85d2ad44ebc2

of creating a more inclusive STEM I&E ecosystem. Without naming the problem, it becomes increasingly difficult to solve and redress the many years of disproportionate representation by people of color, and others from diverse communities. That is why it is important to continue the work of this project, and importantly, to engage policymakers in the relevance of the work's outcomes. Without a talent pipeline, the United States will forgo existing and future opportunities to maintain global competitiveness. More importantly, all people in the nation make up the potential workforce, as well as businesses that will drive high-growth industries. Without a focus on cultivating new talent, the area will continue to outpace the supply of experts to support innovation economies.

While most of the time spent on the project explored critical behavioral shifts that need to happen to change the status quo and redirect focus on inclusive innovation, the scale and velocity of a more diverse movement must come from the voices and actions of impacted communities, who need to be heard, valued, and invited into the STEM I&E fields. What was clear in all of the meetings and convenings was that the existence of a convening body helped to jumpstart the conversations needed to flesh out the common norms and expectations of diverse communities. A national presence and staffing infrastructure will allow this project to evolve and fundamentally change how DEI is factored into debates focused on accelerating efforts to include more diverse students, educators, and entrepreneurs in STEM I&E. There is also urgency in the project's goals and recommendations in an evolving and emerging science-driven ecosystem.

V. Conclusion

Addressing diversity, equity, and inclusion in STEM I&E is a never-ending process, much like the continuum that many participants suggested. It is also a process that requires courageousness because many of the structural barriers, which perpetuate systemic inequalities, will not relent. The "Reimagining STEM I&E by Centering Diversity, Equity, and Inclusion Project" is just that—a bold effort to turn the tables on existing structural and behavioral inequities and return them back to the people best positioned and situated to effectuate change. In the end, the safety of these spaces is required for healthy engagement by diverse students and early professionals. The people that are closest to them as mentors, employers, teachers, and distant role models will be the ones to best guide and enhance their future in these scientific and technical fields. We invite you to use these project findings, strategies, and recommendations to re-envision STEM I&E by centering DEI on your campus or in your community. We welcome your feedback and input on what is working well in your context and where you are encountering challenges. Please send your questions, comments, and insights to equity@venturewell.org.

Appendix One: List of March 2023 Workshop Participants

Nicol Turner Lee, **Moderator**, Brookings Institution

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Eric Bonsu, Bowie State University

Latane Brackett, National GEM Consortium

Rubén Cantú, UT Austin

Dominique Carter, The White House OSTP

Monica Dean, USC Lloyd Greif Center

Tracy Dunn, Benedict College

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Jamie Elder, Industrial Council of Nearwest Chicago (ICNC)

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Kevin Harris, Stillman College

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Lorra Hill, Stillman College

Clare Leinweber, Yale University

Isaac McCoy, Stillman College

Grace Mukupa, American Indian Higher-Education Consortium

Otis Nelson III, Stillman College

Karthika Perumal, Womble Bond Dickinson

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LaTanya White, Concept Creative Group

Neela White, AAAS

Fallon Wilson, Black TechFuture Research Institute

Chithra Adams, VentureWell

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Kristen Golden, VentureWell

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Appendix Two: List of Working Groups and Participants

Working Group One – K-12 pathways

Camisha Parker, **Moderator**, executive director, Virginia State University-Norfolk State University Regional Center

Ragina Arrington, CEO, Clinton Global Initiative University, Clinton Foundation

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Clare Leinweber, executive director, Tsai Center for Innovative Thinking, Yale University

Isabelle Monlouis, associate director, H.J. Russell Center for Entrepreneurship, Robinson College of Business, Georgia State University

Kene Turner, director of National Postsecondary and Alumni Programs, Network for Teaching Entrepreneurship (NFTE)

Noe Vargas, assistant professor, University of Texas Rio Grande Valley

Working Group Two – Community building and belongingness

Rubén Cantú, **Moderator**, executive director, Office of Inclusive Innovation and Entrepreneurship, University of Texas at Austin

Latane Brackett, innovation program manager, Jackson State University

Rebecca Chung, University of Hawaii at Manoa

Zoe Hunter, managing director, Tsai Center for Innovative Thinking, Yale University

Sylvia Robles, assistant professor of practice, University of Texas Rio Grande Valley

Raja Schaar, associate professor, Program Director, Product Design, Antoinette Westphal College of Media Arts and Design, Drexel University

Neela White, project director, American Association for the Advancement of Science (AAAS) Inclusive Ecosystems for Equity and Diversity

Working Group Three – Messaging, narratives, and storytelling

Kristal High-Taylor, **Moderator**, founder and president, nFluence.us, P.B.C.

Oscar Edwards, president and CEO, Higher Growth Strategies

Janeya Griffin, CEO, Equity Space Alliance

Lorra Hill, assistant professor, Stillman College

Kristen Kelley, director of Programs, LGBT Technology Partnership

Mahrinah Lavi Shije, partner, Zia Impact

Qyana Stewart, CEO and principal consultant, GlobalForce Tech Consulting

Working Group Four – Policy and research

LaTanya White, **Moderator**, Racial equity coach

Dominique Harrison, Racial equity consultant

Zach Leverenz, CEO, SeedSpot

Grace Mukupa, policy director, Complete College America

Damon Tull, director of industry alliances, Graduate School of Management, University of California-Davis

Iris Wagstaff, STEM program director, Diversity, Equity, and Inclusion, AAAS

Fallon Wilson, vice president of policy, Multicultural Media, Telecom, and Internet Council (MMTC)

Working Group Five – Access to capital and markets

Isaac McCoy, **Moderator**, dean, School of Business, Stillman College

Marlon Evans, CEO, Nex Cubed

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Appendix Three: List of March 2024 Workshop Participants

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Carolyn Buchanan, regional coordinator; associate instructor, University of Central Florida

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Nan Chen, assistant professor, Tennessee Technological University

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Brian DeHaven, chief program director, Philadelphia College of Osteopathic Medicine

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Michele Dugar, instructor, Blaze Training Solutions

Jerald Dumas, associate professor, North Carolina A & T State University

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Marlon Evans, CEO, Nex Cubed

Edward Fabian, faculty, Stony Brook University

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Arsh Haque, director, Portland State University

Kimberly Haynie, associate professor, University of Arkansas at Pine Bluff

Neil Higgins, business & entrepreneurship instructor, Cuesta College

Bari Hoffman, associate dean of clinical affairs, University of Central Florida

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Isabelle Monlouis, associate director, Georgia State University

Grace Mukupa, policy director, American Indian Higher Education Consortium

Camisha Parker, executive director, Virginia State University

Louis Peña, associate professor, Stony Brook University

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Mahrinah Shije, general partner, Endemic Venture Capital

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Joy Smith, dean, Elizabeth City State University

Sarayu Srinivasan, investor, Investor

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Anna Topping, senior manager, Operations and Impact, TechBirmingham

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Neela White, project director, American Association for the Advancement of Science

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Bibliography

"About SBIR and STTR." America's Seed Fund. Accessed March 7, 2024. https://www.sbir.gov/about.

"Civil Rights Act (1964)." National Archives and Records Administration, 2022. https://www.archives.gov/milestone-documents/civil-rights-act.

Confessore, Nicholas. "'America Is under Attack': Inside the Anti-D.E.I. Crusade." The New York Times, January 20, 2024. https://www.nytimes.com/interactive/2024/01/20/us/dei-woke-claremont-institute.html.

Lupia, Arthur, Margaret Martonosi, Suzanne Iacono, Dawn M. Tilbury, and Karen Marrongelle. "Dear Colleague Letter: Broadening Participation in STEM Entrepreneurship and Innovation (BPINNOVATE)." NSF, November 19, 2020. https://www.nsf.gov/pubs/2021/nsf21023/nsf21023.jsp.

Elnaiem, Mohammed. "What Is Critical Race Theory?" JSTOR Daily, September 2, 2021. https://daily.jstor.org/what-is-critical-race-theory/.

Eltanahy, Marwa. "Igniting Innovation: The Power of Entrepreneurial-STEM Learning in Higher Education." Higher Education Digest, May 25, 2023. https://www.highereducationdigest.com/igniting-innovation-the-power-of-entrepreneurial-stem-learning-in-higher-education/.

"Early Education Inclusion in STEM Can Lay Groundwork for Future." Office of Special Education and Rehabilitative Services Blog, May 28, 2019. https://sites.ed.gov/osers/2019/05/early-education-inclusion-in-stem-can-lay-groundwork-for-future/.

"Fact Sheet: Biden-Harris Administration Announces over $5 Billion from the CHIPS and Science Act for Research, Development, and Workforce." The White House, February 9, 2024. https://www.whitehouse.gov/briefing-room/statements-releases/2024/02/09/fact-sheet-biden-harris-administration-announces-over-5-billion-from-the-chips-and-science-act-for-research-development-and-workforce/.

Ganesan, Vasanth, Ramya Mahalingam, Anil Nathan, Audrey Ware, and Allen Weinberg. "Underestimated Start-up Founders: The Untapped Opportunity." McKinsey & Company, June 23, 2023. https://www.mckinsey.com/featured-insights/diversity-and-inclusion/underestimated-srat-up-founder-the-untapped-opportunity

Gautam, Garima, and William Olson. “Strengthening the Semiconductor Supply Chain Through Supplier Diversity.” SEMI, October 24, 2022. https://semi.org/en/blogs/technology-and-trends/strengthening-the-semiconductor-supply-chain-through-supplier-diversity.

Grossman, Jennifer M., and Michelle V. Porche. “Perceived Gender and Racial/Ethnic Barriers to Stem Success.” Urban Education 49, no. 6 (April 22, 2013): 698–727. https://doi.org/10.1177/0042085913481364.

“ICOR.” International Consortium for Organizational Resilience. Accessed March 7, 2024. https://www.build-resilience.org/.

Jackson, Derrick Z. “A New Study Confirms: Structural Racism in STEM Programs Needs Fixing.” The Equation, October 26, 2022. https://blog.ucsusa.org/derrick-jackson/a-new-study-confirms-structural-racism-in-stem-programs-needs-fixing/#:~:text=In%20another%20Pew%20survey%2C%2062,opportunities%20for%20promotion%20and%20advancement.

Johnson, Shontavia Jackson. “The Colorblind Patent System and Black Inventors.” American Bar Association, 2019. https://www.americanbar.org/groups/intellectual_property_law/publications/landslide/2018-19/march-april/colorblind-patent-system-black-inventors/.

Kim, Anne. “Stem Voices: The Experiences of Women and Minorities in Science, Technology, Engineering, and Math Occupations.” American Enterprise Institute, May 3, 2022. https://www.aei.org/research-products/report/stem-voices-the-experiences-of-women-and-minorities-in-science-technology-engineering-and-math-occupations/.

Mansfield, William, and Dirk Caspury. “Patent Analysis Reveals High-Performance Computing Semiconductors behind AI boom.” IAM, November 8, 2023. https://www.iam-media.com/article/patent-analysis-reveals-high-performance-computing-semiconductors-behind-ai-boom.

Matthew, Victoria. “Studying the Impact of STEM Entrepreneurship Programs: The Why and How.” VentureWell, June 27, 2022. https://venturewell.org/stem-entrepreneurship-programs/.

McGee, Ebony O. “Students of Color Persist in STEM Despite Racial Stereotypes, My Research Shows.” The Washington Post, February 6, 2022. https://www.washingtonpost.com/health/2022/02/06/science-diversity-racial-stereotype/.

Monroe-White, Thema, and Ebony McGee. “Toward a Race-Conscious Entrepreneurship Education.” Entrepreneurship Education and Pedagogy 7, no. 2 (April 6, 2023): 161–89. https://doi.org/10.1177/25151274231164927.

Nadeem, Mehr. “Black and Hispanic Women Are Less Likely to Get Patents than Whites.” Institute for Women’s Policy Research, July 24, 2018. https://iwpr.org/black-hispanic-women-less-likely-get-patents-whites/.

“National Science Board: Vision 2030.” National Science Foundation, 2020. https://www.nsf.gov/nsb/publications/2020/nsb202015.pdf.

Neri, Rebecca Colina, Maritza Lozano, and Louis M. Gomez. “(Re)Framing Resistance to Culturally Relevant Education as a Multilevel Learning Problem.” Review of Research in Education 43, no. 1 (March 2019): 197–226. https://doi.org/10.3102/0091732x18821120.

Niemeyer, David A., Neema H. Nodust, and Jaclyn Castelar. “New California Law Requires Diversity Reporting for Venture Capital and Private Equity Firms.” Reuters, November 27, 2023. https://www.reuters.com/legal/legalindustry/new-california-law-requires-diversity-reporting-venture-capital-private-equity-2023-11-27/.

Ravi, Sarah. “The 2020 Sia Factbook: Your Source for Semiconductor Industry Data.” Semiconductor Industry Association, April 23, 2020. https://www.semiconductors.org/the-2020-sia-factbook-your-source-for-semiconductor-industry-data/.

Riegle-Crumb, Catherine, Barbara King, and Yasmiyn Irizarry. “Does STEM Stand Out? Examining Racial/Ethnic Gaps in Persistence Across Postsecondary Fields.” Educational Researcher 48, no. 3 (February 21, 2019): 133–44. https://doi.org/10.3102/0013189x19831006.

Robinson, Daniel F. “Biopiracy and the Innovations of Indigenous Peoples and Local Communities.” In Indigenous Peoples’ Innovation: Intellectual Property Pathways to Development, edited by Peter Drahos and Susy Frankel, 77–94. ANU Press, 2012. https://doi.org/10.22459/ipi.08.2012.04.

Rothwell, Jonathan, Andre M. Perry, and Mike Andrews. “The Black Innovators Who Elevated the United States: Reassessing the Golden Age of Invention.” The Brookings Institution, November 23, 2020. https://www.brookings.edu/articles/the-black-innovators-who-elevated-the-united-states-reassessing-the-golden-age-of-invention/.

"STEM Talent Challenge." U.S. Economic Development Administration. Accessed March 7, 2024. https://www.eda.gov/funding/programs/stem-challenge.

Thompson, Andrew. "Changes in the Semiconductor Industry: How Patent Strategies Need to Adapt." EIP, October 21, 2022. https://eip.com/us/insights/article/changes_in_semiconductor_industry_how_patent_strategies_need_to_adapt/.

"University Centers." U.S. Economic Development Administration. Accessed March 7, 2024. https://www.eda.gov/funding/programs/university-centers.

White, John. "The Day That Changed the World: April 10, 1790." IPWatchdog, April 9, 2015. https://ipwatchdog.com/2015/04/09/the-day-that-changed-the-world-april-10-1790/id=56422/.

Woodson, Carter G. The Mis-Education of the Negro. Trenton, N.J.: Africa World Press, 1990 (Original print, 1933).


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