Investing in the Future: The Importance of Faculty Mentoring in the Development of Students of Color in STEM

Kimberly A. Griffin, David Pérez II, Annie P. E. Holmes, Claude E. P. Mayo

Underrepresented racial minority students often seek a high level of contact with professors of color, viewing them as role models and proof that success in higher education is possible (Allen, 1985; Banks, 1984; Fries-Britt and Griffin, 2007; Griffin, 2008; Loo and Rollison, 1986; Patton, 2009; Patton and Harper, 2003; Tierney and Bensimon, 1996). These faculty members are often able to connect with students of color in deep and meaningful ways based on shared experiences in higher education. That is, many professors of color once matriculated at predominantly white institutions (PWIs) where they encountered racist stereotypes and felt the same sense of isolation as some students of color they teach and mentor.

Scholarship on faculty of color has focused largely on their lives as professors, addressing how their work is perceived, their experiences with colleagues, and the heavy teaching and service loads they often carry (for example, Allen and others, 2000; Johnsrud and Sadao, 1998; Menges and Exum, 1983; Stanley, 2006). Researchers have done comparatively less work on how these scholars have successfully negotiated various aspects

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of higher education. Considering the gap between minority student interest in STEM and actual rates of degree attainment in these fields, it is especially critical that the past experiences and current perspectives of minority faculty be better understood. Unfortunately, few studies have focused on how scholars of color stay motivated throughout their own educational and professional journeys.

In this chapter, we add to a growing body of literature on persons of color who are reaching the highest levels of success in American higher education and actualizing their professional goals (for example, Fries-Britt, 1998; Fries-Britt and Turner, 2002; Griffin, 2006; Harper, 2008). Specifically, our purpose is to uncover important factors that enable the success of Black professors in STEM. As evidenced throughout this volume, it is important to acknowledge the challenges that students of color in STEM face. Our chapter uncovers ways by which Black STEM professors overcame the hurdles that students of color often experience and managed to persist in their respective fields. Examining this group affords a glimpse into the experiences and resources that are key to academic attainment, informing our efforts to improve the achievement of students at various junctures of the STEM academic pipeline.

**Study Description**

This chapter focuses on a mixed-methods study that explored the experiences of Black professors. We conducted the research in two phases. In phase 1, survey data collected by the Higher Education Research Institute at UCLA (HERI) were used to gain a general understanding of how academic contexts and campus climates, the characteristics of Black faculty, and the characteristics of the students with whom they work collectively shape professors’ mentoring patterns and outcomes. All Black respondents to the 2004 HERI Faculty Survey (1,465 professors employed at over two hundred different institutions across the United States) were included in these analyses. Of the total, 320 (20 percent of the sample) were faculty in STEM-related fields; 258 were employed at PWIs.

While surveys are efficient for studying large groups of people, testing hypotheses about phenomena, and developing generalizable findings, quantitative analyses alone cannot provide the depth and insights necessary to truly understand the trajectories and experiential realities of black faculty (Johnson and Onwuegbuzie, 2004). Qualitative methods can better facilitate our understanding of how others make meaning of their lived experiences, challenges, and achievements (Bogdan and Biklen, 1998; Johnson and Onwuegbuzie, 2004; Merriam, 1998). Thus, in phase 2 of this study, sixty- to ninety-minute interviews were conducted with twenty-eight Black professors employed at two predominantly White public research universities of similar size and academic mission: Oceanside and Column (pseudonyms).
We audiotaped interviews for verbatim transcription and assigned all participants pseudonyms to protect their identities. In the interviews, we asked participants to reflect on their experiences as professors at their home institutions, as well as on both the types and quality of relationships they have with students. Interviews also addressed professors’ journeys into academe and their experiences as both protégés (previously) and mentors (currently). We coded all interview transcripts to identify collective key themes related to the strategies and experiences that promoted these professors’ mentoring experiences and success in STEM. For the purposes of this chapter, we use interviews from seven professors in STEM fields drawn from the larger sample. (See Table 9.1 for information about these participants.)

### Summary of Key Findings

Participants described various sources of support and strategies that facilitated their success in STEM, including personal motivation and drive, family members who encouraged their educational goals, a strong sense of intellectual curiosity, and a desire to make a contribution to their respective fields. Consistent across all interviews was a shared expression of the significance of mentoring and advising to long-term success in STEM. This finding is consistent with other studies that have highlighted the importance of mentoring for both undergraduate and graduate student development (for example, Astin, 1993; Belcher, 1994; Kelly and Schweitzer, 1999; Pascarella and Terenzini, 2005; Patton, 2009; Patton and Harper, 2003).

While we know these relationships are particularly important for underrepresented students in STEM (Adams, 1992), we know less about the specific types of interactions that produce the most positive outcomes. We examined the nature of the relationships these professors formed with mentors, taking note of the approaches that addressed academic and social

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**Table 9.1. Qualitative Sample: STEM Participant Information**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Institution</th>
<th>Gender</th>
<th>Rank</th>
<th>Academic Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darren</td>
<td>Column</td>
<td>Male</td>
<td>Full</td>
<td>Mathematics and engineering</td>
</tr>
<tr>
<td>Diane</td>
<td>Oceanside</td>
<td>Female</td>
<td>Associate(^a)</td>
<td>Life and physical sciences</td>
</tr>
<tr>
<td>Eric</td>
<td>Oceanside</td>
<td>Male</td>
<td>Associate</td>
<td>Professional and life and physical sciences</td>
</tr>
<tr>
<td>Iris</td>
<td>Column</td>
<td>Female</td>
<td>Associate</td>
<td>Mathematics and engineering</td>
</tr>
<tr>
<td>Jackson</td>
<td>Oceanside</td>
<td>Male</td>
<td>Associate</td>
<td>Life and physical sciences</td>
</tr>
<tr>
<td>Michael</td>
<td>Column</td>
<td>Male</td>
<td>Full</td>
<td>Life and physical sciences</td>
</tr>
<tr>
<td>Paul</td>
<td>Column</td>
<td>Male</td>
<td>Assistant(^a)</td>
<td>Mathematics and engineering</td>
</tr>
</tbody>
</table>

\(^a\)Untenured faculty participants.
needs and ultimately facilitated their retention in STEM. Furthermore, we explored how participants translated their prior firsthand experiences as students into their own mentoring styles as they aimed to promote access and retention for contemporary cohorts of students of color in STEM.

**Beneficial Sources of Support.** Although many participants spoke of the importance of familial support, it seems that relatives were not among those who most significantly shaped their academic experiences and careers. Undergraduate professors, graduate advisors, and occasionally older colleagues were primary mentors. Participants described the role that race and ethnicity played in the mentoring they received. Some discussed their beneficial relationships with same-race scholars, while others highlighted beneficial relationships they had with white mentors. Whether there was racial similarity between mentor and mentee or not, these relationships rested on the mentor’s commitment to fostering the mentee’s academic success. As Michael noted, his White mentor took a special interest in him as an underrepresented student by establishing a relationship that allowed the nurturing of his potential in the sciences. Similarly, those who had mentors of color reflected on how those persons recognized their talents and excitement for particular science-related projects.

Having individuals who believed in them and their abilities was critically important to the development of our participants, especially when we consider the environments in which they studied and worked. Although participants were highly successful in college, many of them struggled to overcome discriminatory practices, feelings of isolation, and low expectations from their White peers and faculty. In fact, Michael stated, “It seemed as though people were betting against me . . . people didn’t expect me to succeed.” Similarly, a White professor told Iris, “Your thesis cannot be a normal thesis. It’s got to be an exceptional thesis for you to get out of here.” Darren’s college mentors helped him avoid taking courses with a racist faculty member and assisted him in choosing a graduate program that would be most supportive of his work, specifically encouraging him to apply where he “would not be lost in a sea of new people.”

Meaningful relationships with faculty led to exposure to important experiences that helped participants prepare for careers in academia. Many cited being “pushed” by their advisors to network, ask questions, and explore research opportunities. Moreover, participants perceived that their institution placed a greater emphasis on working collaboratively with faculty on research, publications, and presenting at conferences. These experiences were essential to helping participants identify areas of inquiry, secure employment, and eventually earn tenure. Diane attributed pursuing a career in academic medicine to a relationship she established with her faculty mentor, who explained to her how she could integrate her research with her practice. In addition, Iris described two of her mentors as being supportive and available to answer her questions and refine her scholarly
ideas, noting that they took responsibility for not only helping her complete her dissertation but also assisting her with finding a job.

**Replicating Effective Mentoring Practices.** Faculty mentors were supportive of students throughout their academic and professional careers. Beyond facilitating their progression in STEM, these interactions shaped the ways in which participants reached out to, advocated for, and mentored students of color. Participants reflected on opportunities that their mentors provided them and understood the power and importance of giving back to students of color. Based on the value they placed on their own early exposure to research, several participants cited the importance of identifying and including undergraduates in research projects. STEM faculty noted sponsorship and collaboration as necessary for students to become more aware of research possibilities within their respective fields. Eric noted, “I want students to be able to feel like they can try something and push themselves a little bit. And it’s okay if you fail; it’s okay if you don’t quite do it right. That’s my job.”

Experiences with mentors also affected how professors engaged their mentees around issues of race and racism. A realization of the alienating climate for people of color in STEM played an important role in shaping how participants reached out to and mentored racial minority students. For example, Michael aimed to prepare his students of color for the continuous doubts and scrutiny they would likely face throughout their careers. He told students they would have to work twice as hard to receive the same recognition as their majority colleagues. Acknowledging the impact that race could have on their students’ careers also pushed the faculty we interviewed to be proactive in their efforts to mentor.

Although she had some positive experiences and guidance, Iris noted that she did not receive adequate mentoring during graduate school. Therefore, she took the time to initiate substantive interactions with Black students and made sure they got the help she perceived was necessary to facilitate their success. Given the severe underrepresentation of racial minorities in his field, Darren believed it was necessary to support students of color throughout their educational and professional experiences. He shared, “I brought them in and have a responsibility to try to see them through the program. Once they get tenure, they’re on their own, but we’re helping until they get tenure.”

**New Directions for Research**

Several definitions have been applied in researchers’ efforts to gain a greater understanding of mentoring, most focusing on the needs of and benefits conferred to protégés in such relationships (Kram, 1988). As we explore the power and importance of these relationships, research rarely examines the experiences and needs of mentors (Griffin, 2008; Kram, 1988; Ragins and Scandura, 1999). Studying mentoring as a relationship
with two equal partners focuses our attention not only on mentees, but also on mentors to get a better sense of how successful interactions look and how best to yield mutually beneficial outcomes for both students and faculty of color, particularly in STEM fields.

As we seek to identify effective mentoring practices, it is important to incorporate more questions about the nature of relationships on student and faculty surveys. Questions must go beyond assessing whether a student is being advised or the number of hours a professor spends counseling each week. More detailed questions that differentiate forms of academic support, social support, career advice, and role modeling would allow more differentiated analyses that could pinpoint exactly which student-faculty interactions are related to important outcomes like academic achievement, retention, and the actualization of high degree aspirations.

As we add depth to our quantitative assessments, it is also important to incorporate qualitative methods into the study of mentoring. Such data could help researchers determine which specific behaviors and relationships are important at a given time or why these relationships are so useful and continue to have lasting influence. In addition, qualitative studies can supply nuanced understandings of how mentors help students navigate challenging racial climates. The use of qualitative methods allows us to move beyond the superficial understanding that student-faculty contact facilitates a sense of belongingness in STEM to an informed development of specific strategies appropriate for mentoring students based on their academic and developmental needs.

Mixing qualitative and quantitative methods would allow researchers to embrace both the subjective and objective aspects of knowledge (Tashakkori and Teddlie, 1998), which is especially important when considering the experiences of students of color in the STEM fields. Our study revealed that campus climates and experiences around race and racism, for example, played a significant role in the trajectories of professors we interviewed. It shaped their experiences as students and continued to influence their work as faculty. Counting the number of underrepresented minorities on a campus or the number of hate crimes within the past year would allow us only to speculate about how hostile or unwelcoming an environment might be. Because surveys deal largely in aggregates, researchers sometimes miss individual experiences with racial dynamics in departments, institutions, and academic disciplines. Researchers also rarely give faculty, students, and administrators alike structured opportunities to discuss their personal realities around race (Harper and Hurtado, 2007).

In our efforts to measure and account for the influence of climate on STEM student achievement, it is important to attend to larger trends observed in survey analyses through various forms of qualitative inquiry, such as interviews and focus groups. Institutional researchers who use mixed methods could gain a better understanding of how campus climates
affect students of color in STEM. Consequently, institutional leaders would have richer, more complex findings to shape their decision making and inform programming focused on supporting students and faculty of color in the STEM fields.

While additional attention to student perceptions and experiences is certainly needed, institutional researchers should also consider how racial minority faculty perceive the climate. For example, faculty of color who have been at an institution for a long period can explain how their perceptions of and experiences with the campus climate have changed over time. Although participants in this study indicated that the climate for racial/ethnic minorities in STEM has improved since their days as students, many noted challenges they encountered that persist today.

Along these lines, institutional researchers should also inquire into the climate experience of people of color in different contexts. As scholars have focused attention on institutional climate, there appears to be a void in the literature regarding ways in which underrepresented students and faculty experience climate at departmental and disciplinary levels (Hurtado, Milem, Clayton-Pedersen, and Allen, 1998). While participants in this study reported entering institutions that were supportive of diversity, the climate that most experienced within their specific departments and disciplines was hostile and unsupportive. Thus, institutional researchers must examine the racial climates of particular STEM departments.

References


Kimberly A. Griffin is an assistant professor and research associate in the Center for the Study of Higher Education at The Pennsylvania State University.
DAVID PÉREZ II is a doctoral candidate and research assistant in the Center for the Study of Higher Education at The Pennsylvania State University.

ANNIE P. E. HOLMES is a doctoral candidate and research assistant in the Center for the Study of Higher Education at The Pennsylvania State University.

CLAUDE E. P. MAYO is a doctoral candidate in the higher education program and a student in the Dickinson School of Law at The Pennsylvania State University.