

OPINION

Diversity and Inclusion ^{is}

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Academic institutions are not immune to the ongoing and building tension that is mounting throughout all our society, based on the confronting reality of ethnic and religious intolerance, health and law enforcement inequality and discriminatory remarks from prominent social figures. We also read about federal funding institutions developing strict regulations against gender-based discrimination, reports on ethnic-based disparities in funded grants, and after years and millions of dollars in programs directed to increase diversity, we are still struggling to attain a diverse workforce in academia (Ginther et al., 2011; Hayden, 2015; Valantine and Collins, 2015). In this historical moment that makes us question the social advancement since the 1950s, academic institutions and federal agencies need to develop novel strategies to address the current challenges that weaken the advances already made toward achieving a diverse workforce.

Although we do not discuss diversity issues specifically related to undergraduate neuroscience education, the point we are trying to make is applicable to all STEM disciplines. It is time that members of the academia consider the need to go beyond the unidimensional approach of increasing diversity by better preparing students from underrepresented groups in science. We encourage open discussion from all disciplines and we welcome responses that address diversity issues that may be specific to neuroscience from faculty teaching in this area.

Traditional training programs are directed to enhance diversity through increasing and retaining trainees from underrepresented groups in STEM disciplines. These training programs seek to enhance the academic, research and professional capabilities of students from underrepresented groups. For example, Shultz et al. (2011) showed that undergraduate students who are part of the Research Initiative for Science Excellence (RISE) program, in 25 four-year institutions, identified themselves as scientists, and have greater success (61%) in finishing their baccalaureate degree than non-RISE students (45%). At the graduate level, Byars-Winston et al. (2011) described an integrated graduate training program based on mentoring and achievement of identified competencies required for a successful academic career. The undeniable success of such programs contributed to increases in the number of graduate students from underrepresented groups in STEM that finished their Doctorate. Then, the question is: why do we continue to face the lack of diversity in academia and within the general scientific workforce?

Training programs directed to increase diversity are usually carried out in seclusion. Local and national activities are organized to unite trainees from underrepresented groups with the intention to promote a learning community that leads to a strong professional networks. We know firsthand that the workshops and presentations at these conferences/meetings are excellent, the networking is career changing and the motivation to achieve the academic/professional degree is life transforming. Even though all these needed activities and well-intentioned programs are crucial, this traditional approach of increasing diversity, unfortunately, leads to *training segregation*. These activities nurture the career development of a particular group of students/post-docs and even junior faculty, but fail to promote professional inclusion. We argue that it is the inclusion of all members of the academic community in training activities that develop a community that appreciates and embraces the benefits of a diverse workforce.

Academia plays a dual role in the quest to achieve a diverse workforce. First, academia should serve as a role model by developing strategies that embrace the diversity of their own employees/faculty and demonstrate their success. The second role is developing professionals with the necessary skills and sensitivity to serve as agents of change that transforms their specific professional community into places that build their success on embracing the strength that diversity provides. Therefore, diversity of the workforce should not be based exclusively on achieving representation of different groups, but rather to integrate and value the contribution of those from different backgrounds, including those from the majority culture, in the quest to succeed. The social cognitive career theory, applied to the academia, established that higher social support and lower social barriers contribute to enhanced self-efficacy, which tends to increase interest in an academic career choice (Estrada-Hollenbeck et al., 2011; Trujillo and Tanner, 2014). Lent et al. (2005) showed that self-efficacy predicts students' interest and persistence to pursue careers in STEM disciplines, regardless if they are from underrepresented or overrepresented groups. More recently, Gibbs and Griffin (2013) argued that "generating a love of research or confidence in one's ability" is not enough, but that there is a need for promoting "institutional and systemic reforms" in order to increase diversity.

The establishment of an *inclusive training model* will foster the development of students as a community that

embrace their differences and are able to use these differences to strengthen their working unit. While maintaining the efforts to retain students from underrepresented groups in STEM, students from overrepresented groups should be integrated and incentivized to participate in all developed training activities. The trainees could work together in tasks that encourage team work (e.g., planning community outreach activities) and workshops on hidden biases, leadership, conflict resolution and ethics in the peer-review process. The generated dynamic will promote the development of communication and organizational skills that lead to the integration of diversity as a tool to achieve common goals. This ultimate training objective will require that mentors or trainers establish clear career expectations and benchmarks that trainees should achieve individually and as a group. The assessment of this training model could follow different qualitative and quantitative tools that measure the trainees' orientation to the scientific community, while assessing the quality/gain from the research training. Ultimately, the expected result of a training program based on inclusion is a community that learns together and develops the personal and professional skills required to embrace the benefits of a diverse workforce. Inclusiveness is the key to increase diversity in the workforce.

REFERENCES

- Byars-Winston A, Gutierrez B, Topp S, Carnes M (2011) Integrating theory and practice to increase scientific workforce diversity: a framework for career development in graduate research training. *CBE Life Sci Educ* 10:357-367.
- Estrada-Hollenbeck M, Woodcock A, Hernandez PR, Schultz PW (2011) Toward a model of social influence that explains minority student integration into the scientific community. *J Educ Psychol* 103:206-222.
- Gibbs KD Jr, Griffin KA (2013) What do I want to be with my PhD? The roles of personal values and structural dynamics in shaping the career interests of recent biomedical science PhD graduates. *CBE Life Sci Educ* 12:711-723.
- Ginther DK, Schaffer WT, Schnell J, Masimore B, Liu F, Haak LL, Kington R (2011). Race, ethnicity, and NIH research awards. *Science* 333:1015-1019.
- Hayden EC (2015) Racial bias continues to haunt NIH grants. *Nature* 527:286-287.
- Lent RW, Brown SD, Sheu HB, Schmidt J, Brenner BR, Gloster CS, Wilkins G, Schmidt LC, Lyons H, Treistman D (2005) Social cognitive predictors of academic interest and goals in engineering: utility for women and students at historically black universities. *J Couns Psychol* 52:84-92.
- Schultz, PW, Hernandez PR, Woodcock A, Estrada M, Chance RC, Aguilar M, Serpe RT (2011) Patching the pipeline: reducing educational disparities in the sciences through minority training programs. *Educ Eval Policy Anal* 33:95-114.
- Valantine HA, Collins FS (2015) National Institutes of Health addresses the science of diversity. *Proc Natl Acad Sci U S A* 112:12240-12242.
- Trujillo G, Tanner KD (2014) Considering the role of affect in learning: monitoring students' self-efficacy, sense of belonging, and science identity. *CBE Life Sci Educ* 13:6-15.

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