

Digital Innovation to Remotely Guide the Development of Global Competencies Abroad

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Abstract

The importance of global competencies for an engineering workforce to address cross-border challenges and the emphasis on studying abroad to develop these abilities is well known. Some of the biggest problems in society require extensive collaboration beyond national borders. In today's digital professional context and interconnected global community, borders no longer separate international colleagues. Traditionally, in-person instruction during study abroad programs has been a prominent means to develop a global skillset [1].

Since 2019, Penn State University's College of Engineering has offered a three-week summer study abroad program to develop global competencies through a technical communication course paired with a cultural course in a Como, Italy. In 2023, the faculty employed innovations to both prepare participants for their sojourn while enhancing the potential to foster global competencies. An asynchronous, remote pre-departure course primed students before departure. They were introduced to the language and culture of the region, including using tools/ assignments such as recording dialogues, and reflections, engaging with natives through a digital cultural exchange platform, and creating individual study abroad field guides. Additionally, students participated in a global symposium featuring expert speakers.

During the summer 2023 travel portion of the abroad program, students learned technical presentation skills abroad, while the cultural engagement and language tutelage, previously managed on-site, occurred remotely. While abroad, participants created a website, made entries in a sketchbook, and reflected on topics including observation, cultural competence through experiential learning, and a self-guided cultural excursion in a local village, as well as several Zoom classes delivered by a faculty member who remained in the U.S. Faculty assessed this shift to guide the program's cultural engagement remotely through student focus groups, feedback from the on-site faculty, and course evaluations. This case study discusses how engineering programs could harness virtual guidance to develop global competencies. Lessons learned from this initiative and its potential to add value to study abroad programs are explored.

Introduction

As demonstrated in ABET criteria, an engineering professional must possess global or cultural competencies to devise solutions that may transcend borders. In Criterion 3, Student Outcomes, ABET has embedded within the program objectives, "an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors." Furthermore, ABET incorporates "an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts" into the required educational objectives [2]. A rigorous exploration into the term global competencies defines these abilities as global awareness, global understanding, and the ability to effectively apply intercultural knowledge [3].

Study abroad programs which involve traveling to a destination have historically been one of the primary approaches to cultivate global competencies. Other methods include virtual study abroad programs and the Collaborative Online International Learning (COIL) model, which “connects students and professors in different countries for (online) collaborative projects and discussions” as part of their coursework [4]. Models such as COIL accelerated during the COVID-19 pandemic. However, the authors contend that a virtual study experience is about as appealing a substitute for a program with travel as would be virtual honeymoon in Hawaii. This may be why since the pandemic’s global shutdown, in person experiences have sharply rebounded with more than 1000% growth in physical mobility of students from U.S. HEIs in 2021-2022, while virtual study abroad is not embraced with the same excitement among students [5]. Regarding the scale of engineering student participation, data prior to the 2020 travel disruption indicated that from 2018-2019 approximately 19,000 engineering students studied abroad [6]. (Note that 2022-2023 data was not available at the time of this writing.) It is important to point out that study abroad programs have been trending shorter for decades, with 64.9 % of students enrolled in study abroad programs that are shorter than 8-weeks in duration [7].

This paper discusses a case study of a short-term study abroad program with a required virtual pre-departure preparation course. The program included two courses, one on technical presentation and another which covered cultural engagement content. The case study examines the implications of shifting the cultural engagement course to a remotely guided format. In this examination, the program and course design are described. A student focus group, course feedback, and faculty leader reflections are used to assess the course’s shift to remote guidance. In addition, future directions for how this approach could be utilized are reviewed.

Program structure

Background

Consistent with the tendency for increased participation in short-term experiences, in 2019 Penn State’s Center for Global Engineering Engagement launched a three-week-long program with a start date in the week subsequent to the conclusion of the spring semester. Beyond providing participants with a required technical presentation course, one of the program’s goals was to develop global competencies through the development of and application of knowledge about the region, its language, and culture. Participants in this program enjoyed an itinerary that incorporated cultural immersion through site visits, insights into the historical and contemporary context, as well as intentional interactions with locals and students from the region. An emphasis on traditions, the gastronomic ecosystem, intercultural communication, and aspects of the local economy were part of the curriculum. These cultural elements were integrated into a robust technical presentation course designed for engineering students.

The approach to fostering the global awareness, global understanding, and the ability to effectively apply intercultural knowledge [3] that embodies global competence had been to 1) offer a pre-departure course and 2) include a faculty member with regional expertise on the travel portion. This instructor’s role was to teach an excursion-based course on the program, delving into the cultural content. Furthermore, including a team member with local expertise

lightened the load of the on-site faculty team in terms of navigating the social environment and program logistics. The program operated successfully for several years in this structure. Aside from a pause during the Covid-19 pandemic (years 2021 and 2022), the program enjoyed extensive popularity since its launch in 2019. It had more applicants than any other summer term offering in the College, with an acceptance rate of approximately 50%, due to the high demand and limited capacity. (It was deliberately kept at what was determined by faculty to be manageable number of students.) Student participant numbers were 2019: 20 students, 2022: 18 students, 2023: 20 students. However, despite a roster of 20 participants in 2023, a change to the budget model did not allow for the culture/language faculty role to travel with the program.

A new structure

In response to the inability of the culture/language faculty member to be physically mobile, the decision was made to coordinate the cultural engagement portion from afar. It included self-guided learning at the individual level, while group excursions and Zoom classes were facilitated by the two technical presentation faculty members on the ground. There is evidence to support self-guided learning to enhance global competencies and a foundation of professional guidance can help students avail themselves of the opportunities they encounter. Planned happenstance theory, which may explain this phenomenon, characterized this by saying it is a means of “creating and transforming of unplanned events into opportunities for learning [8].” The theory is germane to study abroad because inherently many of the activities are in the realm of the unknown. This includes language or communication styles, government, and cultural values, in addition to new approaches to solutions and ways of viewing the world. Participants may simply stumble into new situations that promote learning. However, Lokkesmoe et. al. indicated that there is weak evidence of students developing global competence that can be traced back to what could be characterized as cultural immersion in and among itself [9]. Thus, developing global competencies may be more complex than simply placing students in the culture without guidance. Therefore, it was decided that incorporating remotely guided activities to the context of cultural immersion that is present abroad could provide an opportunity to help develop global competencies.

Regarding activities, Schenker advocated for a curriculum that includes self-reflective activities for short-term study abroad programs [10]. And Gaia [11] mentioned including journaling in country and reflection. Schenker also mentioned the value of cross-cultural exchanges and collaboration with natives prior to a summer program, such as “a stronger connection to local university students.” In addition, programs might be advantaged to develop global competencies with an intentionally designed curriculum prior to and after the experience abroad [12]. Beyond teaching participants about the culture and behaviors acceptable in the host region, Varela and Gatlin-Watts encouraged more profound engagement with locals [13].

Course design

The design of global competency portion of the program was conceived to include some themes from the abovementioned literature, including journaling, reflection, cross-cultural exchanges,

connections with locals, assignments designed to promote planned happenstance learning, and education about the local culture and language.

Pre-departure

An asynchronous, remote pre-departure course was utilized to prepare participants for their sojourn. During this course, students:

- were introduced to the language and culture of the region, through online readings, instructor videos, and web resources;
- recorded spoken dialogues in the local language;
- reflected on the course content and submitted summaries on their reflections;
- conversed with natives of their destination country about culture through TalkAbroad, a digital cultural exchange platform;
- created individual study abroad field guides;
- participated in a global symposium and poster session (offered in person) featuring expert speakers, program alumni, faculty, and a U.S. Foreign Service Officer.

In country

After completion of the remote pre-departure course, students were enrolled in the program courses delivered during the study abroad experience. These included a technical presentation course (taught in person) and a virtually delivered course on the local culture, which was blended with in-country group excursions. The on-site faculty leaders responsible for the technical presentation course facilitated these excursions. During the local culture course, students:

- created a website to share reflections and journal entries;
- made entries in a sketchbook to create a record their experiences through mixed media, journaling, and documenting words in the local language;
- reflected on topics including an observation, cultural competence through experiential learning, and program excursions;
- collaborated in groups on a project to explore a local village;
- participated in three Zoom classes, topic included survival language/ culture, group presentation about a local purchase, group presentation about village exploration;
- participated in group excursions, including a coffee roaster and museum, guided tours of several cities, a visit to an organic farm/ social project, a cooking class, and cultural exchanges with local students.

Program assessment

Pre-departure course

Student learning in the pre-departure course was assessed. Below is a sample of the student feedback according to the below prompts. This information was collected via a course evaluation, which 7 out of 19 course participants completed. Students highlighted the video lessons, connecting with locals (via the TalkAbroad platform), and written materials as having a positive impact on learning. Regarding areas of improvement, students voiced a desire for more

in-depth Italian language instruction. They also suggested additional group meetings, particularly in person, to get to know the cohort.

A selection of the course survey results is shared below in response to the prompts:

What aspects of this course helped you learn?

- The videos were my favorite way to learn in this course.
- TalkAbroad sessions helped a lot in understanding Italian culture, and I feel more prepared for going to Italy because of those conversations.
- The class (WEB) was very well organized in Canvas; everything was easy to find, all resource links worked, and the deadlines for assignments were clear. When meeting in person, very friendly and relaxed (to just the right extent). In person, he also asked for our feedback on what he could do to improve the class, whether we linked videos or reading material more, which was nice.
- The course was very informative to prepare for studying abroad. I liked the format of video lectures plus some short reading material.

What changes to this course could improve your learning?

- I think more detailed slides could be helpful or full note sheets on Italian language could be a useful tool for learning Italian.
- I think more meetings (in person or on Zoom) would be helpful. It would provide a way for us to discuss with our classmates what we are learning, which I think would deepen our understanding. Having more meetings would also create more opportunities to ask questions about preparing for abroad and small bits of advice.
- More in person meetings so I could have met the people I am traveling with sooner.

In-country

To gather feedback for this case study on the in-country portion, two focus groups were organized to help assess the program's model. A total of 6 out of 19 student participants volunteered to discuss their experience with the hybrid learning model where the cultural engagement content was led virtually. To enhance the validity of the responses shared, the program's faculty team was not present during this discussion to encourage candid opinions. The focus group was led by an experienced facilitator from the College's teaching and learning center who had no association with the program. Focus group participants were provided with a prompt and a summary of the program's hybrid components. The prompt was reviewed by several faculty members with experience in study abroad and program assessment for modifications before it was provided to the focus group participants.

The focus group facilitator's takeaways from the discussion are summarized below:

Post-experience, the students discussed having a greater appreciation for other cultures and appreciating those differences. They found the course to be very beneficial to them

professionally, and they are still using what they learned this semester. They also feel they are more confident in their independence and ability to handle situations on their own.

Overall, the excursions (which were part of the remote guidance) were discussed positively. Visiting an organic local farm was noted as a unique experience that a typical tourist would not be able to access. Meeting with the local students was discussed positively and the focus group participants noted wanting less formal time to socialize and network with the local students. The Zoom sessions run by the remote faculty where the in-country activities were discussed suffered from bad Wi-Fi. They noted a delay in the faculty's feedback/presentations due to the poor Wi-Fi. Some students recommended students making videos and sending them.

For assignments such as the sketchbook, observation activity, and reflections, student responses were mixed. The students that invested in the sketchbook specifically noted appreciated having created a meaningful souvenir/ scrapbook of the experience. Other students noted that they would have appreciated more flexibility with the assignment that may include more mixed mediums such as photos, materials from their excursions/ adventures, or whatever they found as meaningful.

Faculty feedback

The faculty team leading the program on the ground provided a write up of their impressions of the hybrid program structure according to the below prompt.

In your role as an on-site faculty leader who facilitated cultural excursions, comment on the use of a virtual teaching modality to deliver the program's cultural and language content. How do you feel this virtual modality worked programmatically and impacted student learning? Can you discuss lessons learned, challenges, and recommendations for this practice moving forward.

According to the on the ground program faculty (L. Miraldi & P. Miraldi, personal communication, October 23, 2023), the impact on students of not having a language/culture expert in-country was highlighted, demonstrating both positive and undesirable outcomes. One benefit mentioned was that it "challenged the students more and made things more immersive when they had to work collaboratively to understand a tour guide or facilitator who couldn't explain everything in English." However, "when a tour guide or facilitator had more limited English language skills, it was difficult to pick up the necessary level of detail to maximize learning." This was evidenced in a visit to a local coffee roaster where the business owner could not easily explain the details as well as during a cooking class when "the chef struggled to communicate some of the more technical content." In the same vein, the interactions seemed to be less structured (than if they had been scripted by the faculty member), "leading to a more organic and genuine experience. This worked well for this group since there were several students who were willing to step up and out of their comfort zones to create impactful interactions," including when they interacted with local students. The faculty leader noted that while this was successful during this iteration, it will depend on the personalities of the students. "If your group is shy or reticent, this could fall flat." However, the faculty leader felt that intentional community building might allow students to safely depart their comfort zones and lead to more valuable genuine experiences.

Beyond the student impact, the in-country faculty described how the shift to remote guidance impacted their work and the program. It was noted that “having the language/ culture faculty virtual demanded significantly more time and energy from the in-country faculty.” The in-country faculty had to staff all program events such as excursions and virtual classes, in addition to their own course activities. Furthermore, they had to “solve all logistical challenges and problems throughout all aspects of the program.” This included being familiar with “forms of transportation to help the students get to and from each excursion.” They highlighted at least one episode where this created ambiguity in arriving at the group’s destination. In addition, the Wi-Fi for the remote faculty’s virtual classes was unreliable. There were challenges with using group tickets, including having the incorrect tickets for one activity. According to the faculty, this was partially a result of receiving insufficient information prior. They suggested that “it would be important for the in-country faculty to be looped in on all planning with the in-country provider,” which may help minimize miscommunications and unexpected issues with logistics.

Regarding the in-country programing, there was some benefit to having concentrated the program leadership. According the faculty leader, “there was more singularity and cohesiveness of leadership with the in-country faculty completely in charge of the atmosphere of the program.” However, participants were nonetheless required to submit assignments to the remote culture/ language faculty member, which may have resulted in unclear expectations at times.

Discussion and directions forward

An understanding of local language and culture, and the application of one’s abilities in this area can be critical to the development of global competencies. Pre-departure preparation and assignments have the potential to encourage the development and application of global competencies. Without incorporating these elements into a study abroad program via a tailored curriculum, the development of these aspects will be left to chance. The paradigm of integrating a local expert into the faculty team that operates a study abroad program in country has been harnessed in many traditional programs. However, it should be noted that with a shift to shorter program models, some program offerings may not include learning beyond technical subjects that are simply conducted abroad. In these cases, the extent to which a technical course emphasizes culture and language and the broader theme of developing global competences (and whether it is grounded in theory) should be explored further.

Nonetheless, in the case study described, a program that had previously utilized a well-thought-out model to develop global competencies shifted the in-country instruction of this aspect to virtual guidance. This transition was facilitated by the remaining faculty team. Program participants discussed finding value in some of the activities and excursions that were set up by the remote faculty with local expertise. However, a portion of the feedback indicated that the rationale for assignments was unclear at times. Additionally, the in-country faculty had a limited role in planning the activities. Perhaps, unsurprisingly, there were logistical challenges in their execution. It’s possible that if the on-the-ground team serves as the primary points of contact in developing an itinerary, these challenges could be mitigated. At the same, the feasibility of making this request to faculty that do not have expertise in the local culture might be unreasonable.

It may be ill-advised to shift a traditional program that already includes a local expert on the faculty team to a virtually guided program. However, for programs that do not offer a robust exploration into local language and culture, it may be worth exploring adding a virtually guided global competency component. Ideas from the literature, such as including journaling, reflection, cross-cultural exchanges, connections with locals, assignments designed to promote planned happenstance learning, and education about the local culture and language could be potential components of the curriculum.

To implement virtual guidance, it would be necessary to plan closely with the on-the-ground team to help ensure smooth operations. Another approach could be to hire a local tour operator and include guides for each excursion. This might streamline their execution and lighten the load of faculty who are less familiar with the area. One compelling idea from the on-the-ground faculty was the potential benefit of organic student communication instead of more scripted activities with extensive planning. Creating space for these interactions may require the in-country faculty to intentionally design a community of learners who feel safe pushing their boundaries. This might be coupled with general guidance from afar that empowers participants with personal agency and autonomy to learn together with minimal faculty interference.

It should be noted that this is a case study (rather than a research study) describing a shift to a virtual modality. It did not include an assessment of how students may have gained in their development of global competencies or how virtual guidance (as opposed to the faculty member in country leading) may impact their growth. This paper is intended to provide thought and discussion about the possibilities to utilize remote guidance to promote student engagement with cultural content that may enhance global learning.

Conclusion

The advantages of students possessing global competencies to approach complex technical problems are well established. A popular paradigm to foster these abilities in learners often occurs during learning experiences abroad. With study abroad programs trending shorter, incorporating deliberate guidance on how to develop global competencies could be valuable. One idea discussed is to provide this via remote guidance beyond the technical content in a program. In this paper, a modality shift in content delivery to hybrid from in person occurred. While it appears there were some positive impacts to the introduction of virtual guidance, there were also challenges. Approaching a shift in teaching modality or adding a virtual component to an existing program should be thoughtful and involve the faculty leaders extensively, with attention to the importance of the student community. Research on how students advance in their global competency development across different modalities is beyond the reach of this case study discussion; however, it is an area that may merit exploration.

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