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Rendering the Invisible Visible

Student Success in Exclusive Excellence STEM Environments

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The intersection of racial bias and unfettered membership in the academy reverberates deeply with the historical and ongoing reality of racial oppression of people of color in the United States. Within these exclusive academic space,s there is slow progress toward acceptance of scholars of color in the academy; however, there is more ground to be gained before parity in STEM career access, socialization, and thriving can be achieved. To date, numerous interventions have focused on addressing supposed underrepresented minority (URM) STEM student deficits in terms of STEM preparation and support. However, scant attention has been paid to how the cultural norms, policies, and procedures of higher education institutions, STEM disciplines, and faculty communities negatively impact the URM students' educational experience and hinder student persistence (Harper, 2012). Because the academy was founded within a society of racial and other forms of discrimination, persistent exclusionary practices often block healthy student advancement to STEM education and career (Feagin, 2013). Academia operates within this racialized framework, and indicators of structural racism include inequalities in

access, opportunity, power, and policy impacts and outcomes–whether intentional or not. For example, research shows that URM students often do not have the benefit of developmental relationships with faculty and experience isolation in their classes (Harper, 2012). These conditions pose a challenge to establishing scholarly relationships with peers and with faculty. Most academic departments lack practical knowledge of the lived experiences of URM students and often harbor negative stereotypes about them, particularly around their ability to succeed in STEM. When we consider the current deteriorating racial climate within the United States, coupled with the urgent national need for STEM innovation and scholarship, ensuring URM student success is not disrupted further becomes a clear priority (Robinson et al., 2016).

Rendering the Invisible Visible

The term "inclusion" describes an intentional, sustained engagement with diversity, whether that be diversity of people, curriculum, teaching, or research (Chapman, 2016a). The Association of American Colleges and Universities characterizes inclusive excellence as institutional and individual behaviors that promote diversity and inclusion through innovations that enable equitable engagement, influence, and participation (Clayton-Pederson & Musil, 2005). However, a dichotomy exists when an academic institution's espoused commitment to inclusive excellence is held up against a backdrop of systematic inequities in access and outcomes for underrepresented and minoritized students (Harper, 2012). This is particularly true within predominantly White institutions, which were instituted to promote *exclusive excellence* through discriminatory practices and policies (Feagin, 2013). It is nonsensical to expect these institutions to begin functioning in ways contradictory to their instituted core values. How biases and discriminatory practices function to drive the action of individuals and institutions is a complex dance. Both institutional practices and interactions between individuals may be motivated by intentional discrimination or unconscious biases. The cumulative

effect of these institution-based, discipline-based, and faculty community-based biases is a hostile learning environment for URM students who experience aggressions daily in their classes, labs, and other campus spaces–at times overtly and at other times through passive-aggressive behaviors. This sociocultural milieu reproduces social oppressions such as "know your place" dynamics (Claussen & Osborne, 2013).

INSTITUTIONAL BIAS

Institutional bias is a tendency for institutional practices and policies to function in ways that advantage certain groups and disadvantage or devalue others. Academic institutions are biased against particular social groups, particularly groups that have been marginalized within the larger social context (Taylor et al., 2017). Within the historical context of the United States, which includes the enslavement of Africans as an egregious example, higher education institutions were instituted and normalized around discriminatory and oppressive behaviors. These repercussions continue to drive our higher education as well as other social systems today. This is problematic for URM students, as even well-meaning interactions can result in inequities as a result of following institutional practices and policies. Often, URM students experience racism through ostensibly benign behaviors, practices, policies, and traditions of the institution. What is thereby compromised are learning opportunities, quality of mentorship, levels of participation in various academic programs (e.g., honors programs, study abroad programs), faculty advocacy, and other highly valuable aspects of a student's academic experience (Harper, 2012). Institutional bias occurs across institutions as well, such as racial and other biases being reproduced within the review practices of national research funding agencies. Henry (2010) presents a useful framework for classifying different types of institutional bias: Differential student academic outcomes and experiences may point to possible areas of institutional bias to examine to determine strategies for change. Student persistence may depend on institutional capacity to engage in this level of introspection.

STEM-DISCIPLINE BIAS

Every STEM discipline boasts a unique culture enacted through its values, norms, and assumptions. These unique cultures function like predictive models of who belongs in STEM (Ruder et al., 2018). Students are funneled into categories believed to foretell their potential for success or failure. However, discipline-based biases often manifest in practice as stereotypes about race, gender, and so on (Steele & Aronson, 2005). Stereotypes are used to legitimize exclusionary ideologies, particularly STEM notions of elitism that uphold White privilege and male privilege. At all stages of the STEM "pipeline," URM students may be denied entry through a series of exclusionary practices, whether deliberate or the result of unconscious bias (Robinson et al., 2016). It is imperative that each STEM discipline examine its cultural assumptions for harmful biases and stereotypes about particular groups. Whether an assessment is conducted within professional associations or within academic departments, it requires the will to do this soul-searching work and take action to interrupt biased behaviors.

FACULTY COMMUNITY BIAS

Faculty communities, whether in the form of individual faculty, departments, programs, or committees, also have their own cultures (Bystydzienski et al., 2017). Embedded within an institution, the faculty community is influenced by the culture of its parent institution; therefore, shared commonalities of bias across faculty community culture and the institutional culture may intensify particular negative and positive biases (Lee, 2007). For example, chemistry as a discipline may have a culture that values men over women as brilliant innovators, and, coupled with a similar institutional culture, will exacerbate negative gender biases. However, when intersected with the culture of a women's college that produces strong women leaders, the resulting departmental culture might, at least ostensibly, value its students as future brilliant women leaders in chemistry. Negative biases inhibit student-faculty engagement, limit student access to the tacit information that

might influence future opportunities, and leave students ignored and devalued, whether overtly or as a result of benign indifference. Providing opportunities for STEM socialization between faculty communities and URM students is another strategy for countering the stereotypes and assumptions (Chang et al., 2014).

INCLUSIVE EXCELLENCE—RELOADED

As discussed earlier, inclusive excellence is the process through which educational institutions attain excellence through equitable teaching practices (both in student academic outcomes and pedagogical practices) in ways that erase situational gender and racial biases. Clayton-Pedersen and Musil (2005) lay out an actionable heuristic for inclusive excellence that can increase the likelihood of equitable educational experiences for all students. They argue for:

- focus on student intellectual growth
- socialization into academic discipline(s)
- valuing of the cultural differences students bring to the educational enterprise
- welcoming faculty community and institution
- faculty community and institution competencies to engage across difference

These attributes describe credible components of inclusive excellence environments. Attainment of this refined academic culture will require brutally honest self-assessment as well as institutional courage and fortitude. Institution-wide inclusive excellence requires leaders who understand the interplay between policies, practices, cultures, and educational outcomes. Policies and practices function in ways that provide access and allow students to bring the richness of their identities to their educational experience (Wells, 2008). Increasing capacity for institutions to respond in a timely manner to inequities will be a challenge, especially given that institutions are not designed to change quickly. At the faculty community level, a practice of inclusive excellence will

depend on a willingness to take a hard look at three important cultural areas for faculty: the faculty community, the relevant STEM discipline, and the home institution. As described earlier, looking behind the "cultural curtain" will require courage and a willingness to bear the discomfort and self-doubt.

Thrive Mosaic Scholar Development Framework

Another important strategy is to enable URM students to benefit from their culturally relevant success strategies. Students should not wait for their institutions, STEM disciplines, and faculty communities to become self-aware, increase cultural competency, and take action for change. The Thrive Mosaic Scholar Development Framework enables URM scholars to take ownership of their own professional growth, particularly within biased and privileged environments (Figure 2.1). This framework is a conceptual toolkit for STEM identity and leadership-development integration into the scholar's experience (Chapman, 2018; Nadelson et al., 2017). Identity development is not exclusively the result of interactions with the dominant science culture but includes an amalgamation of interactions across a range of the scholar's own capital sources, including cultural community wealth (Yosso, 2005). The framework supports activation of the full portfolio of URM scholar capital as well as strategic cultivation of additional capital resources. Over time, the student benefits from a rich and growing collection of networks, resources, and assets that contribute to academic success.

Common narratives regarding URM scholar navigation of academic spaces are often deficit-focused. However, a more nuanced narrative acknowledges the value these scholars bring to their institutions and that empowers their academic journey. URM scholar capital consists of the scholar's community cultural wealth (Yosso, 2005), social capital (Martin, 2009), and academic capital (Gruber, 2004). These challenge the deficit-model assumptions commonly associated with URM scholars regarding their ability to thrive in academia. Instead, URM scholars bring added value
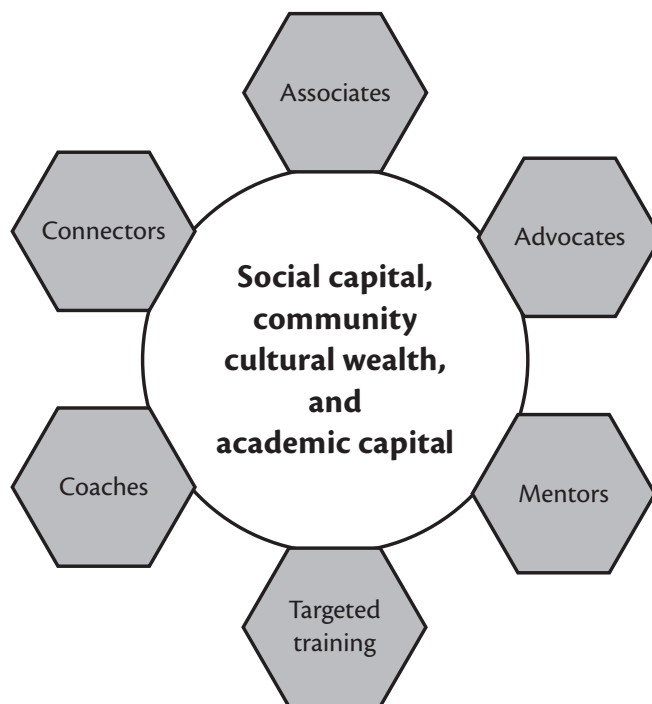
FIG. 2.1. Thrive Mosaic Scholar Development Framework Organizes Various Forms of Capital into Strategic Network Clusters

to the academy in the form of their community cultural wealth and practices of resilience not readily present within these institutions (Bourdieu, 1986). The Thrive Mosaic Scholar Development Framework is inspired by the Igbo/Yoruba proverb, "It takes a village to raise a child," and leverages the cultural and other forms of capital to bolster scholar success. The Thrive Mosaic contains six important roles: associates, advocates, connectors, mentors, coaches, and targeted training. Particular role combinations can be activated at various stages of the scholar's education and career to address specific challenges and opportunities. Within the Thrive Mosaic framework, the ubiquitous mentoring function is divided into mentor and advocate roles to account for the advocacy that is usually missing from mentoring relationships. Similarly, coaching is divided into coach and targeted-training roles to make explicit the need for process coaching as well as subject-expert training. These last two roles, coach and targeted training, ensure either meta-scholar and

process enhancement (coach) or acquisition of specific content knowledge (targeted training).

ASSOCIATE

An associate is a mutual accountability partner. This type of relationship between scholars helps each focus on meeting deadlines, celebrating milestones, and developing meta-scholar awareness (Kelly & Cherkowski, 2017). Just as the term "meta-learning" describes the state of being aware of and taking control of one's own learning (Flavell, 1979; Biggs, 1985), the term "meta-scholar awareness" describes the state of being aware of and taking control of one's particular processes for productive scholarship (Figure 2.2). Associates engage in regular and frequent status updates that cover short- and long-term project goals, specific action steps, and troubleshooting. Associates support one another's persistence in delivering on academic commitments, whether that be writing a research paper, preparing a talk, developing better writing habits, or developing productive meta-scholar processes. This is a high-trust relationship with high expectations for goal attainment. The power of this trusted, collegial relationship is that the scholar engages in explicit and regular episodes of meta-scholar learning, and over time gains a deeper
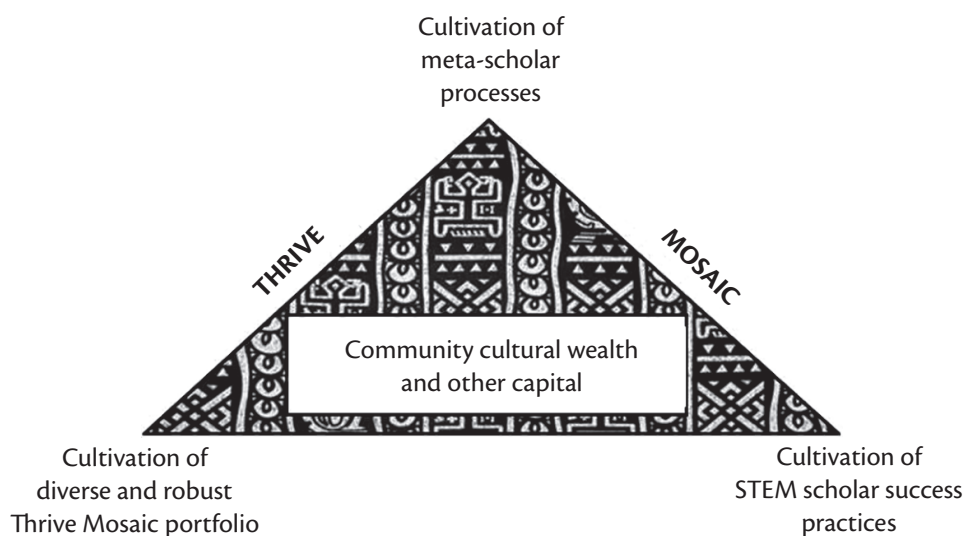

FIG. 2.2. Thrive Mosaic Scholar Development Framework

understanding of what conditions facilitate productive, creative, and rigorous scholarship.

ADVOCATE

An advocate is an academic or professional who knows a scholar's strengths and accomplishments. Advocates are not mentors, nor are they advisors. They may or may not be in the scholar's field or discipline; however, they have garnered a thorough understanding of the scholar's work. They can talk about the scholarship, help to get important appointments or assignments, write letters of support, and submit nominations for awards and leadership opportunities. This is also a high-trust relationship. It is important that the scholar's advocates are cognizant of their unconscious biases with regards to race and other identity dimensions and they are working to minimize the negative impact of those biases. An advocate who is unwilling or unable to talk about the implications of race should not serve in this role.

CONNECTOR

A connector is someone who has an active network (either broadly or in a particular academic area), can connect the scholar to relevant people, and provides access to privileged networks. It is important to have a broad collection of connectors from a variety of academic and professional backgrounds. The summative effects of these connections provide great academic and other forms of capital, such as visibility and reputation building across disciplines, greater diversity in professional opportunities, and exposure to multi-disciplinary research opportunities (Rost, 2011). Additionally, connectors often broker the process of relationship building (Moran, 2005) through their endorsement of the scholar and by facilitating a solid start to the relationship. This is particularly important when the URM scholar is being granted access to previously closed, exclusive networks.

Mentors fall into two broad categories: those who focus on the scholar's overall career trajectory and progress and those who focus on a specific area for advisement or development (e.g., grant development, data plan management, selecting journals for publication). Regardless of their focus, all mentors should guide the scholar in the cultural behaviors of the discipline and serve as a sounding board for ideas and decisions. One should not expect the mentor to engage in advocacy activities; that is not their role. Mentoring relationships are learning relationships for both the protégé and the mentor. Trust between mentor and protégé is the cornerstone of any meaningful mentoring partnership, especially when mentoring across difference. Mentors of the same race or identity group are often desired by the protégé, particularly those of marginalized identities, since these relationships often provide psychosocial support. For cross-race mentoring relationships, it may help to identify mutual commonalities that can serve as an initial foundation for the relationship (Robnett et al., 2018). For mentoring to be effective across race or other identities, the mentor must commit to active involvement to developing cross-cultural competency. If a potential mentor is not willing to develop competencies or discuss race, they should not take on the mentor role.

COACH

Fundamentally, a coach is a process expert. Working with a coach enables cognitive, emotional, physical, and behavioral change to occur by unlocking the scholar's potential to perform at a maximal level. For example, in professional sports, an athletic coach determines a player's star quality and helps their star shine brighter. A Thrive Mosaic coach functions similarly to an athletic coach and helps the scholar identify and think strategically about how to get the most out of their star quality. This includes identifying deficits, which is important when building research teams consisting of complementary talents or for putting together an actionable professional development plan. Coach-client privilege is critical, and

confidentiality is a must in such a relationship. The coach must be experienced in coaching across difference (e.g., race, gender) or they should not serve in the role.

Targeted training is just-in-time learning with subject matter experts. This training is time-bound, laser-focused, often short-term, and very specific in content (Smith et al., 2018)—quite different from other Thrive Mosaic roles because the requirement of cultural competency can be ignored. Instead, the scholar seeks to gain a particular skill (e.g., the principles of fundraising and donor cultivation) or ramp up their knowledge of a particular content area (e.g., how to develop an academic department budget). Although there is no cultural competency requirement for this role, the scholar should make inquiries when vetting training opportunities.

Putting It All Together

The Thrive Mosaic supports URM scholars constructing and making sense of their STEM identities with agency and increasing efficacy (Chapman, 2018). The scholar gains perspective and understanding of their unique STEM identity, gains clarity on what assets they bring to the academy, and enjoys greater access to the closed networks in academia. In essence, the scholar repositions their relationships with the academy and the relevant STEM disciplines. The Thrive Mosaic Scholar Development Framework operationalizes three processes important to unimpeded STEM scholar success:

1. cultivation of meta-scholar processes (which resources to deploy and when)
2. cultivation of STEM scholar success behaviors
3. cultivation of a diverse and robust Thrive Mosaic portfolio

A healthy Thrive Mosaic will contain a diverse collection of people and networks from a variety of disciplines representing a wide

TABLE 2.1 Sources of Underrepresented Minority Scholar Capital

Community cultural wealth capital	Community cultural wealth includes the various forms of cultural capital present in many marginalized communities: aspirational (hopes and dreams; academic identity), linguistic (context-switching), familial (community networks; beliefs of high achievement and efficacy; role models), navigational (strategies for negotiating hostile environments; practices of resilience and persistence), and resistance (historical legacy of challenging inequality and oppression). URM students draw on their community cultural wealth for resilience, motivation, and validation (Kafai, Peppler, & Chapman, 2009).
Social capital	Social capital includes the social connections or networks used for personal and professional gain. Yosso (2005) argued that social capital privileges forms of capital held by the dominant White, male, middle-class group, while devaluing others' forms of capital. URM students can strategically expand their reserves of social capital and increase access to networks and communities previously denied to them (Chapman, 2018).
Academic capital	Social processes that aid in acquiring the knowledge and support necessary to access and navigate higher education (Gruber, 2004). This acquired knowledge often includes strategies for pursuing educational options. URM students can cultivate relationships that afford them access to academic capital.

variety of skills. These provide access to often invisible information and opportunities not readily available to URM scholars. The Thrive Mosaic is intended to increase redistribution of community cultural wealth, social capital, and academic capital within privileged and exclusive academic spaces (Table 2.1). The scholar identifies and addresses gaps, creates opportunities, maintains focus, and navigates obstructions, all while honoring the community cultural wealth and other assets they bring into the academy.

Conclusion

Institutional agents, academic institutions, STEM disciplines, and faculty communities are well-positioned to create equitable

academic opportunities for all students. Greater faculty cultural competency and URM student advocacy are important first steps. These require valuing the student as a scholar and person. This means institutional agents must be able to engage fully and effectively across racial and other differences—in essence, to understand and value what Pöllmann (2013) describes as intercultural capital, which emphasizes "the sphere of relationships and rationalities between difference cultures, without neglecting any of those cultures." For institutions, STEM disciplines, and faculty communities, being in a position to reap the benefits of intercultural capital will involve increasing self-awareness, identifying embedded cultural biases, and having the courage and will to take action for change. This chapter suggests that institutions and their agents take responsibility and action for ensuring they provide truly equitable and inclusive education for URM students. Additionally, the Thrive Mosaic Scholar Development Framework can provide additional support for scholar success, even in the face of systematic oppression.

We cannot ignore the historical context of an academy rooted in a society of discrimination. Persistent exclusionary practices are barriers to URM STEM success. The stakes are high. Valuable talent is being lost. The integrity of institutions and STEM disciplines is being compromised. There is much work to be done before campuses can claim to provide an equitable, thriving academic experience for all students. While student-focused efforts are still helpful, without self-introspection by academic institutions, STEM disciplines, and faculty community cultures, no amount of student-deficit programming will see appreciable gains. Institutions, disciplines, and faculty communities must carry their own weight and do their own homework to disrupt biased practices and take action to end systemic oppression in the academic enterprise.

RECOMMENDATIONS FOR POLICYMAKERS

- Promote policies that advance equitable teaching practices and equitable scholar development in higher education.

- Audit current policies, with periodic re-examination, to inventory any inherent institutional biases and implement actions to address them.
- Promote policies that advance rigorous data, assessment, and information sharing of programs and initiatives that focus on equitable access, advocacy, and professional development for URM scholars at all levels of their careers. Create a clearinghouse or other information portal where this information may be accessed for research, benchmarking, and grant equity-related development.
- Partner with regional accrediting agencies (e.g., Council for Higher Education Accreditation) that hold higher education institutions accountable for maintaining quality standards. Work with those agencies to enact policies to ensure tackling of institutional bias issues is included as an accreditation quality standard.

RECOMMENDATIONS FOR PRACTITIONERS

- Increase cultural competency of all leadership at the academic department level and above. Ensure leadership is able to translate its learning and skills acquisition into programs, initiatives, and leadership decision-making.
- Require that demonstrated cultural competency be part of the promotion, merit, and performance review processes for all faculty and staff.
- Prepare a proactive bias response plan for your campus that addresses both individual and institutional biases that have been identified.
- Work across institutions by establishing consortia that facilitate sharing of information, resources, and implementation practices that better equip all institutions to address the systemic and historical biases and barriers to URM scholar access and advocacy. Create a repository of evidence to inform and guide consortia efforts.
- Audit departments and administrative units to access, inventory, address, and measure progress toward minimizing biases in operational practices.

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