AMERICAN SOCIETY FOR ENGINEERING EDUCATION

Paper ID #35328

Building Intercultural Competencies through the Global Engineering Fellows Program

Prof. Patrick Tunno,

Patrick Tunno, MBA is the Director of the Center for Global Engineering Engagement and an Assistant Teaching Professor at Penn State University. He is a PhD candidate whose research focuses on study abroad and the impact of international experiences on the development of global competencies.

Building Intercultural Competencies through the Global Engineering Fellows Program

Abstract

In 2016, Penn State University's College of Engineering leveraged a need into an opportunity. Study abroad lacked visibility and promotion was limited. At the same time, students returning from global experiences desired to connect with their peers and continue to build on their global competencies and cultural intelligence. In response, the Global Engineering Fellows Program (Fellows) was created to provide an opportunity for globally engaged engineering students to build on their international experiences. In the program, students gel into a diverse cohort though a rigorous training program that teaches them Cultural Intelligence (CQ), how to make inspiring oral presentations about their experiences, prepare for international work assignments, and collaborate in a multicultural team. The program has included engagement and site visits to global corporations, virtual briefings with the World Health Organization, a high ropes course leadership retreat, and extensive volunteer activities to further the global momentum of Penn State University. In addition, Fellows serve the College of Engineering by generating interest in global opportunities and creating meaningful connections between the College's international and domestic students. Fellows act as peer advisers for other engineering students interested in studying abroad, take a course focused on global professional development, and deliver presentations at classroom visits and other global engagement events. The program has been awarded an Advancing a Global Penn State University Outstanding Program Award, a grant for diversity, and is sponsored by IES Abroad.

Introduction

A bicultural perspective bestows benefits including enhanced creativity and independence [1]. This poises students to collaborate on solutions to complex global issues, which is especially relevant in the era of the COVID-19 pandemic. In STEM fields, this ability is essential. The 14 Grand Challenges for Engineering in the 21st century, put forth by the National Academy of Sciences, include preventing nuclear terror and access to clean water [2], and global collaboration is critical. There is a consensus that educators understand the significance of these abilities and their direct application on the job, and that these skills are highly valued by employers [3, 4, 5]. Educators must prepare the future workforce to navigate an interconnected world landscape to find solutions.

Despite a call for critical global competences, they are lacking in college graduates and the workforce [6, 7]. Researchers have indicated that cross-cultural competence is a major interest for both universities and employers, while conceding that addressing these skills remains a challenge [8]. To achieve the ends of developing global competence, study abroad is viewed by institutions as the preeminent means [9]. The merits of study abroad have been lauded towards developing requisite intercultural skills [10]. Additional evidence demonstrating the worth of study abroad can be found in the investments made therein, including the extensive infrastructure higher education has put in place to for its support [11].

Penn State University's College of Engineering observed students returning from global experiences to exhibit intercultural skills, interest in pursuing additional global opportunities, as

well as marked enthusiasm to share their experience with others. At the same time, Penn State's College of Engineering had recently invested in infrastructure with the establishment of a founding director position for a new international unit focused global engagement. One of the goals of this unit included increasing the number of students studying abroad as a means to become more globally competent. The formation of a student focused program for international experience participants appeared to offer the potential to 1) create momentum for global learning and leadership in returnees 2) allow a space to creating meaning from one's experiences 3) establish a dedicated student corps to promote an increase in global experience participation. With these ideas as guiding principles, the Global Engineering Fellows Program was launched.

History and Program Components

Since 2016, when the Global Engineering Fellows Program was founded, it has evolved to a well-known organization at Penn State with the following mission statement *"Empowers globally minded engineering students through targeted professional development that integrates international perspectives, cultural intelligence, and the ability to deliver a compelling message. We generate global momentum as we inspire others to enrich themselves and the world through meaningful international experiences."* Several components are fundamental to the group:

- Enrollment in a course designed to build on international experiences, enhance cultural intelligence and further global professional development.
- Development and application of presentation skills.
- Leadership opportunities, including a leadership retreat.
- Unique insight into global careers.
- Engagement with international students.
- Establish a meaningful connection with a diverse, global cohort.
- Opportunity to earn a scholarship.

Selection and Academic Course

To be selected as a Global Engineering Fellow (Fellow) a student must have completed an international experience, which may include study, internship, or research. Select prospective Fellows who complete an online application are eligible for an interview. Successful interviewees are invited to join the program, becoming full members once they complete a course required for all new Fellows. Upon completion of the Global Engineering Fellows' course, participants are expected to be able to:

- Articulate the values of international experiences to their peers, faculty, and potential employers, in both group and individual settings.
- Demonstrate knowledge of Penn State's international programs that are well-suited for engineering students, summarize the benefits and trade-offs of diverse options, and discuss the application process.
- Make a compelling (clearly argued, articulated, inspiring, and well prepared) presentation about how their international experiences are relevant and beneficial to becoming a successful engineer.

- Anticipate the cultural demands that may accompany international business travel and formulate a plan to compensate for such needs, including identifying appropriate resources to investigate how one can professionally engage with the target culture.
- Discover opportunities for international internships, careers, and fellowships.
- Reflect and build upon intercultural learning experiences and to consider ways to apply their knowledge, skills, and perspectives through campus and community engagement and in preparation for professional pursuits and life after college.
- Assess their own cultural lens and interpret how it influences their worldview.
- Develop an action plan to improve cultural intelligence.

Fellows deliver more than 100 make presentations during classroom visits, information sessions, prospective student visits, new student orientations, and in virtual (often prerecorded) formats. The audience size may range from fewer than ten to more than 1,000 individuals and may include students, parents, administrators, and faculty. Thus, a critical element of the Global Engineering Fellows' course is training in the creation and delivery of presentations. Beyond the mechanics in the creation of compelling TED style presentations, Fellows learn how to distill the crux of an international experience into salient information that conveys the professional benefits of one's experience for future engineers as Fellows aim to inspire their peers to broaden their own horizons. Presentation training teaches Fellows how to explain the connection between their experiences abroad and the development of requisite global competencies for today's society. At the end of the course, through an iterative process emphasizing slide design, speech development, and delivery, Fellows are designated certified presenters. However, equally important is a solid understanding of Penn State College of Engineering's international program offerings. Thus, Fellows are instructed on programs and advising techniques to ensure they can address questions and advise peers on the process to select and apply for an international program.

Potential employers have expressed interest in technically strong students, who can effectively communicate, and have global capabilities, while Fellows have articulated an interest in global careers. For these reasons, the course has incorporated components that build on intercultural competencies and further prepare students for the demands of global assignments. Resultantly, a subset of academic coursework and exercises are designed to expand a student's abilities in this area, culminating in simulation in which participant groups create a briefing memo and deliver a presentation on an engineering opportunity in a country assigned at random. Furthermore, guest speakers are invited to speak to Fellows on subjects that are relevant for working interculturally. Speakers have included the World Health Organization, U.S. Foreign Service, and partners from globally focused industry and academia. In addition, students have agency to reflect upon their own Cultural Intelligence (CQ) and must promulgate a self-directed CQ plan. Cultural Intelligence is a commercial instrument that "is a globally recognized way of assessing and improving effectiveness in culturally diverse situations. It's rooted in rigorous, academic research conducted across more than 100 countries." [11] Participants who complete a CQ assessment gain insight on their CQ Drive, CQ Knowledge, CQ Action and CQ Strategy, as well as how to enhance these capabilities. As part of this instrument, Fellows are debriefed on cultural values and are guided through a discussion on their own such values and how they compare to world-wide norms.

Leadership and Corporate Engagement Opportunities

As Fellows assume a leadership position, it is deemed essential to address this quality in program participants. One approach has been to allow Fellows the opportunity to engage directly with global industry executives on campus as well as on site at companies. This engagement has included attending presentations, touring production facilities, and interacting with the engineering personnel during visits. Regarding addition training for future leaders, Fellows are afforded opportunities to face challenges and take calculated risks. In 2019, the cohort was guided through a leadership retreat that featured a high ropes course. Participants were required to work in groups to complete a series of challenges, competed against other teams, as well as confronted their fears on individual obstacles. While in 2020, COVID-19 required that the high ropes course be transitioned to a virtual escape room, it will be resumed once safety protocols are lifted.

Another aspect of the program where leadership is addressed is through a mentorship program where students who have served for at least one year are eligible to apply to become a mentor. Penn State's Global Engineering Fellow mentors are responsible for working with new Fellows on their presentations, establishing cohesion among the cohort, exemplifying the values of the program, and serving as a resource for those matriculating into the program. Upon graduation, program mentors are eligible to be nominated to receive the Penn State College of Engineering's Global Impact Award, which reflects the College's commitment of impacting the future. The recipient of this award not only demonstrates extraordinary personal change and dedication during their tenure but will have left a lasting mark on the lives of others and is expected to continue to expand their global impact after graduation. This recognition is made to one Fellow annually and traditionally has been awarded to program mentors.

Leadership among Fellows is not limited to domestic students or those in the cohort. Participants also serve as international allies, helping to orient incoming international and exchange students through a global ally program. Each semester as international exchange students arrive at Penn State's College of Engineering, Fellows host a reception to welcome these students to campus. Fellows are paired up with designated peers from institutions abroad prior to their arrival to the U.S. to help them transition to the university, and they participate in joint activities throughout the semester.

Outcomes

Prior to the COVID-19 pandemic, in the course of several years, study abroad numbers had increased more than 30% in Penn State's College of Engineering, a success to which Fellows contributed significantly. The Fellows program attracted the attention of IES abroad, an organization which has sponsored the program since 2018. In addition, the program was awarded an Advancing Global Penn State University Outstanding Program Award in 2018 and a grant for diversity through Penn State's Equal Opportunity Planning Committee (EOPC) for 2020. Individually, Fellows have demonstrated extensive professional accomplishments including, but not limited to, the awarding of a Fulbright grant, spearheading the establishment of a global outreach director role for Penn State's chapter of the Society of Women Engineers, completion

of volunteer work abroad, pursuit of additional study abroad opportunities (in one case to three continents), conducting research overseas, and earning foreign language majors and minors.

Challenges and Future Directions

Global disruptions due to the COVID-19 pandemic have impacted two classes of potential Fellows whose ability to participate in a global experience has been severely restricted, if not eliminated. As a result, the applicant pool has been proportionally reduced. Consequently, a new structure to continue global momentum, recruitment for international mobility programs, and grow global competencies is under consideration. One potential concept may be to recruit matriculating freshman to participate in the Fellows gateway course prior to enrollment in a global program. While they would not be able to reflect their experiences abroad (as they will not yet have occurred), there may be great value in generating understanding of the value of international programs, as well as learning from students who have participated in programs. In fact, future learning abroad may be multiplied as prospective program participants will be extensively prepared to make the most of their time out of country. In addition, these students will have the foresight to be intentional about documenting their experiences in order to make compelling presentations upon their return.

Another consideration about the future of the Fellows program lies in its potential scalability beyond Penn State. During a 2020 conference presentation at the Annual Colloquium on International Engineering Education, as well as in discussions among international engineering directors, peer institutions expressed interest in a network of Global Engineering Fellows. An international network of Fellows could establish a replicable program framework, standards, and desirable outcomes at universities across the globe. Such a network could lead the way in leveraging globally minded engineering students throughout the world towards a common purpose, uniting students who are equipped with the capabilities to lead and inspire the world.

An international network would oversee:

- Standards for organization, such as an ethos, course curriculum, participant prerequisites, program requirements, assessment, and partner responsibilities.
- Coordination of an annual project to promote the betterment of global society.
- Planning for a national/international conference, alternating locations annually.
- Recruitment of partner institutions.
- Quarterly meetings for a Global Engineering Fellows advisory council and leadership.
- Coordination of development efforts, corporate and organization partnerships.

While sustaining existing international initiatives during the COVID-19 pandemic is currently the focus of Penn State's Center for Global Engineering Engagement, there is an undeniable need to consider how the global landscape has and continues to evolve. And, if there is hope in addressing critical global challenges, future engineers must be ready to confront problems as a global, united front with well-developed intercultural abilities. Programs like the Global Engineering Fellows Program may provide a viable model to pursue this lofty, but attainable, objective.

References

[1] C. T. Tadmor, A. D. Galinsky and W. W. Maddux, "Getting the most out of living abroad: Biculturalism and integrative complexity as key drivers of creative and professional success," *J. Pers. Soc. Psychol.,* vol. 103, *(3),* pp. 520-542, 2012.

[2] [Available online] http://www.engineeringchallenges.org/.

[3] Franklin, K. (2010). Long-term career impact and professional applicability of the study abroad experience. *Frontiers: The Interdisciplinary Journal of Study Abroad, 19*, 169-190. Retrieved from https://frontiersjournal.org/

[4] Kehl, K., & Morris, J. (2005). Differences in global-mindedness between short-term and semester-long study abroad participants at selected private universities. *Frontiers: the Interdisciplinary Journal of Study Abroad, 6,* 7–81. Retrieved from https://eric.ed.gov/?id=EJ878383

[5] Stebleton, M. J., Soria, K. M., & Cherney, B. T. (2013). The high impact of education abroad: College students' engagement in international experiences and development of intercultural competencies. *Frontiers: The Interdisciplinary Journal of Study Abroad, 22*, 1–24. Retrieved from http://hdl.handle.net/11299/150028

[6] Mohajeri Norris, E., & Gillespie, J. (2009). How study abroad shapes global careers: evidence from the United States. *Journal of Studies in International Education, 13*(3), 382–397. doi:10.1177/1028315308319740

[7] Tarrant, M. A., Rubin, D. L., & Stoner, L. (2014). The added value of study abroad: fostering a global citizenry. *Journal of Studies in International Education, 18*(2*)*, 141–161. doi:10.1177/1028315313497589

[8] Lokkesmoe, K. J., Kuchinke, K. P., & Ardichvili, A. (2016). Developing cross-cultural awareness through foreign immersion programs: Implications of university study abroad research for global competency development. *European Journal of Training and Development, 40*, 166-170. Doi:10.1108/EJTD-07-2014-0048

[9] Murphy, D., Sahakyan, N., Doua, Y.-Y., & Sieloff Magnan, S. (2014). The impact of study abroad on the global engagement of university graduates. *Frontiers: the Interdisciplinary Journal of Study Abroad, 24*, 1-24. Retrieved from https://files.eric.ed.gov/fulltext/EJ1062085.pdf

[10] Paige, R. M., Fry, G., Stallman, E., Josić, J., & Jae-Eun, J. (2009). Study abroad for global engagements: the long-term impact of mobility experiences. I*ntercultural Education*, 20. doi:10.1080/14675980903370847

[11] [Available online] https://culturalq.com/about-cultural-intelligence/