

## **Stepping out of the Comfort Zone - and the Country: Facilitating In-Depth Student Learning through Nontraditional Communication Assignments**

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# Stepping out of the Comfort Zone—and the Country: Facilitating In-Depth Student Learning through Non-Traditional Communication Assignments

## Abstract

Traditional engineering education methods often are driven by the need to cover large amounts of important material in the short time allowed by the semester or quarter system. However, teaching methods that are primarily concerned with the coverage of multiple topics can sometimes cause students to remain on a lower level of Bloom's Taxonomy. This paper will discuss a series of non-traditional engineering assignments that were given as part of a study-abroad program. The instructors of this course intentionally employed unconventional assignments in order to affect students on a higher cognitive level. Students worked in non-traditional modes and genres about familiar topics in engineering education. Students visited manufacturing centers, historical sites, and universities to see facets of engineering in another culture; however, the assignments associated with these visits were well outside the comfort zone of most engineering educators and students.

## Introduction

The Accreditation Board of Engineering and Technology (ABET)<sup>1</sup> and the National Association of Colleges and Employers (NACE)<sup>2</sup> are among many organizations to assert that communication is an important subject for the modern engineer to be taught. Communication assignments in engineering courses are often predictable: technical reports, technical memos, and persuasive communications, such as proposals delivered via oral presentation or in writing. According to a *Journal of STEM Education* paper entitled "Student Perceptions of Communication: Undergraduate Engineers' Views of Writing and Speaking in the Classroom and Workplace,"<sup>3</sup> students often view writing "as though they were black and white problems." A lack of creativity in creating assignments can lead to a lack of creativity on the part of the students when completing these assignments. The *NAE Engineer for 2020*<sup>4</sup>, discusses the necessity of creativity, calling it "an indispensable quality for engineering," and suggesting that "creativity will grow in importance." Teaching creativity can be a daunting task for engineering instructors because there is so much information to be covered in traditional engineering curricula, there often doesn't seem to be enough time for non-traditional assignments. However, there is evidence to suggest that, while coverage of topics through traditional assignments is important, there is room for creative assignments to be included in course content. LSU's Communication across the Curriculum (CxC) program has found that by including communication assignments as part of traditional engineering assignments, the traditional content was not sacrificed by the inclusion of communication assignments, but was enhanced and facilitated learning at higher levels on Bloom's taxonomy.<sup>5</sup> In the Humanities, it has long been suggested that a diversity of discourse leads to innovative thinking.<sup>6,7</sup> At our institution, we decided that the Encounter Engineering in Europe (E<sup>3</sup>) program was an excellent place to include assignments designed to promote creativity, such as open-form essay writing, video creation, and multi-modal travel blogging, as a complement to more traditional assignments, such as argumentative papers and researched reports, all of which address conventional engineering topics.

This paper will highlight innovative assignments that address engineering topics. Traditional assignments, such as research papers on topics like manufacturing processes, robotics, and automation, were given to establish foundational knowledge about these topics. However, understanding the technical aspects of a topic is not the only consideration. Recognizing human interactions with technologies is also important for deeper understanding of design and analysis of technical content.

### **E<sup>3</sup> Overview**

As of fall 2009, the only opportunity for engineers at LSU to gain an international experience specific to their discipline was to participate in a semester or year-long exchange program. While these programs have distinct advantages to provide students with a valuable international experience, there are limitations including significant costs, substantial time commitments that potentially may delay graduation, and foreign language requirements. Additionally, the College of Engineering is selective when accepting transfer credits, especially from schools overseas. Since the summer courses are LSU courses taught by LSU faculty, the course credit is not a problem. Therefore, a study abroad program that was shorter in length, more affordable, and required no second language was explored. A pilot program created as a summer study abroad experience was initiated so that engineering students would have an opportunity to study abroad.<sup>8</sup> The result was E<sup>3</sup>.

E<sup>3</sup> runs for 3 weeks in the summer. This summer there will be 18 students from LSU's College of Engineering traveling to multiple cities in Germany, touring factories and museums, learning about manufacturing and technology. The students enroll in 1 of 2 courses: IE 4785, Manufacturing, Technology and Society or HNRS 2020: Technical Literacy: Contemporary International Communications, Design, and Industrial Processes. Both of these courses were created specifically for the E<sup>3</sup> program.

IE 4785 serves as a technical elective for certain engineering disciplines while HNRS 2020 meets requirements for students to receive course credit in any one of 3 required categories: ENGL 2000, social science, or humanities. In order to meet requirements for all of those credits, objectives from both the Honors College and the English department had to be included in HNRS 2020.

Initially due to budgeting limitations and responsibilities to on-campus entities, the writing instructor for HNRS 2020 remained on campus while the program director, who also was the primary instructor for IE 4785, traveled to Germany with the students from both classes. Parts of the class were taught via the internet. This course content was delivered by the following methods:

1. Virtual class meetings were conducted via Skype, Adobe Connect, or other internet conferencing software.
2. Asynchronous class modules were prepared videos or narrated presentations that served as lecture material. These modules had homeworks associated with them and were proctored by the E<sup>3</sup> Director.

3. Real-time simultaneous chats simulated the work that was generally accomplished in a traditional class setting. These involved specific assignments, which were discussed with the Baton Rouge instructor via Skype as the work was completed during the trip.

This teaching structure immediately introduced new challenges to the course, requiring students to consider issues like communicating across time zones and managing appropriate times to seek feedback.

### **E<sup>3</sup> Assignments**

While the 2 courses taught during E<sup>3</sup> vary with unique objectives and outcomes, there is overlap between the two classes. Both classes are required to participate in the E<sup>3</sup> blog, keep a daily journal, create a group video project, as well as some in-class assignments.

The two faculty members worked together to develop meaningful and challenging assignments that coordinated well with the study abroad schedule and format. Because the students were constantly moving, traveling to different cities, exploring new sites, and experiencing a new culture, the faculty attempted to develop assignments that capitalized on this unique experience. While writing a research paper about public transportation in the U.S. versus Germany is a traditional method for learning, the faculty felt that the students would benefit from using other means to communicate their learning. Creating video requires a student to show and tell the audience about their topic. Multimodal assignments, writing in different genres, and creating videos seemed better able to capture the essence of the experience. These non-traditional assignments were created as a means to challenge the students' thought processes while effectively communicating the experience. Reflection, analysis, and critical thinking were components necessary to complete each assignment.

### **Open-form Essay**

Essays generally come in 2 forms: open- and closed-form essays.<sup>9</sup> Closed-form essays are thesis-driven essays in which there is a conventional format. Examples of these essays include the typical researched arguments that are usually found in any writing course, as well as technical reports, which have their own formal requirements. Open-form essays are very different. Rather than seeking to prove a known and researched thesis, an open form essay usually has a more personal tone. These essays, rather than working from a thesis statement, usually seek to discover a thesis through descriptive, narrative writing. Because of the writing-to-discover-a-thesis approach, open form essays require creativity. Engineering students often are averse to assignments where they are less sure of the path forward.<sup>10</sup> However, the nature of engineering requires creativity, so the hesitation of the students to embrace the assignment was overlooked. Students had to get creative.

For this specific assignment, the open-form essay was meant to be an analysis of a technological artifact pertinent to engineering. Students were asked to engage with their personal experiences with how technology in Germany differs from technology found in the United States. The primary objective for this essay was to undertake writing as a recursive process that develops and transforms thought. In this case, the transformation of thought was meant to be an understanding of human interactions with a technological experience. Rather than focusing on how the technology worked in mechanical terms, it was an experiential lens through which the students could see and feel the effects of the technology. In other words, it was an open form of primary research.

One student described her experiences in the *hauptbahnhof* (train station):

In the station, foreign sounds besides the language engulf me. *Clunk, clunk, clunk, clunk. Screeching. Pitter-patter, tip-tap. Bing, Bing, Bing.* In the train station, the meanderers amble along towing their children, hordes of students fumble with their careening luggage as it teeters behind them, and knowledgeable locals saunter about the station they practically live in. Remnants of sounds that sound French to me mixed with syllables resembling the noise one makes when clearing their throat resonate over the intercom. The fresh scent of warm bread wafting through the air urges my lustrous desire to eat after having skipped breakfast.

This passage indulges in onomatopoeia and sensory description of a busy train platform. However, this sort of writing requires detailed observation of interactions with technology. These passages are close observation of human interactions with engineered artifacts at a level that is rarely emphasized in engineering courses. This diversity of discourse on these topics should provide insights that might directly affect understanding of engineering. It is about putting human-ness back into the design process.

Another wrote about the difficulty of taking a hot shower:

A steamy moment of drenched bliss, followed shortly by the cold dripping depression of a body no longer in control. Perhaps the Stoics have it right; perhaps it is better to ride along the middle path of life, never fully savoring life's sweetness nor blanching at its bitter aftertaste. Such emotions are elicited by this great marvel of German conservation technology. Bathing calls back to an earlier time, an unremembered time, one that marked our debuts: our births. Warm, wet, clean, and safe- all would be apt ways to describe our state of being in both the womb and while taking a bath. Even though we cannot recall this time, it summons forth a primal series of emotion that was imprinted onto us during the process of our manufacture. We segue from the void of sleep into the cruel realities of life with our daily purification ritual and emerge into the day- soaked, shivering, screaming- just as we entered into the world. It comes as no small annoyance that this cycle is forcibly reduced to a mere third of a minute. The legato tranquility of our cool meditation becomes rudely punctuated by the staccato press of this unforgiving tactile input required by an unyielding system. Twenty seconds is mercilessly shorter than nine months. It goes against nature. It is an abomination. An aberration. Vile and unholy. Still, the German people make these kinds of sacrifices daily in an attempt to better care for the environment. It is a conscious choice that fundamentally affects the form of their personal lives and infrastructure. Convenience and comfort are valued less than conservation and efficiency.

This passage mixes philosophical musing and descriptive writing with engineering terminology in unexpected ways. Interpreting bathing as metaphor for birth, and seeing that birth as the "process of our manufacture" combines the thinking of an engineer with the thinking of a philosopher to better understand the decisions Germans make regarding their environment.

These passages examine the human interaction with technology. While it may seem that these topics are purely exercises in creative writing, their point is to address topics usually approached in a disinterested, technical manner in a more experiential way.

These samples, as well as other writing from the course clearly demonstrate creativity and student investment in the writing task. These essays were a challenge for the students since they all reported to the instructor that they had never done this sort of writing in college or in high school. Most of them had never attempted non-technical writing tasks such as descriptive writing. However, they also reported to the instructor that, while writing in this style was difficult and unfamiliar to them, it was enjoyable.

Of course, the instructors didn't simply collect open-form essays and move on. These essays were meant to be considered alongside the argumentative, researched essays written earlier in the program. The instructors' plans were for these essays, both argumentative and creative, to be scaffolding for the video assignment that finished the trip. The approaches, creative and expressive in the open-form essays, and formulaic and thesis-driven in the closed form, were meant to be complementary.

### **E<sup>3</sup> Blog**

Students were required to create an E<sup>3</sup> blog. Most writing in an engineering course has a singular audience: the instructor. However, by publishing in a public forum, the internet, this blog was intended to communicate with friends, family, and the general public about the group's travel and study-abroad experiences. Every student was required to include several daily blog entries, as well as pictures and/or videos to the E<sup>3</sup> blog. The blog was created and maintained exclusively by the students. The introduction of a broader audience increased the stakes for the students, thereby increasing their desire to do a good job in their writing. The writing is informal and follows a generally open form similar to the open-form essay. There were three students assigned special blog tasks:

- Blog manager – This job included setting up the blog, formatting the page, uploading/formatting the blog posts with pictures, and essentially managing the email account with user's responses.
- Photo Manager – This student was in charge of photography and updating the photo gallery tab with pictures after tours. He or she would caption them and manage that tab on the blog page.
- Blog editor – The editor was responsible for reviewing all blog posts and checking them for accuracy and grammatical errors. The students would email their blog entries and pictures to the editor within 24 hours of their assigned date. The editor would review the entry and then forward to the manager who would post the entry.

While the blog is part of the student's grade, with required submissions with deadlines, the students typically enjoy this assignment. The students have added extra tabs (Meet E<sup>3</sup> and Photos) to the blog to provide more pictures and information. These tabs are not required; these students have added them to make the blog more informative for their viewers. The blog is important because it causes the students to pause in the midst of a very busy and demanding schedule and reflect on their experience. Many times, it is in these reflections that the students discover cultural differences. The blogs also allow the students to record important technical data that is observed while on excursions.

Creating a blog for the program met three ABET General Criterion 3: Student Outcomes:

- an ability to function on multidisciplinary teams
- an ability to communicate effectively
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

In addition, it met several of the course objectives.

- Examine current automotive and robotic manufacturing methods used in the United States and Europe.
- Identify current and future trends in manufacturing and technology.
- Analyze the global impact manufacturing and technology has on society and the environment.
- Identify technology-based ethical issues and conflicts.
- Evaluate the impacts of a discipline-specific technology observed abroad.
- Develop appropriate single- or multi-modal documents to communicate those impacts.

The students were encouraged to write about what impressed them the most during a day or on a tour. The instructor did not tell students what to write about other than to write a narrative that allowed the reader to journey with them and understand the experience. The entry below was written by a chemical engineering student after touring a Dow Chemical Plant. The student highlights some characteristics about the company before providing technical details regarding the cracker. The title for the blog entry was appropriately titled “Not a Cracker That Can Be Eaten.”

We started our day bright and early to tour Dow Chemical outside of Leipzig. Getting off the public tram, we were met with luxury in the form of a private bus to Dow. The two women that introduced us to the company excelled as advocates for Dow. Being a female in engineering, I have already noticed the lack of women in my classes so having intelligent high achieving women start our tour impressed me. Dow Chemical has locations all across the globe and is one of the largest chemical companies in the world. Dow is also in the middle of a merger with DuPont another large company based out of the United States. After the merger, DowDupont will split into three separate companies, agriculture, material science, and specialized products to narrow the focus on different chemical productions.

The Central Germany locations are spread out over four sites with the largest private pipe system in Germany. The site we visited had a cracker right outside the building we congregated in for introductions. A cracker is used to “crack” the molecules in some of their main base materials to branch off the different chemicals into groups for production of final products including ethylene, propylene, styrene, etc. The Central Germany location works with both chlorine and ethanol chemistries in their process which is unique to only three Dow locations in the world, surprisingly Plaquemine being one of the other locations. Taking a bus around the facility and being able to see the towering plants/units and plethora of pipes was so much better than being able to see a site from afar, as I cross the Mississippi river from Baton Rouge to Plaquemine. The air

conditioning was also better in the bus than in my car back in the US so that was also great.

Going into the tour of Dow Chemical I thought the company was interesting enough; but after going on this tour I now know the company is incredible. As a student studying chemical engineering, I knew a little about the company but I learned much more from the few hours we were on site. A word that came up when we were introduced to the company was “global” and that describes the company exceedingly well. On my flight from Baton Rouge, I managed to sit next to a chemical engineer and I distinctly remember explaining to him how I wanted to work for a larger company. Dow Chemical is that company. Dow is huge and is even merging with DuPont bringing in more locations across the globe. Travelling is one of my passions so being able to work internationally would be incredible. Coming out of the Dow tour, I had already convinced myself I needed to learn German if not for Dow then for another job in the future.

Below is an excerpt from an entry “All Revved Up.” This is a Mechanical Engineering student who was fascinated by the BMW plant. After touring the factory he highlights some of the process that he observed.

We then met up with our guide who then took us across the street to see the process of how a BMW is built. The very beginning of the BMW process starts in the press shop, where all of the body panels are molded from flat sheet metal. These molds are so precise that if even one strand of hair fall into it, there could be problems later down the road with production of the car. The fabricated panels are then assembled to make the bodies, which are next painted to create the bright, beautiful finish on the cars. The paint process was one we all seemed to find interesting because of two main highlights. BMW uses electromagnetic attraction to ensure that their paint sticks to the cars. The oppositely charged paint and car are joined together by a rod that creates a magnetic field around the surface area of the paint being sprayed. There is also water flowing underneath the process that catches excess paint. The broken down paint is filtered out and used in the BMW floor mats, while the water is recycled back into the process. After the paint process the interior is installed into the bodies and then the powertrain is mated with the bodies in what BMW calls the wedding. To complete the assembly, final trim pieces are added along with wheels and fuel. Seeing this process was so exciting and educational, and I think everyone wants a job at BMW now! Our tour ended so we hopped back on the *U-bahn* train to head back to our hostel.

In both of these blog entries, the students are providing a narrative allowing the public audience to follow along on the tours and excursions. Pictures are included so that the viewer gets a glimpse at the surroundings. A survey that was completed after the program allowed students to provide feedback about the course and assignments. One question asked, “What E<sup>3</sup> assignment had the greatest impact on your mastery of course content? One student responded, “ Blogging made me think the most critically about my experience.” Another student stated, “I think the E<sup>3</sup> blog had the most impact because it allowed us to recap and rethink what was learned each day. It also allows us to go back and remember each part of our trip.”

The blog entries listed above can be found on the group website at <http://2016lsue3.wixsite.com/geaux>.

### **Journals**

Students were required to keep a daily journal recording events and notes. The journals were taken on tours to write about daily life. In contrast to the blog, which was used for a public audience, the journals were private. Students were not expected or required to share their entries. Journals provided an easy method to document data, reflect on activities, or record personal thoughts. The journals were only spot-checked; grading was based on completeness, not for content. This provided yet another audience for the students: themselves.

### **Stand-alone Videos**

Studying global communications was a central part of this course, so the ability to create a stand-alone presentation was required to meet these objectives. As global communications become more ubiquitous, the need to communicate across time zones has increased. In order to help students become more comfortable with using multiple technologies to create video files, students were asked to create stand-alone presentations in video format.

Students worked in teams of 4 to create a 4-7 minute video illustrating aspects of German culture and how that culture differs from US culture. (Because it was too obvious, food was *verboten* as a topic.)

These were posted to YouTube and made available to the entire E<sup>3</sup> program, as well as the Baton Rouge instructor. The audience for these videos was primarily future E<sup>3</sup> students; however, students understood that the videos would likely be viewed by others, including friends, family members, and LSU administration.

Among the objectives met by this assignment are the following:

- Use technology effectively for presentations (software for video creation, presentation, internet conferencing, etc.) and for research and documentation.
- Communicate effectively, combining written, spoken, visual, and technological modes into appropriate multi-modal artifacts, carefully considering a variety of purposes, different audiences in various contexts, and appropriate formats and technologies.

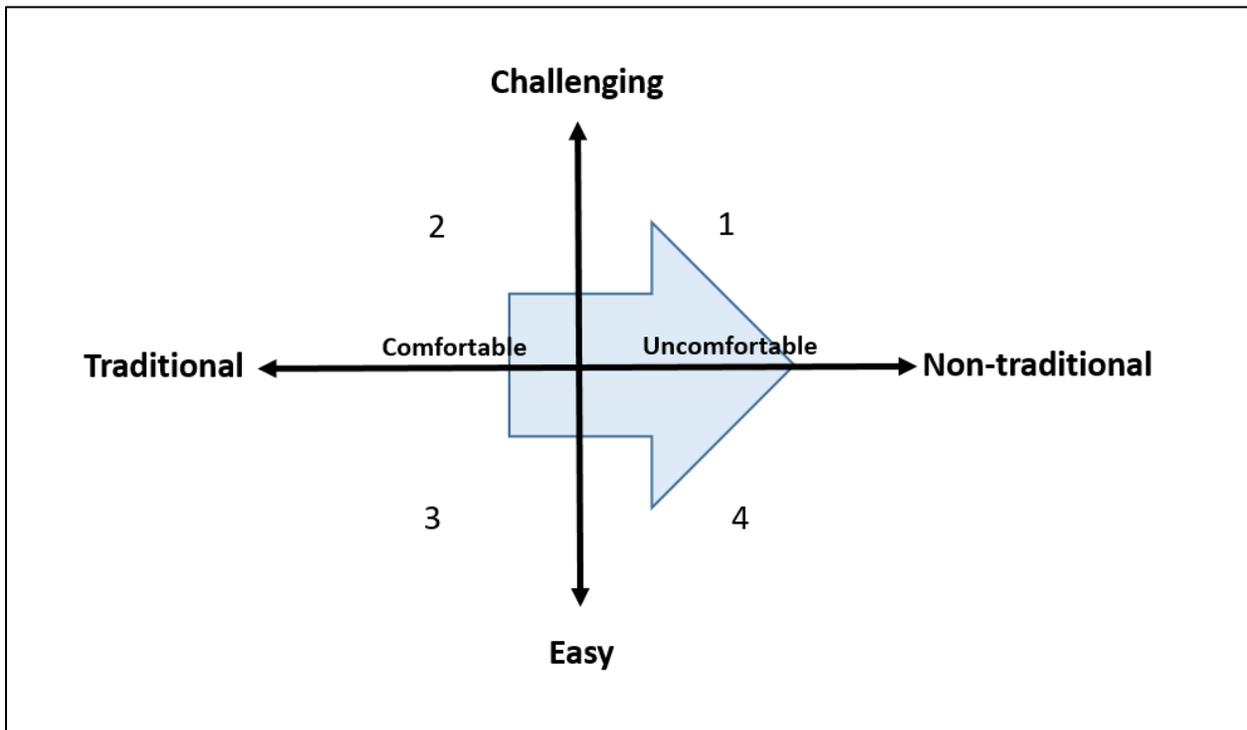
### **The Learning Zones**

To help visualize learning from the student perspective, Figure 1 shows four distinct learning zones: Zone 1, Zone 2, Zone 3, and Zone 4. These zones are created by dividing traditional and non-traditional assignments, as well as challenging and easy assignments.

Non-traditional assignments will often cause students to be uncomfortable. Because they are treading in unfamiliar territory, they are sometimes lost and not sure where to begin. They are not at ease. Traditional assignments, while challenging, are familiar and comfortable. The comfort provides almost an auto-pilot approach. Most engineering assignments and projects typically fall somewhere in Zone 2. The projects and assignments that were part of the E<sup>3</sup> were distributed among Zones 1 and 2. Some of the warm-up exercises included in the pre-trip

meetings and the journal entries were part of Zone 4. The instructors intentionally avoided Zone 3.

The shaded arrow in Figure 1 illustrates the shift being proposed with the new assignments. Instructors can start wherever they are on the chart and gradually move some of their assignments in this new direction with the emphasis on creative, non-traditional assignments that will cause students to slow down and think critically and creatively about the topic. This will challenge both the instructor to create the assignment and the students who are unfamiliar with this type of assignment. Instructors do not need to make drastic changes and push all work into Zone 1. The arrow below shows that moving to the right, even a small amount, will be beneficial.



**Figure 1: The Learning Zones**

Table 1 presents examples of assignments that might exist within these zones. (Not all of these assignments were part of E<sup>3</sup>, but they illustrate the characteristics of the zones.)

**Table 1: Learning Zone Assignment Examples and Perspectives**

<b>ZONE</b>	<b>STUDENT PERSPECTIVE</b>	<b>TEACHER PERSPECTIVE</b>	<b>ASSIGNMENTS</b>
<b>1</b>	Work in unfamiliar areas Ask questions Use new technology Engage mentally Collaborate Must slow down Think intently	Create new assignments Take Risks Concern of failing Takes more time Requires extra explanation Learn new technology Challenges the teacher Use creativity	Blog Open-form essay Stand-Alone videos
<b>2</b>	Solve Familiar problems Work on Auto-pilot Work independently	Cover large quantities of material Minimizes involvement Efficient	Research papers Lab reports Experiments PowerPoint presentations Oral presentations
<b>3</b>	Boring Waste of time Easy	Routine format and structure Easy to grade Fast to create	Textbook problems
<b>4</b>	Engaging Allows class interactions Work in groups Meet others in class	Takes time to create Use for warm-up exercises Helps students get involved	Journal Entries Warm-ups

### **Assessment Survey**

An online survey was sent to all participants of E<sup>3</sup> from 2014-2016 (n=39). This survey was designed to gather student perspectives about the program. Thirty-two of these students completed the survey, which is a high response rate of 82%. Five of the students graduated and are no longer attending the university, so it was unexpected and quite pleasing to get this many responses.

The survey consisted of six Likert-type questions and four open-ended questions. Respondents were given the choices for each question: strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree. The responses to the Likert scale questions are summarized in Table 2 below.

**Table 2: Student Perspectives of the E<sup>3</sup> Program**

Question	% Agree (Strongly Agree)
1. The E <sup>3</sup> assignments were new and different from my other class assignments in engineering.	84% (69%)
2. The E <sup>3</sup> assignments made me think differently about traditional engineering topics.	94% (56%)
3. I learned new concepts through E <sup>3</sup> assignments.	97% (69%)
4. Creating non-traditional artifacts was more challenging for me than traditional work.	72% (13%)
5. I will use new modes of communication in my future assignments and projects.	91% (50%)
6. Blogging about a company tour was an effective assignment to cause me to reflect on my experience.	93% (70%)

Based on this feedback, the experiences abroad and the assignments associated with them seem to have been successful in teaching students new concepts and new ways to think about engineering topics in general. Only one respondent disagreed with the statement that the work was more challenging; there were 8 who were neutral. Along with learning new concepts, only one student indicated that he or she does not plan to use new modes of communication in future projects. The vast majority of students also saw the value in blogging in order to properly reflect about their experiences.

Most of the respondents answered all of the open-ended questions (n=23, 72%). The first question asked participants how the E<sup>3</sup> program changed their perceptions of global issues. Over half of the responses indicated that they have a broader understanding of different cultures and that they were exposed to diverse perspectives; this was the first experience in a foreign country for many of these students. Other comments indicated that students learned that different cultures have similar values and problems (i.e. they better understand how global issues affect everyone), that Germany is more efficient and has a greater emphasis on sustainability, and that there are differences in industry and technologies in Europe.

When specifically asked about what they learned about communications, students had a wide variety of responses. Almost half of them talked about how difficult communication is in a different culture and that it takes effort to focus on body language and tone. The students were surprised that most Germans they met had strong English language skills and realized the importance of learning more than one language.

The E<sup>3</sup> program also asked students to complete atypical assignments, and they were polled on how this affected their understanding of engineering topics. All students who answered this question (n=27) reported learning gains. They either broadened their knowledge by focusing more on application of theories, they were pushed to think deeper and/or differently, or they had to learn the topics more thoroughly since they had to communicate via presentations and writing assignments. One student reported that,

“It forced me to pay extra attention to detail and be fully attentive on factory tours and other excursions because you never know what would end up being useful later. I had not had any engineering classes before E<sup>3</sup>, but I still find myself using the knowledge and experience I gained from E<sup>3</sup> in my classes today, two years later.”

Another student responded,

“It required me to think differently about topics which I usually only see as numbers and free body diagrams. E<sup>3</sup> assignments brought a more “human” point of view to engineering topics.”

Lastly, students were asked which assignment or mode of communication had the greatest impact on their mastery of course content. There weren't one, two, or even three top assignments selected by the participants; the 23 students who answered this question chose 10 different things as being most helpful. From writing an in-depth research paper and blogging to creating a movie and working on a final collaborative project, it is clear that the wide variety of assignments were beneficial to different students in different ways. A few students mentioned that they are still putting to use certain skills they developed in their other courses.

### **Instructor Attitudes**

One effect of introducing unfamiliar assignments to students was the fact that students became quite invested in the completion of their assignments. Most of the students had never been asked to create videos for anything other than entertainment. Similarly, the writing styles were new, as well. While the immediate response to the assignments was often resistance from the students, once they began to immerse themselves in the assignments, they seemed to embrace them. The instructors also found a renewed sense of purpose in the assignments. It was rewarding to see students engaged and challenged.

Different styles of writing did seem to trigger different thinking. One example was that by writing a personal narrative of interacting with German technologies, students saw another side of technology: the human side. This raised ethical questions, such as a student who learned that auto manufacturers design safety features for people who fit within an average range of height and weight. This student's brother was tall, outside of the range used in safety planning. Learning that her brother's safety was not a primary consideration in car design upset the student. This started a discussion about safety considerations and the limitations of engineering to deal with such issues.

### **Future Assignments**

We will continue to find ways to pair traditional assignments with innovative ones. We will expand the breadth of assignments we offer abroad to reach a larger audience through different media as a tool for professional communication. We will continue to adapt our assignments to meet and use emerging technologies. We will also continue to gather feedback on student perceptions of the effectiveness of the assignments, as well as other aspects of the course, like the excursions and the internet-based content delivery.

### **Lessons Learned**

This program is relatively new, existing in its current state for only 3 summers. The program evolves as the instructors adjust to ever-changing realities of a study-abroad endeavor. At this

point, it would be premature to cite trends based on our preliminary data; however, 3 years' experience have provided the instructors with some lessons learned.

- Research for assignments should be conducted before departing the country due to inconsistent internet availability. It may also be wise to conduct research before students leave campus so that students can make use of campus-based resources.
- Engaging in research before arriving overseas primes students for the experiences of cultural immersion. Having completed research papers allows students to have a less analytical, more experiential mindset as they encounter new things overseas.
- Local copies of asynchronous learning modules should be prepared ahead of time so that students are not dependent on internet connections to receive course content. Saving multiple copies of these modules allows student access whenever needed, as many times as needed. Multiple copies also keep content safe from problems that can occur, such as corrupted files, compatibility issues, and other technical glitches that can arise without warning.
- Internet conferences should be conducted before leaving the country so that students can become comfortable with communicating with their instructors via internet conferencing software. Contacts should be made and confirmed beforehand.
- Video messages from students to instructors were a more effective way for students to ask questions of the instructor in Baton Rouge than email because verbal communication cues, such as facial expressions and voice inflections were present. Video messages can be sent without regard to differences in time zones, and can be answered whenever convenient.
- Requiring multi-modal content for the blog develops student familiarity with AV equipment, as well as helps students capture and communicate their experiences more completely. While creating images with words is a wonderful skillset to develop, and one that is employed throughout the course, showing visual images allows the experiences to be shared more thoroughly.
- Encouraging the use of video throughout the trip prepares the students for the process of composing and editing with video, which was required for the final project.
- Great care must be taken to ensure that the courses run concurrently and in synchronicity. If one group of students is working on major assignments while the other has down-time, the work of the busier group will often suffer. However, when the groups' workload waxes and wanes concurrently, the students build camaraderie and maintain more positive attitudes. They become a community unto themselves.

- Instructors must remember that the students may contend with issues of homesickness and separation. These are young people who have varying experiences with overseas travel, and many of them are still developing their senses of independence.

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