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Developing Global Competency Virtually: Student Experiences in a Global Program That Transitioned Online due to the COVID-19 Pandemic

Tawni Paradise[1], Tahsin Chowdhury[1], Kirsten Davis[2], Homero Murzi[1], Michelle Soledad[1]

Abstract

This paper discusses a global program for first-year engineering students that typically combines a spring semester course with an international module in the summer. This year, due to the COVID-19 global pandemic, the course component of the program was redesigned for the post-COVID environment. The purpose of this paper is to present the decisions made during this process and explore their outcomes through analysis of students' feedback and global competence survey results. Four major decisions shaped the program redesign by balancing the desire for students to develop global competence with the acknowledgement that student motivation and energy would be impacted by the lack of travel and COVID-19. Data from students' responses on assignments, survey administration and teaching evaluations were analyzed to understand student experiences after the program redesign. Results from our analysis show students were able to develop global competence without international travel. Implications from the results and next steps are discussed in this paper.

1 Virginia Tech, Blacksburg, United States of America
2 Purdue University, West Lafayette, United States of America

Corresponding author: Tawni Paradise, tawnip92@vt.edu

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Introduction

Global competence is increasingly important for engineering students to develop as the engineering profession becomes more diverse and globally connected (Bremer, 2008; Parkinson, 2009). Global competence can be defined as using one's global knowledge, skills, and attitudes to communicate effectively and appropriately in global situations (Deardorff, 2006). Although engineering student participation in study abroad programs is increasing (Jesiek, 2018), many students are unable to participate for personal, financial, or scheduling reasons (Fitzsimmons et al., 2013). Consequently, it is essential to explore opportunities for students to develop global competence on their home campus through extracurricular activities (Soria & Troisi, 2014), cultural simulations (Davis et al., 2019), or collaborative online international learning (Ogden & Ogna, 2020), among others. Prior work has suggested that students can develop global competence through traditional courses focused on global topics (Davis & Knight, 2018; Kinoshita et al., 2016), but less research has focused on virtual global learning experiences. If such experiences can be designed effectively, they have the potential to open access to global learning to students who might otherwise be unable to participate.

In the wake of the COVID-19 pandemic, many global programs were forced to cancel or adjust their plans. In this paper, we will review the experiences of one such program including the decisions made in shifting the program online and the student outcomes assessed after this shift. By analyzing the results of this experience, we hope to inform the design of future virtual global learning experiences. We are not proposing a model for redesigning a travel-related course in a virtual environment, rather we are discussing the factors that we changed in our travel-related course due to the pandemic, utilizing feedback from students to draw conclusions about the effectiveness of these strategies. Specifically, our analysis addresses the following research questions:

1. How did students respond to the changes we implemented in the course as a part of the shift to online learning?

2. How did students' pre/post scores on the Global Perspectives Inventory (GPI) from the semester we shifted online compare to students' scores in previous semesters?

Context

The Rising Sophomore Abroad Program (RSAP) is a global program for first year engineering students at a large R1 university in the Mid-Atlantic region that combines a 3-credit spring semester course with a two-week summer international module. In a typical semester, the course includes three modules covering global engineering problems, cross-cultural collaboration, and preparation for professional engagement abroad. Each module involves guest speakers as well as a project related to the topic of the module. All students in the program (average enrollment is 160) participate in the same course activities and then travel on one of several international modules (six in 2019). Further programmatic information can be found in Knight et al. (2019).

On March 18, 2020, the university announced classes were moving online, leading to significant challenges for RSAP. We then had to finish the course without the prospect of traveling, generally a central part of students' learning in the program and a key motivator for taking the course.

RSAP Course Changes

In redesigning the RSAP course mid-semester, we made four main decisions related to course structure and course content, which are outlined in the following sections. We tried to balance the development of global competence with the acknowledgement that student motivation and energy would be impacted by the lack of travel and the influence of the COVID-19 pandemic. Our priority was to provide an equitable experience for all students while still achieving the course learning outcomes, so we considered things like students' access to the internet and different time zones. The learning outcomes of the RSAP course are included in Appendix A.

Course Structure

Modified Class Meeting Structure

Typical in-class activities involved active learning through small group activities and talks given by invited speakers. The sudden shift to online delivery with 150 students proved challenging, and we decided against holding

synchronous meetings. In lieu of synchronous classes, students watched videos of speakers who had visited the class in previous years. We offered weekly online office hours and utilized our learning management system to send weekly announcements and address concerns received from students. There was very low office hours participation, potentially due to being overwhelmed with the adaptation to virtual learning, as some students mentioned to the teaching team. In addition, a survey was sent to students regarding their strategy for finishing the remaining assignments in the course.

Assignment Structure

We reduced teamwork and interpersonal contact in our assignments. Mini-Project 3, the major remaining assignment after spring break, typically involved teamwork and interviewing engineers from around the world. First, we were mindful about having students interview practicing engineers, recognizing that people were dealing with a lot at the time. Second, we determined that team projects could present barriers for some groups and increase disparities. We thus determined that individual work was the most equitable approach. Nevertheless, we did encourage students to talk to their peers and do research together when they could. All the assignment changes can be found in Figure 1.

Assignment Deadlines

We changed the deadlines for the remaining assignments by moving them all to the end of the semester, anticipating that this added flexibility would minimize stress for the students. In reality, the lack of structure proved stressful for some students, who initially made little progress on the assignments. When we realized this was a problem, we created a sample project timeline (Appendix B) to help students plan the remainder of their semester. Student comments suggested that this alleviated some of the stress caused by the lengthened deadlines.

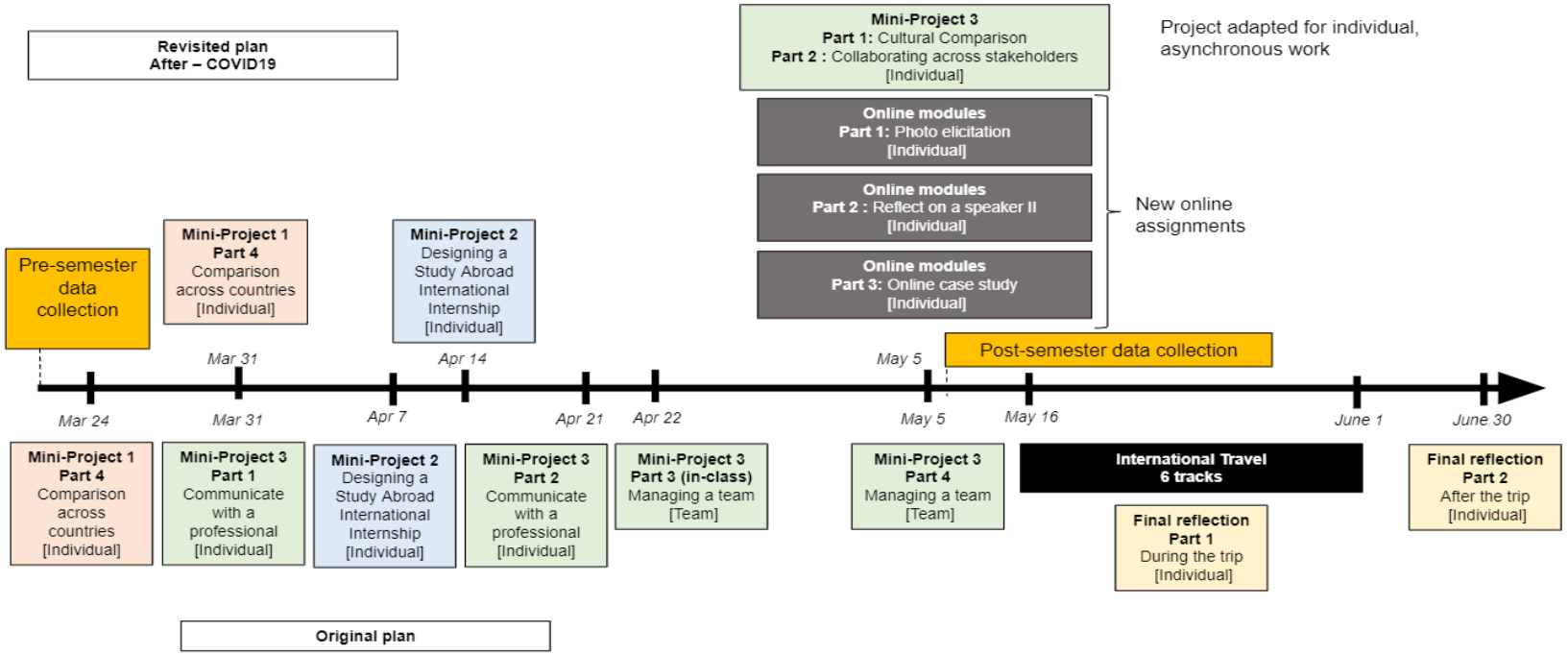

Figure (1): Overview of Timeline Changes Made to the RSAP Course

Course Content

Because we would not be able to travel, we focused all remaining assignments on understanding differences across countries to provide many opportunities for students to understand cultural differences. This resulted in a complete redesign of Mini-Project 3, careful selection of relevant videos from previous year's speakers, the addition of an online case study about a cross-cultural engineering situation, and a new assignment on how to take culturally responsive pictures when traveling abroad. Although there was no comparison for traveling, we hoped that the concentrated focus of these assignments would help students achieve the central learning outcomes of the RSAP course. For example, additional reflection on some of the guest speakers was intentionally designed for students to reflect on the international experience those speakers had. Many of them were engineers who discussed their work in global companies and their experiences doing projects in multiple countries. We hoped that combining these videos and reflections would lead to similar learning to those which students normally obtained by visiting companies while abroad.

Mini-Project 3 & Case Study

The adjusted version of Mini-Project 3 and the additional case study were intended to help students focus on cultural differences in a more immersive way than our course typically included. Mini-Project 3 was based on Hofstede's model of Dimensions of National Culture (Hofstede, 1983; Hofstede et al., 2010), where we asked students to compare the United States to two other countries and provide a reflection on their perceived cultural differences. Many students selected countries they were going to travel to and engaged in deep discussions about cultural differences and what to expect in those countries. The case study built on a global engineering scenario that was developed as part of a situational judgment test of global engineering competency (Jesiek et al., 2015, 2020). Rather than use the scenario as an assessment, we asked the students to analyze the scenario based on the Description-Interpretation-Evaluation (DIE) reflection framework. Students needed to state how they would respond in the situation and explain their reasoning. They were then provided a written interpretation of the scenario based on the cultural context where it took place and asked to reflect on information they had been lacking and how it changed their understanding of the situation. Through these reflective activities, we hoped that students would think about cultural differences in a more nuanced way and gain insights about their relevance in an engineering work context.

Photo Elicitation Activity

The photo elicitation activity was a new addition to the course in 2020.

In 2019, the final assignment asked students to reflect on their trip by submitting pictures they took during the international trip. An evaluation of that assignment identified an opportunity to include an online module on taking culturally and socially responsible photographs, to both prepare students for the assignment and integrate the concept of responsible photography into the development of global competence. In 2020, prior to moving online, students were asked to find a picture online that represented "global engineering" and bring it to class when they listened to a talk on culturally and socially responsible photo elicitation and were introduced to the online module. Students completed the online training and were once again asked to submit a picture that represented global engineering. A majority of students were able to submit pictures that had less stereotypes about global engineering (e.g., service-learning trips to developing countries) and provided pictures that were more realistic (e.g., team of engineers working on a global project, like an airplane).

Data Collection

The RSAP program in this study is located at a large R1 university in the Mid-Atlantic region. To understand student experiences in the 2020 RSAP course, we analyzed student responses on one student assignment, one survey instrument, and one teaching evaluation. There were 150 students enrolled in RSAP at the university during Spring 2020 and they were all asked to complete the above items. IRB guidelines were followed, participation was voluntary, and no incentive was provided. The instructor was responsible for introducing the research project to the class and the teaching assistant collected signed student consent forms. The gender and race/ethnicity breakdown for the 2020 RSAP is shown in Table 1:

Gender	Number
Men	91
Women	59
Not Reported	0
Total	150

Race/Ethnicity	Number
Two or more	15
Asian	13
Black	6
Hispanic/Latino	3
White	108
Not reported	5
Total	150

Table (1): RSAP 2020 Breakdown of Race/Ethnicity and Gender

Student Assignment

Two weeks after the transition to online learning, we asked students to respond to the question: "What is not clear regarding the current plan?" 110 of the 150 total students responded to the question, and those responses were coded using thematic analysis (Clarke & Braun, 2017). Thematic analysis is defined by Braun and Clarke (2014) as a method of identifying, analyzing, and reporting patterns within qualitative data. In addition, Robson and McCartan (2016) state thematic analysis as a generic qualitative method that allows data to emerge from patterns after implementing open coding. A main coder traversed the responses to look for and identify patterns, from which six initial codes were developed and assigned to respective responses. Once the codes had been initially assigned, a secondary coder was provided the list of codes and re-coded the data to ensure inter-rater reliability. While there was large agreement, conversations with the two coders resulted in secondary codes being added to a handful of responses and two additional codes being added to the codebook (resource and appreciation). Table 2 describes eight resulting themes and definitions in the final codebook:

Code	Description
Clear/Understandable	Students describe the new plan after online transformation overall to be well-articulated and structured
Travel	Students raise concern or query on the future of travel for the RSAP program
Finance	Students discuss the financial aspect of the RSAP program including the refund policy, budget for next year travel, etc.
Time Management	Students discuss the way they manage their time for the course including managing time for lectures and assignments after the online transformation
Ambiguous	Students are unclear about the new plan after the online transformation for this course
Assignment	Students have general queries or remarks on the structure of the assignments after the online transformation
Resource	Students describe the available resources provided by the instructors after the online transformation
Appreciation	Positive feedback/appreciation from students after the change in structure

Table (2): Thematic Analysis Codebook for Student Assignment

Survey Instrument

We also used the Global Perspective Inventory (GPI) survey to measure student outcomes, which is an instrument designed to comprehensively measure global perspective. Global perspective includes components of knowledge, attitudes, and skills important to intercultural communication and development of identity and interpersonal relations important to intercultural maturity (Merrill et al., 2012). We chose to use the GPI in assessing the RSAP program because (a) it was developed for use with undergraduate students, (b) it is based on the developmental model of intercultural maturity (King & Baxter Magolda, 2005), and (c) it is affordably accessible. The theoretical grounding for the GPI explores intercultural maturity along three dimensions, which are represented in six scales in the instrument. This multi-dimensional view of global competence aligns with our goals for the RSAP program. Table 3 describes the six scales of the GPI survey —both development and acquisition scales within each domain: cognitive, intrapersonal, and interpersonal. Each of the domains consist of two dimensions. The GPI survey instrument was developed using data from 2012-2014 with 19,600 undergraduate students in the United States (Braskamp et al., 2014), and was found to be valid and reliable (Braskamp et al., 2014).

GPI Domain	GPI Dimension Scale	Description	Sample Item	# of items
Cognitive	Knowing	One's view of different cultural contexts and valuing its importance	I take into account different perspectives before drawing conclusions about the world around me.	5
	Knowledge	Understand and be aware of various cultures and the impact on our global society and being proficient in more than one language	I understand how various cultures of this world interact socially.	5
Interpersonal	Social Responsibility	Interdependence and social concern for others in different cultures	I consciously behave in terms of making a difference.	5

GPI Domain	GPI Dimension Scale	Description	Sample Item	# of items
	Social Interactions	Degree of engagement with others in different cultural settings from different backgrounds	I frequently interact with people from a race/ethnic group different from my own.	4
Interpersonal	Identity	level of awareness of one's own identity and acceptance of one's ethnic, racial and gender dimensions of one's identity	I can explain my personal values to people who are different from me.	6
	Affect	Dealing with emotional intelligence when encountering different cultures by respecting and accepting different cultural perspectives	I am accepting of people with different religious and spiritual traditions.	5

Table (3): DESCRIPTION AND SAMPLE SURVEY QUESTIONS FOR GPI INSTRUMENT (BRASKAMP ET AL., 2014)

A full list of GPI items is shown in Appendix C. Respondents were asked to rate each item using a Likert scale from a score of 1 (“Strongly Disagree”) to 5 (“Strongly Agree”). We investigated the influence of the redesigned RSAP program by capturing students’ GPI through an online survey at two different points in time: before (pre-course) and after the course (post-course). A total of 135 students, of the 150 total students, completed the survey yielding a response rate of 90%. Incomplete survey responses were omitted. The GPI data were also collected for the 2018 and 2019 RSAP cohorts, and the demographics are shown in Appendix D.

Teaching Evaluation

To further explore student experiences through the RSAP course and triangulate findings from other data sources, a free-response question in the teaching evaluation form was investigated. This included 44 student responses to the question ‘Other Comments’ on the evaluation form. Other students either left this section blank or didn’t complete the teaching evaluation. Quotes from this evaluation are included to provide student words that validate our findings.

Limitations

This study was conducted at a single university, using data from 3 semesters of the same study abroad course, limiting the scope and generalizability of findings. However, there remains value in sharing the lessons learned on the impact of curricular changes and decision-making processes in response to unforeseen circumstances. The findings from our study may serve as a starting point for reflection and course planning should similar circumstances arise in the future, despite the fact that these results may be different for other academic disciplines, different types of educational global learning programs, larger student enrollments, or other contextual characteristics that differ from those discussed in this research. The authors have been reflective and thorough in their analysis and provide thick descriptions throughout the analysis and findings to ensure that readers can make their own assessment on the transferability of findings to their particular context.

Preliminary Results

Thematic analysis using a priori codes (Table 2), was performed on the student assignment that asked students to reflect on "What is not clear regarding the current plan?" The students who distinctly indicated clarity about the current plan often raised further comments about element(s) of the course, such as commenting on the usefulness of a provided resource. Other students indicated ambiguity in the plan, and provided feedback related to their concerns. Code counts are provided in Figure 2, categorized as either coming from a student who did or did not directly indicate they were clear about the current plan.

Most students (77) directly indicated clarity with current plans, and the most prevalent secondary code was time management indicating comments about their time management strategies in the course. Shifting all remaining assignment deadlines to the end of the semester proved to be a challenge for many students who reported difficulties managing their time. In response to these concerns, a suggested course timeline was shared to encourage students to make continuous progress in the course. Students who didn't directly indicate clarity were more likely to inquire about a course assignment. Students from both groups (those who were clear with the course plan and those who were ambiguous) expressed a desire to travel in the future with the RSAP program. Overall, the majority of students were clear with current course plans and any uncertainties were addressed by the instructor.

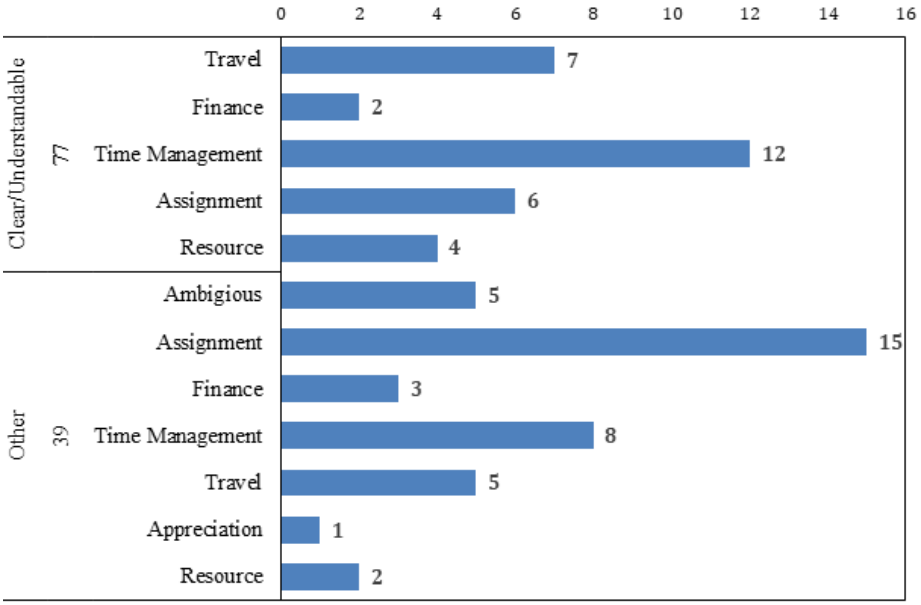

Figure (2): CODE COUNTS FROM STUDENT ASSIGNMENT THEMATIC ANALYSIS

Descriptive Statistics

The mean and standard deviation of the students' GPI scores administered pre-course and post-course for both the 2018-2019 and 2020 cohort were calculated along with their difference and are reflected in Table 4 and 5.

Dimension	pre-Mean	pre-SD	post-Mean	post-SD	Mean Difference
Knowing	3.6	0.43	3.54	0.47	-0.06
Knowledge	3.5	0.6	3.81	0.52	0.31
SocInt	3.28	0.64	3.36	0.62	0.08
SocResp	3.79	0.54	3.8	0.56	0.01
Identity	3.93	0.54	3.99	0.53	0.06
Affect	4.14	0.41	4.15	0.44	0.01

Table (4): MEAN AND STANDARD DEVIATION OF STUDENTS' GPI SCORES FOR THE 2018-2019 COHORT

Dimension	pre-Mean	pre-SD	post-Mean	post-SD	Mean Difference
Knowing	3.72	0.44	3.72	0.52	0
Knowledge	3.66	0.56	3.93	0.49	0.27
SocInt	3.39	0.67	3.51	0.7	0.12
SocResp	3.82	0.51	3.89	0.53	0.07
Identity	4.01	0.49	4.15	0.5	0.14
Affect	4.22	0.42	4.27	0.44	0.05

Table (5): MEAN AND STANDARD DEVIATION OF STUDENTS' GPI SCORES FOR THE 2020 COHORT

Reflected in Table 4, the highest mean for all administrations was on the Affect dimension with an average score of above 4 for all the cohorts on both pre-course and post-course administration. The lowest mean was in the Social Interaction dimension which had an average score of 3.32 for the 2018-2019 cohort and an increased average score of 3.45 for the 2020 cohort. Additionally, the Social Interaction dimension had the highest standard deviation among the dimensions in the GPI, potentially due to the lack of diversity in race and ethnicity among the RSAP cohorts. In terms of score differences between pre-course and post-course administration, the Knowledge dimension had the greatest difference for all the years, with a change in mean of 0.31 for GPI 2018-2019 and 0.27 during GPI 2020 survey.

Independent t-Test

Independent t-tests were performed to compare students' GPI score between RSAP 2020 cohort and RSAP 2019 and 2018 cohorts combined for both pre-course and post-course. Full results are shown in Table 6. In order to control the familywise error rate, the Bonferroni correction in the t-tests were used (Field et al., 2012). We used R programming language to conduct the independent t-tests. Dimensions with significant differences across cohorts are highlighted in green in Table 6.

	Pre-course				Post-course			
Dimension	**T**	**p-value**	**Sig.**	**Effect Size**	**T**	**p-value**	**Sig**	**Effect Size**
Knowing	2.5	0.012	*	0.133	3.22	0.001	**	0.171
Knowledge	2.48	0.013	*	0.132	2.13	0.03	*	1.14E-01
Social Responsibility	0.52	0.6		0.086	1.39	0.16		0.11
Social Interactions	1.6	0.11		0.028	2.07	0.03	*	0.075
Identity	1.34	0.17		0.072	2.73	0.006	**	0.145
Affect	1.8	0.05		0.098	2.5	0.012	*	0.133

*Likert scale from 1 = "Strongly Disagree" to 5 = "Strongly Agree." Significance levels are * = p < .05, ** = p < .01, *** = p < .001.*

Table (6): COMPARING GPI SCORES BETWEEN RSAP 2020 AND THE REST OF RSAP (2018-2019)

The independent t-test shows students' 2020 GPI scores increased in the Knowing and Knowledge dimension for pre-course and in five dimensions for the post-course, in comparison to RSAP 2019 and 2018 ($p< 0.05$) as highlighted in Table 6. Cohen's d revealed small effect sizes for all of the dimensions. Despite the online transformation this year, students had higher global perspective survey scores across different dimensions in comparison to previous years.

End-of-Semester Teaching Evaluations

To further explore student growth throughout the course and better understand which elements of the course may have contributed to students' global perspective, we reviewed the end-of-semester teaching evaluations. We found that teaching evaluations also identify that students increased in their global competency throughout the course, and that they often attributed this to their engagement with the course assignments. In Figure 3, a student recounts their experience in the course.

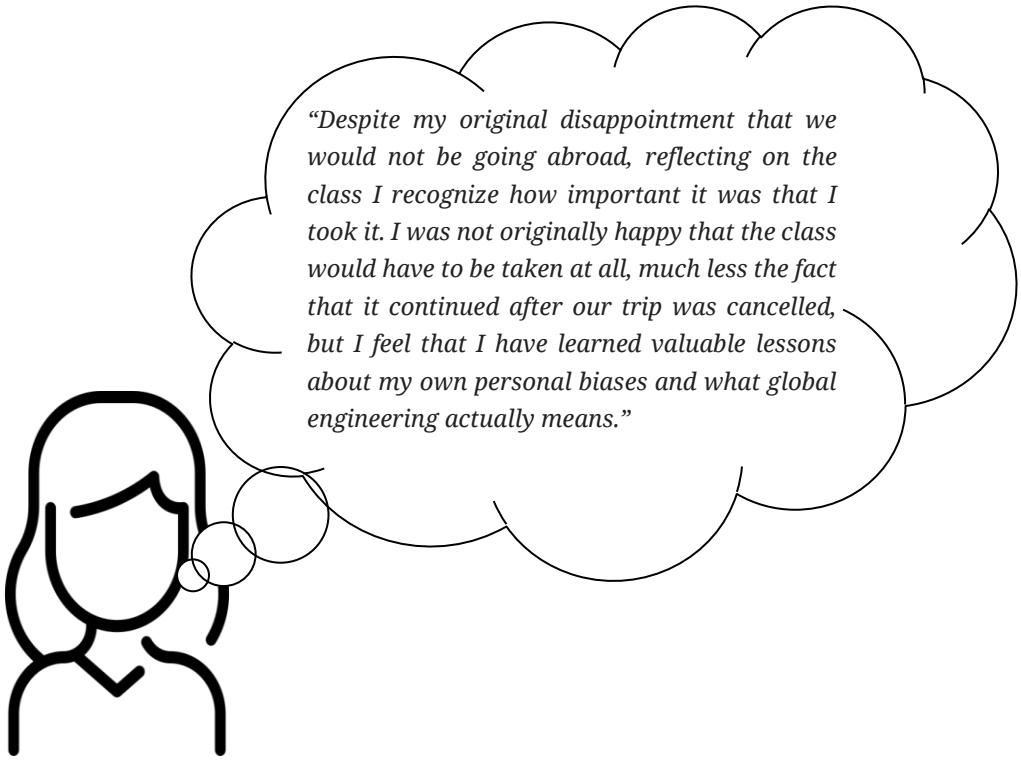

Figure (3): STUDENT RESPONSE TO END-OF-SEMESTER TEACHER EVALUATION SURVEY

Other students reflected similar thoughts about disappointment with not traveling, while noting that the class had a positive effect on their thinking around global issues. This student identifies a better understanding of their own biases and growth in their knowledge of global engineering

Utilizing data from three sources (a student assignment to ensure course clarity, a survey on students' global perspective and the teacher evaluation survey), our team concludes that students were positively impacted by this course and were able to grow in their global competency. From the data, we believe that student outcomes were well aligned with the learning objectives defined for the RSAP program (see Appendix A). Similar to the questions on the GPI survey, students identified skills needed to function successfully in a range of different cultural settings (LO #1), identified global challenges (LO #2), described differences in international contexts (LO #3) and recognized the value of cultural diversity (LO #3). The collected data does not indicate to what extent students achieved this growth as it pertains specifically to the STEM or engineering field, and rather captures the broader perspectives.

Discussion

In response to the COVID-19 pandemic, we were forced to adjust our global engineering course on short notice to an entirely virtual format without the promise of international travel at the end. We were concerned that students would fail to achieve the typical learning outcomes as a result of the new format, additional stress associated with the pandemic, and lack of motivation without the travel incentive. However, from the results of our descriptive statistics and independent t-tests, we were happy to discover that our analysis revealed that this was not the case: students still experienced gains in their global competency and expressed enjoyment with the course material. Specifically, the descriptive statistics and t-tests revealed that students had greater improvement than previous cohorts in the Knowledge and Knowing dimensions of the GPI survey (Braskamp et al., 2014). There are several possible interpretations of this outcome. First, from the t-test results, most of the dimensions show an increased score for this year which might mean that students may have had heightened global awareness associated with the COVID-19 pandemic, although this is not supported by the fact that their scores on the Social Responsibility dimension were no different than previous years. Second, it is possible that changes in the assignment content throughout the course presented more opportunities for students to explore international challenges independently and therefore may have peaked their interests and awareness. In either case, these findings indicate that we were able to provide experiences that improved students' global engineering competency without traveling, supporting earlier work on this topic but extending it to learning in a virtual environment (e.g., Davis & Knight, 2018; Render et al., 2017; Soria & Troisi, 2014).

In further developing virtual experiences focused on global competency, there is a heightened need to provide clear support and structure in the online environment because the students don't have the structure that comes with the in-person class. Our thematic analysis of the student assignment supports the notion that students who were clear on the current path of the course referenced resources and strong communication from the professors, while the students who were ambiguous about the current plan mostly had questions about the assignment expectations and due dates which reflects similar findings from other virtual courses (Withington & Schroeder, 2017). One of the greatest challenges that we experienced in transitioning this course to a virtual experience was providing clear instructions and meaningful resources for the students. Both sets of students, those who expressed clarity and those who were still ambiguous about the current plan, shared concerns about their time

management strategies in the course. We found that indicating a specified pace for the virtual course helps students maintain their progress and engagement with the course. Despite the challenges within the transition to virtual learning, several students still expressed an interest in and a desire to learn more about global engineering and to travel in the future.

All of these findings have implications for programs seeking to provide global learning experiences for students who are unable to travel abroad. Our course adjustments occurred quickly, mid-semester and therefore were neither carefully planned nor researched in advance. Although our awareness of the literature on global learning informed our decisions, our course design remained relatively haphazard and certainly could be improved through greater awareness and experience with online learning formats and approaches. If in this scenario our students still experienced notable learning, we believe that intentional design of virtual global programs could provide important opportunities to expand access to global learning and improve the equity of these types of experiences within higher education. We report our findings in the hope that it encourages others to pursue opportunities to provide such programs and not assume that it is necessary for students to travel in order to become more excited about and aware of global aspects of life and their disciplines.

Next Steps

Reflecting on the semester and our analysis of student experiences and outcomes, our team identified next steps within this course and beyond. We plan to incorporate more regular student feedback and to encourage student learning about global issues outside of the classroom. Our analysis revealed students' ability to develop global competency without international travel which highlights potential benefits of incorporating global aspects into traditional engineering classes or at the university more generally. Even after the pandemic passes, we will look to provide global learning opportunities on the home campus to improve access for students who couldn't normally study abroad (Salisbury et al., 2009).

As part of the work done in this course, the College of Engineering will pilot an online course this Spring semester on Engineering in a Global Context. The course will use a case study approach to develop students' global competency in three core areas: 1) engaging equity and identity in the U.S., 2) intercultural communication, and 3) ethical judgment in a global context. Case studies will show how issues of identity and power operate within engineering

contexts, from the hierarchies of the workplace to the disparities in education and access to engineering fields. These imbalances and dynamics will then be analyzed in a global context with international case studies and comparisons. Students will gain direct, practical experience working across cultures in global teams and participate in sustained reflection on the interdependencies of technology, culture, and engineering practices and identities in a variety of synchronous and asynchronous online learning activities. The course will also include a virtual exchange module where students will be working with peers from a technical university in Germany on a project.

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Appendix A

RSAP Course Learning Objectives

By the end of the RSAP course, students will be able to:

1. Understand global STEM professions and the professional skills needed to function successfully in a range of different cultural settings.
2. Identify global challenges, technological problems, and business opportunities and their implications for STEM professionals.
3. Describe how differences in political, technological, social, educational, and environmental contexts influence STEM practice, including leadership needs, teamwork processes, and problem-solving processes.
4. Describe the value of cultural diversity and how culture impacts STEM contexts in a global society.
5. Engage in a professional international environment.

Appendix B

Sample Project Timeline Provided to Students

Assignments left	**Week of**					**Due date**
	Apr 6 -10	**Apr 13 - 17**	**Apr 20 - 24**	**Apr 27 - 30**	**May 4 - 8**	
Mini-Project 2: Study abroad / International Internships	Work on it, submit by the end of the week					April 14th

Assignments left	Week of					Due date
	Apr 6 -10	Apr 13 - 17	Apr 20 - 24	Apr 27 - 30	May 4 - 8	
Mini-Project 3: Understanding Global Teams	Start doing research	Finish it and submit on Apr 18th	(use if need extra time)			May 5th
Photo elicitation training		Start training, do first module	Finish training early in the week			
Photo elicitation final assignment			Submit assignment by Apr 23rd			May 5th
Watch recorded lectures from last year (available on Wednesday site)		Start watching recordings	Watch remaining of recordings early in the week	(use if need extra time)		
Reflect on a speaker II			Write and submit reflecti-on by Apr 26	(use if need extra time)		May 5th
Online Case Study				Complete the case study online during this week	(use if need extra time)	May 5th
End-of-semester survey (note: this survey will be available on May 2nd)					Once available, fill it out this week	May 6th

Appendix C

Full List of GPI Items

GPI Item #	Scale	Question
GPI 1	Knowing	When I notice cultural differences, my culture tends to have the better approach.
GPI 2	Identity	I have a definite purpose in my life.
GPI 3	Identity	I can explain my personal values to people who are different from me.
GPI 4	Social Interactions	Most of my friends are from my own ethnic background.
GPI 5	Social Responsibility	I think of my life in terms of giving back to society.
GPI 6	Knowing	Some people have a culture and others do not.
GPI 7	Knowing	In different settings, what is right and wrong is simple to determine.
GPI 8	Knowledge	I am informed of current issues that impact foreign relations.
GPI 9	Identity	I know who I am as a person.
GPI 10	Identity	I feel threatened around people from backgrounds different from my own.
GPI 11	Identity	I often get out of my comfort zone to better understand myself.
GPI 12	Identity	I am willing to defend my own views when they differ from others.
GPI 13	Knowledge	I understand the reasons and causes of conflict among nations of different cultures.
GPI 14	Social Responsibility	I work for the rights of others.
GPI 15	Social Responsibility	I see myself as a global citizen.
GPI 16	Knowing	I take into account different perspectives before drawing conclusions about the world around me.
GPI 17	Knowledge	I understand how various cultures of this world interact socially.
GPI 18	Identity	I put my beliefs into action by standing up for my principles.
GPI 19	Knowing	I consider different cultural perspectives when evaluating global problems.

GPI Item #	Scale	Question
GPI 20	Knowing	I rely primarily on authorities to determine what is true in the world.
GPI 21	Knowledge	I know how to analyze the basic characteristics of a culture.
GPI 22	Affect	I am sensitive to those who are discriminated against.
GPI 23	Affect	I do not feel threatened emotionally when presented with multiple perspectives.
GPI 24	Social Interactions	I frequently interact with people from a race/ethnic group different from my own.
GPI 25	Affect	I am accepting of people with different religious and spiritual traditions.
GPI 26	Social Responsibility	I put the needs of others above my own personal wants.
GPI 27	Knowledge	I can discuss cultural differences from an informed perspective.
GPI 28	Identity	I am developing a meaningful philosophy of life.
GPI 29	Social Interactions	I intentionally involve people from many cultural backgrounds in my life.
GPI 30	Knowing	I rarely question what I have been taught about the world around me.
GPI 31	Affect	I enjoy when my friends from other cultures teach me about our cultural differences.
GPI 32	Social Responsibility	I consciously behave in terms of making a difference.
GPI 33	Affect	I am open to people who strive to live lives very different from my own lifestyle.
GPI 34	Social Responsibility	Volunteering is not an important priority in my life.
GPI 35	Social Interactions	I frequently interact with people from a country different from my own.

Appendix D

Gender and Race/Ethnicity Breakdown for RSAP 2018-2020 of GPI Items

Gender	2018	2019	2020
Men	78	108	118
Women	78	48	67
Not Reported	0	4	0
Total	156	160	185

Race/Ethnicity	2018	2019	2020
Two or more	3	14	22
Asian	5	12	20
Black	3	12	12
Hispanic/Latino	2	8	2
White	98	101	122
Not reported	45	9	5
Other	0	4	2
Total	156	160	185

Author Biographies

Tawni Paradise is an adjunct associate professor in Computer Science at the University of San Diego. She holds a Ph.D. in Engineering Education, a M.Ed. in Integrative STEM Education, and a B.S./B.A. in Industrial & Systems Engineering. Her research interests focus on broadening participation in engineering, understanding parent-child engagement in STEM learning at home, recognizing effective pedagogical strategies in engineering activities and evaluating the impacts and effectiveness of engineering outreach experiences.

Tahsin Chowdhury is a Ph.D. candidate in Engineering Education at Virginia Tech. Tahsin holds a bachelor's degree in Electrical and Electronics Engineering, a masters degree in Industrial and Systems Engineering, and he has worked as a manufacturing professional at a Fortune 500 company. As a researcher, he is interested in enhancing professional competencies for engineering workforce development in academia and beyond. He is actively engaged in projects focusing on teamwork and leadership in engineering.

Kirsten Davis is an assistant professor in the School of Engineering Education at Purdue University. Her research explores the intentional design and assessment of global engineering programs, student development through experiential learning, and approaches for teaching and assessing systems thinking skills. Kirsten holds a B.S. in Engineering & Management from Clarkson University and an M.A.Ed. in Higher Education, M.S. in Systems Engineering, and Ph.D. in Engineering Education, all from Virginia Tech.

Homero Murzi is an Assistant Professor in the Department of Engineering Education at Virginia Tech. He holds degrees in Industrial Engineering (BS, MS), Master of Business Administration (MBA) and in Engineering Education (PhD). Homero has 15 years of international experience working in industry and academia. His research focuses on contemporary and inclusive pedagogical practices, industry-driven competency development in engineering, and understanding the barriers that Latinx and Native Americans have in engineering.

Michelle Soledad, Ph.D., is a Collegiate Assistant Professor in the Department of Engineering Education at Virginia Tech. Her research and service interests include teaching and learning experiences in fundamental engineering courses, faculty development and support initiatives, and leveraging institutional data to support reflective teaching practices. She has degrees in Electrical Engineering (B.S., M.Eng.) from the Ateneo de Davao University in Davao City, Philippines, and a Ph.D. in Engineering Education from Virginia Tech.