Diversity Enhancement Efforts Towards Improving Student Attitudes

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Abstract

The Citadel Mechanical Engineering program has been actively involved in providing minority students with academic, social, and personal support while at The Citadel. In 2016, The Citadel celebrated diversity milestones commemorating the 50th anniversary of African American cadets and the 20th anniversary of female cadets in the South Carolina Corps of Cadets. In 2012, a Leadership, Excellence, and Academic Distinction plan was created, outlining the college's strategic plan to enroll a diverse community of leaders as faculty and staff and to expand student diversity. Foundational training and education related to the ethical treatment of cultural, gender, racial, and religious diversity matters were expanded for the Corps of Cadets. The College President established a Diversity Council comprised of cadets, students, faculty and staff. Additionally, a robust menu of clubs, activities, workshops, and services dedicated to fostering an understanding of issues related to diversity and supporting the success of female and minority students, was developed. This paper describes the impact of diversity enhancement efforts and activities on the Mechanical Engineering students and engagement of faculty. In addition, a preliminary assessment of their influence on student attitudes are presented and discussed.

Keywords

Diversity, Minorities, Retention

Diversity in Engineering Field

According to the American Society of Engineering Education, ASEE, Statement on Diversity and Inclusiveness, in order for the engineering discipline to reach its full potential, the engineering education community and the engineering profession must better include all segments of the society. Engineering must actively engage and help promote the pursuit of engineering education and engineering careers with those individuals who have been historically under-represented within engineering[1]. ASEE believes we should create and foster environments where every individual is respected and no one feels marginalized. This can be achieved by supporting the education, recruitment, retention, and advancement of these groups in engineering education, engineering technology education, and the engineering profession. A strategy to increase the participation of underrepresented minorities in science and engineering should play a central role in the approach to sustaining America's research and innovation capacity for at least three reasons: the sources for the future science and engineering workforce are uncertain, the demographics of the domestic population are shifting dramatically, and diversity is an asset[2].

In recent years, ASEE made several attempts to advance efforts that promote diversity and inclusion in the engineering education community. Part of these efforts included creating a Diversity Committee in 2011; declaring 2014-2015 as the Year of ACTION on Diversity; and

establishing the Best Diversity Paper Award in 2015[3]. Studies related to diversity in the engineering field indicate that globalization due to technological development around the world is unavoidable. It is essential that all efforts are made at all levels in an institution to enhance engineering education through the good use of cultural diversity[4]. Data suggest that social class also matters in engineering and that diversity in engineering should be reimagined[5]. More explicit attention to cultural capital and the continuum of social class disadvantage can enable engineering schools to produce better-informed retention strategies and transform engineering education[5].

Studies show success in many actions taken to support diversity in engineering given the appropriate resources and collective national "will" to propagate effective approaches[6]. The one-year retention rate of minority students that participate in diversity-oriented programs tends to be much higher compared to the minority students that did not[7].

Diversity at The Citadel

The Citadel is committed to educating principled leaders and maintains a responsibility to ensure that every member of the faculty, staff and student population are treated with the highest levels of honor, duty, and respect. The Citadel is an Equal Opportunity / Affirmative Action employer and does not discriminate against any individual, or group of individuals, on the basis of age, color, race, disability, gender, gender identity, sexual orientation, religion, pregnancy, national origin, genetic information, or veteran's status in its employment practices[8]. The Citadel's Strategic Leadership Excellence and Academic Distinction (LEAD) Plan 2018 identified the need for a Diversity, Equity and Inclusion Council to promote a culture of inclusion and equity. The Council provides guidance and leadership to improve success in certain objective measurements of diversity in both the college's work force and student body.

In 2016, The Citadel's President established the Task Force for Advancing The Citadel's Commitment to Diversity and Inclusion in order to conduct a comprehensive review of the college's campus climate for minority student success. The goal of the Task Force was also to further diversify student recruiting and enrollment and workforce diversity and inclusion, and to ensure that general education curriculum, particularly the leadership program, includes thoughtful diversity instruction[9].

Diversity at The Citadel's Mechanical Engineering Department

While the focus of The Citadel is on ways to further diversity of student recruiting and enrollment, The Citadel's Mechanical Engineering (ME) Department strives to retain diverse students and be involved in diversity enhancement efforts and activities.

In 2012, the School of Engineering fostered a student chapter of the National Society of Black Engineers (NSBE). Currently, the organization has approximately 20 members spanning the School of Engineering. The Citadel NSBE Chapter has established a relationship with the local Professional NSBE Chapter that includes mentoring and professional development activities. The chapter also helps students at a nearby high school that has high minority enrollment compete in the regional FIRST Robotics Competition. In the fall of 2017, an African-American

professor within the Department of Mechanical Engineering became the faculty advisor for the organization.

Society of Women Engineers (SWE) at The Citadel, started by professors and students from Civil Engineering Department, invited and included ME students in their activities. The Citadel SWE Chapter is involved in 'Introduce a Girl to Engineering', a yearly event for Girl Scouts during National Engineers Week.

Survey of Student Perception

The lives of freshmen at The Citadel are not easy. Every August around 700 hundred 'knobs' begin their military training. They are required to wear uniforms and obey officers and upperclassmen. Their free time is filled with studying, physical training, formation training, and shinning brass. In September, in order to support minority freshmen and foster diversity and inclusion the ME faculty organized a lunch event for freshmen identified as minorities. The freshmen met with minority ME juniors in a friendly and relaxed environment and were allowed to ask questions and create connections. All students were asked to fill out a survey.

The survey was comprised of questions related to students' gender and race and the following yes/no questions:

1. Do you consider yourself a minority?
2. Do others consider you a minority?
3. Do you feel discriminated due to your race/gender by your peers (cadets, classmates)?
4. Do you feel discriminated due to your race/gender by your professors/instructors?
5. Do you feel discriminated due to your race/gender by cadre?
6. Do you feel discriminated due to your race/gender by battalion staff?
7. Do you feel that knowing more cadets/faculty/staff from your minority group would make you more comfortable?
8. Would you attend regular (weekly or monthly) meetings of your minority group?
9. Would you like to have an upperclassmen from your minority group as a mentor?
10. Would you like to have a faculty or battalion staff member from your minority group as a mentor?

Out of 15 ME minority freshmen (women, black, Hispanic, Asian) selected by The Citadel Registrar, 3 students identified themselves as non-minority (2 white males and 1 white/Hispanic male). Excluding these students, the survey results for 12 freshmen and 5 juniors are presented in Figure 1 showing the percentage of affirmative answers.

It can be seen that minority freshmen, much more than juniors, feel that others consider them as a minority and that knowing other minority cadets, faculty, and staff and having a minority upperclassman as a mentor would make them more comfortable. Based on the results from juniors, they are more aware, confident, and secure as minorities and prefer faculty or battalion staff to be a mentor rather than an upperclassman.

Figure 2 shows survey data for freshmen, comparing male to female students' affirmative answers.

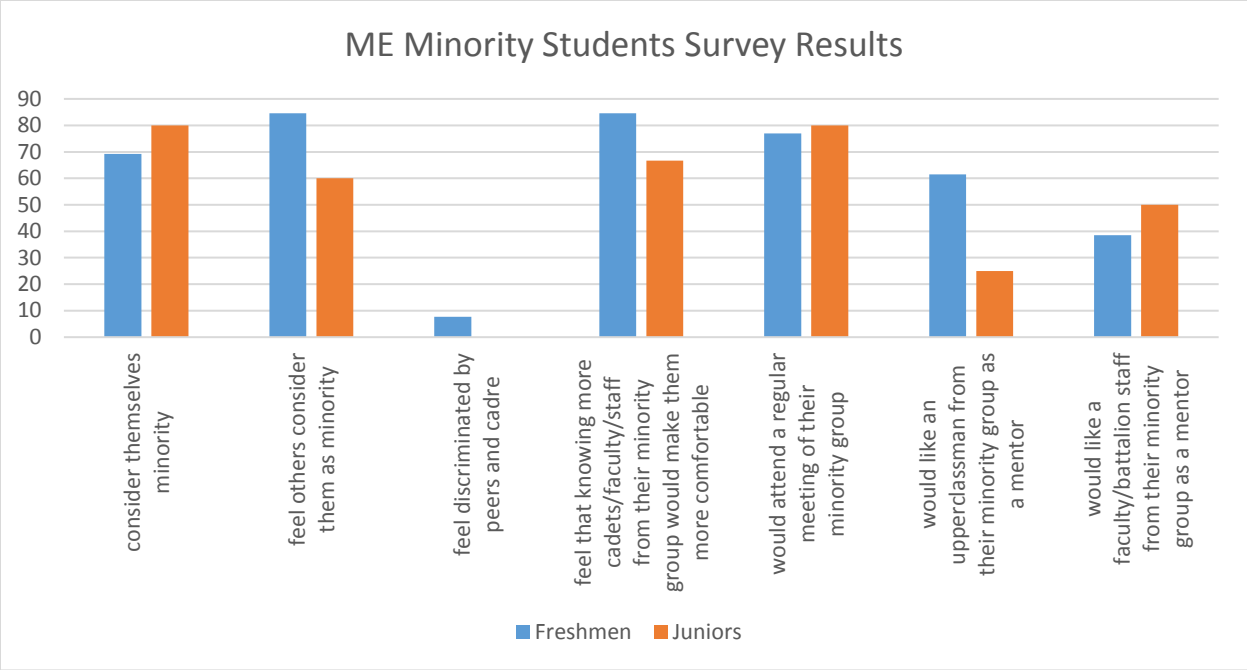

Figure 1. The results of the Mechanical Engineering minority students' survey.

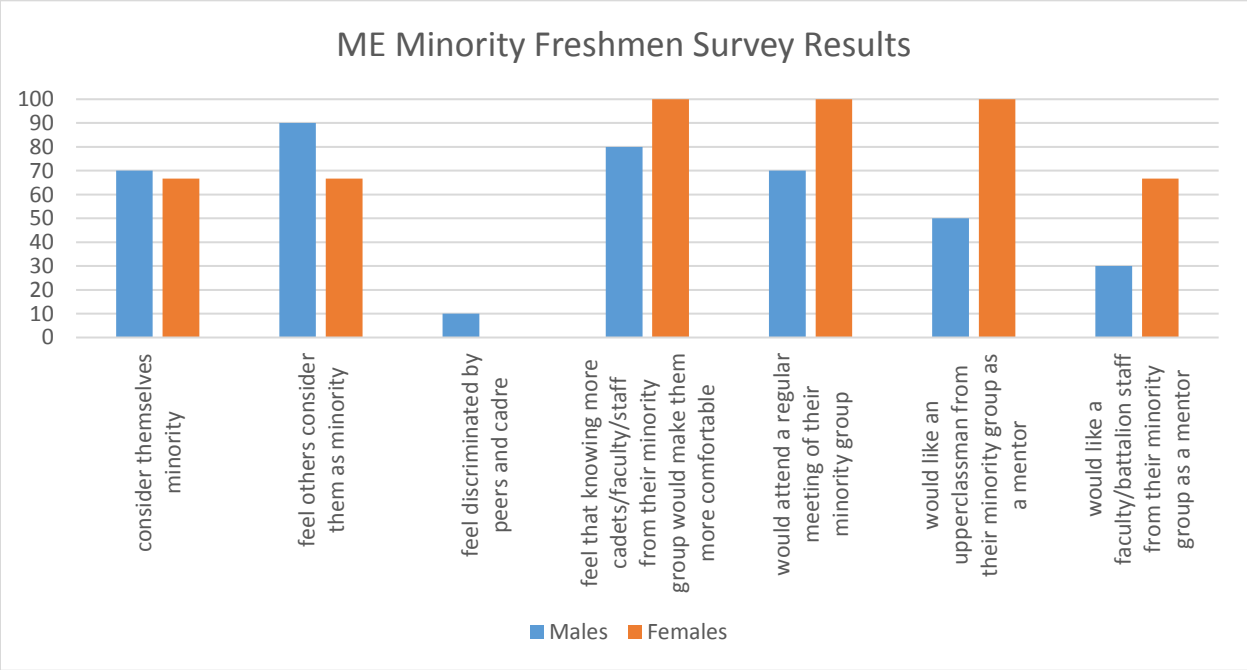

Figure 2. The results of the Mechanical Engineering minority freshmen' survey.

Based on the freshmen male and female students' comparison, it can be seen that male students consider themselves and feel others consider them as minority more than female students. On

the other hand, female students, much more than males, feel that knowing other cadets, faculty, and staff would make them more comfortable and are more open to mentoring activities and connections.

Conclusions

Based on the survey results and interactions with minority students, the authors believe that it would be beneficial for community activities to be available to the minority students. These activities could include education about confidence and mentoring opportunities. Some of the planned activities may include reserved study spaces in the academic building for minority students, increased interaction with local minority professionals in SWE and NSBE meetings, meeting with the local Girl Scouts to do engineering activities, and attending regional and national conferences that target diversity in the engineering field. It is believed that getting the students together at least once in the beginning of the school year is beneficial to ensure that the students can meet each other early in his or her academic experience.

Due to time constrains and students' limited free time, the upperclassmen mentorship program was not initiated in the fall of 2017 and is scheduled for 2018. The results of the minority mentorship activities will be presented in future publications.

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