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## **Understanding the experiences of lesbian, gay, and bisexual engineering faculty and actively engaging them in the ASEE Deans Diversity Initiative**

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# Understanding the Experiences of Lesbian, Gay, and Bisexual Engineering Faculty and Actively Engaging Them in the ASEE Deans Diversity Initiative

## Abstract

Increasing diversity among faculty, students, and working professionals within engineering has been a longstanding goal of engineering professional societies, universities, and government organizations. However, progress has been slow and uneven across groups with diverse identities and across disciplinary specialty areas within engineering. In response, more than 175 engineering deans have now signed the American Society of Engineering Education (ASEE) Engineering Deans Council (EDC) Diversity Initiative Letter to support efforts to increase the participation of women and underrepresented minorities (URMs) in engineering education. In that letter, the signatories pledged to provide “educational experiences that are inclusive and prevent marginalization of any groups of people *because of visible or invisible differences*” [1, Para. 3, emphasis mine]. Beyond race/ethnicity and externally perceived gender, visible and invisible differences encompass dissimilarities of physical and mental abilities, religious and political beliefs, as well as sexual and gender identity. However, those topics have been frequently overlooked in the context of engineering. The lack of data regarding engineers who identify across these spectrums has limited the full picture of existing diversity in engineering.

This paper is intended to continue to fill the gap surrounding diversity of sexuality by discussing lessons learned from the author’s recent dissertation work focused on the experiences of tenure track engineering faculty who identify as sexual minorities. Those lessons include overlap discovered between the experiences of faculty who identify as women and faculty of all genders who identify as sexual minorities. The intended outcome of this paper is to encourage thoughtful discussions with deans and other diversity allies regarding how to expand the EDC Diversity Initiative beyond its gendered and racial/ethnic lenses to incorporate additional identities held by engineering faculty members, students, and staff. The paper concludes with implementable suggestions for how to fully engage the lesbian, gay, bisexual, queer, and others (LGBQ+) population in the ASEE Dean’s Diversity Initiative.

## Introduction

In 2011, the ASEE Diversity Committee was formed and charged with developing a strategic plan “to position the Society to increase diversity in the profession” [2, Sec. Strategic Plan]. In October 2011, National Academy of Engineering member Dr. Lynn Conway appeared on the Prism magazine’s cover to accompany an article titled, “Secrets are out: Lesbian, gay, bisexual, and transgender engineers are no longer willing to hide their true selves” [3]. Dr. Conway was a former IBM engineer who made significant contributions to the company’s products in the mid-1960s as a male engineer. However, upon physically transitioning to female, Dr. Conway was fired from her job and basically erased from the company’s and the nation’s history books. Decades later, after concealing her previous identity for decades and completing a successful career as a computer programmer, researcher, and educator, she finally shared her long-hidden secret [3]. Two years after that cover article was published, the editors of ASEE’s Prism Magazine chose to publish an email from a society member and reader titled, “Is All Diversity

Good?” [4]. The letter presented the author’s position that, the “dear people...caught up in the homosexual/lesbian/bisexual/transgender lifestyle...need true help and true hope and not encouragement or approval of a detrimental, negative lifestyle” [4, Para. 2]. The letter also included discredited statements [5] regarding negative outcomes of “the behavior” [4, Para. 2].

A swift reaction to the letter itself and the magazine editorial board’s decision to publish the letter began a discussion about what more the ASEE should be doing to reiterate its official position that diversity was a positive and necessary attribute for the engineering profession. The Engineering Dean’s Council (EDC) Diversity Committee members responded to what they described as a “teachable moment” [6] by declaring 2014-2015 as the Year of Action in Diversity. One of the tangible actions taken was to draft a letter in which deans pledged to provide “educational experiences that are inclusive and prevent marginalization of any groups of people because of visible or invisible differences” [1, Para. 3]. The EDC’s letter listed eight professional organizations that would be engaged to provide assistance with identifying and implementing diversity measures. However, the two professional organizations that support sexual and gender minorities in science, technology, engineering, and mathematics (STEM), Out in STEM (oSTEM), and the National Organization of Gay and Lesbian Scientists and Technical Professionals Inc. (NOGLSTP), were missing from that list [1]. That same year, Farrell, Minerick, Cech, Chavela Guerra, and Waidzunus [7], on behalf of the ASEE, received a National Science Foundation grant that funded the development of a virtual community of practice (VCP) for LGBTQ+ equality within the society.

Flash forward to 2017 and more than 175 engineering deans have now signed the EDC Diversity Initiative Letter [1]. The diversity initiative website [8] was up and running, but the University of California Davis’s (UC Davis) newly posted diversity plan was the only one on that site to explicitly mention sexual orientation and gender identity. Even then, those criteria were in the “inclusion” section of the document — not the diversity section, which remained limited to women and underrepresented minorities (URMs) as defined to include African American, Native American/Pacific Islander, and Latinos [8, Sec. UC Davis]. The difference was that the diversity section “relate(d) to recruitment, retention, and graduation from the College of Engineering” whereas the inclusion section involved “creating a welcoming environment and sense of belonging for all students regardless of race, ethnicity, gender, age, religion, language, abilities/disabilities, sexual orientation, gender identity, socioeconomic status, geographic region as prescribed by University of California policy” [8, Sec. UC Davis]. Diversity involves increasing the representation of those who are otherwise missing and focuses on bringing people with different traits into an organization; inclusion is about ensuring that those who differ from the majority population are encouraged to fully participate once they are brought into the organization and are treated with respect and valued for their differences. Both diversity and inclusion are vital to the long-term success of the engineering profession. While it is laudable that policy mentions populations beyond women and URMs, the policy differences as described in the new UC Davis plan indicate that there will be active recruitment and retention efforts for only a small subset of the diverse population that they intend to serve. This leads to a question of how limited budgets will be spread between “diversity” and “inclusion” efforts. At the same time, the political environment within the USA has taken a sharp turn against recent gains made by the LGBTQ+ community. In the opinion of this author, it is time to discuss ways to engage a larger pool of allies within the ASEE, engineering academia, and the profession to ensure that

hard earned recent gains are not lost. The author's dissertation was intended as a next step to identify the current state of the environment for engineering faculty who identify as sexual minorities and to provide suggestions for how to make that environment more inclusive.

### Overview of the research project

While applying to participate as a community leader in the ASEE VCP for LGBTQ+ Equality, the author learned of the emerging research regarding the current state of the engineering environment towards LGBTQ+ individuals within engineering academia and industry and decided to focus her dissertation on the topic. The author sought out the experiences of tenure-track engineering faculty who self-identified as sexual minorities and analyzed findings through the lens of Goffman's [9] stigma theory. Goffman's [9] theory proposed that individuals with potentially stigmatizing identities, such as non-normative sexual identities, would use passing, covering, and compartmentalizing techniques to hide or downplay that aspect of their multifaceted identity. Passing involved attempts to hide one's identity and instead, identify with the non-stigmatized majority identity—in this case, heterosexual. Covering involved downplaying one's *known* minority or stigmatized identity in an attempt to make that identity less conspicuous. Compartmentalization was the separation of various identities or aspects of one's life—for instance, by not discussing one's personal life at work. The intent of the study was to learn how engineering faculty manage their social images and relationships with peers and students in an environment that strongly enforces a technical/social dualism where the technical is strongly favored and social identities and topics are downplayed or considered not relevant to “real” engineering [10-12].

### *Research question*

The author's dissertation [13] sought to answer the primary research question, “How do full-time, tenure-track engineering faculty members who self-identify as sexual minorities experience working in Doctoral Universities as defined in the 2015 Carnegie Classification?” This question was supplemented by investigating how these faculty members described their multifaceted identities including and beyond their sexual orientation and how they perceived that those identities influenced their relationships with their professional colleagues and students.

### *Methods*

The study included a sequential exploratory mixed methods approach that involved collection of initial data via an anonymous survey followed by in depth interviews of respondents who were willing to participate confidentially rather than anonymously. All names included in the study were self-selected pseudonyms. This particular mixed methods approach allowed for information collected during the quantitative phase of the study to shape the questions and direction of the subsequent qualitative phase and was appropriate because the researcher had few *a priori* expectations of what the quantitative findings would show. The survey was distributed via respondent-driven sampling/snowball sampling where the author used her contacts gained through the ASEE VCP to supplement her personal network to spread the survey announcement and encourage participation. In addition, she emailed 158 of the ASEE Deans Initiative Letter signatories who were identified as being affiliated with institutions that met the doctoral

institution inclusion criteria. In her email, she requested that the signatories forward the information to *all* faculty members due to the typically hidden nature of eligibility for participation in the study [14]. Although a few deans and deans' representatives indicated their willingness to share the information with *selected* faculty who they thought might be interested, no additional participants were gleaned from this recruitment method. One organizational representative requested that the researcher obtain full institutional review board approval from the target institution prior to allowing the request for participation to be shared with their engineering faculty. While this may be standard practice for that institution, it set a high barrier given that the likely best-case result would have been only one or two additional participants. Additional details regarding the methodology for this study are beyond the scope of this paper but are detailed in a separate paper presented at the ASEE Zone IV conference in March 2018 [15]. The key takeaway from this paper is that the ASEE deans who signed the pledge should have been a strong base of support for broad dissemination of the study's survey request, but were not. It is likely that there were a variety of reasons for this lack of uptake for the survey request and that is one of the topics of discussion in this paper.

## Findings

Data collected included 11 survey responses and 6 follow-up interviews. Three men and three women, one of whom identified herself as genderqueer, participated in 60- to 90-minute individual interviews with the researcher via Skype or ZOOM video conference software. Faculty participants ranged in age from their thirties to sixties, and worked in varied regions of the mainland United States. All but one of the survey participants identified themselves as white, and that participant chose not to complete an interview so the potential for this study to investigate the intersectionality of ethnicity, gender, and sexuality was limited. Findings were mixed regarding whether participants felt the need to hide aspects of their identities, including their sexual identity, from their colleagues and/or students. One participant noted that, "everything except whiteness and upper middle class gets left behind. Femaleness, sexuality, religion, [and] politics are all unwelcome in my place of work." Goffman's [9] concept of compartmentalization was the status quo within engineering so much so that all social identities other than that of engineering and technical specialists appeared to be ignored. University and community demographics and interactions between members of the University and surrounding community influenced the experiences of faculty participants, as did actions of the respondents' peers.

### *University and community*

Responses to a faculty member's status as a sexual minority differed by geographic location, but in more complex ways than one might expect. For example, Phyllis noted that her university sat inside a "bubble" that separated the institution from the rural, conservative, and "deeply racist" environment surrounding it. The college town included "a tight community with a strong sense of protecting our own and welcoming all people to our university setting" and the "LGBTQ faculty-staff organization has for decades served as a resource to the wider LGBTQ community in the region because there are so few resources in the surrounding area." In contrast, Alex described the community surrounding his institution as being, "like Pleasantville" and "liberal-minded and open to alternative values and lifestyles," almost to a fault. He and his partner were

held to the same expectations as other couples, which made it “easier to navigate a same sex partnership” within the community, but “depressed the LGBT culture” to the point that the town no longer had any LGB-centric bars where they could go to “be among our gays. It’s like we need to go [somewhere else to] just be there among them.” In the first case, a subset of the university community recognized the lack of external support for the LGBTQ community outside the institution and extended their efforts to be inclusive based on sexual identity, rather than university affiliation. In the second case, because the larger community appeared to be so accepting of sexual minorities, the community actually lacked dedicated spaces where individuals who shared a sexual minority identity, but not a university affiliation, could gather to socialize. The end result was that faculty members in both locations had limited opportunities to socialize among others who shared the sexual minority facet of their identity, which left participants feeling less than fully integrated into their university and surrounding community. Whereas the alienation felt by Phyllis and Alex may have been unintentional, other participants faced separation from their peers through active exclusion.

### *Exclusionary behavior*

Within their work environments, several respondents noted instances of exclusionary behavior whereby faculty who identified as lesbian, gay, and bisexual were held to different expectations than faculty who identified as heterosexual. Recurring examples of this duality included discussions of the person’s partner as part of the faculty member’s everyday life and recognition of major life events such as marriage. For instance, David indicated that he was subjected to decades of overt counseling by his faculty mentors that he should hide his sexual minority status and that if people discovered that he was gay, it was his fault for not adequately covering. He noted that although they “wouldn’t say it very explicitly,” he understood that he was being told, “You need to cover. You need to make sure that you don’t make anybody else uncomfortable with your being gay. And if they do feel uncomfortable, it’s your fault because you didn’t cover well enough. . . . So that was always kind of on [his] mind” when it came to building good working relationships with his peers. Even though he and some of his peers have now worked together for several decades, they still talk almost exclusively about science and engineering. When describing his peers, David noted, “They seem very uninterested in hearing anything about my personal life so they never ask questions.” He went on to say that, “in the past [that] has always been fine with [him] because [he] wasn’t that comfortable talking with them. But...with each other, [there is] lots of socialization [and] knowing about each other’s families and that kind of stuff.” This has left David feeling as an outcast among his peers. Although he and his spouse have been together for nine years, his spouse has never accompanied him to a work-related event, even when others’ spouses have been invited and present. David noted that he has finally reached a point in his career and his personal life that he is no longer willing to cover his relationship. Therefore, he and his spouse plan to attend the next departmental event together, but do not expect a positive reaction from his colleagues to their appearance.

Jane faced years of blatant sexual harassment starting from the time she was a graduate student, even when she told her harassers that she was lesbian. Then, she spent the first 15 years of her career as one of the only women engineering faculty members in her entire college, at two separate institutions. So, she was pleased to finally connect with a group of other women colleagues at her current institution. Yet, because she still hid her sexual identity from most

people at work, and was single at the time, she frequently felt excluded from the topics of discussion with the other faculty that tended to focus on husbands and children. In one session, several of her colleagues mentioned their strong support for the state's proposed gay marriage ban. Jane "was just stunned. [She went] back to [her] office and cried!" During our interview, Jane choked up before saying, "this [was] just personally hurtful!" After she got married, and in conjunction with the fact that one of her colleagues was trying to use her sexuality to discredit her research, Jane made a conscious decision to come out to the women faculty group. She described her experience at the women's faculty meeting to discuss work-life balance and the burden of domestic chores. She was excited to finally be able to participate fully and honestly in a discussion. Her colleagues spent the first 20 minutes of the meeting congratulating a faculty member who had just returned from maternity leave. Once the conversation returned to the topic at hand, each attendee was in turn describing how she managed household chores, typically by describing what maid service she hired. When it came to be her turn, Jane shared with her colleagues that she had recently cut the time she spent on house chores almost exactly in half. Her colleagues seemed intrigued, and asked, "How did you do that?" Her response was that she "got married to a woman!" As a nearly 60-year-old woman who was married for the first time, she was an ecstatic newlywed. In response to her announcement, instead of congratulating her like they had her colleague who just had a baby with her husband, the group immediately fell into a stunned silence and then continued the discussion as if Jane had not just announced a major life event. Jane said that she did not "know if the giant elephant in the room was a pink elephant because their husbands were not helping [with housework] and there's inequity there," or if was a "lavender elephant" because the group just realized that one of their colleagues was lesbian. In either case, the experience left Jane frustrated and angry that her colleagues were so willing to congratulate the new mother in the group, but not the newlywed, ostensibly due to the gender of her spouse.

David and Jane's stories highlighted their colleague's discomfort with their same-gender partners, and their struggles with passing or covering their sexual identities. Phyllis' experience differed because she was bisexual. She explained, "As a bi person, there are weird politics" and "It's so arbitrary because, to me, my partner's gender is kind of just a random happenstance of life." After starting her career at an institution with a female partner, Phyllis' later relationship was with a male. One colleague asked her to explain if her identity had changed. Now that she was dating a man, "Did she still consider herself queer?" Whereas she and her former partner had fit in with other lesbian couples in her department, she and her new male partner seemed to be purposefully excluded from social events. She felt that once she started dating a man, "my relationship was just invisible to [her colleagues]." Of all the participants in the study, Phyllis would have had the easiest time passing as heterosexual, because she had a male partner. However, she went out of her way to correct people who made assumptions that she was lesbian when she was with a female partner, or heterosexual when she was with a male partner. On several occasions she noted that when she corrected people's assumptions, many would ask her, "Why are you making an issue out of this?" Her response was that, otherwise, "you are erased either way." Phyllis also described several instances where she actually lost domestic partner benefits that she was previously eligible for because her partner was male and they remained unmarried. The irony, she noted, was that she could not marry her female partner but she could request that she be given access to campus resources and be added to Phyllis' university health insurance plan. She could not do the same for her opposite-gender domestic partner because they

were not married. Therefore, a policy that was designed to be inclusive actually made her feel specifically excluded.

### *Intentional inclusion*

On the other end of the spectrum, two of the study participants worked to incorporate their spouses into university events whenever they felt it was appropriate. Evelyn worked at an institution with high-ranking administrators who were openly gay or lesbian, although none of those administrators was in the College of Engineering. Even though she posted family photos in her office and included her wife and daughter in college and research group events, she noted that, in general, her relationship was not a topic of discussion with her colleagues because she typically did not discuss non-work-related topics at work. Even when commiserating with other faculty members, the discussions typically focused on the lack of time each of them had to meet the standard expectations of a faculty position. So, even though she worked to integrate her identities as a wife and mother into her professional environment, her colleagues did not engage with her in discussing those roles. As far as her colleagues were concerned, she was simply another engineering faculty member who specialized in a particular, technical topic and was willing to take on more administrative roles than other colleagues. Even though she did not intentionally compartmentalize her personal and professional identities, the overarching engineering culture of compartmentalization at her institution prevailed. Compartmentalization was a well-documented aspect of the engineering culture, and based on the literature reviewed, was not limited to those who identified as sexual minorities [16].

Nick also intentionally tried to integrate aspects of his personal and professional identities by outing himself during his on-campus interview to ensure that his status as a partnered, gay male was known to his potential colleagues. He did this by asking if the university had resources to help his husband find a job. A few months later, when Nick's husband was unable to attend the college's holiday party due to a work conflict, one of the members of Nick's interview committee seemed overly concerned. The colleague questioned him repeatedly, "Did you not feel comfortable bringing your husband? Why isn't he here? Are you uncomfortable?" It was unclear to Nick if all other married couples were similarly questioned whenever a spouse was unable to attend an event. He felt that his colleague was so busy trying to ensure that he and his husband were included, that she went overboard and assumed that an innocent time conflict was indicative of something more. Like Evelyn, Nick included photographs of his spouse in his office and shared evidence of the various aspects of his identity beyond that of being an academic. Nick prominently displayed photos of his professional accomplishments alongside photos of his family and hobbies such as hiking and drinking craft beer, providing each equal space on the windowsill in his office. An interesting perception that I had was that these photographs were ambiguous. Someone who did not realize that the individual in two of the three photographs was Nick's husband would simply see two close friends sharing various adventures. This was an instance where Nick as a white male had the privilege of turning aspects of his diversity on and off. Depending on the level of separation he wanted to maintain, he could choose whether or not to explain whom he was with. From the posted pictures, few people would immediately notice or consider the fact that the two men were in a romantic relationship. Yet, if one of the subjects in the photos was female, everyone would assume that it was Nick's significant other. This demonstrated an example of heterosexism in our everyday academic environment.



## Implications

Throughout the literature review and data collection for this study, it was obvious that compartmentalization—or an enforced technical/social dualism that separated what was considered appropriate in an engineering environment—was the standard [10-12]. Although the phenomenon was not limited to those who identified as sexual minorities, it appeared to be doubly enforced on them. In other words, examples described by some of the participants demonstrated the added layer of expectation laid on them to manage their image.

### *Encouraging faculty members to present as integrated people*

Breaking the enforced silence regarding who engineering faculty members are as human beings and, instead, acknowledging and celebrating how those identities could bring diverse perspectives to bear on the teaching and learning of engineering concepts should be a goal of every engineering dean and department chair. If it were the norm to share information about one's family and hobbies, alongside one's technical interests, individuals who were in some way underrepresented might feel less pressured to hide or downplay their differences. In the case of sexual minorities, individuals might feel less pressured to pass as heterosexuals or expend cognitive energy covering their sexual identity. Research findings based on diversity of gender [17], ethnicity [18], and political affiliation [19] demonstrate that “socially diverse groups (that is, those with a diversity of race, ethnicity, gender and sexual orientation) are more innovative than homogeneous groups” [20, p. 43]. In addition, “Simply interacting with individuals who are different forces group members to prepare better, to anticipate alternative viewpoints and to expect that reaching consensus will take effort” [20, p. 43]. Based on these findings, it is reasonable to extrapolate that diversity of sexual orientation could provide positive benefits to an innovative industry such as engineering; although to date I could not find any published studies on that topic. Hence, in contrast to the prevalent belief that social identities are irrelevant to so-called “real” engineering [10, p. 45], social identity diversity has been proven to increase innovation through creative tension [20] and therefore should be of vital concern to engineering deans and industry leaders. Through more open conversations with their peers and students, all faculty members could work towards the Deans Council's goal of providing a truly inclusive educational experience.

Tenure-track faculty members at doctoral universities represent an important resource for both the institutions of higher education where they work and for students who enroll at those institutions [21-26]. When those resources become constrained because of unnecessary forces, both the institutions and their students suffer from the loss of potential. When faculty members are not forced to expend energy on hiding aspects of their identities, it releases that energy so that they can live up to their full potential. Welcoming all faculty members to personalize their offices to the extent they feel comfortable and engaging students in critical discussions of how their multifaceted identities affect their motivations to engineer/design innovative solutions to the world's most pressing problems could go a long way to dissolve the technical/social dualism that has long been the culture within engineering [10-12]. Obviously, there are limitations to what information should be shared in a work environment. However, this author would propose that the limits enforced in the current engineering culture go beyond what is healthy and

necessary for a discipline that aspires to expand its ranks to include a broader range of individuals than are currently engaged in the profession.

### *The role of deans*

Deans have always been the figureheads responsible for sharing the visions of their colleges, schools, and departments of engineering. They help set the priorities and strategies that lead to expectations of appropriate behavior. In that role, they may have the greatest potential to start a sea change that could help to reduce the marginalization and invisibility of engineering faculty members who identify as sexual minorities that has remained nearly a decade after Riley [27] noted that situation. The large number of deans who have signed the ASEE letter pledging tangible actions indicates willingness to further improve and expand efforts to foster truly inclusive and diverse environments within engineering academia. This is important because the concept of interdependence of discrimination [28] has shown that the environment for underrepresented minorities has impacted the success of *everyone* within that environment. Negative social and environmental conditions within academic environments have limited the potential of both faculty and students, whether or not they share specific identity traits.

Therefore, deans who have signed the ASEE diversity initiative letter should be vocal regarding the importance of diversity beyond the lenses of gender and ethnicity. This should include support for the elimination of discrimination based on sexual identity so that all faculty members can focus their talents and efforts on what truly matters—meeting their professional expectations—just as those who identify with majority populations do, without an additional cognitive load of managing their identity [9, 29]. Based on the first half dozen diversity plans that were posted on the Engineering Deans Diversity website, it is obvious that more needs to be done to encourage institutions to explicitly discuss how sexual minorities and other invisible differences will be addressed in their upcoming initiatives. Otherwise, the products of the ASEE Diversity Initiative are likely to be similar or identical to those policies already in place at institutions within the United States. Without additional, potentially challenging conversations, the diversity discussions will remain limited to gender and ethnicity and the so-called solutions will be limited to continuing the deficit model perspective where women and minorities are missing something that would make them successful in an unchanged engineering environment.

### Conclusion

Diversity and inclusion should be about more than simply allowing in those with visible, assumed identities and counting checkboxes. True inclusion requires an environment where all people who chose to embark on a journey be allowed to follow that path to the best of their ability. Not everyone who wants to be an engineer or an engineering faculty member at a doctoral institution will succeed. However, it would behoove those who have the power to level the so-called playing field to do so to the best of their abilities so that a diverse range of individuals could remain among the ranks that shape generations to come and, quite literally, the built environment in which we all live.

## References

- [1] American Society of Engineering Education Deans Council. "Deans diversity initiative letter," [Online]. Available: <http://www.asee.org/documents/member-resources/edc/EDC-DiversityInitiativeLetterFinal.pdf>. [Accessed Dec. 1, 2017].
- [2] American Society of Engineering Education Diversity Committee, (2016), *ASEE: Action on Diversity* [Online]. Available: <https://diversity.asee.org/strategy>
- [3] J. N. Schock, "Secrets are out: Lesbian, gay, bisexual, and transgender engineers are no longer willing to hide their true selves," *ASEE Prism*, vol. 20, no. 5, pp. 44-47. Available: [http://www.prism-magazine.org/oct11/feature\\_03.cfm](http://www.prism-magazine.org/oct11/feature_03.cfm). [Accessed Dec 1, 2017].
- [4] W. Helmer, "Is All Diversity Good?" (in Email from Readers section), *ASEE Prism*, vol. 23, no. 1, pp. 10, Sep. 2013.
- [5] E. Schlatter and R. Steinback, (2011, February 27), "10 anti-gay myths debunked," *Intelligence Report, 2010 Winter Issue*, [Online]. Available: <https://www.splcenter.org/fighting-hate/intelligence-report/2011/10-anti-gay-myths-debunked>
- [6] L. Martin-Vega & G. Holder, "Move Beyond Outrage," (in Email from Readers section), *ASEE Prism*, Oct. 2013.
- [7] S. Farrell, A. Minerick, E. Cech, R. Chavela Guerra, and T. Waidzunus. "NSF-EAGER: Promoting LGBTQ Equality in Engineering through Virtual Communities of Practice" (NSF Award #1539140) [Online]. National Science Foundation Award Search, [https://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1539140](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1539140). [Accessed: Dec. 1, 2017].
- [8] American Society of Engineering Education Engineering Deans Diversity Initiative website, [Online]. 2017. Diversity Initiatives/Diversity Plans section. <https://deansdiversity.asee.org/diversity-initiatives/diversity-plans/>. [Accessed: Dec. 1, 2017].
- [9] E. Goffman, *Stigma: Notes on the management of spoiled identity*. Englewood Cliffs, NJ, USA: Prentice-Hall, Inc., 1963.
- [10] E. A. Cech, "Culture of disengagement in engineering?," *Sci., Technol., and Human Values*, vol. 39, no. 1, pp. 42-72. 2014.
- [11] W. Faulkner, "Dualisms, hierarchy, and gender in engineering." *Social Stud. Sci.*, vol. 30, no. 5, pp. 759-792. 2000.
- [12] W. Faulkner, "'Nuts and bolts and people': Gender-troubled engineering identities." *Social Stud. Sci.*, vol. 37 no. 3, pp. 331-356. June 2007. Available: <http://journals.sagepub.com/doi/10.1177/0306312706072175> [Accessed: Dec. 1, 2017].
- [13] R. E. Sandekian. "(Dis)integrated identities: Experiences of tenure-track engineering faculty

who identify as sexual minorities,” Ph.D. dissertation. Dept. Leadership, Policy, and Development, Coll. Edu. and Behavioral Sci., Univ. of N. Colo, Greeley, CO, 2017.

[14] D. Bilimoria & A. J. Stewart. “‘Don’t ask, don’t tell’: The academic climate for lesbian, gay, bisexual, and transgender faculty in science and engineering.” *NWSA Journal*, vol. 21, no. 2, pp. 85-103, Summer 2009.

[15] R. E. Sandekian, “Finding the rainbow needles in the engineering haystack: Connecting with a hard-to-reach Population,” presented at the 2018 ASEE Zone IV Conf., Boulder, CO, USA, Mar. 25-27, 2018.

[16] E. A. Cech. “The veiling of queerness: Depoliticization and the experiences of LGBT engineers,” in *Proc. of the 2013 Amer. Soc. Eng. Edu. Annu. Conf. and Expo.*, June 23 - 26, Atlanta, Georgia, USA. [Online]. Available ASEE PEER, <https://peer.asee.org/22628>. [Accessed: Sept. 20, 2017].

[17] C. L. Dezsö & D. G. Ross. “Does female representation in top management improve firm performance? A panel data investigation,” [Robert H. Smith School Research Paper No. RHS 06-14]. Available: <https://ssrn.com/abstract=1088182>. Mar. 9, 2011. [Accessed Dec. 1, 2017]

[18] O. Richard, A. McMillan, K. Chadwick, & S. Dwyer, “Employing an innovation strategy in racially diverse workforces: Effects on firm performance.” *Group & Org. Manage.*, vol. 28, no. 1, pp. 107-126, 2003. Available <https://doi.org/10.1177/1059601102250022>. [Accessed Dec. 1, 2017]

[19] Loyd, D. L., Wang, C. S., Phillips, K. W., & Lount, R. B. Social category diversity promotes premeeting elaboration: The role of relationship focus. *Org. Sci.*, vol. 24, no. 3, pp. 757-772, 2013. Available <https://doi.org/10.1287/orsc.1120.076>. [Accessed Dec. 1, 2017]

[20] K. W. Phillips, “How diversity works.” *Scientific Amer.*, vol. 311, no. 4, pp. 42-47. 2014. Available: <https://www.scientificamerican.com/article/how-diversity-makes-us-smarter/>

[21] A. W. Astin, *What matters in college: Four critical years revisited*. San Francisco, CA, USA: Jossey-Bass, 1993.

[22] E. Benjamin, “How overreliance on contingent appointments diminishes faculty involvement in student learning. *Peer Rev.*, vol. 5, no. 1, pp. 4-10. 2002.

[23] J. J. Duderstadt, “The future of the university: A perspective from the oort cloud.” *Soc. Res.*, vol. 79, no. 3, pp. 580-600. 2012.

[24] R. L. Geiger, R. L. “The ten generations of American higher education.” In P. G. Altbach, P. J. Gumpert, & R. O. Berdahl (Eds.), *American higher education in the twenty-first century: Social, political, and economic challenges* (3 ed., pp. 37- 68). Baltimore, MD, USA: Johns Hopkins Univ. Press. 2011.

[25] G. D. Kuh, *High impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC, USA: AAC&U. 2008.

[26] P. D. Umbach & M. R. Wawrzynski, "Faculty do matter: The role of college faculty in student learning and engagement," *Res. in Higher Edu.*, vol. 46 no. 2, pp. 153-184, 2005.

[27] D. Riley. "LGBT-friendly workplaces in engineering." *Leadership and Manage. Eng.*, vol. 8, no. 1, pp. 19-23, Jan. 19, 2008.

[28] H. W. Hackman. "Teaching LGBTQI issues in higher education: An interdependent framework." *Diversity & Democracy*, vol. 15, no. 1, pp. 2-4, Jan. 2012.

[29] C. M. Steele, *Whistling Vivaldi and other clues to how stereotypes affect us*. New York, NY, USA: W. W. Norton & Company, Inc., 2010.