Navigating a Career in Academia: Insights from Emeriti Engineering Faculty

Abstract

This holistic single-case study design grounded by Sternberg's Triarchic Theory of Intelligence explores the future of the engineering professoriate and the professional practices and personal qualities emeriti engineering faculty believe are necessary for success in academia. The emeriti faculty also share how they observed the ways in which race/ethnicity and gender, and the intersection of the two, influence the professional paths of early-career underrepresented minority engineering faculty. Findings indicate the future of the engineering professoriate will be based on faculty continuing to develop useable technology that improves the human condition. Emeriti faculty note the balance in research, teaching, and service is dependent upon one's creative, analytical, and practical abilities; and the balance can be complicated by race/ethnicity and gender. A thorough understanding of pathways for success in the engineering professoriate has the potential to positively impact the professional trajectories of early-career faculty.

Navigating a Career in Academia: Insights from Emeriti Engineering Faculty

Introduction

Learning the ways in which to navigate a career in academia and balance the demands associated with the profession is a complex and complicated process for early-career faculty. While many avenues are available to seek advice on success in the world of promotion and tenure, little scholarly work has been devoted to this topic in the engineering professoriate. A thorough understanding of pathways for success in engineering can positively impact the professional trajectories of early-career faculty. Therefore, the purpose of this holistic, single-case study grounded by Sternberg's Triarchic Theory of Intelligence (1985, 1988) is to share the collective wisdom of renowned emeriti engineering faculty who provided career insights on the future of the engineering professoriate and the professional practices and personal qualities they view as critical to success in academia. As these practices and qualities vary substantially by discipline, emeriti faculty in the same field are in a position to illuminate these valuable characteristics to their early-career counterparts. The emeriti faculty also shared the ways in which they observed how race/ethnicity and gender, and the intersection of the two, influence the professional paths of early-career underrepresented minority (URM) engineering faculty. The research questions for this study are:

1. What is the future of the engineering professoriate?
2. What are the professional practices early-career faculty should fulfill to be successful in the engineering professoriate?
3. What personal qualities should early-career engineering faculty be able to demonstrate in the engineering professoriate?

4. What are the ways in which race/ethnicity and gender, and their intersection, influence the professional trajectory of early-career URM engineering faculty members?

Literature Review

A majority of faculty cite a passion for the discipline as the primary reason for pursuing a career in academia (Bosanquet, Mailey, Matthews, & Lodge, 2017). Yet, passion alone will not equate to success if early-career faculty do not demonstrate excellence in teaching, research, and service. In teaching, it is essential that faculty deliver course content in an inclusive, accessible format coupled with high and realistic expectations for student learning and achievement (Austin & McDaniels, 2006). Research contributions, by way of publications, presentations and sponsored program activities, typically hold the most weight in promotion decisions—particularly for those who must secure grants (Anderson, Ronning, De Vries, & Martinson, 2007; Austin & McDaniels, 2006; Fairweather, 1993; Green, 2008; Luchs, Seymoure, & Smith, 2012; Soto, 2014). To efficiently fulfill service expectations, early-career faculty can align activities with promotion and career goals, such as university committee work and mentoring students (Austin & McDaniels, 2006; Sorcinelli, 2011). However, service can be complicated for URM and female faculty as they often receive and accept more service requests than others (Baez, 1999; Dancy & Gaetane, 2014; Hurtado & Figueroa, 2013; Rockquemore & Laszloffy, 2008).

Forging relationships are one way early-career faculty can advance professionally and build a reputation in the field. Frequently this occurs through mentorship from senior faculty who can teach new faculty about department expectations and tenure processes, as well as aid them in developing a network of colleagues who will support them through promotion, tenure, and beyond (Cawyer, Simonds, & Davis, 2002; Hyers, Syphan, Cochran, & Brown, 2012; Yun,

Baldi, & Sorcinelli, 2016). This is particularly important for early-career faculty who must learn

the values, ethos, and philosophy of their institution to guide their efforts and improve the

possibility of positive tenure evaluations (Austin & McDaniels, 2006; Fairweather, 2002). In

particular, URM faculty and women benefit from explicit guidance and mentorship as they often

do not receive informal career advice (Blood et al., 2012; Buzzannell, Long, Anderson, Kokini,

& Batra, 2015; Hyers et al., 2012; Yun et al., 2016). This is especially concerning for women as

female role models are scarce in STEM fields (Bhatia & Amati, 2010).

     The primary challenge of the professoriate often cited by early-career faculty is managing

the heavy workload and associated chronic stress (Rockquemore & Laszloffy, 2008; Sorcinelli,

2011; Soto, 2014). Time management techniques, such as setting priorities and avoiding

multitasking, are an important skillset in academia as there are habitually a myriad of projects to

complete at once (Sorcinelli, 2011). Additionally, early-career faculty often struggle with

balancing work responsibilities with their personal and family life. Respondents to a survey by

Bosanquet et al. (2017) reported feeling forced to sacrifice personal life goals, such as starting a

family, in order to manage their heavy workloads. This finding was particularly salient among

female faculty, who tend to serve as primary caregivers (Barrett & Barrett, 2011; Bosanquet et

al., 2017; Nelson-Gray, 2012; Schiebinger & Gilmartin, 2010); they often report feelings of guilt

and selfishness as they spend time away from their families (Soto, 2014). In reality, it can

negatively effect the likelihood of promotion and tenure, as men are nearly 40% more likely to

earn tenure than women after having children (Ceci & Williams, 2007; Handelsman et al., 2005;

Rosser, 2004).

     Managing the goal of promotion and tenure while navigating entry into academia can be

challenging and lead to feelings of isolation and extreme worry about achieving tenure (Gappa,

Austin, & Trice, 2007). Thus, specific personality traits can increase the chances of early-career faculty being successful in academia. For example, collegiality and serving as a team player are important ways to establish oneself and build a positive reputation in the field, as well as engage in a community of scholars (Bronstein & Ramaley, 2002). Pritchard (2015) also described the concept of "mental toughness" (p. 98) as a useful tool for working toward personal and professional goals, which involves approaching work mindfully, adopting an objective lens to deal with difficult situations, and using emotions to feel empowered.

Theoretical Framework

To guide this study, Sternberg's (1985, 1988) Triarchic Theory of Intelligence was selected as the theoretical framework. Theoretical frameworks build on a foundation of established knowledge, offer logical explanations for the relationships observed, and reveal new understandings about a phenomenon (Anfara & Mertz, 2014; Babbie, 2015). The theory provided a structure for contemplating the ways in which the emeriti faculty conceptualized the three components of intelligence:

1. Creative abilities: an individual's capacity to generate new ideas;

2. Analytical abilities: the ability to decide which ideas to pursue; and

3. Practical abilities: the process of putting ideas into practice and persuading others of their value.

The role of intelligence offered a framework for organizing and communicating the professional practices and personal qualities that may be perceived as most desirable and keys to success in engineering, helping to position the ways in which race/ethnicity and gender influence the professional trajectory of URM early-career engineering faculty.

Methodology

Research Design

A holistic, single-case study design grounded by Sternberg's Triarchic Theory of Intelligence (1985, 1988) was utilized to explore the future of the engineering professoriate and the professional practices and personal qualities believed by emeriti faculty to be necessary for success in academia (Yin, 2018). The theoretical propositions that intelligence is actualized in three components (creative, analytical, and practical) underpinned the critical case approach of the study. As noted by Yin (2018), theoretical propositions are important in placing the circumstances in which a phenomenon is to occur—in this case, the ways in which intelligence translates to a successful academic career in engineering. Inquiries also were conducted to understand whether race/ethnicity and gender, and their intersection, influence the professional trajectory of early-career URM engineering faculty. Multiple one-on-one interviews with the emeriti faculty allowed for their rich perspectives and experiences to be explored over time (Stake, 1995; Yin, 2018). The research questions of this study were:

1. What is the future of the engineering professoriate?

2. What are the professional practices early-career faculty should fulfill to be successful in the engineering professoriate?

3. What personal qualities should early-career engineering faculty be able to demonstrate in the engineering professoriate?

4. What are the ways in which race/ethnicity and gender, and their intersection, influence the professional trajectory of early-career URM engineering faculty members?

Participants

Seven emeriti engineering faculty participated in this study; they were selected because of their renowned stature in the field, collective expertise, and continued engagement in academia during retirement. Most maintained sponsored research activities and research labs, some taught undergraduate and graduate engineering courses, and one held an administrative assignment in his Provost's Office. All participants were White, male, and retired from the same doctoral-granting university with very high research activity, representing various engineering disciplines such as aerospace, biomedical, chemical, industrial systems, and mechanical.

Data Collection

This study is part of a larger project that focuses on the Increasing Minority Presence within Academia through Continuous Training (IMPACT) mentoring program pairing emeriti and URM early- and mid-career engineering faculty for career mentorship. The IMPACT program and this research are sponsored by a National Science Foundation INCLUDES (Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science) Design and Developments Launch Pilot award (17-4458). Over the course of two years of the IMPACT program, emeriti faculty were invited to participate in four rounds of interviews; four participated in all rounds, two participated in three, and one participated in two, resulting in 24 completed interviews.

Per Institutional Review Board approval, all individuals were provided with consent forms detailing the purpose of the study and the interview procedures. The interviews averaged 45 minutes in length, were digitally recorded, and were conducted through a one-on-one process with one interviewer to ensure the data were gathered in a systematic manner (Patton, 2015). Four semi-structured interview protocols were developed to ensure questions were asked in a

specific order and were carefully worded; probing questions were embedded to provide opportunities to seek clarification (Patton, 2015).

Data Analysis

The interview data were analyzed using both inductive and deductive techniques. Silverman's (1993) inductive approach of finding themes and patterns occurred by coding in cycles and embedding opportunities for frequent reflection. Using this method, data were coded in a comprehensive manner to identify cross-references between the data and the evolving themes while memoing. During the first cycle of coding, descriptive codes were created, which summarized the basic topics of the data, as well as evaluative codes that categorize specific career insights from emeriti faculty (Miles, Huberman, & Saldaña, 2014). During the second cycle, data were reviewed again, and emerging themes and patterns were identified. During the third cycle of coding, Stake's (1995) four-step deductive process was followed to report the themes, which included direct interpretation, categorical aggregation, pattern recognition, and naturalistic generalizations using Sternberg's Triarchic Theory of Intelligence (1985, 1988). The emerging themes and patterns from the inductive analysis were compared with the theoretical framework to further define and finalize the themes (Patton, 2015). After additional memoing and review of the data, four final themes were identified.

Trustworthiness

Multiple verification strategies ensured the findings were trustworthy (Lincoln & Guba, 1985). In order to address credibility, researchers utilized cross-case synthesis throughout the analysis of each interview to examine whether the themes were cases of similar or different perspectives of the emeriti faculty (Hayes, 1997). Miles et al. (2013) highlighted the flexibility of this approach when data collection occurs in a phased design. To ensure transferability, thick,

rich descriptions were utilized, and data saturation occurred prior to the completion of all 24

interviews (Patton, 2015). Dependability was addressed by evaluating the manner in which the

themes represented the whole of the text (Silverman, 1993; Stake, 1995). Researchers ensured

confirmability by validating themes in the early and late stages of the data analysis process

(Miles et al., 2013). Dependability and confirmability were accomplished by involving multiple

researchers in evaluating and providing feedback on the identified themes, which enabled the

comparison of several feedback loops. Application of these verification methods of establishing

trustworthiness mediated the limitation of including only emeriti faculty who participated in the

IMPACT program, self-selected to be interviewed, and self-reported their views and experiences

(Lincoln & Guba, 1985; Miles et al., 2013).

Findings

Following data analysis, four themes emerged. The emeriti faculty shared their

perspective on the future of the engineering professoriate, defined the professional practices and

personal qualities necessary for success in academia, and provided insights into the influence of

race/ethnicity and gender, and their intersection, on the career success of URM faculty.

The Future of the Engineering Professoriate

All emeriti faculty identified "improving humanity" as an important component to the

future of the engineering professoriate. One noted, "[In engineering] we make things better for

humanity. We're the makers. We're not the discoverers of knowledge. Those are the scientists.

We're the people who make things with scientific principles." Each shared that engineers

develop new technologies that are translated into useful, real-world activities to better the human

condition, and the engineering professoriate will continue to reward faculty who are efficacious

in that endeavor. One participant commented that successful engineering professors of the future

will "graduate people who have a commitment to making life better, that could mean safer airplanes and better bridges and healthcare delivery systems that are technologically sound." They spoke as one in describing the importance of continuing to invest in the future of the engineering professoriate, as they viewed it as an investment in the future of humanity and society. Therefore, to be successful in the future of engineering, all three abilities of Sternberg's Triarchic Theory of Intelligence (1985, 1988) are required: creative abilities for developing technologies to improve humanity, analytical abilities to know what is needed for "making life better," and practical abilities for turning ideas into reality.

When looking toward the future, the emeriti faculty articulated a need for new ways to restructure engineering academia to ensure its survival in an era of scarce resources and intensifying demands. A few indicated a need to "bifurcate" the pathway to tenure by rewarding what they described as the classic professor who taught and researched, and the professor who only taught. One stated, "We're going to hire a lot more instructors and we are going to need to honor those instructors with giving them more teaching professorships with no research role." Another asserted "there are too many universities where people are forced to pretend to do research and that is going to have to end because there's not enough funding to go around." These types of structural changes were seen as necessary to ensure the contributions of engineers in academia are rewarded and recognized for their varied talents, rather than expecting all early-career faculty to perform along the same traditional lines of teaching, research, and service.

Professional Practices for Success

The emeriti faculty identified professional practices needed of early-career faculty members to be successful in the engineering professoriate. As one emeriti faculty participant described, "academia is a real rat race," success in research, teaching, and service is necessary

for tenure and promotion. Early-career faculty must focus on each area; however, as one emeriti faculty member articulated, it is a "daunting challenge" for new professors to find the right balance. As every institution is different, they emphasized the importance of new professors knowing and satisfying the expected balance for their specific institution.

Research and publications in engineering tend to carry the most weight, even outside of the top tier universities. In order to advance professionally, professors must conduct original and innovative research that "results in good work for humanity." In addition, they should produce high-quality publications and not focus solely on the number of publications. In the words of one emeriti faculty participant, "the issue is not just having a bunch of publications, but having publications that are meaningful, and of an intellectual depth that they lead to new ideas, new technologies." However, the emeriti faculty did not dismiss the fact that numbers are still important. As one described, universities are "numbers driven" and the "number of publications, number of dollars brought in" impact a new professor's career trajectory. "Number of dollars" relates directly to securing grants and funding, which the emeriti faculty also identified as necessary for success. While securing external funding alone does not equal success in the eyes of the emeriti faculty, the funding provides professors with the opportunities to create a more "active research lab," which ultimately results in more research and publications.

While the emeriti faculty acknowledged a balance between research, teaching, and service, they warned against over emphasizing teaching because it may hinder competitiveness if a professor desires to leave his or her institution. In addition, teaching is not held to the same standard as research. One emeriti faculty participant described a common belief in the STEM fields that "teaching is punishment for not producing enough research." It is important to note that not all emeriti faculty agreed with this sentiment; however, it was acknowledged as reality at

some universities. One believed the focus should be on a professor's strengths and the ways in which he or she best contributes to the university and the engineering profession, whether through teaching, research, or service. However, this is not common practice in academia, and it is imperative for new faculty to understand the expectations for tenure and promotion.

In order to understand these expectations and to grow in the profession, emeriti faculty emphasized the importance of early-career URM faculty finding a mentor. While new faculty members may have been successful as a graduate or PhD student, upon becoming professors they are "basically starting over," as one emeriti faculty participant articulated. Connecting with a mentor helps new faculty navigate academia, as well as have the opportunity to advance knowledge in the engineering field, to hone one's teaching skills, and to provide service in one's areas of expertise. Some institutions offer mentoring programs for new faculty, but emeriti faculty noted that, in the engineering field, some new faculty feel as though they should be able to "stand on their own" and do not take advantage of mentoring opportunities. However, they believed it is vital for new faculty to commit to mentoring not only to understand the demands of academia, but also to get involved in conferences, research, and grow their professional networks. As one emeriti faculty member emphasized, "survival [in academia] is very much influenced by the steps you take early on . . . [new faculty] are going to need help. They're going to need guidance." Mentors can provide the needed guidance and support so new faculty not only survive, but also thrive.

The professional practices described by the emeriti faculty directly relate to Sternberg's (1985, 1988) three components of intelligence. Each emphasized success in teaching, research, and service; finding the right balance among the three requires the creative, analytical, and practical abilities of the Triarchic Theory of Intelligence. Early-career engineering faculty must

be innovative and original (creative abilities), discern areas of synergy to pursue (analytical abilities), and determine the appropriate balance for their individual institutions (practical abilities). In addition, pursuit of a mentoring relationship will help new faculty develop their creative, analytical, and practical abilities to be more successful in the engineering professoriate.

Personal Qualities for Success

The emeriti faculty identified personal qualities necessary for success, all of which connect to Sternberg's (1985, 1988) three components of intelligence. While they emphasized the importance of possessing the technical skill and analytical ability needed for engineering, they also believed these traits alone will not help new faculty advance. They need creativity and vision "to see things a little differently than people or find a niche that other people haven't found." The emeriti faculty described the ability to view a problem through a creative lens and find different solutions and connections, which is vital to becoming a leader in the engineering field. In the words of one participant, "Non-creative people, they can go into engineering, because of their analytical ability, but they can't really become a leader. People who are leading the engineering fields are people who are extremely creative." They believed having new and unique ideas is important for the next generation of engineering professors, and one of their roles as senior faculty is to promote and foster this creativity. Another participant remarked that new faculty are "young, they're creative, they're energetic"; each quality has the potential to positively impact the future of the engineering profession. In Sternberg's Triarchic Theory of Intelligence (1985, 1988), creativity is one of the three components and described as the ability to generate new ideas, which mirrors the emeriti faculty's definition of this necessary quality.

In addition to creativity, the ability to get along and collaborate with others is a personal quality essential for professional advancement. The emeriti faculty stressed the importance of

early-career faculty participation in team activities. As one participant pointed out, "[engineering] is not a single artist in a studio, it's a team of people"; therefore, collaboration is key. Similarly, another described research as "a people business," so new faculty must possess the "social skills to interact with and benefit from other people." One participant articulated, "You're not going to last if you cannot get along [with others]."

Not only do engineering faculty need the social skills to collaborate with their colleagues, but also, they must work with students when conducting research and teaching. One emeriti faculty member believed charisma is important "to attract graduate students" who want to collaborate with the professor on research projects. Likewise, new professors should possess the personality "to convince somebody to support research that you think needs to be done to improve something." The people skills described by the emeriti faculty are captured in the Triarchic Theory of Intelligence practical abilities component. New professors need the practical ability to relate with others, put their ideas into practice, and persuade others to join with them.

The emeriti faculty acknowledged the "pressure is intense" in academia; therefore, having the "grit, persistence, and ability to overcome challenges" is essential. This requires the three components of the Triarchic Theory of Intelligence: creativity to find solutions, analytical ability to understand the ideas to pursue, and practical ability to persist in the face of challenges. Additionally, being respectful, dedicated, hardworking, and organized are qualities identified by the emeriti faculty as important for success. They believed innate talent in the field is imperative as well; however, talent can only "get someone so far." New faculty should possess the personal qualities described, in addition to talent to flourish in the engineering professoriate. The emeriti faculty believed talent is to be nurtured and channeled so new faculty know in what direction to focus their careers; emeriti faculty saw nurturing talent as one of their roles as senior faculty in

the field. One emeriti faculty participant added being a professor in engineering is "the best job in the world, but you have to love it, because you can't do it if you don't love it."

The emeriti faculty also believed certain personal qualities are detrimental to an early-career faculty member's professional trajectory, such as arrogance or disrespect. Being overly controversial or not following precedent and tradition also can hinder success. One participant noted new professors will not be taken seriously if they are not "credible" or have no evidence to demonstrate their ideas have worked. He warned against being "all talk" and having no experience to stand on, which may lead to one's "value being diminished" in the field. These personal qualities relate to the analytical and practical components of intelligence—if faculty lack the ability to anticipate and avoid these potential attitudinal and dispositional pitfalls, they will struggle in academia.

Impact of Race/Ethnicity and Gender

Most emeriti faculty believed race/ethnicity and gender, and their intersection, can impact an early-career faculty member's professional trajectory. Nearly all indicated the challenge for URM faculty to find a balance between research, teaching, and service, as often they are expected to perform more service duties than their counterparts in order to demonstrate an institution's commitment to diversity. One participant remarked:

> The good news is universities realize they have to have diversity on their committees; the bad news is there's not that many [diverse] faculty and so the same faculty are called on. I mean, in engineering, it's bad enough probably to be a woman, but to be a black woman, makes it even worse [in terms of service obligations].

Thus, service responsibilities can be quite complicated for URM faculty; they may be "caught in the trap" of focusing their time on service rather than on their research agenda and refining their

teaching abilities. The capacity to advocate for themselves on the appropriate balance is captured in the practical abilities' component of intelligence. One emeriti faculty member added there are "cultural kinds of gaps" between URM faculty and their colleagues, which can be disconcerting. However, the emeriti faculty believed having a mentor to answer questions, provide advice, and connect them with other colleagues can mediate potential and actual challenges as they navigate the expectations of academia.

Emeriti faculty described the difficulty of finding female and minority professors in the engineering field because, as one described, "there aren't enough of them out there." Another noted that historically barriers have existed for minority and female students pursuing careers in engineering. While he believed they are "in the past" and "those barriers are being dismantled," he emphasized the importance of making a conscious effort to bring more diversity into the profession. "If we are to have the engineering workforce we need for the 21st century, we have to bring in these underrepresented populations . . . it is the necessary thing to do." However, acknowledging these barriers, while being diminished, may still exist to some degree implies that race/ethnicity and gender impact an individual's opportunity to even begin their career in the engineering field. Therefore, although one may possess the creative, analytical, and practical abilities described in Sternberg's Triarchic Theory of Intelligence (1985, 1988), their race/ethnicity and gender may have a greater impact on their opportunities to secure a position in academia and progress in the profession. This is an area for further research and exploration.

It is important to note that, in contrast to a majority of the emeriti faculty comments on the significance of race/ethnicity and gender in the engineering professoriate, one individual indicated feeling unsure of the difficulties URM faculty may currently face: "I'm sure in the past [race/ethnicity or gender] has played a significant role [in being successful]. These days, I don't

have a good perspective to say something real knowledgeable." While these comments are limited to one emeriti faculty member's experience, they suggest race/ethnicity and gender, and their intersection, may not be noticed or perceived as relevant by some emeriti faculty.

Discussion

One of the major challenges new professors face is navigating the mounting expectations and demands of academia. The perspectives and insight of professors who have walked before them provide new faculty with tangible tools for charting the course of their academic careers and considering the future of the engineering professoriate. This study adds to the literature by providing insight into the professional practices and personal qualities identified by emeriti faculty as critical for a successful career in academia, as well as the abilities early-career faculty must develop and possess to earn tenure and advance in the engineering professoriate. In addition, the study provides the unique perspective of emeriti faculty on the future of engineering, which is also important for new faculty to consider as they begin their careers.

The future of the engineering professoriate appears to be grounded in continuing to develop practical technologies that improve the human condition. The emeriti faculty believed this is true of all engineering disciplines, be it chemical, civil, electrical, or mechanical. Each emeriti faculty pointed out that those across all professoriate ranks who can inspire others to think along those lines will be successful in the future of academia, as more individuals are needed in the field. They also articulated a need to reconsider the role of the tenured professor. The rewards should not be for only those who are successful in teaching, research, and service; a need exists to elevate the role of the instructor who does not hold research responsibilities to also be eligible for tenure.

By sharing perspectives and experiences from their days in academia, the emeriti faculty articulated the necessary attributes that contribute to success. In addition to professional steps to pursue, which include finding the appropriate balance between teaching, research, and service, personal qualities and attitudes such as creativity and collaboration are important when pursuing tenure and promotion. Past scholars also have identified these traits as necessary for success (Bronstein & Ramaley, 2002). Moreover, the valued personal qualities described by the emeriti faculty align with Pritchard's (2015) description of mental toughness, which is an increasingly important attribute as academia becomes more demanding and requires faculty to employ mindfulness skills in order to thrive.

Sternberg's (1985, 1988) Triarchic components of intelligence aligned with the career insights provided by emeriti faculty as necessary for success. Knowledge of these practices and qualities can provide new faculty with a "roadmap" as they begin their careers; however, the emeriti faculty also emphasized the importance of finding a mentor. As every institution is different, having specific feedback and support from senior faculty at the same university further benefit the careers of new faculty, despite that the commitment to mentorship requires humility from high-functioning, independent new faculty. Further, mentorship proffers the advantage of learning about a particular department's values—an essential means of increasing the likelihood of success in the professoriate (Austin & McDaniels, 2006; Fairweather, 2002).

It is important to highlight the impact of race/ethnicity and gender on new faculty. URM faculty may experience additional challenges, as the intersections of their identities result in being called upon more frequently for service-related activities, such as mentoring students of color and serving on diversity-related university committees. This is consistent with the literature stating URM faculty are expected to be more involved in service activities than non-URM

faculty (Baez, 1999; Rockquemore & Laszloffy, 2008; Soto, 2014). However, the emeriti faculty also described the existence of historical barriers that make it difficult for underrepresented populations to enter the field of engineering. While those barriers may not be as prevalent today, their existence has made a lasting impact on the profession, as presently only 6.3% of engineering professors identify as URM (National Action Council for Minorities in Engineering, 2014). Indeed, a particular lack of female role models is seen in engineering to attract URM students to the profession (Bhatia & Amati, 2010). Therefore, possessing the qualities and practices identified by emeriti faculty and described in the Triarchic Theory of Intelligence is only one part of the equation for success. Incoming faculty should possess such qualities, as should current faculty, as they work to break down existing barriers and explore new ways to attract and welcome URM faculty into the profession. However, in order to increase the number of URM faculty, more URM students majoring in engineering and pursuing a career in academia are needed. Faculty must possess the charisma and ability to work well with others, as described by the emeriti faculty, to attract new students into the field and to dismantle existing barriers. This is an area for further research and exploration.

Conclusion

Few studies have investigated the professional and personal qualities needed for success in the engineering professoriate; therefore, this holistic, single-case study fills the gap through targeted interviews with emeriti faculty. This research provides insights on the future of the profession and how to navigate a career in academia with attention to the ways in which race/ethnicity and gender, and their intersection, influence the success of early-career faculty. Defining the professional practices and personal qualities early-career faculty must exhibit in order to be successful provides an "insider" perspective with valuable advice in developing one's

professional trajectory within the engineering field. However, the professional practices and

personal qualities identified by emeriti faculty are not specific to engineering; thus, this research

provides all new faculty with practical insights into success in academia.

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