

## **Exploring the Experiences of Prospective Transfer Students in a Global Engineering Program**

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# Exploring the Experiences of Prospective Engineering Transfer Students in a Global Engineering Program

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## Introduction

Participation in high-impact practices, such as experiential learning through study abroad, has been shown to increase rates of student retention and engagement [1]. Specifically, study abroad is a high-impact practice that supports students' academic success and enhances interpersonal, intrapersonal, cognitive, and global competencies. Developing these competencies also increases student marketability post-graduation, as outlined in the attributes of the Engineer of 2020 [2]. This paper examines how two programs have partnered to provide these study abroad experiential learning opportunities to transfer students: 1) the Rising Sophomore Abroad Program (RSAP) offered at Virginia Tech, and 2) the Virginia Tech Network for Engineering Transfer Students (VT-NETS), which is a partnership between Northern Virginia Community College (NOVA), Virginia Western Community College (VWCC), and Virginia Tech (see the Program Context section).

Although literature highlights the importance of student involvement in study abroad programs, some students remain systematically underrepresented (e.g., students from underrepresented racial minority groups, prospective transfer students, and students from low socioeconomic status [SES] or first-generation backgrounds). This access inequity is particularly pronounced for students from low SES backgrounds, as students typically fund their own way in study abroad programs [3]. In addition to cost barriers, lack of foreign language proficiency, perceptions related to graduation delays, and fear of discrimination have been shown to hinder student participation in study abroad programs [4].

We situate our study in the broader conversation of increasing access to study abroad programs for students from diverse backgrounds. Historically, broader efforts to diversify engineering programs have primarily focused on gender [5] - [7], race [8], [9], and ethnicity [10]. More recent efforts, however, have explored additional identities and intersections of identities that may influence student experiences, such as veteran status [11], [12], disability [13], SES [14] - [20], first generation college student status [19], and students who identify as LGBTQ+ [21]. In this paper, we contribute to the conversation on broadening participation in engineering by focusing specifically on prospective transfer students from low SES backgrounds, as defined by their federal financial need status. Not only are students from low SES backgrounds underrepresented in higher education [22] and engineering specifically, they are further underrepresented in study abroad programs. Even though students from low SES backgrounds may show other predictors of interest in studying abroad, like involvement in high school extracurricular activities and exposure to diversity [23], their SES seems to outweigh these predictors and may prevent them from studying abroad.

RSAP and VT-NETS are uniquely situated to remove some barriers to participation in experiential global learning opportunities through full program scholarships and structured preparatory coursework for transfer students from low SES backgrounds who may otherwise be

systematically excluded. Accordingly, the purpose of this paper is to illuminate the lived experiences of prospective transfer students who qualified for federal financial aid and participated in VT-NETS and RSAP. The research question guiding this investigation is:

*How do prospective transfer students describe their experience in an engineering study abroad program?*

## **Program Context**

### *Rising Sophomore Abroad Program (RSAP)*

RSAP is a global engineering program that caters to first-year and transfer engineering students. It combines a spring semester course on global engineering practice with international modules immediately following the semester. The program aims to help students consider context in their engineering problem solving, develop intercultural teamwork skills, and become interested in and prepared for future global engagement. The course teaches students about global engineering through the use of guest speakers from different departments and industry, group projects, case studies, and written reflection. International modules, each around two weeks in length, involve visits to engineering companies, universities, and cultural sites. The program currently serves around 180 students on approximately seven different international tracks annually. Prospective transfer students from NOVA and VWCC were included in the program in recent years through a partnership with the VT-NETS scholarship program.

### *Virginia Tech Network for Engineering Transfer Students (VT-NETS)*

Funded through the National Science Foundation (NSF) Scholarships in Science, Technology, Engineering, and Mathematics Program (S-STEM), VT-NETS is a scholarship program and research project focused on improving collaboration efforts between Virginia Tech and two community college partners. The primary objective of VT-NETS is to determine how all three partners can increase the success and efficiency of engineering transfer through community college-to-bachelor's degree pathways, thus increasing attainment of A.S. and B.S. degrees in engineering. VT-NETS works toward increasing access to co-curricular programs, streamlining and aligning advising between institutions, and developing a cohort mentality among the pre-transfer students at the community college. One intention of this programming is to integrate transfer students into their RSAP track prior to travel and provide a scholarship through VT-NETS to fund participation in the study abroad program. An additional goal of this program structure is to have participants form a cohort mentality with Virginia Tech students so that upon successful transfer, the VT-NETS students will have colleagues already at the institution who can help ease their transitions. To participate in VT-NETS, students must meet federal financial need requirements.

## **Methods**

Our study is situated within the larger research and program assessment efforts of RSAP and VT-NETS. This paper focuses on a subset of qualitative data in the form of journal reflections from prospective transfer students in VT-NETS who recently participated in RSAP. Methodological decisions stem from a pragmatic worldview [24], with the intention of

understanding prospective transfer students’ experiences in engineering study abroad programs. Our intent is for this study to inform future efforts to broaden access to study abroad.

*Program Context and Participants*

A total of 12 prospective transfer students submitted reflective journals, written during the two-week abroad portion of the program, and consented to participate in research. This study samples the reflective journals of eight participants from one cohort. Journal reflections were purposefully sampled based on level of reflection found in the journal entries after an initial round of coding. Journals were selected if the student went beyond describing the day-to-day itinerary and included thoughts about how the experiences influenced their learning and development. Table 1 provides a summary of participant demographics.

Table 1. Summary of Participant Demographics

<b>Demographic</b>		<b>Number</b>
<b>Race/Ethnicity</b>	White	5 of 8
	Hispanic/Latino	2 of 8
	Asian	1 of 8
<b>Gender*</b>	Male	7 of 8
	Female	1 of 8
<b>SES</b>	Low-income	8 of 8
<b>Age</b>	18-24	5 of 8
	24-30	2 of 8
	30-36	1 of 8
<b>Current or Military Veteran</b>	No	6 of 8
	Yes	2 of 8
<b>Previous International Travel / Experience</b>	Yes, 4-6 times	3 of 8
	Yes, 2-3 times	1 of 8
	No	3 of 8
	Unavailable	1 of 8

\*We acknowledge that gender and gender expression are not binary. Participants in this study self-identified as male or female.

We acknowledge the limitations of our sample, notably the lack of diversity in gender, race/ethnicity and the lack of information about participant's identities relating to LGBTQ+, disability, and first-generation college student status. However, participant demographics in our study contribute to recent efforts focusing on SES as an important contributor to diversity in engineering [15] - [20], [25]. We emphasize that transfer students from low SES backgrounds remain underrepresented in study abroad programs. We also highlight that two of our eight participants identified as current military or military veterans, an identity which also contributes to broadening participation in engineering.

Participants sampled for this narrative analysis represent various global tracks, where "track" refers to the country or countries visited during the abroad portion of the program. All global tracks included visits to engineering companies and/or university research labs, interactions with local university faculty and students, and cultural immersion experiences. Each track traveled abroad for 14 days, for a total of 12 days in-country. For the cohort sampled in this paper, VT-NETS students participated in one of three tracks: China, UK/Ireland, or Europe. Each track had at least three VT-NETS students. We have not specified which track students traveled on in order to protect their anonymity.

#### *Data Source*

Data for this narrative analysis are written journal reflections completed by participants during the abroad portion of the global engineering program. Table 2 provides an overview of the reflection prompts given to students while abroad. In addition to these prompts, students were asked to write daily reflections on their experiences abroad. Sampled journals range from 7-15 pages in length.

#### *Data Analysis*

We conducted a narrative analysis on reflective journals from eight VT-NETS participants in the broader experiential global learning program. We employ narrative as a method of analysis [24], [26], [27], focusing on the stories participants share in their journal reflections. Our analysis follows recommendations for narrative analysis [24] by focusing on a limited number of participants (n=8), exploring and illuminating their individual experiences, and reporting on participants' experiences chronologically. Our analysis conceptualizes students' stories in a three-dimensional space according to: 1) personal and social interaction, 2) continuity of past, present, and future, and 3) situation (place) [26]. We search for themes in participants' stories and analyze deeper meanings of words used by participants [24]. Because our analysis uses participants' journal reflections, the participants and researchers are co-constructing the narratives reported in this paper [24]. Lastly, we note the importance of narrative as a method of analysis to illuminate stories and voices of historically marginalized populations [28], such as the prospective transfer student participants in our study, all of whom qualify for federal financial aid.

We used multiple iterations of elemental coding methods [29] to identify themes in participants' stories. A single author reviewed and coded each journal during each coding pass. After researchers familiarized themselves with each journal, a hybrid coding scheme [29]

consisting of descriptive coding to describe students' stories [30], with simultaneous in vivo coding to capture stories in participants' own words [29], was applied. Following, the research team collaborated to develop a preliminary codebook, and used it during a second pass of deductive coding. The research team then discussed discrepancies in operationalization of the codes until we reached consensus. Data analysis concluded with a third coding pass, which included deductive coding with a final codebook. We provide the final codebook in Appendix A.

Table 2. Summary of Reflection Journal Prompts Given to Students

<b>Relative Date Prompt Assigned During Trip</b>	<b>Prompt</b>
At the airport or upon first arrival in-country	Set goals for your time abroad in RSAP. Make a goal for each of the following: learning, professional development, and cultural engagement. Every four days return to this and see how you are doing.
After a few days	What have you learned so far on the program? What can you do better with respect to seeking out learning opportunities? Think about how you can point to specific activities or observations on the trip as examples of learning during a future job interview.
Halfway point	Describe a time that you felt a bit uncomfortable on the trip so far- with the travel, being in a new environment, with your peers. How did you deal with that situation? What did you learn from this experience?
Later in the trip	What differences have you seen with respect to engineering, culture, business, and technology between the cities you've visited and with the U.S.? How might these differences influence what you think about other countries in the future?
Next to last day	Tell stories about two people not affiliated with RSAP who you encountered during your travels - not about how you met, but about their lives and experiences. What makes each story especially meaningful to you?
Last day	Pretend you are in an interview situation for an internship responding to a few questions. Here is the interview scenario: I see you participated in an international experience. That's very unusual for an early-college engineer and is fantastic that you were selected for this program. What new knowledge or skills did you learn or build upon while you were abroad? What specific examples from the in-semester class or module helped you develop those skills? How can your RSAP experience be a value-add for my company/organization?

### *Limitations and Constraints*

This study is not without limitations and constraints, primarily in terms of the sample. Although potential transfer students are admitted into VT-NETS, they self-select into RSAP, meaning some students in VT-NETS did not participate in RSAP. Therefore, this study is not representative of all VT-NETS students or of transfer students more broadly. Those who did choose to participate may have more experience and comfort with travel and may not be representative of a transfer student with less experience abroad. Additionally, we opted for a

purposive sampling approach to include the richest, most reflective journals in analysis. This decision means that experiences of four of the twelve VT-NETS students who participated in RSAP are not captured or included in our analysis. Finally, for sake of brevity, our findings include discussion of only five themes prevalent across participant experiences, leaving out focused discussion of other compelling themes that should be explored by future studies.

It is important to note that this study does not attempt to nor is it designed to make claims of generalizability. Accordingly, we do not claim that our sample is representative of all potential transfer students or of all potential transfer students at the institution, especially because of their unique position in the VT-NETS program. Ultimately, this research adds a rich qualitative description of the experiences of eight potential transfer students who chose to participate in RSAP and wrote deeply reflective journal entries. The results provided here can be used in RSAP and elements of the findings may be transferred to other programs with similar contexts to inform future efforts.

## **Results**

To begin the narrative analysis, we first summarize the frequency of codes across participants' journals. Then, we describe participants' experiences relating to each code. The data come directly from participants and what they felt was important to record. Thus, the results summarize and synthesize participants' depictions of their experiences.

### *Overview of Journal Code Counts*

Figure 1 provides the frequency at which each code was applied to each participant's journal. We applied one code to each unique instance, so the code count is reflective of how many unique instances a participant wrote a journal segment that connected to a code. Figure 1 illustrates that participants wrote about different types of experiences in differing volumes. For example, two participants, Matthew and Ian, have a higher number of codes overall than the other participants. Matthew wrote about interactions with locals and peers from the program much more often than the other participants. On the other hand, some participants, like Kevin and Steven, did not mention their interactions with peers from the program. Because of variations like this, we narrow our discussion to a few participants, where appropriate.

Two additional figures provide the average frequency at which each code was applied (Figure 2) and the average frequency for each track (Figure 3). From Figure 2, we see that some experiences, like connection to engineering and professional development, were reflected on more than others. In Figure 3, we see that the averages vary by track, but it is important to note that only one participant from the China track met the selection requirements.

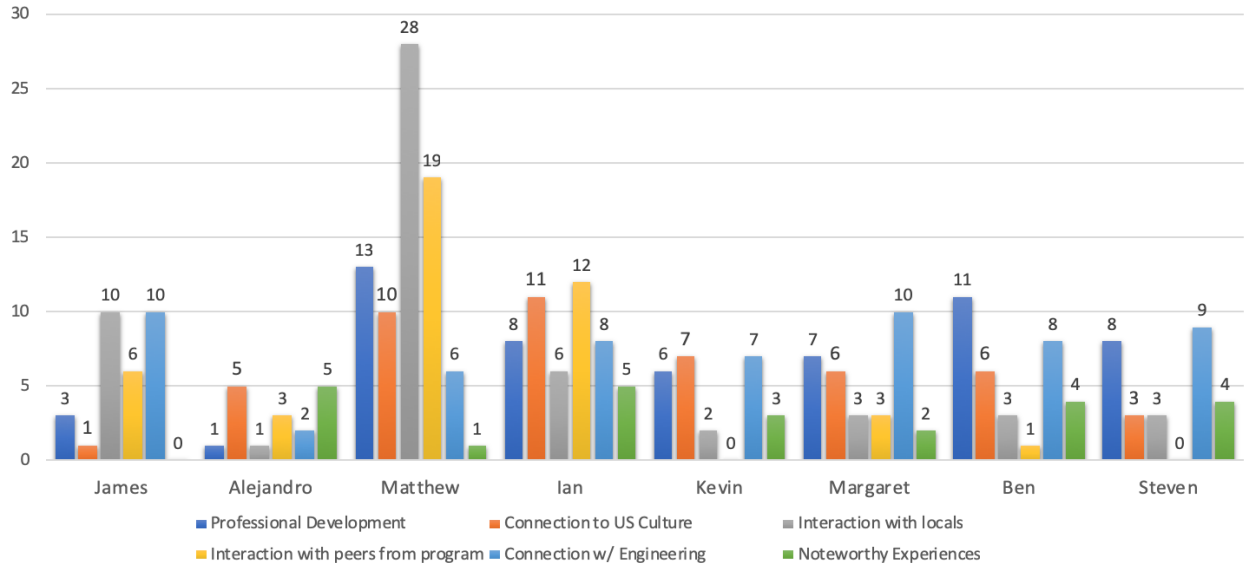


Figure 1. Participant Journals: Detailed Code Frequency Count

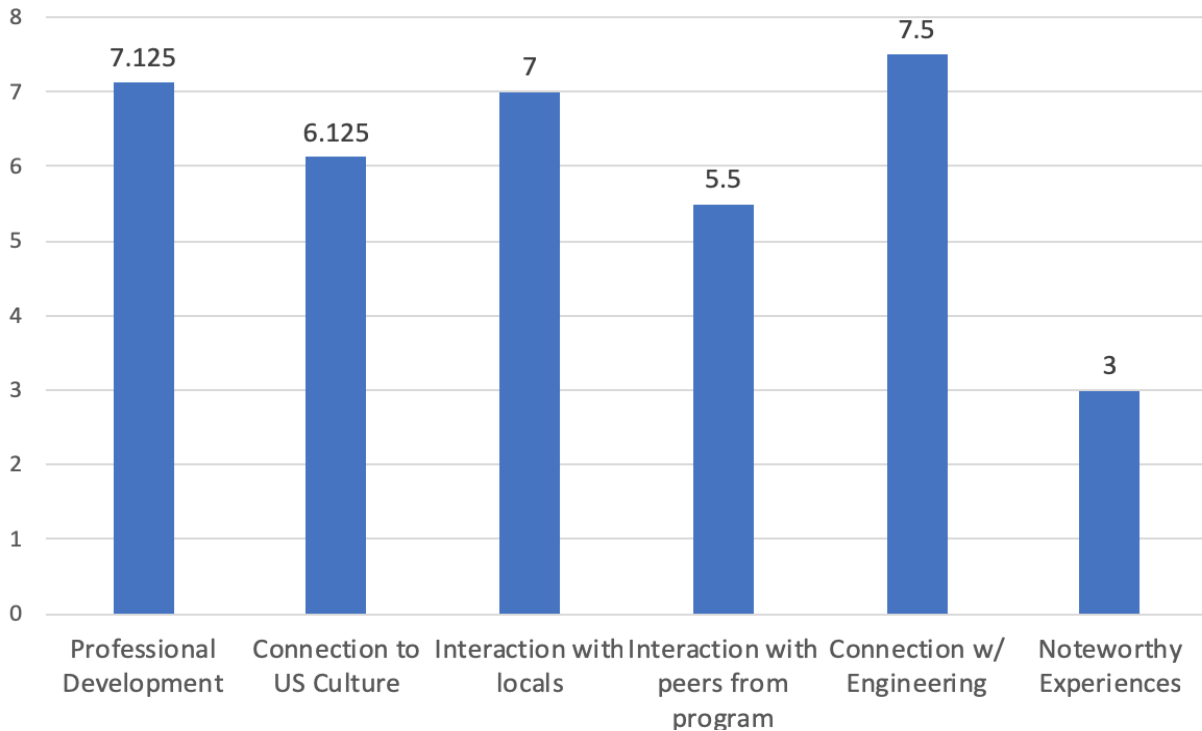


Figure 2. Average Frequency of Codes (n=8)



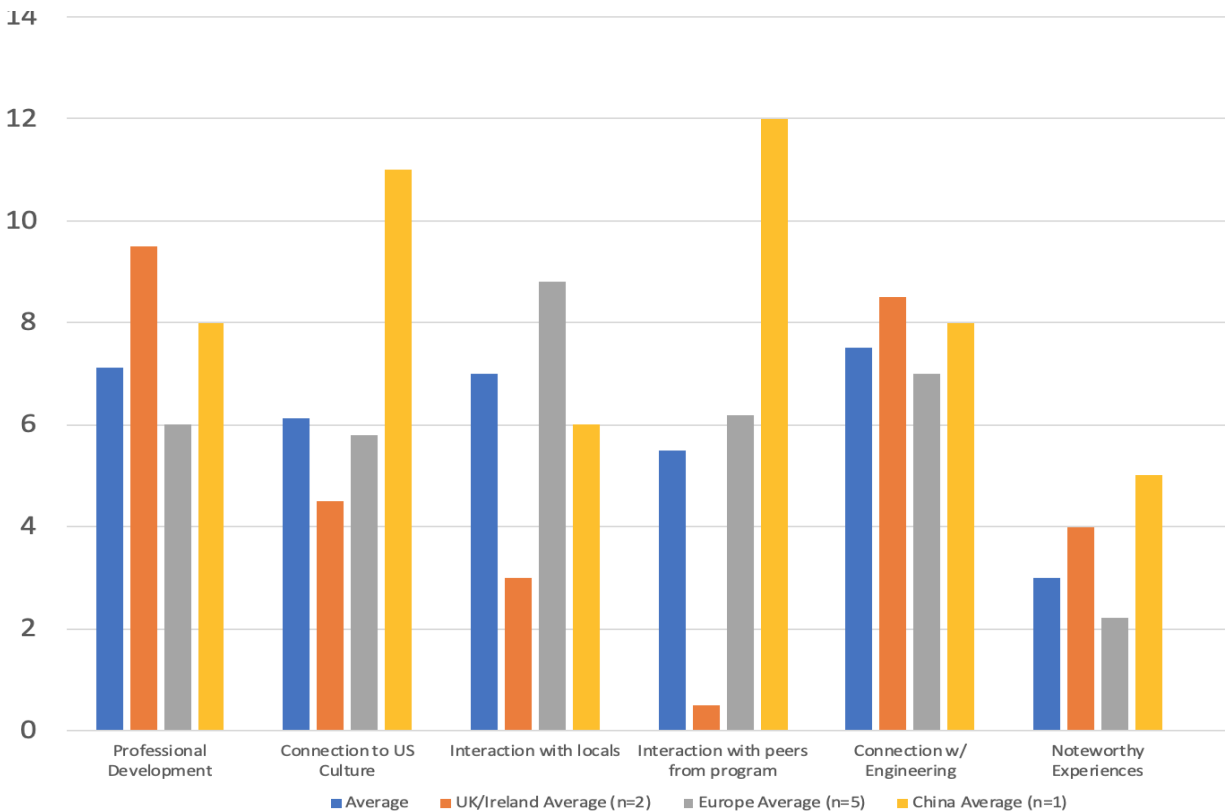


Figure 3. Average Frequency of Codes by Track

### Discussion of Codes

*Professional Development* captures participants' reflections on experiences that will prepare them for the future (in college or beyond), which was one of the required prompts. Participants reflected primarily on visits to engineering companies and universities and described gaining or realizing the importance of a variety of skills, including global competency skills. Additionally, some participants described an increased interest in engineering or motivation to become an engineer.

Participants described gaining or realizing the importance of professionalism, problem solving, teamwork, adaptability, networking, communication, and independence. Margaret mentioned gaining or being exposed to nearly all of these skills, crediting the program with helping her improve her teamwork and communication skills. In the end, she believed she would be able to bring "a whole new perspective" to her engineering work. Similarly, Ben realized the importance of "dressing professionally" and speaking in a way that is "knowledgeable and respectful to the interviewer" in obtaining a job.

Further, participants developed a deeper understanding of the design process, including recognizing what is meant by constraints, how teamwork is an essential aspect of the process, and problem solving. For instance, James described witnessing a company take constraints into account, which he had only ever encountered in a class setting prior to this experience:

When brainstorming solutions to a variety of problems in countries around the world, as a class exercise, we always had to consider the resources available. A solution was often only as good as the available money, political support, or physical materials . . . visiting such a variety of engineering departments and companies gave me a better appreciation and understanding of how different groups will use their resources differently.

In terms of global competency skills, participants described becoming more comfortable with travel, developing cultural competency, and developing deeper understandings of language use and language barriers. Steven described gaining cultural competence, saying the international module helped him “be open to change” and helped him be “more understanding on the difference of cultures and backgrounds in the application of engineering.”

Finally, both Ian and Matthew described learning how to handle communication challenges related to language differences. Ian described learning how to communicate in the face of a major language barrier. Matthew described being inspired by his experience on the trip to learn a new language, saying “the seed had been planted” for his interest in the French language, perhaps via pursuit of a graduate degree in French.

Altogether, participants described either gaining or realizing the importance of several key professional development skills. Participants indicated that they gained these skills — or at least recognized their importance — thanks to their experiences visiting companies and universities, which points to a major benefit of participation in an engineering-focused study abroad program.

*Connections to United States Culture* includes reflections wherein participants drew connections to home by comparing or contrasting their experiences abroad with their experiences back home (locally or nationally). Many students drew connections to everyday elements of life back home, like food, coffee, alcohol, transportation, stores, and universities. Others mentioned buying souvenirs for friends or family back home, and one participant, Ian, mentioned wanting to bring his family to places he visited. Additionally, Matthew made several comparisons relating to work ethic between the countries he visited and the United States. He described disdain for the perceived alcohol culture among locals and general “laziness” he observed in the countries he visited, drawing comparisons to the culture he was accustomed to in the United States.

A handful of the items coded for connections to home also overlapped with the items coded for connection with engineering. Most notably, Margaret drew connections between the roles she observed women filling at a car manufacturing company in Italy as opposed to an engineering company in the United States:

When [at an engineering company visit] in Italy, I saw women mostly involved in fixing the interior of the car such as the cloth and leather seats. In the US, at [another engineering company], there is a big group of women who are involved with the activity men do such as the design of aircrafts and other objects.

Because Margaret is the only woman in our sample, we cannot draw any wide-reaching conclusions about the experience of female community college students on study abroad experiences. We can, however, say that Margaret was in tune with gender issues in engineering, which was one of the workplace elements that the instructor primed students to observe.

*Interaction* captures participants' reflections on interactions with *locals* (anyone outside of the program) or *program members* (staff and students). We focus first on locals. As mentioned in Table 2, all participants were asked to reflect on interactions they had with two people not-affiliated with RSAP. As a result, all participants mentioned at least one encounter with someone outside of the program. Several of these mentions were rather ordinary. Alejandro recalled meeting a man from the United States and talking with him about life and their plans. Kevin described meeting locals and discussing sports or comparing their city to Kevin's home city. Steven reflected on conversations about stereotypes and history with locals. Ben expressed a desire to interact with locals and then described two successful encounters: one about sports and one about U.S. politics. Finally, James described meeting people in bars and meeting a "certified communist" among other locals. James reflected on his interactions with various non-program participants throughout the trip:

For me, the most lasting value of RSAP comes down to the countless conversations I had with local students or professionals across the whole trip. The number of times I was either surprised by an answer to a question or was in a situation where I had no idea what was coming next accumulated into a perspective-expanding mosaic of ideas that I simply would not have had otherwise. In short, I learned a lot about how differently other people, and other cultures, will approach solving a problem.

Additionally, several of the participants who traveled to non-English speaking countries described struggling with the language barrier. Ian described meeting two monks but having no way to verbally communicate with them. Another participant, Matthew, described trying to initiate a conversation with locals and being denied: "It started with myself attempting to find a stranger to talk to in the bar. The only opening I saw was a group of men. I walked right up, asked if I could join, and they declined. Which I honestly didn't mind."

Matthew is an interesting case in this category, as he had significantly more instances of interactions with others than his peers (see Table 1). Nearly each instance recorded an interaction with a new person. In some instances, Matthew reported staying up until 9:00 am to talk with locals. Several of Matthew's entries capture him wrestling with what he terms the "laziness" of the culture. He told several stories about shops closing early so the owners could go out for beers and made rather scathing remarks about the "laziness" he believes this practice exhibits. In one entry, Matthew described giving entrepreneurial advice to someone selling scarves. Despite his numerous interactions, at the end of Matthew's journal he wrote that he wanted to "step it up with engaging with locals" by "[getting] out of my comfort zone a bit more." He reflected on his desire for local interaction, noting that "most of my growth will come from engaging with strangers [abroad]."

Interaction with *program members* captured both positive and negative interactions between participants and their peers. The students at Virginia Tech participated in a semester-long course together, which was designed to help them build community and prepare them to travel. The participants in this study met the Virginia Tech students once during the semester prior to travel at a weekend visit to Virginia Tech. In addition, some VT-NETS participants are significantly older than their Virginia Tech student counterparts. As a result, these program-level interactions are particularly unique and potent. For example, one student, Ben, described feeling uncomfortable around Virginia Tech students.

In the group, there are only a few of us that are not currently going to VT. There have been times where I have felt a little uncomfortable around the group. I am not the best at actively trying to make myself known within a large group. It has been especially difficult since the VT students are already familiar with each other through the RSAP course they took this past semester. Normally, I am more on the quiet side with people I have not known awhile. Back home, I am extremely comfortable and more vocal in my friend group. But if I am always comfortable, I will not grow as a person. I am grateful I have this opportunity to be out of my comfort zone and meet new people.

Similarly, Ian described feeling out of place and taking on a mentoring role among his fellow participants. He even described other students calling him “dad”:

So far, there have been a couple encounters that have made me feel somewhat out of place, but that is to be expected. These don’t bother me at all. It was my fellow students. I know I am slightly older, so maybe it is a maturity thing as well, but there is a certain way to act and not to act when traveling to other countries. It’s important to be respectful of the culture you are walking into. Your body language says a lot about your outlook and thoughts about certain people and situations. The situation involved a couple students who ended up laughing, pointing and cursing inside a store, which eventually made me step in and tell them as politely as possible to control themselves. They ended up cursing me under their breath as they walked away. It kind of showed me their true character and the lack of maturity. It was kind of funny, though, later on in the trip when they were around me and started to act in the same manner, they would look my way and I would give either of them a nod and they would immediately stop the nonsense. My fellow student from [community college] and most of the students that I interacted with from VT ended up calling me “dad” for about half the trip.

James described a similar experience, feeling a responsibility to act more mature and diplomatic than his counterparts. On the other hand, Margaret, wrote in her journal about being unaware that she would be expected to room with other participants. On all tracks, roommates were assigned, and assignments were different at each new hotel or hostel.

When arriving at the hotel in [city] . . . I was paired with a student from VT. I was really nervous because I never roomed with a complete stranger before, and I didn't get a chance to really to talk to any of the VT students at the start, but after getting to know her I felt so much better. She was really nice and easy to talk to, so I was able to feel comfortable fairly quickly.

Finally, Matthew, who is significantly older than the majority of the other students, described challenges in relating to the other students and further described feeling a duty to expose the Virginia Tech students to other opinions: "I find it difficult to be anything other than silly with them. I still get that 'I know everything' mentality from them. Perhaps it is part of my duties to guide them a little on this trip to help them become exposed to other opinions and realities, that is what the university is about at its core."

Whereas other participants mentioned interacting with the university students, the experiences they described were much more ordinary, for example, eating meals and sightseeing. The potency of Ben, Ian, James, and Matthew's journal entries reveal an important social dynamic for program facilitators and administrators to be aware of: age. These participants describe struggling to fit into the group and taking on a mentoring type role. Further, this age difference becomes much more important to consider as transfer students are introduced to such study abroad experiences, as this student population has much greater enrollment of nontraditional college students.

*Connection with Engineering* captures any reflection in which the participant draws connections to engineering. This code differs from *Professional Development*; professional development pertained to the attainment of a variety of skills, and, conversely, *Connection with Engineering* pertains to a general understanding and appreciation for engineering. All participants drew connections to engineering, and this code emerged in several different ways across the participants' journals. The key themes that participants describe are (1) gaining a deeper, broader understanding of engineering; (2) inspiration or awe-inspiring; (3) confirmation of interest (positive or negative).

Several participants described that visits to engineering companies and visits to historical, engineering-related sites helped them gain a deeper, broader understanding of engineering. One participant, Steven, described developing a broader understanding of engineering and how to work with people from a different culture, writing, "I understand global challenges and have widened my knowledge towards engineering aspects. I could work with local groups that might have different beliefs and values toward engineering-based concepts."

Another participant, Ben, credited his visit to a historical and cultural site with helping him broaden his focus from solely software development:

Since I am in computer science, my focus is more on technology, software, and programs. Seeing [historical and cultural site] gave me a broader spectrum of what engineering is. Engineering is more than programming and developing software. I knew

this, but seeing [historical and cultural site] reopened my eyes since I have had such a focus on software for the past year.

Alternately, James described learning about how engineering can be used for evil after a powerful visit to a concentration camp in Germany (emphasis added):

The heavy day. Dachau. I am writing this portion of the journal some time after returning to the States because it took a while to process the experience of visiting the Nazi concentration camp. I ended up not being able to see the complete tour because at a certain point I reached my limit and had to return to the visitor's center to wait for the tour group to finish. The point in the tour where this happened was when we reached the crematorium. I did not expect it, but as we were being told about the purpose and history of these damned buildings and told that the tour would continue by walking through them, my emotional dam broke and I could suddenly not hold back tears. In the instant, the thought of standing in same room as those machines of death overwhelmed me. It was instantly clear that these kinds of machines, the instruments of the holocaust, *embodied everything that was the antithesis of what engineering means to me*. As engineers we are supposed to apply our talent to bettering the lives of others, instead of escorting them through hell. Overall, the Dachau trip did not make me happy, not that it was supposed to, but I still highly value the experience on the scale of my whole life. The things that were seen, the stories that were told, and the emotional impression that was made over the course of this visit is unlikely to ever be forgotten.

In this reflection, James connected his beliefs about the purpose of the engineering to an intense emotional experience at a RSAP site visit. Each track visited a plethora of engineering-related sites, including engineering companies, universities, and cultural sites. Steven's, Ben's, and James' excerpts reveal the deep impact that these engineering-themed visits had on students.

In addition to gaining a broader understanding of engineering, participants described being inspired by the companies and sites they visited. James felt particularly inspired by a company visit that emphasized engineering to make life better. Similarly, Matthew described his gratitude and excitement to become an engineer after visiting an assembly factory:

This, however, was one of my first times in an assembly factory. I was in awe looking at all of the systems in place to keep the factory running. I am so grateful to be studying engineering and having the opportunity to learn how all this stuff works. Human beings are amazing, and we have created amazing things. I'm so lucky that I get to be one.

Finally, participants credited the engineering-themed visits with helping to develop or confirm their interests. Kevin, on a visit to a civil engineering company, realized that he is not interested in "that type of field." However, on a visit to a hydroelectric power plant, Kevin found confirmation that he wanted to pursue electrical engineering. He described learning a lot about himself because he was "really interested in this tour, which helps confirm that I want to

specialize in electrical engineering.” Kevin further reflected on what he had learned about “how hydro dams work and how they solve solutions during floods and mechanical problems.”

Alternately, an older participant, Ian, described experiences that connected to his past hobbies and interests: “Today really made me miss building cars and fabricating them. The factory was like a toy store to me. I wish I could have taken pictures. I felt like I was in a live version of How It’s Made.”

Altogether, participants drew a wide range of connections between their experiences on the trip, especially engineering-themed visits, to engineering or to the participant’s relationship with engineering. This indicates that these participants reflected on and benefited from the engineering experiences that were built-into the trip.

*Noteworthy Experience* captures significant experiences that were meaningful or novel to the participants, either positive or negative. Within this code we found several themes: bucket list, first-time, grateful, and desire to travel more.

First, participants described several noteworthy experiences as ‘bucket list’ items. Students described seeing sites that they had always dreamed of seeing or described experiences as once in a lifetime. For example, Alejandro described seeing “amazing!!” sites that “one must experience in person within their lifetime.” Ian and Steven described similar experiences, noting “I have always wanted to go to both places” and “this has been one [of] my dreams to [visit],” respectively.

Whereas Alejandro, Ian, and Steven described positive, bucket list-type experiences, other participants described first-time experiences, both positive and negative. Participants reflected on first-time experiences ranging from traveling outside the country, traveling on an international flight, coping with jet lag, to learning how to use an ATM. Overall, participants deeply valued the opportunity to travel. Additionally, many participants expressed spurred interest in future global experiences. For instance, Steven described a desire to “travel more as it is my main goal in life on top of pursuing a career in engineering.”

## **Concluding Discussion**

Although literature suggests that experiential global learning programs positively impact student outcomes, not all student groups are equally represented in global programs. As we have discussed, some student groups remain systematically excluded from global programs in engineering, including prospective transfer students and students from low SES or first-generation backgrounds. Experiences of these students are underexplored largely because of the minimal representation of these groups in global programs. Thus, this paper illuminated the experiences of prospective transfer students from low SES backgrounds who participated in RSAP through VT-NETS.

Using narrative as a method of analysis, we examined the journal reflections of eight prospective transfer students in RSAP. Our study suggests two key findings. First, and perhaps most salient, prospective transfer students reflected candidly on moments of discomfort and tension during interactions with peers from Virginia Tech. Several of the prospective transfer students in our study were significantly older than their Virginia Tech counterparts. In their

journal reflections, participants in our study reflect on their age as a point of dissonance with their peers. Participants described being called “dad” by their peers or sustaining added “duties” to look out for the younger participants. Our study reveals a distinct social dynamic created by participant age differences, and this insight should inform future efforts to foster belongingness for all students in RSAP. For example, rooming arrangements could be made intentionally (on some tracks, roommates were randomly assigned). Additionally, track leaders could help bridge the age gap for transfer students, inviting the older students to spend free time and evenings with the trip leaders who are closer in age and may have more shared lived experiences.

A second key finding observed across journals is the influence of RSAP on broadening perspectives of engineering. Participants’ journals reflected broadened definitions of the type of work engineers do, the purpose and values of the engineering profession, and even the types of people that engineers are. Notably, several participants articulated broadened perspectives of *their own futures* in engineering, seeing new, international engineering career opportunities such as graduate school or internships. Through various interactions and observations at companies, universities, and cultural sites, students repeatedly described expanded perceptions of engineering. Importantly, RSAP and VT-NETS are unique; to our knowledge, no other engineering-focused global program exists in the community college context. If providing a global experience is not feasible financially or within time constraints, we suggest offering field trips to local companies to community college students to help them achieve a similar broadened definition of engineering.

Overall, we highlight a need to expand access to study abroad programs and a need for program administrators to integrate potential transfer students into programs like RSAP carefully and purposefully, especially when those students are older than their peers. This paper also calls for more research into the experiences of potential transfer students, including longitudinal studies, which assess the long-term impacts of participating in an experiential global learning programs on success at a 4-year institution. Ultimately, additional research into the experiences of potential transfer students can illuminate the best ways to serve them and facilitate a smooth transition to a receiving institution.

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## Appendix A

Table 3. Final Codebook

Code	Operational Definition	Example Quotation
Professional development	Students reflect on experiences that will prepare them for the future (in college or beyond)	“I felt like a new person as it opened my thoughts to culture differences. It widens my perspective through my international experience. I felt like I gain knowledge in understanding the professional view with diverse groups. It was a meaningful experience.” (Steven)
Connections to home context	Students draw connections to home by comparing or contrasting their experiences abroad with their experiences back home (locally or nationally).	“Throughout the trip, we have had people yell “Go Hokies!” in most of the cities when they saw our Virginia Tech apparel. Even though I am not at Virginia Tech yet, I feel like I am starting to become part of the Virginia Tech family.” (Ben)
Interaction with locals	Students reflect on their interactions with people they meet abroad who are outside of the RSAP program.	“We also met an Australian and a New Zealander who have each been traveling Europe for a couple of months, on their own, and it was interesting to trade stories of travel and life back in our respective homes.” (James)
Interaction with peers from program	Students reflect on their interactions with people who are participants of the RSAP program.	“My fellow student from [community college] and most of the students that I interacted with from Virginia Tech ended up calling me “dad” for about half the trip.” (Ian)
Connection with engineering	Students reflect on experiences abroad related to the broader engineering profession	“I also learned a little bit of what it would be like to work for an engineering company. As students, we already knew the math, but we did not know what are the specifics to working for an engineering company.” (Ben)
Noteworthy Experience	Students describe a meaningful and novel experience, either positive or negative, that was significant to them on the trip.	“The [mountains] look amazing!! The scenery in the train ride was just phenomenal, it is something one must experience in person within their lifetime.” (Alejandro)