Harnessing Student Leadership to Drive an Inclusive Environment in an Undergraduate Engineering Program

Dr. Corinna Marie Fleischmann P.E., U.S. Coast Guard Academy

CDR Fleischmann graduated from the U.S. Coast Guard Academy in May, 1998 and was assigned to the U.S. Coast Guard Cutter Elm where she served two tours: as a Deck Watch Officer and Assistant Navigator from May 1998 to March 2000 and as the Operations Officer from March 2000 to June 2001. From 2001 to 2003, she was a member of the Facilities Engineering Branch at the USCGA. During this tour, she served as both the Safety Officer and the Construction Officer. In this latter capacity, she was the Contracting Officer’s Technical Representative (COTR) as well as Civil Engineering Project Manager for the Academy’s $5.2 million dollar construction program. In 2003, she was selected for graduate school and attended the University of Texas, Austin where she earned a M.S.C.E with an emphasis on Construction Engineering and Project Management. In December 2004, she joined the USCGA faculty as an Instructor. During her time at the Academy, she has been the advisor for both the American Society of Civil Engineering and Society of American Military Engineers student chapters, a member of the SUPT Gender Policy Group, and worked with CGA Admissions in several diversity outreach programs. In August 2009, CDR Fleischmann became a member of the Permanent Commission Teaching Staff and in 2014, completed her Ph.D. in Civil Engineering at the University of Connecticut. She holds a professional engineering license in the state of Florida and a certification as a Certified Sustainable Building Advisor through the National Sustainable Building Advisors Program.

Ms. Richelle Leone Johnson
Session: Understanding inclusion, equity, and diversity in the effort to broaden participation, transform institutional leadership and promote student-centered success strategies in academia

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By
Corinna M. Fleischmann, Ph.D., P.E. Associate Professor
Civil Engineering Program Chair, United States Coast Guard Academy
Richelle Johnson, M. Ed., Education Program Specialist,
Office of Inclusion and Diversity, United States Coast Guard Academy

Abstract - Promoting student centered success strategies is a primary goal at the United States Coast Guard Academy (CGA). CGA, the smallest of the five federal service academies, is an undergraduate institution of approximately 1000 cadets (students) with four engineering majors; approximately 40% of the Cadet Corps (student body) graduates with an engineering degree. The CGA educational experience emphasizes leadership, physical fitness and professional development. Our cadets go directly into positions of leadership in service of others in the Coast Guard. For this reason, leadership is a focal point in cadet development. The CGA works to ensure our leaders are developed in an inclusive and supportive environment. This environment is cultivated through seven diversity councils made up of members of the Cadet Corps. These councils (1) promote a culture of respect that values a broad spectrum of skills and perspectives while ensuring supportive and rewarding learning environments for all; (2) provide experiential opportunities for cadets to engage in leadership practices and (3) serve as conduits by which underrepresented cadets can interact with cadets who embrace the philosophical, intellectual, and operational value of diversity as a means to living the mission of "developing culturally competent leaders of character". Ensuring CGA cadets understand the importance of inclusion, equity and diversity in leadership is essential for all graduates. Our engineering graduates benefit from what is being done Corps wide and these Corps wide activities open doorways for discussions in engineering classrooms that may not normally be opened in an engineering setting, specifically, gender discussions surrounding the “confidence gap” and the “imposter syndrome”. Success discovered in some of these unscripted conversations is being explored in the hopes of fostering more intentional discussions on this topic and others related to the inclusion of all underrepresented groups specifically in engineering.

Introduction/ Background

The United States Coast Guard Academy (CGA) is a small undergraduate military institution of approximately 1000 cadets (students). Not unlike other military academies and institutions of higher learning, CGA continues to struggle to eradicate all traces of race and gender bias on our campus. What is unique about the Coast Guard Academy is our willingness to confront the challenges that we face when it comes to equity and inclusion. To start with, we are creating more, not fewer spaces for informed dialogue
about equity and inclusion. We are doing this for faculty, staff, senior leaders, and cadets. Numerous divisions across CGA including the Office of Inclusion and Diversity, the Cadet Training division and Academics division, all provide professional development, facilitate critical dialogues and support cadets as this institution encourages student leadership of the Cadet Corps. Across all divisions, creating a climate of inclusion is a top priority as CGA is graduating students that will serve in our organization. Technically minded leaders who can effectively lead is a top priority of this institution. CGA is a small school; typical graduating class is around 200 cadets (students). Approximately 70% of the student body makes it to graduation where they receive a diploma and a commission in the United States Coast Guard (USCG). While at CGA, cadets receive a small paycheck each month and their living expenses are covered in return for a 5 year commitment to the USCG upon graduation. All graduates serve onboard operational USCG units for their first tour (typically ships) and then can choose more specialized assignments for their follow on tours. While at CGA, cadets have a choice of 8 academic majors including 4 ABET accredited engineering majors. Approximately 40% of the Cadet Corps graduates with an engineering degree each year. All cadets, regardless of chosen undergraduate major, receive an educational experience that emphasizes leadership, physical fitness and professional development to prepare them for positions of leadership in service of others in the U.S. Coast Guard. This paper focuses on the CGA Department of Engineering’s efforts to harness the student leadership development already taking place at CGA and utilize this leadership to improve the environment of inclusion in engineering.

The Leadership Experience

Leadership is a focal point in cadet development. Every graduate of CGA takes at least one academic course in Morals and Ethics and one course in Organizational Behavior and Leadership. Every graduate also spends weekly training periods and summers further developing their leadership skills through a 200-week course of instruction. The mission underpinning all efforts at the United States Coast Guard Academy is to produce officer ready Leaders of Character. As defined by our institution, a Leader of Character is “a leader who embodies the Coast Guard values and influences and inspires others to achieve a goal by seeking to discover the truth, deciding what is right, and demonstrating the courage to act accordingly… always”. During this 200-week experience, cadets learn to lead self and to lead others using the LEAD model.

- Learn from Theory.
- Experience through Practice.
- Analyze using Reflection.
- Deepen understanding through Mentoring.

The LEAD model emphasizes four components that enhance holistic leader development and contribute to developing Leaders of Character. LEAD helps us define what we do, explain why we invest in leader development, and shows how we do it consistently across the corps of cadets during the 200-week experience. The LEAD framework enables the transformation of cadets from freshman into service-ready ensigns who are Leaders of Character.
Diversity Councils

CGA also works to ensure our leaders are developed in an inclusive and supportive environment. This environment is cultivated through diversity councils supported by the Office of Inclusion and Diversity and is comprised of members of the Cadet Corps. Per the Coast Guard Academy’s Strategic Plan to “Cultivate a Supportive and Inclusive Environment”, the councils seek to promote a culture of respect that values a broad spectrum of skills and perspectives while ensuring supportive and rewarding learning environments for all. In accordance with the LEAD model, the councils provide experiential opportunities for cadets to engage in leadership practices and decision making that impacts the Corps through council-specific events and through the Diversity Peer Education Program. The councils serve as conduits by which underrepresented cadets can interact with cadets who embrace the philosophical, intellectual, and operational value of diversity as a means to living the mission of CGA - "developing culturally competent leaders of character," through the transmission of diverse cultural traditions and languages via self-immersion while simultaneously modeling a community of inclusion for the Corps.

Each council at CGA was established and organized to support various underrepresented groups at CGA. The respective missions of each of the councils are as follows:

1. GENESIS COUNCIL - The Genesis Council's primary mission is to provide the cadet corps with opportunities to learn about and experience, first-hand, the history, cultural nuances, and issues that characterize the African-American/Black diaspora today and to provide a support network, based upon a familial atmosphere and fellowship, for council members. As the first diversity council, the Genesis Council seeks to bring cadets from a multitude of different backgrounds and walks of life, together for positive discourse, intellectual stimulation, and personal growth. By teaching cadets more about themselves and their peers, the Genesis Council hopes to foster an even more welcoming and understanding climate at the Academy. It is with this footing that the Genesis Council will begin the year and embody in all of its endeavors.

2. COMPAÑEROS COUNCIL - The Compañeros Council seeks to provide a means by which cadets of Hispanic background and cadets with an interest in Hispanic culture and the Spanish language can celebrate Hispanic heritage and promote awareness of Hispanic culture within the corps of cadets. By learning about and immersing members into the Hispanic culture's foods, dances, films, and the Spanish language, we aim to enhance members' understanding of Hispanic culture. We encourage each other to succeed while at the Coast Guard Academy and as officers upon graduation through networking opportunities throughout the year with Coast Guard officers and officers from other services through organizations such as the Association of Naval Service Officers (ANSO) and the National Naval Officers Association (NNOA). Members of the Council also strive to improve the New London Community and build relations with its Hispanic Community by engaging in Community Service and participating in local cultural events.
3. ASIAN-PACIFIC AMERICAN COUNCIL - The mission of the Asian Pacific American Council is to develop better-informed leaders who are more prepared for the growing diversity in the Coast Guard as well as the American workplace. Through cultural events, community service, guest speakers, lectures, social activities and networking with other schools, we hope to provide our members with a better understanding of the Asian and Pacific Islander cultures. Our vision is to instill in the corps of cadets a greater awareness and appreciation toward the growing interdependence in the world that we live in.

4. WOMEN'S LEADERSHIP COUNCIL - The mission of the Women’s Leadership Council is to promote female health and wellness, create a professional female leadership network, and create a positive relationship between female and male cadets. The council promotes diversity of thought through various speakers, themed lunches, and opportunities for mentorship. It best prepares members for challenges and experiences that men and women will face in the fleet, while building leaders of character.

5. INTERNATIONAL COUNCIL - The mission of the International Council is to expand the international perspectives and cross-cultural competence of the corps of cadets through education about foreign culture as well as networking and support programs. We provide opportunities for cadets to meet with international counterparts and learn about their cultures. These opportunities prepare CGA cadets for effective participation in the dynamic global society, broaden their awareness about international events, and establish international networks that they can rely on in the future. Additionally, we host foreign military delegations throughout the year. Through these partnerships, we forge new relationships with international sea services and expand the Academy’s global recognition. Furthermore, these partnerships with international sea services inspire them to send their top qualified citizens to our Academy as International Cadets. Today, we holdfast with this tradition and at the same time expand our support service for all other within the corps. We believe that these support programs make our Academy a better place to live for all cadets, both international and American.

6. SPECTRUM - Spectrum, will work to promote a campus environment accepting of all the Academy community, bringing LGBQ (Lesbian, Gay, Bisexual, Questioning) persons and others together, through advancing the principles of "Leadership," "Professionalism," and "Respect," and the values and mission of the United States Coast Guard Academy. We will promote the idea that every member of a community is valued and respected regardless of their sexual orientation. We will do this by Building Community, creating an environment of Understanding, and Supporting our shipmates.

Ensuring CGA cadets understand the importance of inclusion, equity and diversity in leadership is essential for all graduates.
Imbalance in Engineering

Coast Guard Academy graduates are inculcated in leadership experiences. Every graduate feels they are prepared to perform their job in the organization upon graduation and lead a team to accomplish a mission. However, not every graduate of the engineering program is able to transfer their ingrained knowledge of leadership into the field of engineering and when asked if they are prepared to lead in their chosen field, many engineers lack the ability to see how these leadership skills will apply as an engineer. Women and underrepresented minority students are no exception. Statistics from the 2016 National Science Foundation’s Science and Engineering Indicators [1] show that women make up about 20% of the graduates in engineering. At CGA, 25% of this year’s graduating class of engineers will be women. While we feel fortunate to have the number of women at our institution exceed the national average for women in engineering, this fact also indicates that we, therefore, should feel an increased obligation to change this thought culture in our female graduates.

While our engineering graduates absolutely benefit from what is being done Corps wide in terms of leadership training, experience with diversity councils, and positions of significant leadership within the Corps of Cadets, our engineering students, particularly the women, still lack confidence in terms of their engineering path forward. Female students continue to feel they do not have the skills and intelligence required to make it as an engineer. From conversations overheard outside my office to direct conversations with my students, women continue to question their intelligence and belonging in an engineering environment. The phenomenon of the “Confidence Gap” is pervasive – women are less self-assured than men and Kay and Shipman [2] show that confidence matters as much as competence for success. Many of our students also experience the “imposter syndrome” or “imposter experience” presented as their low expectation of success, an inability to internalize their own accomplishments and a persistent fear of being exposed as a fraud [3].

Presently, engineering faculty and staff at this institution have noticed and discussed this lack of confidence which seems to be proportionally higher in our female students. Using one recent example: the majority of our students take the Fundamentals of Engineering national exam in November and our success rate is typically very good. In November of 2017, all 22 of our seniors took the FE and 72% of our students passed – indicating we had 6 students who did not pass on their first attempt. The gender make up of these 6 students is two women and four men. Both of the women were very concerned about the fact that they did not pass. Both felt it was a reflection of how little they actually know about engineering and both questioned whether they would stick with the profession after graduation due to this singular data point. The four male students who did not pass never said a word to any member of the faculty. This anecdote demonstrates one small sample of a small group. The fact that both of these women sought out faculty members to discuss their concerns is a fact that we find very promising. Off-line discussions in either one-on-one settings or small groups seem to be getting the message to our female students that we are here to support them.

The Way Forward
Moving forward, the intent is to purposefully recreate settings, both large and small scale, where these intimate conversations can occur, spaces where a larger audience of both men and women can participate. Knowing that 20% of engineering school graduates are women, yet women make up only 11% of practicing engineers is a concern for the field of engineering and for the future of female engineers in the engineering profession [1]. We are looking to quantify what we are seeing and develop strategies for eradicating it from our engineering environment.

Current efforts are underway in our capstone design course (CED) – a course mandated for all seniors at our institution. In CED, students work in teams of 3 to 5 to accomplish their capstone project over the course of the Spring Semester. In these teams, we continue their leadership education using the LEAD model. Students have Learned the leadership theory in previous course work and we build on that theory through practice and Experience. Each member of the team is required to rotate through the leadership position and guide the team on the completion of their capstone project. At specific points throughout the semester, we provide tools for the students to assess and reflect on their time as the team leader and on the pros and cons of their peers in the same leadership role (Analyze using Reflection). With these assessments in hand, the CED coordinator and their project mentors discuss their assessments both as a group and on an individual basis (Deepen understanding through Mentoring). This process has been very successful and has assisted our students in better understanding their own leadership preferences and the struggles encountered in group dynamics. These discussions sometimes, but not always include conversations about gender and race.

As stated earlier, our institution devotes a significant amount of time and energy to leader development. Corps-wide leadership discussions open doorways for dialog in engineering classrooms that may not normally be opened in an engineering setting, specifically, gender discussions surrounding the “confidence gap” and the “imposter syndrome”. With the initial success discovered in some of these unscripted conversations and our success with the intentional implementation of leader development in CED, moving forward we plan to deepen the discussions of leadership to ensure that inclusion and diversity are discussed and to start these conversations in an engineering environment prior to the senior year. Fostering more intentional discussions will help to connect the dots for our students who are engineers leading in an inclusive environment.

While our students have numerous mentors through their chosen major, sports team and military program, our next step is to target more mentors, including student to student as we have successfully done in the diversity councils, to help them to deepen understanding through mentoring. As Yong [4] found, a student’s actual grades had no bearing on their odds of staying in engineering. The active ingredients are belonging and confidence. The small group and personal discussions are improving our student’s sense of belonging and confidence. Expanding on these discussions is the current focus of our efforts to broaden participation and improve retention in engineering.
References


Author Information

Corinna Fleischmann: Commander in the United States Coast Guard, Civil Engineering Program Chair, Associate Professor at the United States Coast Guard Academy, New London, CT, Corinna.M.Fleischmann@uscga.edu.

Richelle Johnson: Education Program Specialist, Office of Inclusion and Diversity at the United States Coast Guard Academy, New London, CT, Richelle.Johnson@uscga.edu.