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A Top-Down Approach for Diversity and Inclusion in Chemistry Departments

Rigoberto Hernandez[*] and Shannon Watt[†]

School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332-0400
[*]Email: Hernandez@gatech.edu
[†] Email: shannon.watt@gatech.edu

The Open Chemistry Collaborative in Diversity Equity (OXIDE) works together with chairs and thought agents in the leading research-intensive chemistry departments to advance diversity systemically and sustainably. Through discussion with social scientists and evaluation of our discipline, we are working to identify effective practices, policies and procedures that can be implemented within the chemical academy to advance diversity equity. Within this effort, diversity is interpreted broadly; it includes gender, gender identity, race-ethnicity, disability status and sexual orientation. OXIDE organizes the biennial National Diversity Equity Workshops (NDEWs), held most recently in April 2013. NDEW focus topics vary and have included sessions on contributing factors; interventions; organizational structure, behavior and dynamics; and recruiting, hiring, retention and promotion. NDEW2013 was the first of the chemistry-directed diversity equity workshops to include a specific focus on lesbian, gay, bisexual, transgender, queer, intersex and questioning (LGBTQIQ) equity. OXIDE gathers annual faculty demographics data from over 100 research-intensive chemistry departments and partners with *Chemical & Engineering News (C&EN)* to publish the results. OXIDE also

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maintains a dialogue within the collaborative through surveys, print and web dissemination, campus visits and other avenues. In this chapter, we argue why leading research-intensive chemistry departments must advance diversity equity within their faculty ranks and discuss how OXIDE catalyzes this transformation.

Introduction

The Open Chemistry Collaborative in Diversity Equity (OXIDE) was founded in 2010. It grew from the 2009-2010 Diversity Equity Workshop Planning Committee (DEWPC). The latter was initially formed to provide continuity to the prior workshops—funded by the National Science Foundation (NSF), National Institutes of Health (NIH) and Department of Energy (DOE)—held to address the alarmingly low representation in the leading research-intensive chemistry departments with respect to women,[1] racial and ethnic minorities,[2] and chemists with disabilities.[3] These early workshops shared the hypothesis that substantive progress could be made only if the leadership of the leading research-intensive chemistry departments was engaged in changing the culture through dialogue, with social scientists providing perspective and solutions backed by solid research. Despite the successes of these workshops in changing policies and procedures to advance a more diverse chemical workforce, they lacked continuity because they were ad hoc events without supporting infrastructure or the promise of long-term follow-up. In recognition that each department has only one department head or chair to attend such events annually or biennially, OXIDE introduced the National Diversity Equity Workshops (NDEWs) based on the notion that all issues related to diversity—whether in common or particular to a given group—should be discussed within a single conversation between chairs, social scientists and representatives of diversity communities. In addition to gender, race-ethnicity and disability status, OXIDE has also included sexual orientation and gender identity as another critical component of diversity that must be addressed within chemistry departments. NDEWs were held in 2011 and 2013. They are planned to continue biennially until at least 2017.

OXIDE's partnership model (see Fig. 1) maintains continuity between NDEWs. OXIDE works with *Chemical & Engineering News (C&EN)* to publicize the faculty demographics obtained in cooperation with chemistry departments; gathers information from social scientists and diversity communities about barriers and solutions to diversity equity; disseminates the information among all the partners; and consults with individual chairs and departments on implementation of diversity-related initiatives.

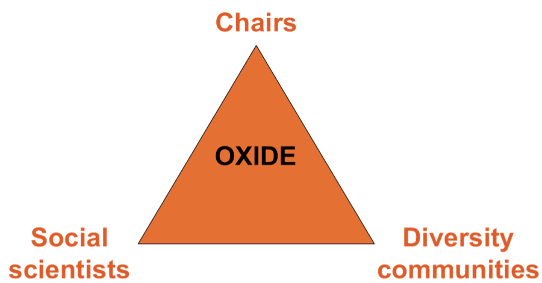

Figure 1: A graphical representation of OXIDE's partnership model connecting department chairs, social scientists and diversity communities. OXIDE serves as an active conduit of information between all three groups.

A critical component of the OXIDE program is the recognition that substantive and sustained change in the climate of chemistry departments must arise both top-down and bottom-up. The bottom-up approach entails training and encouraging new scientists from diverse groups to pursue academic positions, and this model has been adopted by many successful training and mentoring programs. The top-down approach entails changing the culture, policies and practices of existing chemistry departments and universities so as to make academic positions attractive to under-represented scientists as a career choice. This can only be achieved in partnership with the leadership of chemistry departments, but requires active engagement with outside groups such as OXIDE to enable coordination across the academic community.

Diversity Defined

When speaking about diversity, there is invariably a question as to what exactly the term means, and what constitutes a diverse group. We interpret diversity to mean the inclusion of the other, where "other" is anyone unlike oneself. The other can differ in any of a number of attributes from categories such as gender, gender identity, race, ethnicity, disability status, sexual orientation, socioeconomic status, culture, life experiences, ideas, geography, university pedigrees, political ideology, country of origin (international), and others. A group is therefore diverse if its membership includes individuals expressing different attributes and which does not actively or passively exclude individuals with particular attributes.

It is ironic that the inclusion of people from some categories (such as country of origin) has historically been used as an indicator of a world-class department, but that the presence or absence of others (such as domestically-educated first-generation immigrants) has been ignored entirely in such rankings. Presumably the strongest departments are those that draw from the broadest possible pools of individuals. An international presence, for example, within a faculty indicates that the talent pool was broadened to include a larger—that is, worldwide—population. Consequently, the National Research Council (NRC) and others use counts of international faculty and students[4] as part of their rankings criteria. By analogy, the absence of under-represented groups should indicate that the pool was actually smaller, and be an indicator of diminished quality. Interestingly, the recent NRC rankings study[4] found little correlation between rankings and the level of participation from under-represented groups within faculties. Whether this finding is due to biases in the academic system, statistical insignificance arising from the very small number of professors from particular under-represented groups, or other factors is not known. However, the fact remains that there is a dramatic difference in the demographics of the faculty in comparison with the general population, as summarized below. This disparity suggests that we are not drawing the best talent equitably from within this nation's population and that our failure to do so is incompatible with the academic driver towards excellence that relies on attracting and retaining the best talent from the greatest possible pool of individuals.

In this chapter, as in the OXIDE effort, we focus on four diversity categories—gender and gender identity; race and ethnicity; disability status; and sexual orientation—because available data indicate that members of these groups are under-represented in the academic chemistry workforce in comparison to the demographics of the broader U.S. population. The data discussed below clearly indicate the existence of under-representation with respect to the participation of women and members of racial and ethnic minority groups. Unfortunately, the numbers are so small—and often lessened by underreporting—with respect to several of the categories that the level of under-representation is hard to measure. Indeed, the relative absence of said individuals in any given scientific gathering is palpable. The mismatch in the demographics between the broader population and the faculties is inequitable. The drivers that lead to it are the diversity inequities which OXIDE seeks to eliminate in academic chemistry departments by encouraging them to make doing so part of their excellence mission.

The Broader Context

Society as a whole has yet to truly remove the diversity inequities faced by individuals belonging to under-represented groups. Indeed, the lack of diversity equity in the workplace throughout all sectors, not just the chemical workforce, is presently receiving much attention from the public. Despite the many advances that women have made in attaining executive positions of companies and universities, many barriers to equitable participation continue to exist. For example, recent publications by Susan Patton,[5] Anne-Marie Slaughter[6] and Sheryl Sandberg[7] describe some of the existing challenges—that is, diversity inequities—that women continue to face in balancing their private and professional lives in comparison to their male counterparts.[8] Underrepresented racial and ethnic minorities are occupying positions at the top of the business and political world—including current notable examples such as Barack Obama (President, USA), Don Thompson (CEO, McDonald's), and Sonia Sotomayor (Associate Justice, Supreme Court)—and yet their representation is still far from equitable across the middle and upper tiers of leadership in the public or private sectors.[9] The barriers faced by individuals whose real or perceived sexual orientation, gender identity or gender expression lies in the lesbian, gay, bisexual, transgender, queer, intersex, and questioning (LGBTQIQ) spectrum remain clear through current newspaper accounts and headlines devoted to not-so-prominent athletes who reveal their gender identity or sexual orientation, and in the intensity of the battle for marriage equality. Moreover, there is no doubt that great LGBTQIQ scientists such as Alan Turing[10] suffered dramatically because of the prejudice they faced, and that some present-day scientists remain hesitant to fully reveal their gender identity or sexual orientation. The aging of America, as well as the return of wounded American soldiers from military action, has shone a spotlight on acquired disabilities and the obstacles generally faced by individuals with disabilities in the workforce. While these examples point to the difficulty of the resolving existing diversity inequities, they also create an opportunity for academia to help in identifying solutions and leading the rest of the nation forward if we are able to resolve these issues within our own ranks.

The Rationale for Diversity

Universities and their chemistry departments, in particular, are driven by metrics indicating quality with respect to their mission to advance science and train students. Invariably, the metrics involve some kind of interpretation, making them difficult to quantify absolutely. In the business world, it is simpler to quantify success (through profits, for example), though it may be hard to ascertain the impact of any one individual in an absolute sense. Nevertheless, the so-called business case for diversity is a hypothesis that has been put forward.[11] It posits that through greater diversity and inclusion, a business unit can gather a wider range of perspectives and knowledge, thereby resulting in enhanced decisions and actions that cater to a broader customer base in the increasingly global marketplace. Furthermore, when employees feel that they have a more diverse and inclusive workplace, personnel turnover is reduced, and employees tend to be more engaged and productive. While the evidence for the business case is still emerging, there do exist reports supporting the overall hypothesis that the return on investment for companies is higher when the working group is diverse.[11-14] Equally importantly, having a reputation as an accommodating work environment—that is, one that is necessarily receptive to diverse employees—

allows a company to draw from a greater workforce pool, thereby facilitating the hiring of the most talented individuals.

The business case for diversity is also relevant to chemistry departments, to the extent that each is a business unit. Such departments can likewise benefit from greater diversity.[15] The academic workforce consists of talented and successful scientists of every gender identity, race-ethnicity, disability status, and sexual orientation. Those departments that are able to successfully attract and retain diverse talent are therefore at a competitive advantage. In addition, the combination of diverse faculty and more equitable climate in a given chemistry department advances the department's educational mission and presumably enables it to attract more diverse cohorts at all levels. Evidence of the latter may be illustrated in the successes of the Louisiana State University Chemistry Department in attracting and training a comparatively large number of under-represented minority doctorates.[16-17]

Diversity Demographics

Substantial mismatches clearly exist between the demographics of the U.S. population and those of the academic chemistry community at nearly all post-secondary educational and faculty levels. This remains true even though the demographic groups on which OXIDE focuses—women, racial and ethnic minorities, individuals with disabilities, and individuals who identify as LGBTQIQ—comprise a significant proportion of our nation's people.[18] The great disparity in gender, racial and ethnic demographics was highlighted early on by Donna Nelson through her diversity surveys.[19-20] She used the NSF ranking of chemistry departments according to chemical expenditures, and this practice has continued, in large measure, because it is indisputable and roughly correlated with other rankings by the NRC.

The representation of women in academic chemistry is illustrated in Figure 2. While women in 2010 comprised 50.8% of the U.S. population[18, 21] and earned nearly the same proportion (49.9%) of chemistry bachelor's degrees,[18] this is one of the only cases where educational or professional attainment by members of diverse groups approaches parity. Female representation drops significantly at the doctoral level, where 37.8% of chemistry Ph.D.s were earned by women in 2011.[18] In the OXIDE chemistry faculty demographics survey for the 2010-11 academic year, we found that women comprised 16%-17% of faculty members in the top 10, top 25, top 50 and top 75 chemistry departments.[22-23] These percentages increased to 17-18% in the 2012-13 academic year, based on data from our more recent survey.[24-25] The slow growth in representation—a pace that has been roughly consistent for at least a decade[25]—is still far from parity, indicating that educational and professional processes for women in academic chemistry are still not equitable.

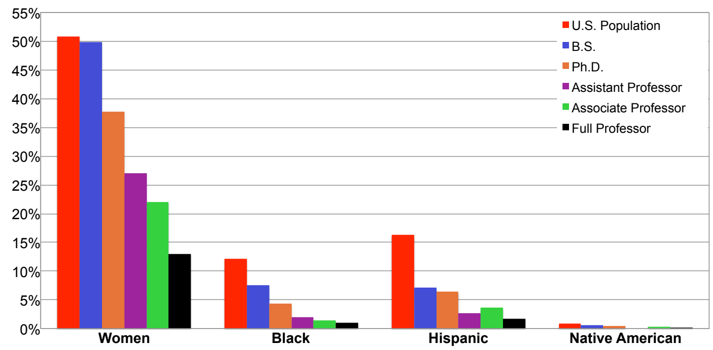

Figure 2: An amalgam of the comparative demographics in the U.S. population (red bars),[18] B.S. chemists (blue bars),[18] Ph.D. chemists (orange bars),[18] Assistant Professors in chemistry (purple bars),[20, 22-23] Associate Professors in chemistry (green bars),[20, 22-23] and Full Professors in chemistry (black bars)[20, 22-23] with respect to women, blacks, Hispanics and Native Americans.

The prevalence of under-represented racial and ethnic minorities—that is, African-Americans, Hispanics or Latinos/as, and Native Americans—in the U.S. and in academic chemistry is illustrated in Figure 2. The representation with respect to individual and collective groups remains even further from parity than for female scientists. Members of these groups collectively encompassed 29% of the U.S. population in 2010,[18, 21] yet they represented just 15% and 11% of the chemistry bachelor's and doctoral degrees earned by U.S. citizens and permanent residents in 2010 and 2011, respectively.[18] The gap widens even more among tenure-track faculty at top fifty chemistry departments, where under-represented racial and ethnic minorities comprised 5% of assistant and associate professors and 3% of full professors in 2007.[20] Figure 2 illustrates comparable trends for the individual racial and ethnic groups. This mismatch in representation becomes even more critical when we consider that the white, non-Hispanic portion of U.S. population is on the decline: It was 69.1% in 2000,[18, 21] dropped to 63.7% in 2010,[18, 21] and is expected to fall below 50% circa 2043.[26] As the U.S. will become a "majority-minority" nation (i.e., no one race or ethnicity exceeding 50% of the population) by mid-century,[26] it is increasingly urgent that we draw equitably from this ever-growing section of the talent pool. Indeed, the dramatic drop in participation by under-represented racial and ethnic minorities between the doctoral degree and assistant professor ranks suggests that there is a substantial difficulty in bridging the gap through postdoctoral positions; this was strongly highlighted in the report from the Workshop on Achieving Racial and Ethnic Equity in Chemistry.[2]

Specific and accurate demographic data regarding disability status is unfortunately difficult to come by because of numerous reasons that include under-reporting due to stigma and disparate and/or evolving definitions and data collection methods.[3] Available data regarding the demographics of individuals who report having one or more disabilities include:

- approximately 10% of the civilian, non-institutionalized U.S. population aged 18-64 in 2012;[18]
- 11% of undergraduates in science, technology, engineering, and math (STEM) fields circa 2009;[3]
- 3.4% of chemists earning doctoral degrees in 2011;[18] and
- approximately 8% of STEM Ph.D.s employed as professors in universities and 4-year colleges in 2010.[18]

Paradoxically, the prevalence of disabilities increases at the faculty level; this has been attributed to the fact that disabilities often manifest themselves or are diagnosed as people age.[3]

Current estimates suggest that 3-4% of the U.S. population self-identifies as lesbian, gay, bisexual, or transgender.[18, 27] Unfortunately, chemistry- or even STEM-specific data with respect to sexual orientation and gender identity seem to be largely unavailable at all educational and professional levels.

Academic Jobs Are Rare Events

An objective of the OXIDE program is the alignment of the demographics of academic chemistry faculties so as to be in proportion with national demographics. One obstacle, however, is that the number of tenure-track/tenured faculty positions is relatively small. For example, in the top fifty chemistry departments, there are approximately 1,600 tenure-track professors.[22-25] As such, doubling the percentage in a category with 1% representation would require the addition of only 16 faculty members, which is on the order of a typical year-to-year fluctuation in the total number of faculty. However, the data summarized above indicate that the participation gaps for under-represented groups at nearly all post-secondary educational and faculty levels are currently substantially larger than can be accounted for by these small fluctuations. Consequently, there is a significant need to address the disparity.

The small and finite number of faculty positions presents an additional hurdle. In 2003, there were 6,268 B.S. chemistry degrees awarded, 1,029 Ph.D. chemistry degrees awarded, and roughly 50 new tenure-track positions advertised by the top fifty chemistry departments.[2] These are clearly diminishing odds for success along the career path towards a faculty position at one of the leading research-intensive chemistry departments. The good news is that there are a large number of rewarding career paths available to chemistry Ph.D. holders. However, the relative rarity of professorial positions in the leading research-active chemistry departments translates into an additional barrier for any young chemist considering this option as a career track. Anecdotal evidence suggests that this barrier is more severe for members of under-represented groups because they are also being highly recruited by other sectors.[2, 15]

Meritocracy and Bias

There is no question that academic departments and their faculty should be driven by rigorous standards of quality and excellence. Publications, citations, grants, patents, awards and other quantifiable metrics can be used to frame the quality of past accomplishments and form the basis for predicting future success. However, even these metrics require interpretation and therein lies the possibility for bias or implicit bias to cloud meritocratic decisions. Social scientists and lawyers have been aware of the role of implicit (or unconscious) bias for some time.[1-2, 28-29] Much of our social behavior is driven by learned stereotypes that operate automatically—and therefore unconsciously—when we interact with other people. Some of these implicit biases are actually useful in the sense that they represent our past experiences with aggregated empirical metrics and their correlations to future success. The problem occurs when those implicit biases are not connected to objective standards of success. Such implicit biases may in turn lead to decisions about hiring and promotion that are inequitable with respect to diversity.[30-39] Implicit bias tests[40] (from Project Implicit, for example) provide a way for individuals to assess the degree to which they hold implicit biases associated with given stereotypes and to form a basis for studying the presence of implicit biases within various cohorts.

Scientists often pride themselves on their ability to think logically and analytically, as they have used such tools successfully in advancing their science. Consequently, they often believe themselves immune to the effects of implicit bias. The implicit bias tests cited above provide a useful tool for most scientists to learn to appreciate the error in this hypothesis. Implicit bias has been shown to play a role in many situations—such as in letters of recommendation,[30] evaluation of curricula vitae and resumes,[31-35] evaluation of teaching credibility,[36] funding of research grant applications,[37-38] and leadership[39]—that contribute to the diversity inequities that have historically led to underrepresentation of individuals from certain groups within chemistry faculties. As scientists in an academic setting, we thus need to be particularly vigilant about the impacts of implicit bias and work towards mitigating them within all of our interactions with students and colleagues of any background.

Other Barriers to Diversity Equity

Beyond implicit bias, many other factors can also serve as inequitable barriers to the success of each member of a diverse work group. Handelsman and coworkers,[41] for example, wrote an influential article listing the significant negative impact of bias and campus climate on the careers of female faculty.

Unfortunately, individuals from diverse backgrounds face these and many more barriers due to myriad factors that have been identified in the social science literature:

- schemas and stereotype threat
- accumulation of bias
- lack of universal design
- insufficient mentoring
- nsufficient/unequal "family-friendly" policies
- overburdening the under-represented
- unwelcoming/non-accommodating climate
- unwelcoming/non-accommodating professional cultures
- qualitative vs. quantitative assessment
- solo status
- minimizing differences/colorblindness
- depoliticization and meritocratic ideology

Unfortunately, our space here does not allow us to discuss these topics in depth. Interested readers are encouraged to use these as search terms in their further study.

The role that some of these issues play in creating unaccommodating environments for individuals from diverse backgrounds are often not intentional, but they are nevertheless harmful. Any one of these barriers would likely be insignificant on its own, but their accumulation tends to deter diverse participation.[29]

One such example lies in the possible marketing strategy by a department to feature pictures of prominent individuals from the past—whether they be chemists from their department or more broadly—on a website or on the walls of their building. Such advertising is well-intentioned, as it seeks to show the accomplishments of chemists and the possibilities that a chemistry career would afford a young person. However, at the present moment, the bulk of past scientists are white, male, seemingly heterosexual and apparently able-bodied. As such, this strategy also promotes the unintended message that chemistry is not a career choice for individuals from diverse groups.

Alternatively, a department may choose to publicly position itself as following "colorblind" practices, meaning that it explicitly and consciously claims not to see race and ethnicity when making meritocratic decisions. However, these policies can generate ironic effects for individuals who may feel that their sense of identity is being stripped away and that the diversity they add to the organization is not being valued. Thus, "colorblind" policies have been seen to be counterproductive in the sense of repelling diverse participation.[42-43]

Yet another possibly ironic action undertaken by departments attempting to improve the diversity climate is requiring participation in diversity training, perhaps in tandem with the annual lab safety training that is common practice in chemistry. Unfortunately, the success of diversity training as typically implemented in the business sector has been seen to range from ineffective to even counterproductive with respect to increasing diverse participation.[44] This result is perhaps not surprising to chemists because safety training, when done poorly, also has a tendency to have little impact on changing the safety culture in departments. Consequently, it is not enough to simply institute an external diversity training program. Instead, departments must embrace an internal program that is effective and inclusive of all their members.

In summary, the barriers to diversity equity are unfortunately large in number. While these barriers can originate from issues existing prior to their identification, they can also arise as unintended consequences of some attempts to redress inequities.

Removing Barriers

In order to remove the barriers to equitable participation, it is important to first identify them. This therefore drives a need to discuss issues such as implicit bias and the damaging effects it can have in unfairly assessing individuals from different backgrounds. It is also useful to raise awareness of and address the many possible barriers encountered by individuals from particular under-represented groups, as discussed above. For example, the Workshop on Gender Equity[1] identified the lack of campus daycare facilities—and family-friendly practices in general—as a significant barrier to the success of tenure-track female chemists. While this issue was particularly relevant in the area of gender equity, the solutions enacted—for example, the introduction of day care services on many campuses or individualized arrangements subsidized by instituttional funds—have helped to create a more accommodating environment for all faculty. Another example lies in the tenure decision, which is a barrier that all tenure-track faculty face. Historically, the standards for success have been given in relative and opaque terms. The problem is that the lack of clear dialogue and transparency in discussing these standards does not promote inclusive excellence.[1-2] (It is notable that this observation appears to be true whether we are speaking about the metrics to assess promotions along the tenure track or the quality of a department as a whole.) As a consequence, many chemistry departments and universities are now providing clear outlines for the tenure and promotion process and statements about the standards that will be used in making such decisions.

One possible approach toward identifying and correcting remaining diversity inequities would hinge on the passive offer to remove barriers as they are identified by individuals within a department. Such an approach would perhaps be well-intentioned and motivated by the argument that there is no way to know what particular individuals will need. However, it is unlikely that individuals near the bottom of the academic ladder —such as graduate students or assistant professors—would risk their tenuous positions by making such requests. Instead, department administrators and thought leaders need to take a proactive approach, learning about and changing policies and practices that have already been identified as creating diversity inequities. While this top-down approach can lead to much better departmental climates, it requires active engagement by chemistry department chairs or heads.

The Open Chemistry Collaborative in Diversity Equity

OXIDE was formed precisely to change the academic chemistry infrastructure from the top down so as to flatten diversity inequities in academic chemistry departments. We partner with department chairs, placing both the responsibility and the credit for solving the problem on them, rather than on single change agents in the rank and file. Our top-down approach complements existing and successful bottom-up programs such as those by SACNAS,[45] AISES,[46] NOBCChE,[47] NOGLSTP,[48] COACh,[49] and others. We are helping to create an accommodating and inviting climate in leading research-intensive chemistry departments such that individuals from diverse backgrounds mentored and trained through the bottom-up approach will choose to remain as tenure-track faculty in leading departments.

The key elements of the OXIDE strategy are summarized as follows:

1. Change academic chemistry infrastructure from the top down.
2. Be excellence-driven; diversity is key to the post-modern meritocracy.
3. Partner with chairs of research-intensive chemistry departments.
4. Assign responsibility and give credit to the partners.
5. Focus on reducing inequitable policies and practices that have historically led to disproportionate representation.
6. Collaborate with social scientists, who have a broader knowledge of diversity and inclusion.
7. Focus on diversity writ large (e.g., gender and gender identity, race-ethnicity, disabilities, and sexual orientation).
8. Disseminate information about inclusive excellence and diversity broadly.

These elements are infused in OXIDE's two most visible activities: the annual faculty demographics surveys and the biennial NDEWs. In order to maintain dialogue with chemistry faculties and their chairs between NDEWs, OXIDE relays news by email, updates material and information on our website (http://www.oxide.gatech.edu), delivers presentations in departments and at (inter)national meetings, and engages in conversation with chairs and their representatives though virtual and physical meetings.

OXIDE conducts faculty demographics surveys to collect data on the year-to-year demographics of tenure-track/tenured faculty at leading research-intensive chemistry departments, which are defined according to the NSF rankings of chemical research expenditures mentioned earlier in this chapter. Department chairs or their designees report the aggregate demographics, by rank, of the faculty who meet the above criteria and who are primarily (i.e., greater than 50%) appointed in the department. These criteria have been chosen for consistency with earlier data sets.[20] Gender data for the academic years 2009-10,[22-23] 2010-11,[22-23] 2011-12[24-25] and 2012-13[24-25] have been gathered and reported in *Chemical & Engineering News* and on the OXIDE website. (We use the term 'gender' rather than 'gender identity' here because we received no data about individuals who define their gender in ways besides the male-female binary, although we afforded chairs an opportunity to provide such data in the 2011-13 survey.) Race-ethnicity data were also collected for academic years 2011-12 and 2012-13, and we plan to disseminate this data in 2014. This longitudinal repository of demographic data, which we plan to continue building annually, allows the chemistry community's progress to be measured as we (hopefully) shrink the gap in representation between chemistry faculty and the general public. In the future, we plan to carefully explore possible methods for gathering data about faculty sexual orientation and disability status while keeping in mind the particular sensitivities and privacy concerns associated with data collection related to these demographic categories.

The most recent NDEW was held April 15-16, 2013 in Arlington, VA. More than 70 participants—including chairs and designated representatives from over 35 chemistry departments, social scientists, and representatives from federal agencies, foundations, and diversity communities—listened attentively to lectures from social scientists and others, engaged in breakout sessions, and collaborated on possible solutions to address diversity inequities. For the first time, an entire session was devoted to discussion of the diversity inequities faced by LGBTQIQ chemists and the actions that can be taken by departments to create a more inclusive climate in this respect. A session on organizational structure, behavior and dynamics discussed research-based strategies for mitigating implicit bias, stereotype threat and colorblindness. Effective practices were provided in a session on recruitment, hiring, retention, and promotion. The context of professional cultures and how they can reinforce inequalities played a critical role in a session on creating an inclusive climate. In addition to the primary sessions, NDEW2013 engaged participants in a series of breakout groups. Each group was assigned a different topic, article or website to motivate its proposal for new practices and policies that could be implemented to address an existing shortfall in diversity equity. Post-workshop assessment data indicate that numerous departments have begun to implement programs and practices to reduce diversity inequities as a result of their participation.

One outcome of NDEW2013 was the construction of a set of recommendations intended for immediate implementation by the chairs:

1. Conduct a faculty meeting on diversity excellence:
    a. Walk your faculty through the generic department presentation given at NDEW2013 (or a version customized to your department).
    b. Make sure that you do not advertise the event as diversity training.
    c. Emphasize strategies that mitigate stereotype threat.
2. Create mentoring programs (vertical and horizontal).
3. Create a department diversity committee.
    a. It should be broadly reflective of your faculty's perspectives (for example, include straight, able-bodied white male faculty in addition to faculty from under-represented groups).
    b. Don't overburden faculty from under-represented groups.
    c. Establish deliverables to measure the committee's success.
4. Conduct faculty searches in broad areas.
5. Respond to current and future OXIDE surveys (for example, on workshop evaluation, demographics, and climate).
6. Implement a policy/program targeted to address climate and/or demographics. If possible, partner with OXIDE to assess it.

These are a minimal set of actions that departments can make to begin changing the climate towards inclusive excellence. We are happy to report that several of the participating departments have adopted all (or nearly all) of these suggestions (though precise statistics are pending, as analysis of the NDEW follow-up data is in progress).

Many of these suggestions should require little explanation to the reader, based on what has already been discussed in this chapter. However, the fourth suggestion[50] may seem surprising. It is based on the fact that the numbers of individuals in faculty applicant pools are integers and that the numbers of under-represented individuals in such pools tend to be particularly small integers. Consequently, if the area of expertise for a particular faculty search is defined too narrowly, there is an increased possibility that the number of qualified applicants from under-represented groups will be very small and perhaps equal to zero. Meanwhile, an outstanding candidate in a different research field who would be overlooked by this narrow search strategy might not remain in the job pool for a subsequent year's search and may even leave academia entirely. Departments should therefore not limit themselves to conducting annual searches based solely on area of research expertise. Instead, they should focus on the best candidates available in any given year and think more broadly in terms of how these candidates fit the needs of the department's overall research portfolio across several search years. In so doing, departments are more likely to enhance both their diversity and quality.

Readers interested in more details about OXIDE and our activities can refer to our website, http://oxide.gatech.edu.

Conclusions

In summary, by working with the chairs of leading research-intensive chemistry departments, OXIDE aims to reduce inequitable policies and practices that have historically led to disproportionate representation on academic faculties with respect to gender and gender identity, race-ethnicity, disabilities, and sexual orientation. OXIDE and its partners are driven by the notion that the meritocratic underpinning of research-intensive chemistry departments will be stronger if conjoined with the notion of inclusive excellence. Indeed, all the elements that make a chemistry department more diverse are critical to advancing its mission and increasing its academic prestige. The chairs and thought leaders within chemistry departments play a critical role in creating the climate from the top down. As such, OXIDE's role is that of a connector between department leaders, diversity communities and the social sciences so as to identify and remove barriers to diversity equity.

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