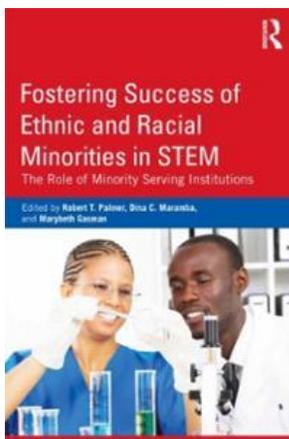


Professional Book Review

Palmer, R. T., Maramba, D. C., & Gasman, M. (Eds.). (2013). *Fostering Success of Ethnic and Racial Minorities in STEM: The Role of Minority Serving Institutions*. New York, NY: Routledge. 264 pp., ISBN-13: 978-0-415-89947-5 (pbk), \$ 45.95.

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U.S. institutions need to increase success rates in graduating students in science, technology, engineering, and mathematics (STEM). While this need exists across racial and ethnic groups, underrepresented minority (URM) students are disproportionately less successful than non-URM students in completing STEM degrees (Leboy & Madden, 2012; President's Council, 2012). In the midst of what is a national crisis in STEM, some institutions are outperforming others. In particular, Historically Black Colleges and Universities (HBCUs) produce the largest number of underrepresented minorities completing STEM bachelor's degrees (Clewell et al., 2010) and those progressing to STEM doctoral studies (Stage & Hubbard, 2009). In *Fostering Success of Ethnic and Racial Minorities in STEM: The Role of Minority Serving Institutions*, a collection of chapters written by multiple authors,¹ numerous perspectives are presented describing factors impacting the success of HBCUs and other Minority Serving Institutions (MSIs) in educating URM students in STEM, despite recognized institutional disadvantages in regards to resources and lower student preparation. In the reading of this text, it becomes clear that there are a number of recurring themes associated with promoting the success of underrepresented students in STEM.

In the opening chapter, "Charting the Course: The Role of Minority Serving Institutions in Facilitating the Success of Underrepresented Racial Minority Students in STEM," Palmer, Maramba, Gasman, and Lloyd provide a rich, if brief, historical overview of institutions primarily serving minority students. Historically, HBCUs were largely founded in the period of legal segregation to serve the educational needs of African Americans. Palmer et al. discuss desegregation legislation linked to funding for HBCUs that has led to increased student diversity, though it is not clear that this is leading to increased performance for the URM students at these institutions relative to students at MSIs not actively pursuing desegregation plans (Montgomery & Montgomery, 2012).

In Chapter 2, "Minority-Serving Institutions and STEM: Charting the Landscape," Stage, Lundy-Wagner, and John delineate the fact that HBCUs and Tribal College and Universities are similar in founding principles, yet Hispanic Serving Institutions (as of 1992) and Asian American and Native American Pacific Islander Serving Institutions (as of 2008) are both largely predominantly White institutions (PWIs) that enroll a legally designated percentage of

underrepresented students from designated racial/ethnic categories and are not historically rooted. Notably, Hispanic Serving Institutions do not have as robust an impact on URM student success as that documented for HBCUs. This is likely related to the observation, later made in Chapter 11, that most Hispanic-serving institutional programs designed to promote Latino/a STEM performance focus on “cultural capital transfer,” i.e., transferring knowledge on how students can survive at or adapt to institutions, rather than institutional evaluation and transformation to create more inclusive, equitable environments. The use of defined institutional assessments to assist in the development of “culturally inclusive practices in STEM” is advocated (p. 151). Stage et al. report that the percentage of STEM degrees conferred to African Americans is approximately nine times higher at MSIs than PWIs, suggesting that MSI institutional climates foster success for URMs in STEM. This is in agreement with the statement made later that “HBCUs show an expectation that student success will be a collaborative effort among the students, peers, faculty, administrators, counselors, students’ families and communities” (p. 155).

In Chapter 3, entitled “Impact of Institutional Climates of MSIs and Their Ability to Foster Success for Racial and Ethnic Minority Students in STEM,” Strayhorn identifies factors of HBCU campus climates deemed important for increased academic STEM achievement including (a) small classes leading students to feel that they “matter” individually; (b) a sense that faculty/staff truly care about students as individuals based on the “ethic of care” (p. 40); (c) supportive cultures that engage faculty and peers rather than competitive environments; and (d) a “sense of belonging” (p. 42). The importance of supportive, non-competitive cultures in promoting underrepresented student success in STEM is also recognized by Cole and Espinoza in Chapter 4, “Engineering the Academic Success of Racial and Ethnic Minority Students at Minority Serving Institutions via Student-Faculty Interactions and Mentoring,” and Gray in Chapter 7, “Supporting the Dream: The Role of Faculty Members at Historically Black Colleges and Universities in Promoting STEM Ph.D. Education.” Gray also highlights the need for role models to demonstrate the attainment of “possible selves” (p. 90), as well as providing “intentional interactions with faculty members” (p. 95). In a related discussion in Chapter 6, “Teaching to Teach: African American Faculty, HBCUs, and Critical Pedagogy,” Mitchell, Dancy, Hart, and Morton describe distinct pedagogical training and practices of HBCU-trained educators that are likely associated with a more positive outlook regarding student abilities and potential for success. These include “pedagogically meaningful knowledge inherent in the systematic inquiry, scholarly dissemination and pedagogical practices” (p. 73) and “a strong sense of conviction and purpose directly connecting faculty teaching, pedagogical relations and overall expectations of students” (p. 82) possessed by HBCU-trained educators.

In Chapter 8, “Community Building Minority Serving Institutions and How They Influence Students Pursuing Undergraduate STEM Degrees,” Flowers and Banda delineate three specific aspects of community that are associated with success in training URMs at MSIs: (a) a “community of knowledge” to mitigate

educational gaps or inequalities linked to reductions in degree completion; (b) a “community of support” to foster the faculty engagement and mentoring that is critical to the success of underrepresented students, largely students of color, in STEM; and (c) a “community of vision” that is linked to institutional leadership demonstrating a commitment to a vision that is steeped in an environmental or social context. In Chapter 9, “Academic and Social Integration for Students of Color in STEM: Examining Differences between HBCUs and non-HBCUs,” Essien-Wood and Wood also highlight community integration experiences as supportive of success of underrepresented students majoring STEM at HBCUs.

In Chapter 10, “Broadening Participation in STEM: Policy Implications of a Diverse Higher Education System,” Espinosa and Rodriguez explore policy implications and support inter-institutional learning, including discussions between STEM investigators and practitioners at minority- and majority-serving institutions, and a need for institutional accountability. They highlight a “need to identify practices that if scaled up correctly could produce rapid gains” (p. 134). The authors effectively argue that HBCUs and other MSIs, due to documented successes, have significant contributions to make to a more general understanding of how to meet the needs—education and sociocultural—of URM students in STEM. Notably, they provide support that HBCU institutions serve Latino/a students as well as Hispanic Serving Institutions do, and thus the benefits can extend beyond the population for which the institutions were historically founded.

Despite the benefits of inter-institutional programs, which include both increased access for MSI partners to the infrastructure and resources present at PWIs and the primary benefit of increased access to students of color for PWI partners, disadvantages do exist. A major struggle for HBCUs and other such institutions serving minority students is identified by Newman and Jackson in Chapter 13, “Collaborative Partnerships in Engineering between Historically Black Colleges and Universities and Predominantly White Institutions,” as insufficient funding to build and maintain the facilities needed to support cutting-edge STEM programs and research locally at these institutions, which has long-term implications, including the impediment of independent growth and sustainability of the HBCU institutions.

Two major impediments to reframing approaches to promoting the success of underrepresented students in STEM at a range of institutions and the widespread transformation of higher education institutions into diverse communities of success are (a) the mobilization and empowerment of institutional agents of change and (b) the revision of motivations for supporting and promoting educational equity. Institutional agents are individuals that utilize their bank of “human, social, and cultural capital that can impact the social mobility of racial and ethnic groups that are underrepresented in higher education in general, and STEM in particular” (p. 160). In Chapter 11, “Action Research: An Essential Practice for 21st Century Assessment at HSIs,” Dowd, Sawatzky, Rall, and Bensimon suggest that there is an exigent need for accountability imposed by funding agencies for funded individuals and institutions to have an “intentionality

in service” and “intentionality of engaging” (p. 163). In “Achieving Equity within and beyond STEM: Toward a New Generation of Scholarship in STEM Education” (Chapter 15), Garibay expounds upon the need to revise motivations in his discussion of the widely engaged and frequently articulated link between equity in STEM and U.S. economic competition and global preeminence. He effectively argues for “equity-oriented STEM education” (p. 216): aligning the need for improving STEM education and degree completion outcomes with democratic principles of equity in education, rather than merely as support for national superiority. Engaging and sustaining such a change in the very motivation for increasing the success of all individuals in STEM will require great effort, but also offers great reward and transformation.

The contributors to this edited volume provide compelling evidence that there is much that can be learned by *all* institutions from the successes of a number of MSIs, including HBCUs, in educating underrepresented students in STEM. One of the major challenges to achieving greater rates of success in educating minority students at a wider range of higher education institutions, which is not adequately addressed in the text, is identifying an impetus to stimulate the depth, longevity, and collaborative nature of engagement that will be needed for such transformations to be initiated and sustained, such that they lead to the widespread production of more inclusive educational environments. However, in describing the successes that a number of institutions have had in training such students, this volume makes a significant contribution to a national discourse on ways to improve educational outcomes for a diverse student contingency in STEM.

Notes

1. Authors of the individual chapters are as follows:

1. Robert T. Palmer, Dina C. Maramba, Marybeth Gasman, and Katherine D. J. Lloyd
2. Frances K. Stage, Valerie C. Lundy-Wagner, and Ginelle John
3. Terrell L. Strayhorn
4. Darnell Cole, and Araceli Espinoza
5. Soko S. Starobin, Dimitra Jackson, and Frankie Santo Laanan
6. Roland W. Mitchell, T. Elon Dancy II, Dana Hart, and Berlisha Morton
7. Shannon Gray
8. Alonzo M. Flowers, and Rosa M. Banda
9. Idara Essien-Wood and J. Luke Wood
10. Lorelle L. Espinosa and Carlos Rodríguez

11. Alicia C. Dowd, Misty Sawatzky, Raquel M. Rall, and Estela Mara Bensimon
12. Robert T. Teranishi, Dina C. Maramba, and Minh Hoa Ta
13. Christopher B. Newman and M. Bryant Jackson
14. Kenneth Taylor and Robert T. Palmer
15. Juan C. Garibay

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