Acopian Art

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Introduction

Currently, there are a lot of issues surrounding the engineering culture regarding its rigidity, exclusiveness, and dissonance between end users of engineered systems and the engineers themselves. For this project, we are focusing on the ways that these issues and the Acopian Engineering Center specifically impact the engineering culture at Lafayette. The goal of this project is to address the cultural of engineering education by introducing art into Acopian. Using art to promote changes in environment and culture is a common trend. Our work can fit within the larger context of creative placemaking, which focuses on the benefits of "partners from public, private, non-profit, and community sectors strategically [shaping] the physical and social character of a [place] around arts and cultural activities. Creative placemaking animates public and private spaces, rejuvenates structures, […] and brings diverse people together to celebrate, inspire, and be inspired," (Markusen and Gadwa, 2010, p. 3). In our case, we hope to use art to shift towards a more inclusive and interdisciplinary environment. To accomplish this, we interviewed a wide range of community members about their impressions of the culture, the aesthetics of Acopian, and their interests in our design, which we will discuss in further detail in our political context/methodology section.

The Acopian Engineering Center is the hub to the four engineering disciplines and computer science; therefore, a majority of these students spend the bulk of their time either in classes or studying here throughout the day. It is the only academic building that is accessible 24 hours to these students, as well. Despite its popularity for studying and working on group projects, it is still viewed as one of the most "dreadful" and

"miserable" buildings according to a recently conducted survey composed of Lafayette engineering students.

To the students that were surveyed, compared to other academic buildings on campus, Acopian lacks open spaces, welcoming features, natural lighting, windows, and rooms for collaboration. The lack of these aspects pose a problem for Lafayette students. Scott Hummel stated that, "The Acopian Engineering Center was built for functionality, not to be the most aesthetically pleasing building on this campus" (as cited in Blake, Hansen-Kemp & Millar, 2017). Acopian was built with the purpose of providing students with an academic space to do work instead of figuring out a way to create the best environment possible for its students' success. Due to this, students are forced to try to maneuver not only through the already rigid and exclusive engineering discipline but also, the dullness that Acopian presents.

We aim to implement an art installation on the exterior wall of Acopian (facing Markle Hall) that will encourage collaboration, inclusivity, and interdisciplinary study within its walls. Our first step towards generating a design was to take the temperature of our community and find out what basic elements might be important to them. Students have made clear that light and open space are two of the most important factors that they consider when looking for a study space (Student 3, 2018). Understanding that we do not have the resources to alter the structure of Acopian, our challenge was to explore ways in which we could achieve an environment similar to that of Skillman Library or Oechsle Center for Global Education by enhancing the built environment with art. For example,

our Engineering/Art student panel made two suggestions: using plants (Student 1, 2018) and using color (Student 2, 2018).

After speaking with engineering, art, and psychology students and professors, we have generated three design alternatives. The first is a mural with a "cutaway" design. In other words, painted on the wall will be images of the interior of the building, as if we have torn away the brick and are looking directly into Acopian. However, what is being depicted inside will be unconventional. For example, there will be a classroom full of plants; there may be a classroom of students doing yoga, making art, or cooking; there will be a classroom of students operating advanced robots. Eli Cooper, a senior Mechanical Engineering and Studio Art double major, suggested depicting actual student or professor projects, which would be a great way to incorporate the achievements of our Engineering Department into the work. Other elements that we have been prompted to consider include using moving parts or using glow in the dark paint so that the image transforms at night when many engineering students are still in Acopian working (Student 1, 2018).

The second design alternative also uses painted panels, but not in the form of a mural. This design involves cutting and painting smaller panels, and then backlighting them with colored light. This will provide an even greater effect at night, which is, again, when engineers and other students continue to study in Acopian. The final design alternative also uses light, but rather than having any paintings, incorporates plants as a sculptural element. This alternative could also have some continuity with an interior

installation by implementing colored light and a vertical garden into a room inside Acopian.

Our group considered several constraints during the process of creating a solution to the engineering culture at Lafayette through the application of art. From a physical standpoint we cannot alter the structure of Acopian. Proposals of that scale include planning, labor, materials, and time but a goal for our project includes restricting unnecessary costs and a reasonable completion schedule. So, our group initially was limited to working on the facade of Acopian and using the exterior as our canvas. This presented another challenge regarding the many small windows spanning across the wall. The windows must be incorporated into the design since they cannot be removed because our group wants to keep as much natural light accessible to the users of the building. The next set of challenges involved the features of our art piece. First, we wanted to create a piece of art that begins to let the community members on campus view Acopian as part of the interdisciplinary culture that Lafayette college presents. However, keeping the professional features inherent to Engineering are also important. The curriculum of engineering is taxing and graduation in this field is difficult. The hard effort and time students devote to engineering at Lafayette usually results in some form of post-graduation advancement. Ensuring the student's hard work is displayed appropriately and represents the determination required for the major is important. This does not mean engineering cannot be fun. The art should allow exploration of various activities with the technical and creative mindset that Acopian could provide. The other constraint regarding components of our art piece is the need to update or change our

mural as time moves on. The interests surrounding our current time period and students might not be the same 50 years from now. A piece of art that relates to multiple generations is important for the significance of our piece to continue in the future. So, deciding between updating the art or using one idea that also connects to future generations was a challenge. The last constraint involved the community. All of the end users like the students, professors, administrators, or even prospective students and families should be incorporated into our design and application process. Our solution uses art as a medium to begin the conversation surrounding the culture of engineering at Lafayette. If the art piece does not resonate with the intended audience, the meaning is lost from the beginning.

These challenges create an exciting opportunity to better the quality of Acopian and lives of students. One of the major ways in which we have strived to tackle these challenges is through the use of stakeholder panels. By using a set of questions geared towards learning opinion, suggestion, and concern of various students and professors across many disciplines, we isolate recurring concerns and discover new ones that, perhaps, stakeholders did not realize were shared problems.

Using interviews, we discovered a sentiment shared by many alumni that has bearing on Acopian's stress issue. According to these alumni, they were cognizant of the high stress and anxiety levels within Acopian, especially the levels of students in the building late at night and early in the morning before classes. They, however, did not view this as a problem. To them and their experience over four years, the stress and anxiety were indelible constants of Acopian's engineering and computer science

education; the emotions were to the building as peanut butter is to jelly, expected to fall hand in hand with the other more often than not. These stress and anxiety levels are in no way a definite part of the education, and through diligence and effort can be affected to improve.

On the technical end, there is concern, for instance, of how the mural will age. This is meant in the same way that a mural painted in the 1970's will seem out of date in the 21st century; the styles of clothing, art, technology represented by the mural will be representative of the time painted, but will not translate into the future. Our panel boards mounted on top of the exterior brick acts as a solution to this challenge. With them, we have the ability to change the mural over time. Panels can be removed, repainted or replaced to create new images to better reflect the needs and sentiments of the time.

The purpose of this report is twofold: first, we wish to communicate the information that we have uncovered in our extensive interview process. Second, we will flesh out the three design alternatives that we have generated from those interviews. As we have begun to explain, all designs fulfill some desires from stakeholders but also have unique sets of challenges. Our goal is to thoroughly outline the advantages and disadvantages of each in the hopes that we lay a strong foundation for this project to be carried on. With additional resources and time, we believe an alternative can be chosen and seen through to implementation.

Social Context

As written in the introduction section of our project, engineering is seen as a very exclusive and rigid field; therefore, our proposed solution is utilizing art as a medium to

help alleviate this. The first section of our discussion focuses on the subsets of an overall social context for this problem through three lenses: educational, psychological, and cultural. We seek to improved the lives of students and staff inside Acopian Engineering Center, to foster true interdisciplinary action, and change a culture surrounding Lafayette Engineering that is not healthy to those inside or outside. To this end, we consider how our project options/proposals affect the people working inside Acopian Engineering Center, the people outside of the center looking in, and the campus overall. To better analyze these effects, we use the educational context, psychological context and cultural context that provide the foundations for this work.

Educational Context

The educational context giving shape to this project encompasses the effects art has upon learning. This includes factors such as coursework, ambiance, and integration into classroom and learning space. As the building stands, Acopian is similar in design to multiple other buildings on campus, a product of a time and style that gave the campus its signature brick look. Hugel, Acopian, Kunkle, and Watson all share a similar design pattern, and as such the four buildings in and around Anderson Courtyard blend together into one long stretch of academic space.

Our study included a series of facilitated discussions and surveys with current students and professors in engineering, art, and psychology, which we discuss at greater length below. In total we interviewed thirteen students and two professors. During a group interview, three engineering and art double major students, referred to as Student 1, Student 2, and Student 3 pointed out the viability and enjoyment of spaces such as

Acopian and Kunkle for studying and learning versus newer spaces. . To them, Acopian and Kunkle, as well as similar buildings, had limited spaces where there was a significant openness towards the outside world. Speaking specifically of Acopian, Student 1 had this to say: “I'm going to say something very cliche. But more windows. I really don't like the bottom floors. At least floor two there's tiny little windows at the top of the thing and you're like, "oh I can maybe see someone's feet" but that's about it.”

Student 1 made another valid point, one echoed by his associates during that interview. When asked about Lafayette’s engineering culture and how it might be changed, Student 1 made reference to his feelings regarding the “hands-on” aspect of engineering and art curriculums. He said the following:

> I also feel like in art there's a lot more forced hands on experience. So in engineering you can get that hands on experience by yourself if you like talk to professors and you're like, "hey I want to do research" or like go to the ASB meetings but it's not like automatic; you have to seek it out. Versus art classes, like, you have to take materials and methods; you have to take a drawing class or something. Like there's ME 210 but that's it; it doesn't go anywhere from there. There's not as much forced hands on experience.

In recent years, there has been a significant push towards changing education curriculums of STEM (Science Technology Engineering and Mathematics) to include an integrated focus on the arts. In her discussion of the rising trend of STEAM education, Michelle H. Land argues a number of reasons why art has a critical place among the rest of STEM. One of her major points focuses on how students learn. In the wake of the No Child Left Behind Act, Land argues, teachers taught to the curriculum, instilling right and wrong answers without a critical emphasis on problem solving, creative solutions, or complex and roundabout thinking (Land, 2013). Early teaching of this “right/wrong”

mentality rears its head within Acopian. As much of students' early engineering education revolves around definitive problems and equations, the mentality is perpetuated. Student 1's point regarding ME 210 being the sole early hands on course has clout here; it is there students begin to grasp creative thinking to problems, where no one solution is absolute.

Multiple authors and researchers echo these sentiments. Jessica Lahey wrote of her father's teachings, instilling the lessons that creativity and know-how must work in tandem to create, for The Atlantic in 2014 (Lahey, 2014). California science teacher Christine Mytko adopted "Maker Mondays" with her students, encouraging artistic creativity applied to problem solving and class science activities. On her website, Mytko also posted articles and presentations discussing the addition of more current and hands on technologies to better link the arts and the sciences (Mytko, 2014). Better integration of arts and interdisciplinary space into Acopian alleviates pressure on students and educators to perform and find the "right solution." Exterior art adorning Acopian is the first step of many to tackling this problem. In our primary design, a mural painted on segmented panels, there are engineering and construction questions students could analyze for education purposes. The art provides an opening to which conversation and discussion can start. It brings the arts and interdisciplinary action into the classroom in such a way that has been lacking in Acopian, to the detriment of those inside.

Psychological Context

The psychological context surrounding this project mainly addresses the perception that engineering is a discipline that is rigid, exclusive, and strict. In addition to

engineering already having these perceptions, The Acopian Engineering Center physically reflects these downfalls through its aesthetics and physical layout or structure of the building. In other words, the perception of engineering as a rigid and exclusive fields has not changed and we believe that the aesthetics of Acopian plays a role by reinforcing this rigidity and exclusivity through its dullness or darkness and shortage of communal spaces. Currently, Acopian does not serve as a building that promotes the colleges mission of being interdisciplinary and collaborative. “Clear links have been drawn between poor quality school buildings and classrooms and poor outcomes for learners” (Hall et al., 2007). It does not have many aspects of the building that promotes self care, stress relief, or the welcoming of non-engineering Lafayette students. Therefore, we are interested in trying to find a way to change this using art as a medium.

According to Scott Hummel, “Acopian Engineering Center was built for functionality, not to be the most aesthetically pleasing building on this campus” (Blake, Hansen-Kemp, & Millar, 2017). Therefore, it is probable that many key features of a building that help it serve as a positive learning environment were not a priority when this building was designed. Some vital components of a positive learning environment include greenery, windows, noise, ventilation, lighting, and open space. However, for this project, we will mainly focus on greenery, windows, lighting, and open spaces, since noise and ventilation are two aspects that would be difficult to enhance through an art medium.

Enhancing these aspects can be vital to creating a positive learning environment (Higgins et al.). From our student panelists, the engineering students collectively came up

with a variety of different key flaws that they believe either inhibit their learning, make them not want to do work in Acopian, or just make it seem more dreadful in Acopian. First, lighting affects mood and attitude which can also affect and influence how a person performs (Hall et al., 2009). These students believed that poor, dull lighting and a lack of natural lighting were two aspects that they would like to see improved or changed (Students 6, Student 7, Student 8, & Student 9, 2018). For example, a civil engineering student stated that, "The buildings on campus that seem most inviting to me have lots of windows/ natural lighting and many open spaces. Most of the spaces are very closed off or only have windows that are awkwardly out to the hallway instead of outside." (Student 6, 2018). Having students observe these flaws and see that it creates a more unwelcoming environment compared to other spaces on campus can create a disconnection between the ability to do their work and the effectiveness of their work.

Lastly, in Acopian, there is a lack of windows and furthermore, the view from the few windows that the building does have is not an interesting one nor does it show a lot of greenery. Unfortunately, the lack of windows directly equates with a lack of natural light being allowed to enter into the classrooms. For example, there is a huge glass staircase in the rear facing side of Acopian, yet this glass staircase provides a view to a parking lot. In addition, a student panelist complained that some of the windows in the labs are facing the internal parts of Acopian; therefore, it displays the hallway or another room (Student 6, 2018). According to student panelists, natural sunlight is an aspect of a studying area that they all collectively feel is something that they look for when trying to find a study space (Student 6, Student 7, & Student 8, 2018). In addition to not providing

natural lighting, the absence of windows also prevents students from having a view of greenery, flowers, nature, and the Anderson Courtyard. Leather et al. (1998) concluded that having a window view that displayed natural, rural elements led to its participants reporting that their emotional stress levels decreased and therefore, they reported having less of a desire to quit their jobs. Similarly to this study, Wells (2000) concluded that her participants had higher cognitive functioning when they had nature in the direct view from their windows. These two studies show the positive effect that nature can have on a person when trying to accomplish cognitive or stress-inducing tasks; therefore, mimicking or creating the accessibility to these aspects can be ideal and beneficial for a student's mental health and educational potential.

In addition to lighting, student panelists believed that the color scheme of Acopian was not a positive one. Collectively, the panelists described Acopian as being "dull", "dark", "bland", "dreadful", and having a "lack of color." Additionally, they believed that adding some colorful, form of art to either the interior or exterior of the building would improve their mood while studying in Acopian. *The Effects of Color on the Moods of College Students*, analyzed responses from 499 college students regarding the color schemes of buildings, their favorite colors, demographics and more. The following two pie charts are two of the graphical displays resulting from this study. They are adjacent to each other to be able to see the differences between how many students disliked gray and brown versus how many chose the two as one of their favorite colors. This difference is visible by comparing the slice on the left with the slice on the right. The chart on the left is a graphical representation of the respondent's least favorite colors

and the chart on the right is a graphical representation of the respondent's favorite colors, as shown below:

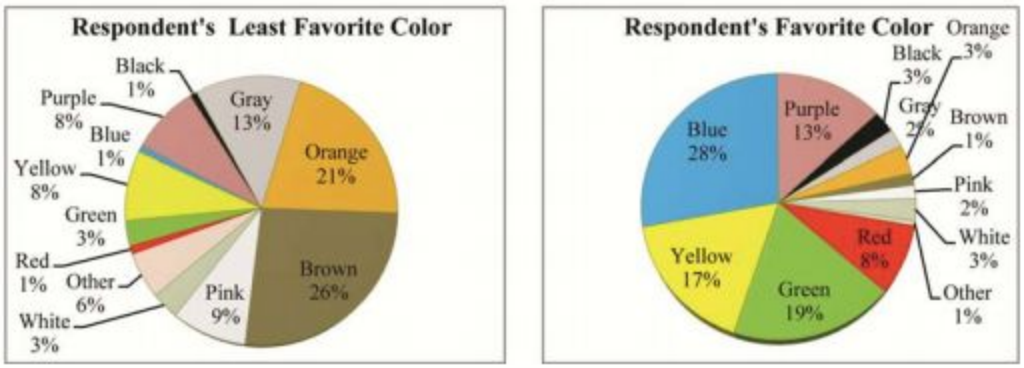

Figure 1: Statistical information about respondents (Kurt and Osueke, 2014)

From this study, 26%, or about 130 students, listed brown as their least favorite color; whereas, only 1%, or about 5 students, listed it as their favorite color. In addition, 13%, or about 65 students listed gray as their least favorite color; whereas, only 2%, or about 10 students, listed it as their favorite color. In other words, brown and gray are two colors that are seen as the least favorite to a total of 39% of students that participated in this study. Unfortunately, Acopian's classrooms consists of a lot of gray and brown color schemes with the obvious overlooking of their white walls, a seemingly neutral color that people neither did not like nor favoritized. This study concluded that "The need to know the effects of colors on moods of individuals is very essential for architects. In most cases, the use of appropriate and/or correct colors would increase the functionality of that space." (Kurt & Osueke, 2014, p. 11). Therefore, adding appropriate color to Acopian would have an effect on the mood of students in those spaces and their efficiency.

For example, compare the differences between a computer lab from Skillman Library, pictured left, versus one from Acopian, pictured right. The lights are brighter.

Although it is difficult to see here, there are three larger tables in the middle for people to do work or sit together. Also, there are four brightly colored paintings that are on the anterior wall of the room; where as, the walls of this computer lab in Acopian are strictly white.

Figure 2: Skillman Library (Lafayette College "Skillman Library," 2010)

Figure 3: Acopian Engineering Center Computer Lab (Lafayette College "Acopian Engineering Center," 2018)

Even though lighting and color are just two of many things that students believed should be changed about the environment and atmosphere of Acopian, they were the two that more students seemed to notice from conducting our panels and doing outside research. We believe that the lack of these two things combined takes a significant toll on

students psychologically, mentally, and emotionally. Despite this, these two can be easily incorporated in an art piece on the external wall of Acopian.

Cultural Context

Lafayette College prides itself in being one of the few liberal arts college with a very strong engineering program. It is a factor of Lafayette that sets it apart from many other colleges. This unique feature allows Lafayette to promote collaboration between students and faculty and broadcast how interdisciplinary the school is. Lafayette's mission statement says, "[Lafayette] will continue to work toward greater integration of A.B. and B.S. programs so that all students may be the beneficiaries not only of specialized inquiry but of connected, interdisciplinary inquiry as well"; however, this is not always the case as seen when analyzing the culture surrounding engineering at Lafayette. For example, Figure 2 below, shows an image of a group of students congregating to do work without any comfortable places to sit or do their work except tables.

Figure 4: Students congregating to do work. Taken by an engineering student (2017).

Currently, the lay out of Acopian's main lecture classrooms are very similar to engineering classrooms from the mid 1900s. For example, Figure 5 on the left is a picture taken from one of The Pennsylvania State University's mechanical engineering classrooms; whereas, the Figure 6 on the right displays what a typical Acopian lecture classroom looks like today.

Figure 5: Mechanical Engineering at the Pennsylvania State University (The Pennsylvania State University, 2018)

Figure 6: Acopian Engineering Center Classroom (Lafayette College "Acopian Engineering Center," 2018)

Unfortunately, these two classrooms are very similar yet one major difference is that Figure 4 is from a time where engineering was a field even more exclusive than it is today due to more people having the ability to receive a higher education. If our classrooms still mimic those of that time, what aspects of them are expected to contribute to the college's goal, as stated in its Innovation News Website, of having "transformational ideas comes from our classrooms, labs, art and music studios, and

alumni community" if the classrooms themselves do not represent values of inclusion and innovation.

To gain a greater understanding of how non-Engineering Studies students feel about the culture surrounding engineering on campus, we conducted student panels. The panelists consisted of students from a variety of different majors outside of engineering as well as all four engineering disciplines. The panelists ranged from freshmen to seniors, as well.

Collectively, students described engineering as an elite and prestigious field that has a very good reputation externally; however, there is a lot of stress and difficulties associated with engineering. A civil engineering student stated that,

> The engineering culture at Lafayette seems to be one where engineers take pride in their engineering degree and in the prestige of our engineering program. Another, less healthy, aspect of the culture is that all the engineers seem to be trying to act like they have the hardest life. Everybody is comparing their workload, exam difficulty, and how many hours a week they spend in Acopian to try to make it seem like they have to work the hardest in their major.

This citation suggests that there is a sense of competitiveness within engineering culture that might serve as an unhealthy disadvantage to engineering students.

In addition, a chemical engineering student stated that "the engineering culture is very unified, perhaps even to the extent of not including other majors" (Student 8, 2018). Unfortunately this belief of exclusiveness and unwelcoming attitudes towards non-engineers is also recognized by non-engineers as well. Two non-engineering students stated that they believed that being in Acopian is "intimidating" or that they feel that the "there is a school attitude that [favors] engineers"(Student 11, Student 12 & Student 13, 2018). In other words, they feel that they do not belong and should not work in Acopian

despite it being the only academic building that is opened 24/7. To go along with these feelings, engineering students believed that having a more inviting Acopian would definitely create a more positive environment.

The culture surrounding Acopian can eventually take a huge toll on its students because the amount of long hours per week engineers spend in there. On average, upperclassmen engineering students stated that they do work in Acopian for over 20 hours a week at times. In addition to the long hours spent here, as previously stated, Acopian is the only building available to students, specifically engineering students, 24/7. Therefore, not only do students have to deal with the rigidity, exclusiveness, and strictness of the discipline on a daily basis but they also have to combat against the tiredness and fatigue that they encounter while being in this building for longer and later hours of the day.

The subsections of the social context: educational, psychological, and culture, that we described above are important to understand in order to recognize why implementing an art piece(s) to Acopian can have an effect on the Lafayette community. In other words, the social context was a way to understand why it is a problem that engineering is seen as a rigid and exclusive field.

Political Context

In this section we discuss the political contexts relevant to our project. We want to achieve our goal of making Acopian more inviting to non-engineers and of making Acopian a better learning environment for engineers. To do this, we must consider all those who could be affected by the implementation of our designs. We begin with a

discussion of our methodology. Next, we orient you to our stakeholders. These are community members who feel affected by the engineering culture in some way or who possess knowledge that is relevant to our work. We explain the ways that we have used our stakeholders to carry our design forward. Finally, we address decision makers and the political feasibility of our project.

Methodology: Community-engaged Design

In this project, we wanted our community members to be the driving force behind our design process. There are numerous groups who are knowledgeable about our topic, which we will discuss further in this section. Our goal of creating a more inclusive and interdisciplinary environment in Acopian and the Lafayette engineering department is not an easy task. However, those who have identified our engineering culture as a problem or who have a stake in our community (within engineering, Lafayette College, and beyond) are most equipped to address it. For that reason, we have taken a community-engaged design approach.

This design practice is generally centered on racial, class, and gender inequity in the design process. Community-engaged design looks to decrease "the inherent inequality in access to information and resources in typical relationships between designers, planners, and the communities they serve," (Boone, 2016). Although a racial, class, and gender equity lens should be considered in all design projects, the practice can be applied generally to mean that community members must be integral in the process. For our purposes, we have worked with the idea that "community engaged design must build in local ownership of the process, outcomes, and benefits, both in material

(property, wealth) and non-material (decision-making) ways. With ownership, community stakeholders become empowered and attain an agency to articulate and shape their needs in their own voice," (Griffin, 2016). What does this mean in the context of our project? We want as many stakeholders as possible in the engineering and greater Lafayette community to feel some sense of ownership over this project.

One way to ensure equitable inclusion in the design process is to conduct a thorough stakeholder analysis. To do this, one possible method is to start by generating as many relevant names of people, organizations, institutions, etc. as possible. Then, these names can be plotted on a graph of influence vs. interest (Metris Arts Consulting). In almost all design projects, a lot of weight is given to the voices of those who have high interest and high influence. However, the benefit to this method is to identify stakeholders in two other important categories. The first is high interest, low influence. These are voices that are historically dismissed because they may not have the power to push forward implementation. Still, they are impacted and have a valuable perspective. An example of this stakeholder type might be an art student who has interest in a design project but seems far removed from engineering. The second category is high influence, low interest. These voices are important to include because they are more likely in a position to aid in implementation, even if they are less interested in the project. An example of this stakeholder type might be a member of the Board of Trustees.

Who Thinks This is a Problem

Several groups of the Lafayette community should be involved in the discussion of the engineering culture at Lafayette. The students and professors who constantly use

Acopian are just one group of many. Acopian is always advertised to prospective families through the perspective of administration officers and tour guides. A physical display of values representing Acopian would provide a clear idea to prospective families. This presentation also affects the surrounding Lafayette community which includes students and professors of other disciplines. It can be a gateway for the rest of the community to understand the kind of culture and values the engineering division at Lafayette truly wants to display to the rest of campus.

Engineering students are the first and immediate group who believe there is a problem surrounding the engineering culture at Lafayette. A response from a student at Lafayette, who is currently part of the mechanical engineering program, to the question of "What is the current engineering culture?" says, "There's definitely a superiority thing. But I would say within engineering it's very collaborative and very inclusive. But yeah, they definitely see themselves as separate from the rest of the campus," (Student 3, 2018). The problem with engineering culture is presented clearly by this student. Engineers have the sense of feeling like a superior student. In some scenarios this creates an unnecessary distance between them and other disciplines on campus. Engineers have been exposed to the need for collaboration within their discipline. In the book Engineering and Sustainable Community Development multiple historical examples show the success and failures of community development projects if engineer does not bring in a perspective outside of the technical realm (Lucena et al., 2010). Even if students would deny the need to collaborate with other majors, the idea to include more perspectives towards a common goal is undeniably similar to collaborating with multiple

areas of study. Even among engineering students between the Bachelor of Science and Bachelor of Arts majors, there are discrepancies regarding the level of interdisciplinary programs offered in the engineering department. The ability to collaborate with majors that are not housed in Acopian is very limited.

Figure 7: Mechanical Engineering Drag Race (Zovko.C, 2018)

This absence does not let engineers question other majors to try and gain another perspective on a problem. The Engineering Studies curriculum constantly presents students with courses and outside events to try and engage in an interdisciplinary program. Even with these additions, students feel the engineering culture is not up to a standard that truly represents what the college wants to endorse as an “interdisciplinary educational program” because not every student is given the opportunity to work in a multi-discipline collaborative environment that promotes inclusion of many majors offered on our campus.

Engineering professors also believe a change should come or at least an opportunity for change should be available. Through many of my Engineering Studies courses at Lafayette, teachers have strived to create the direction of courses to incorporate multiple areas of different Lafayette majors. The policy studies course, EGRS 251, highlights not only the technical side of engineering but also begins to make students think of the other factors that have to be considered when talking about a problem. The government has different levels to achieve specific milestones, different levels of society have different opinions regarding issues, or a technology can be used in different ways than the developer intended which creates a new field of expertise. Learning about these various nuances for what would normally be viewed as a simple technology or straightforward law is a valuable outcome that teachers want to bring to students. In the previous capstone report from 2017 the authors referenced Scott Hummel, the head of the engineering department, and he stated the direction of engineering at Lafayette could follow a more interdisciplinary route. Funding is available, so the idea of creating these newer and more complete courses are on the minds of professors in Acopian and the donors who support the future of engineering culture at Lafayette (Blake et al., 2017).

The admissions realm views the current engineering culture as a problem. Admissions officers and tour guides constantly depict Acopian as a building that is interdisciplinary by combining the outside world with the technical knowledge provided by engineering professors of Lafayette. However, this idea is not constantly presented. A student who works as a tour guide for Lafayette college admissions said,

> I think the engineering culture at Lafayette is relatively interdisciplinary, which is what I say on my tours...However, I don't think that is advertised enough, and I think the school should work much harder to promote engineering studies classes,

> and other business-related engineering courses, to students outside of the department because I think they offer valuable academic and life skills that go unnoticed at this school. (Student 4, 2018)

Advertising a strong and enticing point but not consistently displaying these values will diminish the merit for the future of engineering culture. Changing the culture now and being able to publicly present it to prospective families can create a stronger relationship between not only the incoming students who are interested in engineering and Acopian but also with the non-engineering majors. If students are able to feel like they can be connected to a place even before they step foot on campus, a stronger impression is produced. Creating these connections that reach all incoming students who took a tour of Acopian can influence the future generations to promote and accept a more interdisciplinary approach to their work. A current student at Lafayette who is a Psychology and Governmental Law double major referenced one of the first classes that Lafayette requires as an incoming freshman, the First Year Seminar, and found that even though her class was in Acopian and taught by an engineering professor, there is so much to write about after learning the technical aspects. The student feels there is more to engineering that just building stuff in a lab and the discipline can be very versatile (Student 4, 2018). Trying to create this interdisciplinary culture is possible at Lafayette but trying to reach students before they come to Lafayette could improve the process of shifting our culture in the future.

The rest of the Lafayette community which includes primarily students but also professors from other disciplines of the college can identify the current problem with the presentation of engineering as a true interdisciplinary culture. Even though majority of

their time is not spent inside of Acopian part of their reasoning to not enter the building is because of the uninviting nature that surrounds the architecture.

> If Acopian was advertised as a less intimidating and more welcoming environment to students of all majors, I would definitely study there. Right now, Acopian just reminds me of late nights and headaches based on what I've heard from my engineering friends… (Student 4, 2018)

This is one quote from a student at Lafayette who is not part of the Engineering Studies program, but her message resonates with many other students through the Lafayette community. Stories from friends or alumni depict Acopian as a place that brings hardships and stress. The students who are part of the engineering majors and work in Acopian each day present the building as a symbol that intimidates many other disciplines from thinking about using the building. Terrifying other students from a building through stories of headaches and stress does not promote the inclusive and collaborative culture that Lafayette engineers should present.

Who is Knowledgeable about This Topic

Several groups of people helped guide our design and application of this project in a positive direction. First there are the art professors on and off Lafayette's campus who can provide our group with valuable information. The perspective an artist brings to any art piece includes a level of creativity with a mix of technical application. Creativity is necessary to ignite the interests in students, teachers, and other members of the community who will interact with the piece. A technical perspective in the artists' work is important because the correct way to apply the art piece or a more effective medium to present art will be included in an accomplished artist. In an article that argues the necessary use of studios in higher education, artist's use this space to gather "material

knowledge." This idea ranges from how the art piece would interact with other areas surrounding the art piece to how an observer would react if they could touch it or even be a simple test in visual stimulation (McHugh, 2014). An artist will be able to manipulate the deep intricacies to create a full piece that engages the community and is implemented through the most effective medium. Also, if a local artist works on the project, a deeper connection could be achieved, not only to Lafayette college, but also the surrounding community in Easton can be incorporated into the art piece.

Another important group included in our project will be the psychology department. They will give us more insight into the intricacies of the human mind and what exactly creates reactions from outside influences. In particular, our group wants to ensure a sense of wellness is projected in the art piece and make Acopian a building that promotes a more calming or relaxing environment for students, professors, or tour groups. This will influence the goal to start a new culture connected to Acopian. An interdisciplinary structure is the foundation for a more inclusive and collaborative culture that our group is working towards. A direct connection to an interdisciplinary course is the mindset of students and faculty who use the building. In the book *Creating interdisciplinary campus cultures: a model for strength and sustainability* the author, Julie Thompson Klein, states three different methods to promote the growth of interdisciplinary programs. The starting point for all alternatives is understanding the most productive way to think about important questions and understanding the correct environment to hold these discussions. The most effective method is through a "transformative" model which includes elements of the other two models, "modification"

and “integration.” Klein describes this model as “It recognizes the need to address new issues, such as gender equity, ethnicity, multiculturalism, globalism, ethics, the environment, health, and educational policy. These issues pose questions and make demands that are only partly engaged at present” (Klein, 2010, p.68). There are many issues in our current society to discuss and there is a lack of conversation surrounding these values that require examination. A place that welcomes this kind of conversation is necessary and requires more than just a larger space. The help of psych professors and students will provide a closer understanding regarding the application of colors, lighting, or significant details on images that create a mental process that could be analyzed. Their field will open the possibility to understand the complexities attached to the human brain that influence the urgency to discuss topics outside of a student’s respective field and promote collaboration.

The admissions office is another source of valuable information because they are in charge of presenting our school to prospective families. Administration officers and tour guides highlight aspects of Acopian to visitors and knowing what they say and their reasoning behind it influences the design of a public display like our mural during a tour. Presentation of buildings on tours is an important part of the college selection process. In the article “How do high school students structure an important life decision? A short-term longitudinal study of the college decision-making process” The authors details several factors high school students consider as they make a decision for college. The study included three separate rounds of evaluating these students decisions and the trend after the third round of trials showed an increase in importance surrounding factors like

"Campus appearance," "Campus atmosphere," and "Location" and decrease in "Admissions requirements," "Course Offerings," and "Class Size." The author says:

> ...information easily obtainable from a college brochure or catalog (e.g. , requirements, procedures, statistical summaries) becomes relatively less important as information about an institution's 'character', perhaps obtained from campus visits, is acquired… Admissions officers might consider what information to present to prospective students and when to present it. (Galotti et. al, 1994, P. 604)

As a high school student forms their decision the importance of what they see and experience during a college visit becomes more important than any information session or section on the admissions website. The buildings and atmosphere leave a stronger impact on a prospective student. To ensure our group presents the correct environment we analyzed two sets of perspectives when interviewing representatives from the admissions office. First, we can see how admissions wants to "market" the engineering building of Lafayette to prospective families. Understanding their approach to the building will be valuable to incorporate in the design because our goal with this project is to put the engineering culture Lafayette college represents as a proud display on Acopian. The admissions office will not have to feel like they are misrepresenting the culture of Acopian because tour guides and admissions officers can physically point to images that represent an interdisciplinary culture.

Figure 8: A tour given at Lafayette ("Admissions visit," n.d)

Understanding the goals from the admissions office will also bring a certain level of knowledge we can use from prospective families. The typical college selection process causes families to visit many schools aside from Lafayette College because there are many available. Students, on average, choose usually between four different schools (Galotti et. al, 1994, P. 602-603). Some schools will have pieces of art or designs of buildings that stand out from the rest. Olin college has a beautiful engineering building that always engages visiting families. The New School in New York has high aesthetic appeal even though it is surrounded by countless buildings. Gaining insight from the admissions group about colleges that prospective families visit and resonate with aspects of other campuses can be information we apply to our buildings.

Our group is another viable source who is knowledgeable about the topic. Many hours of research, writing, revisions, and presentations not only demonstrate our knowledge about the topic but also push forward the goal of previous capstone reports and continue providing a basis for future reports on this topic. There are many mediums that can be used to address the problem surrounding the engineering culture at Lafayette college. The alternatives our group created will be described in later sections of this report and each are very unique. However, gaining the initial understanding about the current engineering culture through interviews and hearing Acopian described as a “place of stress” or “not very welcoming” is most important because the problem does not change. Explaining and expanding on the problem about engineering culture at Lafayette College provides valuable insight for decision makers and future projects relating to this topic.

Identifying the Needs and Desires of our Community

We have conducted interviews with students from a range of fields, including engineering, art, and psychology. We've consulted with engineering and art faculty, as well as with administrators and student tour guides. These interviews have served two main functions. The first was to help us define our problem and clarify our goals and desired outcomes. We asked questions about their experience with the engineering culture (either as an insider or an outsider), which revealed, as we have discussed, concerns about the perceived exclusivity and sometimes single-mindedness of engineering. "It's no dark secret that some engineers have […] the idea that their way of designing and modeling is vastly superior and it's not necessarily. It may be repeatable, but it is just one model of the human experience," says Professor Kerns of the Art Department. One of his main goals for this project is for an art installation to inspire "connectivity" and "intellectual unity" (Kerns, 2018).

We asked specific questions about the built environment: what do students look for in a study space? Without being bound by structural limitations, what would students ideally change about Acopian? In a panel of engineering and art double majors, three students identified a number of qualities they look for in a good learning environment. Among them were natural light and plants. One junior explained why he values greenery indoors: "I think it's just that you can see the nature; you don't feel like you're stuck in some building," (Student 1, 2018). This information helped us to pinpoint areas where the space and culture leave room for improvement. Although we cannot alter the

structure of Acopian, knowing these values allowed us to begin to think of designs that might imitate natural light, for example.

The second main function of the interviews was to receive input on the actual design of the art installation. At first, we asked interviewees if they had any general elements that they would like to see incorporated. The engineering/art student panel expressed interest in introducing more color into the building in the form of a painted mural. They also liked the idea of having moving parts on the façade (Student 1, 2018). Next, we spoke more specifically about mural design. The students suggested using themes related to each engineering discipline, or drawing on actual professor or student research projects to generate imagery (Student 2, 2018).

Figure 9: Professor Kerns in his studio ("The Octopus Meditations," 2018)

The two art professors that we interviewed, Ed Kerns and Jim Toia, had vastly different ideas for the design of the installation and each pointed out concerns with the mural idea that we had been exploring up to that point. Kerns remarked, "does the work of art there have to be panels with paint? Could it be something made with light? […] Let's do something really big." Additionally, Kerns and Toia both suggested artists that

they thought might be beneficial to look to for inspiration. Although these artists are neither stakeholders nor decision-makers for this project, they have expertise in this design field and so they are also important voices to consider in the process. Per Kerns' and Toia's recommendation, we looked at Stephen Antonakos and Leo Villareal. Information regarding our investigation of these artists is further discussed in the technical context sections.

We walk a fine line in trying to find a balance between the expertise of our wide variety of stakeholders (as well as the expertise we bring), many of whom have very different visions for this design. However, as we have outlined, equitable representation is a key component of community-engaged design, so it is important that we work through these conflicts. One way that we tried to reconcile this was by looking for overlap. For example, in our first project brainstorm—before we had spoken to any of our interviewees—we had considered using light as an element in our design. Our thought process was, since engineers spend many long nights in Acopian, having an installation that could be visible or even enhanced by darkness might be appreciated. Then, without be prompted, we heard the idea of light come up in our next three interviews, from both students and professors in art and in engineering. We saw similar results with plants and with color. This repetition signaled to us that these three elements might work to connect communities across campus.

Community-engaged design is time consuming and logistically challenging. However, we believe that this approach will ultimately bring us closer to our goal of inclusivity and interdisciplinary practice: "through a commitment to process and the time

and resources needed to uncover the intrinsic values shaping community processes, designers, planners, and others can create opportunities for empowering relationships and networks and not just the physical infrastructure of communities," (Boone, 2016). These valuable conversations have allowed us to examine our three different design options and assess the pros and cons of each. Our investigations into our community's needs helped us determine what will and will not work and has propelled this project forward.

Decision Makers and Political Feasibility

Much like our stakeholders, decision makers are also crucial components in the political context of this design process. Decision makers include: our team, upper level administrators and engineering faculty such as Engineering Department Head Scott Hummel, the Board of Trustees, and President Alison Byerly.

Figure 10: President Alison Byerly with first-year design students ("Engineering Looks to the Future," 2016)

With them in mind, we have considered the political factors affecting the feasibility of this proposal. One major incentive that the school has to support this project is its stated commitment to an interdisciplinary education. Scott Hummel writes of the engineering

department, “by combining an outstanding technical education with a well-rounded perspective of the humanistic, social, artistic, and global elements of modern problems, Lafayette’s distinctive blend of engineering and liberal arts reinforces our people-centered approach.” The school has a vested interested in continuously working towards better embodying this mission. According to the authors of Art Stairs, “an installation that combines engineering and art is a perfect addition to highlight the interdisciplinary nature of learning engineering on a liberal arts campus,” (Blake et al., 2017).

Our project benefits from the fact that the location for our installation is visible to highly trafficked areas, including Markle Hall, the admissions building. Whereas the Art Stairs project was somewhat hidden in the back of Acopian (Blake et al., 2017), this work could be easily used as a selling point for the school because of its visibility.

Technical/Economic Context

General Technicalities

This piece of artwork will be applied to is the exterior wall of the Acopian Engineering Center facing the Markle Admissions Building.

Figure 11: Exterior Façade of Acopian as captured by Nia Holland (2018)

As shown in the image above, this wall has 16 rectangular, glass windows on it. Each window is a single hung window with a fixed window above meaning that only one of the glass sections is movable (Wilford-Hunt, 2018b). These windows helped us to narrow down our design ideas because we did not want to build or make anything that would cover them. This is because, currently, Acopian already has few windows that provide a view to the exterior and natural light. Many students, as we learned throughout our student panelists sections, states that they did not believe Acopian provides enough natural lighting into its classrooms. Another part of Acopian that condensed our design ideas was that Acopian is already a standing structure which means that we had to figure out a way to work with the space that we were given since the skeleton or location of the building can not change.

The wall is a brick surface that is a flemish bond brick structure design. This means that the bricks alternate from having its long side, or stretchers, towards the exterior and then its face, or headers, towards the exterior. Brick walls have a variety of different physical characteristics that require different types of maintenance and construction strategies to improve the quality and appearance of the wall. The three main maintenance and construction strategies include repointing, efflorescence, and expansion control. Repointing is a process that occurs because over times the joints in between the bricks will begin to decay as a result of allowance of too much water to enter in between them. Efflorescence is when a type of white or greyish salt like powder appears when too much water evaporates from the surface. The last is expansion control which is the expansion of bricks. Naturally, bricks will expand and move as they are exposed to water

or snow. Also, temperature forces bricks to expand and contract. To help alleviate the pressure that the movement of the bricks causes on the surface and stability of the wall, expansion joints are placed in areas where the bricks are expected to crack, such as near windows (Wilford-Hunt, 2018a).

The combination of the amount of windows that is on the surface of the wall and these three main consideration points regarding the material, brick, that is used to build the wall have shaped the way our group researched and created different ideas for the art piece along this wall. In addition to not wanting to cover any windows, the maintenance of both the wall and the art piece is something that must be considered when deciding on an alternative. Generally speaking, we have developed three alternatives; whereas, each one addresses one of the main consideration points or it is removable to allow maintenance for the wall or for the art piece to be recreated. Since we are proposing three different solutions, each has its own technical context.

General Economic Context

In order to explain the economic context of this project, we have decided to describe the specific economic context of each alternative separately; however, there are more general aspects of the project that apply to all three contexts such as funding, the broad breakdown of project expenses such as materials and labor, and economic benefits from investing in an art project utilizing Acopian as a canvas.

This project would most likely be funded by either the school or a donor. However, we expect that the project would be funded through grants that are given to the engineering department through donors and alumni. If this is not the case, then this

project would have to be taken from the general engineering budget that the school sets aside. Since we are proposing three different alternatives for this art piece, it is impossible to generalize and give accurate numbers now to what this project will definitely cost since each alternative is a framework of a type of design that can be implemented and carried out in the future; therefore, each price heavily depends on the project's future. However, in each alternative's specific economic context we provide numerical estimates and ranges regarding the materials needed to fulfill these frameworks. In addition, we expect that another part of these expenses for each of the alternatives will stem from installation fees meaning transportation of materials, hiring an artist or artists, and actual labor fees; whereas, labor fees also include any cleaning or prepping that the surface may need before undergoing this project and not just the actual project itself.

Even though there is time and investments needed to make this project project possible, we believe that incorporating one of our alternatives to Acopian will create benefits that outweigh these expenses in the long run. For example, this project has already incorporated students and professors from a variety of different majors outside of just engineering. Therefore, the process of this project has already served as a connector between the engineering education space and its students with outside students and professors that typically do not step foot into Acopian.

In addition, student panelists have responded that they believe that having an art piece outside of Acopian will improve the aesthetic of Acopian and therefore, making it more desirable to walk to, to look at, and to be inside of. Increasing this desirability will

hopefully increase students' and professors' productivity. If an increase in the productivity of the students and professors occurs then the school will begin to gain more publicity and receive higher rankings for its engineering department which currently is rated at eleven by U.S News. Currently, the system for becoming ranked is based solely off of deans across the country and their opinions and knowledge of the reputations of each engineering program. Therefore, if the reputation continues to approve our rankings will continue to rise which will make more students want to apply to Lafayette to get the best education possible.

In addition to drawing more students through this fashion, admissions would be able to broadcast this project to prospective students to promote what it means to be an engineer within a liberal arts college. Because this wall faces the admissions building, where tours of the campus typically begin and end, it will be easy for tour guides to explain and talk about how the project came about. They can describe the process in which engineers worked with a variety of different people within the Lafayette community such as professors and students outside of engineering to improve what it means to be a student at Lafayette College. Therefore, the school will be able to broadcast the connectivity of the majors across Lafayette's curriculum because of this participation from students and professors throughout a variety of disciplines. In addition, having a project of this nature embodies what it means to be interdisciplinary, a value that the school projects onto its visitors, prospective students, and current Lafayette community. The combination of increased rankings and this marketing strategy can really help Lafayette draw more prospective engineering students to not only apply and

consider Lafayette but to choose Lafayette over other colleges which is a major benefit for Lafayette's expansion plans.

Alternative 1: Mural

Technical Context

One of our proposed designs involves the use of panels on the façade of Acopian to depict a large art mural or several smaller pieces. The use of panels provides flexibility and proven durability. Exterior art murals have been created for a variety of purposes and have continued to show off their meaning and colors for many years. Philadelphia has a popular mural called "We the Youth" that has been on display since 1987. Some more contemporary pieces like "Evolution of the Bike" in St. Louis was created in 2012. Art murals are technically feasible and continue to be painted today.

Figure 12: "Evolution of the Bike" (Evolution of the Bike, n.d)

Figure 13: "We the Youth" (Kochman et. al, n.d)

The use of panels applied to the exterior façade of Acopian creates a non-invasive method to the structure of the building and can introduce a path to allow flexibility on the images presented on the wall. As time goes on the meaning of an art piece can be misunderstood as the intended audience changes and grows. It is not possible to control the community, but through the use of panels the school is given an option to change the presented images into a more effective depiction of Acopian's changing culture in the future.

The technical process regarding the implementation of the panels is the main factor that allows for the switches. There are 5 essential steps to ensure the mural is appealing and durable. First, the location must be inspected. Constant direct sunlight and moisture, like a sprinkler constantly spraying the wall, will deteriorate the quality of the mural even with the correct exterior paint. Next comes surface preparation. The surface must be clean of residue paint and mildew otherwise the adhesion process become more difficult. Through use of the panels majority of this step will be by passed but an

acceptable surface will increase the overall effectiveness of the application process. Applying the paint to the panels is the next part. This will involve several steps and because of the panels an artist can work inside a controlled environment like a studio until the time of application on the facade. A sealer and primer have to be applied to the boards. The sealer lowers chances for the wood to warp and protects the material. A primer prepares the surface of the board to improve adhesion of the paint. Two coats of exterior acrylic paint should then be applied for the decided images. The direction of paint application should follow the furthest image of the mural to the closest image and darker colors applied before lighter colors. The final step is a medium gloss varnish as the final layer which includes an "extra shine" to the mural and also adds another layer of protection against constant wear and tear ("Mural Making Process – Department of Art & Art History," 2018).

There were two possible designs involving a mural on the exterior facade of Acopian. The first image represents an idea of Acopian from a side perspective but "cutting away" the wall and allowing the public to see the multiple activities and programs that are possible inside of Acopian. During the presentation of the newest science building of Lafayette, the Rockwell integrated science center, this idea was shown to allow viewers gain an idea of what would be going on inside the new building. Our group felt this concept of being able to see the inside of a building from the outside could be powerful and appealing to the members of the community. Visitors do not have to walk each floor to gain an initial understanding and the mural will gauge the interest of these viewers. These images would represent the culture of engineering at Lafayette after

analysis of the social and political contexts. The other option would be multiple smaller images on panels that also represents a positive view of Acopian but instead of using the same images for the rest of their life span on exterior, there would be a new set panels that depict the current time of Acopian to allow new generations to resonate with the building in the future. The second image helped guide our group towards this concept because there was a sense of multiple areas or efforts coming from different directions to represent and support one common theme. There is a range of age, environments, and styles of cloth being represented in one wholistic image and the final result of everyone's effort in the mural is a peaceful world. Seeing the various aspects of the design leading to one powerful idea is a powerful medium to represent the multiple majors creating a more interdisciplinary and collaborative environment inside Acopian. The two art pieces responsible for our group's inspiration is shown below.

Figure 14: Cut-away mural ("Lafayette College Plans Integrated Science Center," n.d.)

Figure 15: The local earth vision ("Community Visioning Workshop," April 2013)

Our final concept for a mural incorporates the two above mentioned ideas. Our group wanted to ensure we keep the ability to clearly display aspects that represent a more positive culture inside of Acopian. Also, keeping the idea of multiple factors influencing one common theme is important because more than one effort is necessary to achieve a new culture. Understanding these two important features results in a practical design where we might not use all areas of the facade of Acopian but try to use as much as possible to get viewers interested in the mural and start to talk about the new possibilities inside Acopian.

Figure 16: Final mural concept design as created by Olivia Guarna (2018)

Economic Context

The economic dimensions of the mural project will fluctuate depending on multiple factors. Morgan mural studios is a company that specializes in creating murals. They published a case study in 2015 detailing the process of a public mural art project in Redwood City, California. One of their sections cover the cost estimate for a public mural. They said,

> The cost of a mural is typically between $20-$40 per square foot. This estimate is inclusive of design, materials, wall prep, and labor. Some of the variables affecting this range include geographic region, the condition of the wall, the experience of the artist, and the level of detail desired in the mural painting. (Bricca et. Al, 2015, Pg. 8)

Many factors are accounted towards creating a mural. The price range comes with many tangible factors that become clearer as a project progresses. Another example of an estimate about the price range of murals comes from the Philadelphia Department of Recreation Mural Arts Program. They conducted a case study in 2001 to help more members of the community understand the value of public art works and attempt to increase professional opportunities for artists to work on public murals. The estimates they produced for an average mural cost was between $10,000 and $15,000. This included artist's commission, the scaffolding, the paint, the brushes, and other painting supplies (Stern et. Al, 2003, Pg. 33). The study also provided a closer look at the fees of an artist. This ranged from $2,800 to $24,600 because sometimes the project required more than one artist, or a person would design while others would paint (Stern et. Al, 2003, Pg. 33). Settling on the cost of an artist is an important factor leading to the rest of the project budget. In particular, the progression of design ideas would benefit from

having an already chosen artist to work on the project. The Pittsburgh Art council published a guide on how to properly develop public art murals similar to the efforts of the Philadelphia Mural Arts program. Considering design development and the role of the artist the author said,

> If you want the artist to collaborate with anyone to develop the content, be sure that you are clear about that in the beginning and that the artist agrees to that process. Or, if the artist wants to gather their own group of people to collaborate with or find inspiration in other community resources, help the artist connect with that they need. (Brown, n.d)

The artist has a core role during the early stages of the project and must be considered during future stages. They have immediate input during the implementation process of the art piece like necessary materials which alters the price range.

Artists work with certain vendors and companies because of the trust created from previous projects or recommendations. The artist should be given the freedom to work in this aspect because it will promote a more comfortable environment to work and lead to a higher quality product. Sherwin-Williams is a very large and popular vendor who have endless options regarding exterior acrylic paint so pricing from their site seemed applicable. The prices for exterior acrylic paint on their site ranged from $47.99 per gallon to $87.99 per gallon. The price change is mainly influenced by the gallons of paint that have a level of primer mixed with the paint for increased quality. However, gallons of primer are also available, and majority of prices are in the range of $56.99 per gallon to $62.99 per gallon. The type of brush used also comes with its own set of pricing. A brush that supports acrylic paint and best used for exterior work is the Purdy XL Glide recommended by Sherwin-Williams. The price varies because of the various sizes of

available brush widths. The smallest is 1-½" at $13.59. The largest available is 3-½" at $24.19. The final prices for art murals are difficult to estimate during the early stages of research, but as more information is presented and decisions are made regarding the artist it will be easier to apply a more reasonable cost for this project.

Alternative 2: Light-Based Art

Technical Context

Another possible option our team investigated for the eastern wall of Acopian Engineering Center is a vertical art installation utilizing light, contrast, and shadows. In an interview, Professor Kerns directed our focus to a number of new pathways, one of which was towards the artist Stephen Antonakos. Renowned for his artwork utilizing neon light and rectangular panels to create visually stunning contrasts of color and shadow ("Stephen Antonakos," n.d.).

Lafayette College and the greater Easton area is no stranger to Stephen Antonakos' artwork. In 2011, Antonakos was a part of a press conference at the Simon Silk Mill. As a part of their redevelopment plans, the Redevelopment Authority of Easton brought in Antonakos to create a piece for the Simon Silk Mill. At the conference, they revealed the concept of his work: A light design mounted on the one-hundred-foot tall smokestack on site at the silk mill, acting almost as a beacon for people traveling the Sterner Arts Trail ("Artist Wants to Light Up the Silk Mill," 2011). This is not the only piece of his near Lafayette. Inside Buck Hall's lobby, there is a second piece by the artist titled "For JT," shown below:

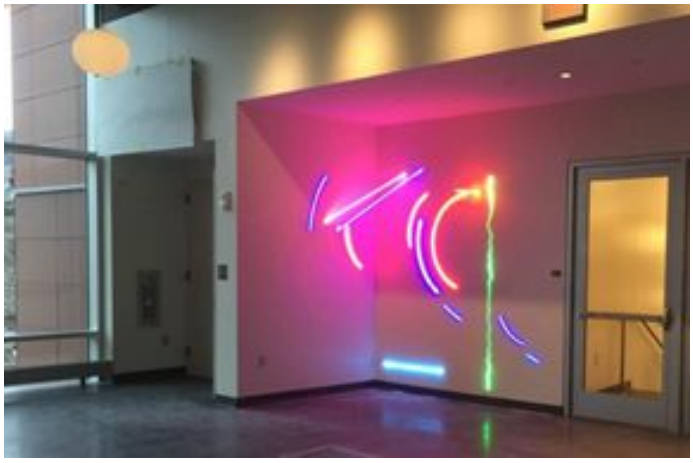

Figure 17: Antonakos' "For JT", ("Stephen Antonakas," 2018)

Figure 18: Concept for Silk Mill ("Artist Wants to Light Up the Silk Mill," 2011)

We do not have access to exact specifications of Acopian Engineering center, but for the purposes of estimating material needs at this time, we can compare the relative size of nearby objects as compared to the building. For example, using the most recent Google Maps data via satellite imaging, we see two bicycles parked in front of the building. Using the relative size of one bicycle to the building, we can relate a number of bicycle lengths as a unit of measure for the building. The average size of an adult bicycle is around sixty-eight inches, and we can use this as our approximate conversion ("Bicycle Parking Info," n.d.).

Using this method, we see the brick section of the east wall of Acopian Engineering Center is roughly 60’ by 20’ (59’ 5 4/24” x 19’ 9 ¾”). Additionally, window sizes are roughly 3’ 9” by 5’ 7” (3’ 8 21/25” x 5’ 6 3/5”). This gives us an idea of how much neon lighting and other materials will be needed. From here, we have options. Either the installation can be neon lighting with no other components as tubing on the outer wall or as tubing lining the windows, as seen in the public work “The Search.” Another option could be similar in style to Antonakos’ piece “Respite”. Both pieces are shown below.

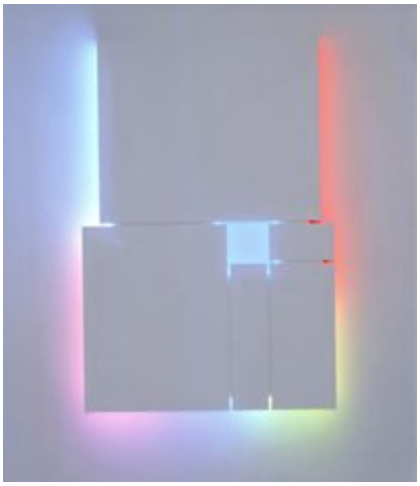

Figure 19: “Respite” (Stephen Antonakos, 2018)

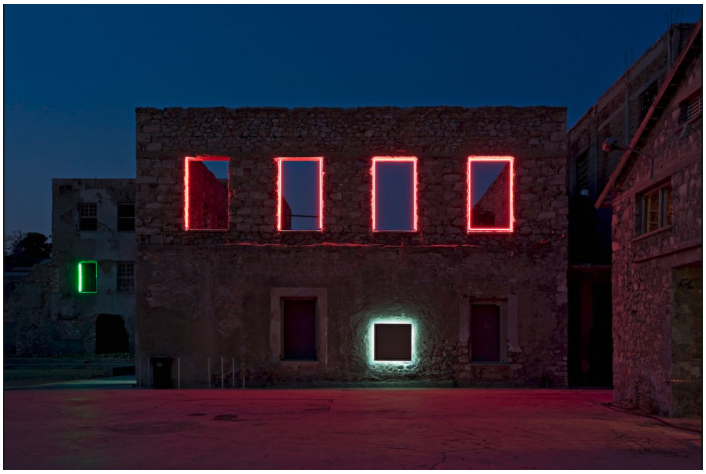

Figure 20: “The Search” (Stephen Antonakos, 2018)

The primary and most important part of the lighting installation will be the neon tubes. It is possible to purchase them in their glass tube form or as bendable tubes which can be cut and altered to length and position. Multiple online distributors sell the neon tubes as well as accessories. Accessories include brackets for mounting, plugs, covers and connectors. Were we to go with lighting only along the perimeter of the windows on the building's east side, we would need roughly 18' 8" per window, or a total of about 300' for the sixteen windows on that wall.

If we were to go with panels in front of the lighting elements, we would need wood or plastics capable of withstanding outdoor elements and would need to determine the shapes or objects they would represent. If the desired shapes are not rectangular, we would need to take into account material sizes required to cut the desired formed. Finally, there is the thought of hardware and bracketing for attaching the panels to the face of the wall, as well as equipment or scaffolding to get people to the necessary height to hang and mount pieces.

Figure 21: Final light art concept design as created by Olivia Guarna (2018)

Economic Context

The main component for this version of our proposed art installation is the neon light fixtures. Spools of 150 feet are available online for $700 to upwards of $760, depending on color ("21 results for 'neon' | 1000Bulbs.com," 2018). The light spools can be cut at eighteen-inch intervals and are rated for outside usage. The lights are expected to operate through 30,000 life hours and have the added benefit of operation through singular or multiple LED failure. As the installation is on the exterior of the building, the lights will only operate from dusk to daylight, when the art will be most visible to the public. This reduces maintenance and replacement cost significantly, as instead of twenty four hour operation, power will be supplied for between twelve to fifteen hours, depending on season and sunlight fluctuation day-to-day.

The lights require power supplies and brackets to connect to the wall. Individual power supplies run for about $145 and transformers run for around $100. Bracketing, connectors, and other accessories run at much lower prices, ranging from packages of ten end caps for $1.38 to $7.25 for mounting clips and $12.29 for splicing cables and pins. Mounting clips come with the necessary screws for connection onto a surface. If we were to apply only neon tubing to the sixteen windows, which we know from before requires roughly 300 ft of tubing, then the cost of lights is upwards of $1500, not including necessary brackets and power supplies. Brackets, assuming four per window, wind up at about $29 and power supplies, because it would be sixteen separate installations (unless we linked them behind the brick with extenders) would be upwards of $1600.

If, instead, we go with backlit panels where the art is a mixture of the bleeding light and shadows from covered space, the light pricing changes drastically, but this is dependent on desired shapes. Antonakos' covered lighting style often used rectangles of painted wood, but he occasionally used curved or three-dimensional pieces. We are confined in design by the placement of the windows, not by the shapes we would desire. These panels and shapes would be made from a pressure treated/weather resistant wood. A 2'x4'x1/2" sheet of pressure treated exterior plywood costs $17.98 per sheet (Lowes.com, 2018). Not including bracketing/attachment, the cost of wood could increase rapidly.

The benefits of using light elements for an art installation are the very low maintenance costs as well as the long lifespan. To get the full effect, operation should be conducted only in the dark or dim light. As such, the effective life of the lights will be longer due to lessened use per day. Upkeep of panels, if used, will cost a little more, but should last for quite some time, and can be easily replaced if damaged.

In addition to the costs laid out above, though, there is a larger economic context to consider here as well. This design is heavily influenced by the work of Stephen Antonakos. It also draws from aspects of Professor Kerns' studio practice that he shared with us. This piece even more so than the mural is a true installation piece. For that reason, the school would likely need to go through the process of commissioning an artist to complete the project. For civic projects, this can be involved and demand some time and resources. The Los Angeles County Arts Commission outlines their civic art procedures for a 2016 project. Their artist selection process included the following four

steps: artist selection panels, selection of project artist(s), establishment of pre-qualified list, and conflict of interests. They fill their panels with individuals who have "background or professional expertise in the arts," (Los Angeles County Arts Commission, 2016, p. 4). We might like to broaden this definition based on the way we have structured our entire design process; we would consider including other stakeholders in the panel in addition to artists. The establishment of a pre-qualified list of artists is also a key step. Having a strong understanding of our influential artists in the project (such as Stephen Antonakos) will narrow our search significantly and direct us more quickly towards appropriate options. Further, we can search within our own community for qualified parties. In fact, Professor Kerns suggested that this project might be accomplished in house.

Next steps include sending out Requests for Qualifications (RFQ) and Requests for Proposals (RFP) (Los Angeles County Arts Commission, 2016, p. 7). Once a proposal is chosen, contract negotiations must take place with the artist. Further, with this type of project, a maintenance and conservation plan must be made in consultation with the artist. All this must take place before the implementation phase. This process is not unique to this alternative. However, if we strive to create a more complex installation here, it will demand the necessary time and resources to move through this procedure.

Alternative 3: Vertical Garden

Technical Context

Our final design alternative also has an element of light, but incorporates plants into the piece as well. Early on, our student panel of art and engineering double majors

identified nature as a positive feature of an inviting and comfortable study space, especially when there is a lack of natural light: “if you can't do windows [because] you're underground or something, even just plants [help]. I think it's just that you can see the nature; you don't feel like you're stuck in some building,” (Student 1). Because the two bottom floors of Acopian are underground and even the classrooms above ground tend to be dark, using plants is beneficial.

Vertical gardens are excellent plant solutions: they allow for nature to be introduced into spaces without taking up too much room. Rather than being spread on the ground, plants are placed in small planters, which are then mounted to a wall with an irrigation system. These installations create “green walls.” Based on a recommendation from Professor Toia, this alternative will have an outdoor and an indoor component. We hope that combining the two will provide aesthetic continuity for Acopian and also be more effective in achieving our goal of creating a more comfortable and inclusive culture inside Acopian. Both installations will consist of vertical gardens and light projections. Acopian’s exterior façade consists of brick columns broken up by the windows. As it is, the space feels strict and regimented. Having vertical gardens climb each of these columns would give the façade a much more organic feel. Further, each column would be uplit with projected white light to illuminate the installation at night. Below is an example of an exterior vertical garden on Kalamazoo Valley Community College’s campus. Their garden introduces colored plants that are arranged in a pattern. Similarly to this example, ours would be composed of a series of tall, narrow gardens sitting between

windows and could experiment with color and pattern in the same way. This would go a long way in softening the shell of Acopian.

Figure 22: Kalamazoo Valley Community College (LiveWall, LLC "Projects," n.d.)

Green walls are also viable indoors. In connection with the outside installation, we would like to implement a vertical garden with light in the interior as well. To echo the engineering students we interviewed, introducing nature inside Acopian could have a strong impact on the culture and hopefully cultivate a more comfortable learning environment. Professor Toia of the art department suggested dedicating one small room in Acopian to this installation and using the room as a relaxation space for students. The room would have a vertical garden on only one wall so as not to overwhelm the space. Additionally, soft, colored lighting could be hung throughout the room to break away from harsh fluorescent lighting, which was another interest of the engineering/art student panel. This room could act as a comfortable study space or a break room for students who spend long hours working on computers or in labs. However, if there is not a room in Acopian that could be purposed in this way, a vertical garden could be implemented in a

number of existing common spaces, including the lobby. Even a very small wall of plants would have a significant impact on the space.

Below is an example of an interior green wall. This garden was constructed in an architecture office. One of the benefits of green walls is that they soften the space but maintain a professional environment. Whereas other art installations might be considered inappropriate for an engineering center, this type of solution would break up the monotony of a white wall without creating a distraction for students. This office example also shows that these green walls can be very small; we would not need to dedicate a huge space to this project for it to be effective. A small patch of plants would be enough. If we were not to dedicate a classroom in Acopian to a vertical garden relaxation room, having a garden in the lobby similarly to the architects would still help to achieve our goal.

Figure 23: MBTW Landscape Architects Toronto Office (LiveWall, LLC "Projects," n.d.)

In combination with a light element, this could create a very compelling installation. The colored lights could provide a relief for students who are up late studying. Beyond that,

Professor Kerns believes, “the power of the [light] metaphor is so complete. You shed light on a problem; in darkness you move towards the light.” A light metaphor is inclusive.

There are two technical elements of this alternative: the installation and maintenance of a vertical garden and the installation and operation of the lights. The light will be simple. The outdoor installation would require seven LED floodlights to up-light each column. Installation and maintenance of these lights will be very simple, since they will be located on the ground in an easily accessible spot. For the interior, we suggest using blue LED rope lights. Research has shown that college students tend to associate cool colors with restfulness (Yildirim et al., 2011), which can counteract the high-intensity of the engineering culture. Rope lights can be hung around the perimeter of the room, either on the floor or the ceiling depending on preference. The room could be supplemented with soft white LED lamps if additional light is needed.

The vertical gardens pose more of a challenge than the lighting, but are still feasible. Likely, installation of the systems will require a hired contractor. However, the systems are ultimately fairly simple. The structure is made using an aluminum grid with irrigation conduits and drains attached. This grid supports a number of individual planters (LiveWall, LLC “Engineering Living Walls,” n.d).

Figure 24: LiveWall Infrastructure (LiveWall, LLC "How to Install a Living Wall from LiveWall," n.d.)

For indoor vertical gardens, the wall must also be covered in waterproofing material (LiveWall, LLC "Indoor Living Wall Solutions," n.d.). Planters with fully-grown plants and water usually weigh no more than 10-15 pounds per square foot, which can be easily supported by the brick exterior and is rarely an issue for interior walls as well. Plumbing is the greatest unknown because it requires the advise of a contractor, but each water valve only requires 8-10 gpm and a regulated 15 psi of pressure. From an engineering standpoint, Acopian is a good candidate for a vertical garden because it is less than 60 feet tall, so there is relatively low wind impact, which can cause problems with plant stability and irrigation (LiveWall, LLC "Engineering Living Walls," n.d.). Additionally, green walls reduce noise, which would be an advantage in the interior relaxation space (LiveWall, LLC "Frequently Asked Questions," n.d.).

The vertical gardens will involve a limited amount of ongoing maintenance. Once the infrastructure is built, the irrigation system runs automatically. Mainly, the only maintenance required is the upkeep of the plantings. Plants can be chosen based on the

environment, so climate and access to light will play a part in the decision. Hardy perennials typically require less maintenance. They will likely only need to be changed every three years, once they become “root bound,” (LiveWall, LLC “Frequently Asked Questions,” n.d.). There is more freedom in choosing the interior plants because light and temperature are controlled. Because the walls are constructed of individual planters, plants of different colors or textures can be arranged in patterns, which allows for artistic freedom. Further, this pattern can change every few years to keep the walls feeling new.

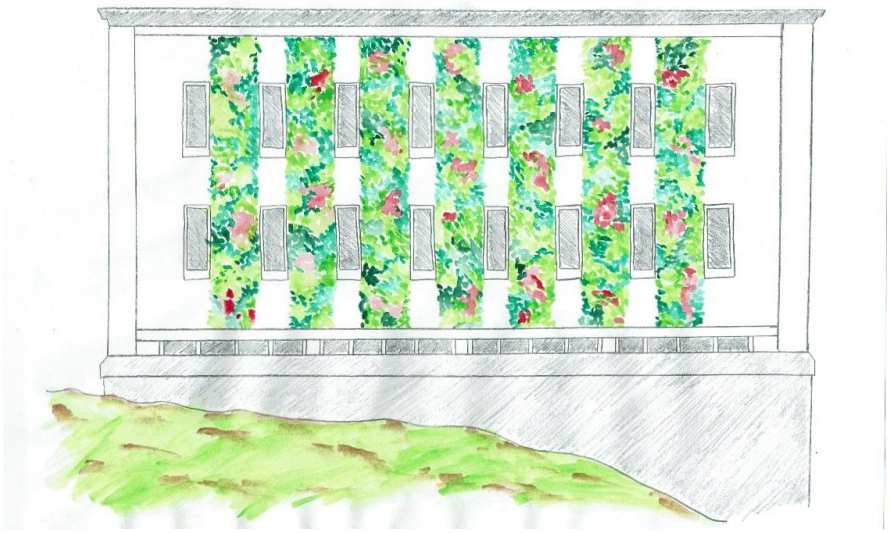

Figure 25: Final green wall concept design as created by Olivia Guarna (2018)

Economic Context

Much like the second alternative, it is relevant here to consider the broader economic context involved in civic art projects. One benefit of this alternative is that it requires hiring a contractor rather than commissioning an artist. We imagine the school might feel more comfortable with this type of installation because hiring a contractor to do this type of work is a more familiar process. Although this process has some overlap

with the second alternative--we will need to send out RFQs and RFPs and negotiate contracts here as well (Los Angeles County Arts Commission, 2016, p. 7)--certain aspects of it will be much simpler. We will not need to convene a panel to identify qualified parties. In this case, the school can easily search for many firms that specialize in constructing vertical gardens. With this solution, the school will also maintain a higher degree of control over the process and outcomes, whereas "if you're going to commission [an artist] to do it, you kind of relinquish the control," (Toia, 2018). Further, maintenance for this design might be more straightforward than that of a complex installation piece.

With this being said, we can estimate to a certain degree the more specific costs of this alternative. We believe the initial costs and maintenance fees of the design alternative are reasonable. The light elements are extremely affordable. Acquiring the seven LED floodlights and the blue LED rope lighting will cost approximately $500 (1000Bulbs.com, n.d.). Although LED lights have a higher initial cost than other lighting options, they are more energy efficient and have a longer life, so they are ultimately a better alternative. Further, because all lights will be placed in easily accessible locations, they will also have a very low installation cost.

Figure 26: LED Floodlight (Super Bright LEDs Inc., n.d.)

Figure 27: Blue LED Rope Light (Lighting EVER LLC, n.d.)

The vast majority of expense for this alternative comes from the vertical gardens. Without knowing the exact requirements for attaching the water source, this cost is harder to estimate. However, installation of the green walls themselves is estimated to be between $90-$140 per square foot (LiveWall, LLC “Frequently Asked Questions,” n.d.), including the cost of labor. An interior 15-foot wide by 9-foot tall green wall would cost approximately $12,150-$18,900. The exterior garden would be more in the $35,000-$60,000 range. Additionally, plants need to be replaced every few years and can range widely in price depending on what is chosen. However, other than planting, maintenance costs should be very low. Since we live in a climate with cold winters, watering the exterior wall will be scaled back significantly in winter months. We estimate this alternative will cost below $100,000, including installation, plumbing, and plantings. Although the costs are not insignificant for this alternative, we believe that that the benefits to the community will be palpable.

Conclusion

Our project's objective was to figure out a way to incorporate a form of art on the wall of Acopian facing Markle Admissions Building. The three alternate solutions: the mural, light installation, or vertical garden that we propose are very different solutions to the same problem, which is the rigidity and exclusivity surrounding the engineering culture at Lafayette College. However, we believe that each of the designs can help work towards changing this to create a more interdisciplinary and inclusive field. Each of these design ideas surfaced from either extensive research from other case studies, student surveys, and student/professor panels. In addition, we analyzed the social context, political context, economic context, and technical context surrounding this topic to make each solution specific to the needs of Lafayette. Laid out in the rest of the conclusion are the pros and cons of each of these designs and what needs to be done next to turn this project proposal into a reality. However, we believe that despite their cons, each design solution will provide some of the benefits laid out in the three subsections of our economic context and our social context: educational, psychological, and cultural. Luckily, all three of our design solutions are not mutually exclusive. This means that there can also be a combination of any of these solutions as the final product if this projects gets picked up by someone.

Mural

There are benefits with the implementation of an art mural on the facade of Acopian. First, the multiple images displayed on the exterior will reach various communities on the Lafayette campus. Our group wants the mural to resonate with many

members attending or visiting the college and dedicating sets of panels to display several groups of images allows the necessary flexibility to ensure different communities are represented. Gaining input from sources and continuing student panels will be valuable knowledge for the future implementation of the project. Another positive aspect of this alternative is the ability to change the panels in the future. The college will not have to worry about the relevance of the images presented on the exterior of Acopian because panels allow switching and storage of previous images. This also presents an opportunity for the Lafayette community to be more involved in the design process of the next illustration and promote an interdisciplinary environment of Acopian. Applications from all disciplines offered at Lafayette could submit proposals detailing a representation of an image reflecting the interests of their respective majors. Trying to display many areas of campus in the mural is a positive start to promote an interdisciplinary environment. There are also some negative consequences applying the mural to Acopian. The intended message to promote collaboration and inclusiveness of Acopian might not reach all members of the community. Our group understands there are two perspectives we have to consider. There are students who use Acopian every day for their studies and there are students who have not stepped foot into Acopian once in the Lafayette career. We want "insiders" to learn more effectively and "outsiders" to feel more welcomed inside of the building. A mural might not be powerful enough to display the message and fuel the interest of an interdisciplinary environment among the surrounding members of campus. This alternative would also only be a first step towards other initiatives promoting a more welcoming environment. The exterior facade is just the gateway to the inside of Acopian.

Trying to make students feel more welcomed inside the building will take more efforts in reconstructing or rearranging the inside of Acopian into a more collaborative and relaxing place. A mural can display these physical spaces or ideas, but to continue including more students into Acopian and ensuring a positive environment lasts an interior element of the project is missing from this alternative. Murals are a great alternative to publicly display a message and would begin the conversation surrounding a larger idea. However, the idea feels like just a start to the project of promoting a new culture inside Acopian.

Figure 28: Final mural concept design as created by Olivia Guarna (2018)

Light-based Art

A light sculpture has the benefit of visibility during the day and during the night by nature of it being neon lights. This has the added benefit of causing Acopian to stand out against the other buildings on campus. Acopian's east wall is visible from the vast majority of the quad. This means that students walking along the quad during the evening will see a light installation on Acopian. Visibility is assured. Attracting students through

the art introduces students from all majors to the building, creating a sort of "ice breaker" introducing the building. Additionally, the creation of this type of installation has great potential as a multi-discipline capstone project, independent study, or as a project in EGRS 480.

During our live presentation, factors were brought to our attention we had not considered when creating a light installation. Chief among questions was whether or not we had considered the light pollution effects and environmental repercussions from the glowing during evening hours. We did not analyze how the neon lighting would affect light pollution levels in and around the college. To better understand the effects of these factors, we would need better data on the size of the wall and the size of the windows. For the purposes of our preliminary investigation, we used an estimate based on the average size of a nearby bicycle compared to the building. This gave us ballpark measurements so that we could generate ballpark costs and material needs, but for quality data on light pollution we need to know the true size of the space.

If future students are to undertake this project, it is critical to begin with measurements of the eastern wall of Acopian, the windows, and the space between windows. The wall needs analysis for exterior and interior electrical systems the lights would access for power. The building's exterior also needs study for purposes of the mounting brackets to ensure their safe and effective attachment to the outside surface. From there, participants need to settle on a design for the exterior space. This can be done within the team but we recommend conducting student, staff, and shareholder interviews for a better poll of opinions and desires.

At that point they can calculate material needs and costs. When looking at neon lighting tubes, it is important to understand how much rain/moisture the tubes will be exposed to. The team needs to find properly rated tubes for outdoor usage. We recommend calling distributors to get definitive answers as language used on websites can be cumbersome and hard to understand. The team will need to acquire funding, most likely through shareholders. This amount of development should be achievable within the period of one semester. Before moving any further down the process, students should ensure measurements, costs, and material needs are correct and an avenue for funding is established.

Figure 29: Final light art concept design as created by Olivia Guarna (2018)

Vertical Garden

Finally, we summarize our vertical garden alternative. Again, this alternative has an interior and exterior component: a green wall on the wall facing Markle hall and a green wall with soft blue light in a relaxation room in an Acopian classroom or lounge. To complete this process, we would need to hire a contractor that specializes in installing

vertical gardens. Based on our research, we believe Acopian is a good candidate for an exterior garden. We estimate that this alternative will cost below $100,000.

There are a couple of drawbacks to this design that the school would need to consider. Like all large scale projects, this alternative comes at a high initial cost. Additionally, it would require major maintenance approximately every three years to replant the planters, which might be labor intensive. As far as the interior wall, there is also the issue of space. Green walls themselves take up very little space. However, if we wanted to create the entire relaxation room, we would need the engineering department to either part with one of their classrooms, or agree to renovate one of the majors' existing lounges. Space is a hot commodity in Acopian, so this could pose a challenge.

Still, we recommend this as a viable alternative. There will be costs associated with any project. We believe this alternative has enough mass appeal to find supportive funders. Maintenance will be required, but unlike most of the landscaping work that is done on Lafayette's campus every year, this will not be an annual task. Finally, we believe the benefits of an indoor relaxation room would be well worth the disruption to Acopian's current setup. The impact students would be immense. However, if the engineering department could not reallocate a space for it, a green wall can still be implemented in the lobby without taking up any space.

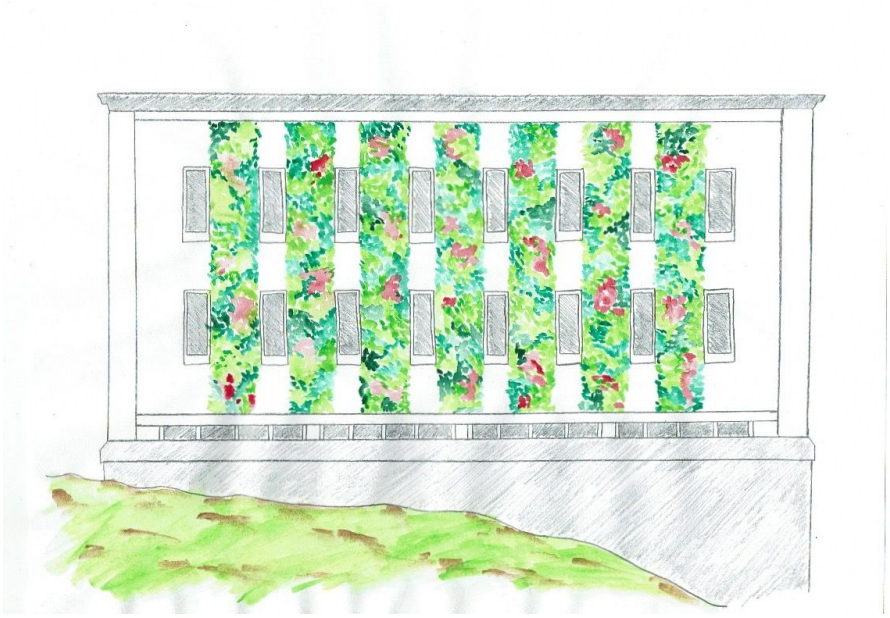

Figure 30: Final green wall concept design as created by Olivia Guarna (2018)

Moving Forward

Throughout the course of semester, our group's research and interviewing led us to be able to propose three different solutions and an analysis on the pros and cons of each solution as previously stated. Since we have three solution proposals, there is still a lot to be done if one or more of these design solutions are actually going to be implemented and there are many people that can be involved in the installation of one or more of these design solutions. While presenting the findings of our capstone project, we were asked about the differing environmental aspects of three different designs. We responded with saying that the environment was something that we did not go into depth analyzing; therefore, we did not have the information available to give an accurate enough analysis of them. We believe that this is a lens that definitely needs to be considered before an actual installation occurs more despite our group not having enough time to do so. Not only will this be important for our environment but it could also help

Lafayette reach their climate action plan of being carbon neutral if something such as a vertical garden is installed, for example. That is to say, each design definitely has their own effects on the environment.

In addition to analyzing an environmental context, we recommend that whoever takes over this project or something similar focus on conducting more research specially on Lafayette's campus to see what specific design idea would be most effective. This includes what plants and their order on the wall, the actual pictures of the mural, the shapes or types of lights for the light installation, and what colors are most effective for all three. Also, since these designs are not mutually exclusive, the next group could possibly figure out a way to implement more than one of them. After that research and the group finds one solution, we recommend doing a better economic analysis which included contacting possible artists and figuring out labor and material costs to a greater and more accurate extent. Lastly, we recommend involving more stakeholders that are responsible for finding funding or actually hiring contractors to make sure that all of this is indeed feasible.

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Note: certain names have been changed to protect the identities of our interviewees.

Appendix A: Engineering and Art Student Panel Transcript
Conducted by Olivia Guarna on October 30, 2018

Olivia: Okay, so just to give a little background on the project, our group was assigned to do an art project for Acopian, which our professor, Cohen wants us to focus on this exterior wall that's facing Markle. And the idea is to make a more inclusive, inviting environment for this building, which a lot of people feel is necessary. But I want to get your thoughts on that more. But to start, can everyone say your name, major, and class year.

Student 3: I am [Student 3], I am a junior, and I'm a mechanical engineering and art double.

Student 1: I'm [Student 1] and I am exactly the same as that: junior, mechanical engineering and art double major.

Student 2: I'm [Student 2], I'm a senior, and I'm a mechanical engineering and art double major.

Olivia: Okay so you're all Mech Es?

All: Yeah.

Olivia: Okay, um, alright cool.

Student 2: Apparently nobody else branches out.

Olivia: Yeah I guess. I know I thought it would be that most of the doubles would be Civ E and Art but--because then it's like architecture.

Student 3: Have you talked to Simone?

Olivia: Is she engineering?

Student 3: Mm hmm. She's ECE.

Olivia: Oh I did not know that. Oh okay I might reach out to her. Thank you for that. Okay so first question: what are your impressions of Lafayette's engineering culture and is there anything you would like to see change?

Student 2: I feel like a lot of engineers kind of have a stick up their ass. Like the whole like "oh we're engineers and we do the hardest work."

Student 3: There's definitely a superiority thing. But I would say within engineering it's like very collaborative and very inclusive. But yeah they definitely like see themselves as separate from the rest of the campus.

Student 2: I feel like anyone who's a double major like has a bit more understanding of it but there aren't very many engineers who are double majors.

Student 1: Yeah, this is us. Hello. I also feel like in art there's a lot more forced hands on experience. So in engineering you can get that hands on experience by yourself if you like talk to professors and you're like, "hey I want to do research" or like go to the ASB meetings but it's not like automatic; you have to seek it out. Versus art classes, like, you have to take materials and methods; you have to take a drawing class or something. Like there's ME 210 but that's it; it doesn't go anywhere from there. There's not as much forced hands on experience.

Olivia: That makes sense. Um, what do you guys think about--not necessarily work load but culture around completing your work and study habits of engineers?

Student 2: I feel like the first couple of years it's a lot of like "oh I'm going to suffer on my own" and "oh no I'll never figure it out." Somewhere during junior year you hit the point of like, if I don't work with other people I'm not going to get anywhere and then you start to actually make friends in your major and do all the homework with each other.

Student 1: Yeah, I feel like engineering's got a good collaboration thing going on. And art could be better about that. I guess I feel like it's a lot of individual but I guess that's good.

Olivia: No honestly I think so too because I feel like that major, a lot of people think it would be collaborative but it really it's not at all.

Student 3: Yeah, like I'm finding you have the opportunity to learn from your classmates when you go to actually present your work and at the end of the projects but there isn't so

much gaining ideas from each other along the way nor do people get together to work on their art projects in the studio or anything like that.

Olivia: Yeah, for sure. Okay, um, what do you look for in a learning or study space.

Student 3: I like blackboards and whiteboards personally. I like to write big and having--so being in a classroom where I can like spread out and take up as much room as I want is preferable for me.

Student 1: I'm a fan of super quiet. Maybe a window or two. That's about it.

Student 2: I don't know. I do most of my work in my common room in my dorm. So the ability to focus depends on like is it a Friday night and everyone's hanging out and playing video games? Or is it, you know, like two in the morning on a Wednesday and no one else is awake? Actually no, there are a lot of us awake.

Olivia: Do you still live in Ramer?

Student 2: Yeah.

Olivia: Okay. What about you, do you do most of your work in this building?

Student 1: I actually run away from this building because it's very scary.

Student 2: Yeah, I don't like working in here.

Student 1: The environment--there's like people like bleary eyed and staying up late with their coffee and redbull and ahhh. So I run away to the nice library where there's nobody.

Student 3: I really like working in here. Probably because of like the blackboard thing mostly um but I feel like the library is overcrowded a lot of times, especially if it's between the hours of 8 and 10pm. Everybody's in the library doing work and I can't--like I like my room to be my room and I don't really like to use the common room in my dorm or anything so I don't know for me, coming to this building is like this is where I do academics so I just kind of keep it all in the same place.

Olivia: Do you usually study by yourself or with other people?

Student 3: Always in groups. Almost always in groups.

Olivia: Okay, what do you think makes certain buildings on campus feel more inviting or inclusive than others?

Student 2: I mean part of it is just like, how old is the building? Cause like, I don't know, some of the super old buildings--like I would never go do work in Kunkle, just cause it kind of scares me because it's probably haunted. Yeah, so I don't know if that's a huge factor but it's there a little bit. I like that the basement that they just did here is like it's nice but also it's really loud for some reason. I think it's cause they don't have a real ceiling. They just have all the pipes and vents and shit so you just hear it. It's really nice. It's really nice to have a group class in there and then you can't hear each other.

Student 3: I guess yeah like appearance wise, being in a newer building is one thing but along with that is like, when they have a lot of windows. Like the library, yeah I don't know that's a really nice, inviting thing. Same with--like I think about how you said Kunkle--like yeah no part of me wants to step foot in Kunkle. But like, buildings like New Oeschle on campus, which I also have no purpose in going to New Oeschle, but I'd be way more likely to go do work in there versus Kunkle just cause it looks nicer, it looks open and not so restricting.

Student 1: Yeah, I totally agree. Just windows instead of fluorescent lights. And also, even if you can't do windows like if you're underground or something, even just plants. I think it's just that you can see the nature, you don't feel like you're stuck in some building.

Student 2: The only thing about windows though is I don't like feeling like it's a fishbowl. Not a fan. Like our lab, Rachel's lab, where there's--

Student 1: Well that's not really a window. It's gotta be a window to outside.

Olivia: Okay, um, what is your biggest complaint about Acopian as a building or study space right now? If you have any.

Student 1: I'm going to say something very cliche. But more windows. I really don't like the bottom floors. At least floor two there's tiny little windows at the top of the thing and you're like, "oh I can maybe see someone's feet" but that's about it.

Student 2: I actually do on occasion like to feel like I'm in a pit. I do, it's a common thing.

Olivia: Haha, not something I've heard a lot but it's legit.

Student 2: Yeah once in a while it's just like a small space where I will sit here and I will do my work and I will not leave my tiny, comfy pit.

Olivia: Okay, that actually does make sense.

Student 2: Like the computer labs are occasionally just really gross. Like the graphics lab, not a clean area. And like I know that's probably really really hard to, I don't know, mop under all the computers and stuff but that floor is disgusting.

Olivia: Um, so I want to move now towards the art installation specifically. Before we get into any design specifics, I'm wondering if are any ideas or elements of any type of project that you'd really like to see incorporated for this particular site. Like types of installations. One thing we've been thinking a lot about is, should there be a technical aspect because this is an engineering building? So, does the art need to really reflect an interdisciplinary--should it be very engineer-y, should it be--

Student 1: I like things that move. I think that might be cool. But I don't know why, just because if you're bored and you're looking out the window and you don't want to work and you're looking out the window you have something to enjoy.

Student 2: Did you say this was going to be on--

Olivia: It's going to be on the exterior wall over here. I can show you a picture of the wall.

Student 2: Okay, cool. Cause honestly a big colorful mural would be good. Colors, very good.

Olivia: This is the exterior building. It faces Markle.

Student 3: Are you thinking structurally to change anything about the building or just some kind of sculptural/mural type thing.

Olivia: Something sculptural/mural. I think we probably don't have the resources to change anything structural. One thing I'm really interested in, though that you said, is

that when you're inside looking out--so is that something that you guys think would be an important element of this project?

Student 1: That would be really cool.

Olivia: Being able to experience something from the inside?

Student 1: Yeah, if you could see from the windows from the inside from the classrooms, like a little snowman or something, that'd be cool.

Student 2: Yeah, even if you just put something on the windowsill or something like that.

Student 3: Yeah, just as a reminder that Acopian is not just a pit for engineers. It is but we can also interact with the outside world too.

Student 2: It's a pretty pit.

Olivia: Okay, you said murals. Do you have--I don't want to put pressure on you, but are there any themes or images that you think would work well for this type of mural? I know you said colors. Are there any images?

Student 2: I don't know, gears. That's the most engineering thing.

Student 1: Honestly, I was thinking gears too.

Student 2: Honestly, gears are really cool.

Student 3: As mechanicals we're--

Olivia: You guys are such Mech E's--

Student 3: Well what if you did something that was related to each discipline too? Like gears because we're all mechanicals but you know a light bulb or--

Student 1: Or four gears, one with each department written on them. But Mech E's the best one so we get gears.

Olivia: Okay so now I'm going to--so our group has been toying with different design ideas and I wanted to get your thoughts first but we have sort of an idea and I was

wondering--so I'm just going to explain it and get some feedback on it. So we were also thinking of going possibly the mural route because--even though it seems pretty obvious--it is very colorful and really noticeable so we thought it might have a big effect. So, one of our group members had this idea to do a cutaway mural. So basically you paint on the side of the building and then it looks like you're looking into the interior and seeing different things going--basically different classrooms but rather than--

Student 3: So it'd be like a perspective or something?

Olivia: Yes. And rather than painting classrooms that you actually would find in here, incorporating a lot of different types of things. One idea he had was having a room with a lot of plants and greenery, which is sort of what you said. I think he also said a room with people doing yoga, a room with people playing with robots. So it would be engineer-y and not engineer-y. Do you guys have thoughts on that idea?

Student 2: One thing you could do is ask professors about their research. See what they're doing research in and what some of the applications are. So, I mean, I don't know. You definitely have Professor Nesbit's doing stuff with bio mechanics, so you'd have something with that. Rachel is doing fiber deposits, so you've got plants and then something made out of plants.

Student 1: I know there's a bunch of professors working on a fish project.

Student 2: Oh yeah, there sure are the fish. That's Brown and--

Student 1: Utter. And then also maybe Sabatino sometimes? I don't know. It's a big project; everyone's excited about it.

Olivia: Okay, that's cool.

Student 2: There's Professor Mante and his concrete. He loves concrete so much.

Student 1: He loves it.

Olivia: Are there any ways that we might incorporate moving parts, sculptural elements, or other non-mural elements into that kind of design?

Student 2: I feel like wind powered stuff is--I don't know, feasible.

Student 3: If you had a mini wind turbine that actually blew in the wind.

Student 2: Ooh that would be cool, like little pinwheel dudes. Wind chimes.

Student 3: Yeah.

Olivia: Do you think wind chimes would be annoying though?

Student 2: I don't know, that's a great question.

Student 1: Probably, yeah.

Olivia: Okay so maybe no sound but moving parts.

Student 1: And integrated into the painting, like if someone's twirling a rope or something. That's a really bad example.

Olivia: No, I get what you're saying though.

Student 2: Or but like if you had a kid holding a pinwheel and you actually had a pinwheel sticking out that's kind of cool.

Student 1: Or if you had a robot.

Student 2: Yeah, a little helicopter and you have a little blade on the top that actually spins.

Olivia: Alright, I like these ideas.

Student 1: Or an entire functioning classroom made out of wind stuff. That would be cool.

Student 2: You could also get stuff from senior projects. So like, some race car stuff, bridge design, I don't know what else do we do?

Student 1: Well, there seems to be a wind turbine project every year.

Olivia: Oh yeah? Okay.

Student 2: The Civ E's always have their bridge. The Mech E's and the ECE's always have a car.

Student 3: What do the Chem E's do?

Student 1: They make oil. I think.

Student 3: Polymers and stuff? Polymers aren't real exciting to put on a mural.

Olivia: Okay, let's see what else. Would you like to see an art project--maybe this or maybe something else--but whatever's on the exterior have an element that could be incorporated into the interior space of the building? Like, is art inside the building something you would be interested in?

All: Yeah.

Student 1: As long as it's not annoying.

Olivia: What would you think would be annoying?

Student 1: Probably noise inside a classroom or--

Student 3: Even just moving parts indoors might be unnecessary.

Student 1: Like if a professor's trying to teach and there's a little pretzel spinning sideways.

Olivia: Okay so no distractions. What would be good though? Colors?

Student 3: Probably nature. Even if it's paintings of plants and trees. Cause I know that's something we said made a space more inviting and less restricting.

Student 2: I don't know how feasible this would be but there's a high school back home that ceiling tiles, they paint all of them. I think it's an english class that did it because it was names of all the books that they read and they paint all the book covers on them. So I don't know exactly how that would translate to engineering but that's just kind of fun if your ceiling tiles are colorful.

Student 1: In my dorm freshman year, someone wrote in glow in the dark paint on the ceiling tiles but--you could do that on the ceiling tiles but you could also do that on the outside so you could have two different murals: one at night, one in the day. And it charges up and then you turn off the lights and it--

Olivia: Alright talk me through that one more time. So you have regular paint mural for day--

Student 1: And then I think there's neon paints out there that you can get and just paint on the wall and maybe at night the engineers turn into people eating, gears, I don't know.

Olivia: Okay, and then did you say something about charging up?

Student 1: Oh, no no no--

Olivia: It's like glow in the dark paint?

Student 1: Yeah. So it just needs sunlight but that happens in the day.

Olivia: Okay, I really like that idea. One issue we've been working on for a mural for this wall is that, as you saw, there's equal amounts of brick and window. And it's not like groups of windows and groups of open space, it's really interrupted space. So do you think a mural would work on that space?

Student 2: I feel like it would be best if it isn't one solid image but instead it's a whole bunch of little things that go together but aren't--like you can't just put a painting on it. You can be like, here's things that are in between all of the windows. And have stuff that sort of connects everything.

Student 1: Just strategically, you know, design elements. Like a thing that flows through and keeps flowing through or maybe integrate the windows into some parts of the piece and maybe ignore them in others. But I feel like, whatever you decide, you just look at the piece and you look at the windows and see how you can be clever about using them. Integrate them; pay attention to them, don't ignore them. Maybe even be clever with them. Actually, clever would be really cool. I don't know, I can't think of an example but there's lots of people who have used the frame of the painting weirdly or paint a fake frame and then have like tentacles coming out.

Olivia: So one thing we were thinking of, which probably I think we might be leaning away from was looking into technology--like you know how buses sometimes have full covering advertisements on the outside of the windows but when you're inside you can see out of them?

Student 1: Oh, yeah.

Olivia: So, that's one option we might look into but I don't know how feasible that would be. But how would you feel--if we weren't doing that--obviously we don't want to block any light coming in because this building could already use more light but having limited painting directly onto the glass. What do you think about that? Or do you think anything is taking away too much from the windows?

Student 1: Yeah.

Student 3: Yeah, I feel like if you're going to do that in some places, I just feel like it would look weird to have some windows painted over and some not. So it seems like kind of an all or nothing thing. Like either you work around them and incorporate them into the design or you pretend they're not there and paint right through them. i don't know.

Student 2: I feel like it would just not look quite right because you have a lot of texture stuff. Cause there's the concrete frame around the window and the window goes in a whole lot and then you just have weird stuff going on.

Student 1: Also, on the bus window thing, I think you probably should do that because you're going to easily be able to see the difference between a painted thing and that. That's going to look--

Olivia: That's what I was thinking. It's like a totally different quality. Also, even though you can see out, the windows are still really tinted. That's why I was thinking it's probably not a good option. But, yes, that's a really good point. Alright, my last question is, who would you like to see completing this art installation? Whatever it is. I mean, where do we look to hire artists, should they be hired artists, should they be students? What are your thoughts on that issue?

Student 3: Hired artists would be interesting but also if there's a way that part of it could incorporate the students in some way, like not like making them do the really really detailed and technical parts of the drawing but--for example, when I was a kid we painted

a mural in my elementary school and it was a garden mural but then everybody got to put their hand print on to make flowers and stuff like that, which is super kindergarten but you know, something like that. Just to integrate the students somehow.

Student 2: You could also reach out to alumni from Lafayette who are now professional artists; that might be kind of cool. Because then they're Lafayette students but also then you know that they aren't going to make it look bad.

Student 1: I feel like someone looking at the piece, I probably wouldn't care that much who made it, probably more important that it looks good. Like if it's ugly, I'll just be like "oh that's ugly." Cool some kids made it but I kind of wish it wasn't ugly.

Student 2: Yeah, I mean you could also ask current art majors if they're interested.

Student 1: And they're probably pretty good.

Olivia: Obviously you can't speak for everyone but do you think there would be interest from the student body in putting in time to help work on this?

Student 3: I think you could find it, definitely within the art department and people who--well, like us who have a vested interest in this building and beautifying this building and the arts. Yeah, I do think you could find people.

Appendix B: Professor Ed Kerns (art) Interview Transcript
Conducted by Olivia Guarna on November 6, 2018

Olivia: [explaining the project] ... to do an art installation on the exterior wall of Acopian that's facing Markle.

Kerns: The whole class is doing this?

Olivia: No, we're four people. And--it was actually Cohen's idea--but I guess the issue we're trying to get at is--we've talked a lot about the engineering culture here and everywhere but--

Kerns: What kind of engineer are you?

Olivia: Engineering studies. So that's what this capstone is.

Kerns: So you're the broadest engineer.

Olivia: Yes. So I guess we were talking about Acopian and how it's not very inclusive or inviting, especially to non engineers.

Kerns: It is a very difficult building to feel comfortable in and they've tried to friendly it up with a lot of photographs. I think it's in part the structure of it and when you walk in, you're confronted with heroes of the past and with mostly--I haven't been there recently to look at the art but I remember a lot of engineering male heads and then problematically, the photographs--if you're deeply interested in the subject, would probably be broadly interesting but they're not connected, they're not about connecting other things. It's engineering centric. And I understand that relative to the idea that they were trying to assuage things like ABET, which is the accrediting agency. Also, to find their ranking higher. And so you encourage engineering centric--just like art centric--things to push the public's perception to a higher level of how serious and engaged you are.

The real issue here is, at Lafayette in terms of background, one of the strengths that you must've heard of when you were applying (others have heard of it) is we have engineering and liberal arts. Right? And that combination is a winning combination for jobs and success. Well, it is if it's integrated. But as a marking point, you have to demonstrate that. So I don't think the building is a visual symbol [...] does a good job of representing connectivity.

And so, I think the idea of the integrated science center has shifted the paradigm a little bit because the paradigm has been shifted by people like Cohen and like Veshosky and others who are broader in their view of engineering. It's no dark secret that some engineers have a--whether it's out of insecurity or whether they actually believe it--the idea that their way of designing and modeling is vastly superior and it's not necessarily. It may be repeatable, but it is just one model of the human experience. And I think that rubs--chafes some people in other disciplines.

And also engineering is very well funded. And other programs don't have a long history as engineering does, for which people came here to study engineering and science to extract stuff from the Pennsylvania ground. You can get anything from slate to coal to anthrocycle (?) in particular out of the ground, you need to produce engineers. So, it's had a long history of internalizing its success. I think that's a good way to put it. It doesn't reach out as--but some individuals in there do. And they make inroads, like Professor Cohen and I noted Veshosky as well. And they reach out to other design based disciplines that have public voices like the arts.

So here's where the paradigm I think has shifted. Rather than promoting that we have liberal arts and engineering, what we ought to be saying is something broader, which is we deal with the idea of educating and making models of experience in multiple ways. Through reductionist, scientific, and mathematical models, and perhaps through expansive models that don't require repeatability but are models of experience [...], like painting, poetry, writing, and so on. And when you do that, the model gets redefined with the result. It's engineering plus liberal arts equals question mark or blah blah equals human capacity enhanced. So, I like that model a lot. And I think where you see disciplinary walls bending or falling, bio, chemistry, chemical engineering finding its way into the life sciences and design coming across sustainability issues, you need partnerships. Broad partnerships. So I think the college is trying to move that way, through no fault of the administration. I mean I think it's the faculty that realized how important that is. And I know certainly in the arts some of my most interesting students have been out of engineering and they're shocked that this other way of modeling is so appealing to them.

So I see it as what E.O. Wilson, who was a great naturalist and taught at Harvard for years, called Consilience, where there is--in all of the seeking of modeling in different ways--the goal is intellectual unity. You know, there is an overall intellectual unity to problems. You can be the most brilliant engineer in the world and have no empathy, have no poetry, and design something that solves a problem but is inelegant as a response

to the environment, for example. And vice versa. So it's important, especially on the undergraduate level. And I would also say, the real question for me and for some engineers--because I know a lot of people at MIT because I've worked up there in the visual arts lab--for them too and how they treat undergraduate engineering education. Many schools are not so wedded to ABET accreditation because they think on the undergraduate level--

[Brief interruption]

Kerns: I'm exhausted.

Olivia: Okay, well I wanted to pick your brain a little bit about--so after talking to some engineers I think we decided that a mural might be the best approach because a lot of them expressed interest in introducing color into the building.

Kerns: Where is this? I mean it's on the outside wall?

Olivia: Yes, let me show you a picture. It's the outside wall facing Markle Hall. This is the building.

Kerns: Yeah, so this is the wall that faces Markle?

Olivia: Right, so we wanted to do a mural and one idea that one of our group members--

Kerns: So it's a brick surface that you'd cover; you would install some panels and paint.

Olivia: Exactly. One idea was to make a mural that looks like a cutaway of the building so that you're looking into classrooms but it wouldn't be traditional engineering classes. It would be a variety of--

Kerns: Stuff going on.

Olivia: Right. And it's ranging from very engineering things to kind of ridiculous things. So I have a couple questions for you. First of all, I want to talk a little bit about the feasibility of doing this.

Kerns: What's the space between the windows? Did you measure that?

Olivia: We haven't and we're working on that but yeah, that's definitely a concern. Do you think a mural is a mistake there because the space is so interrupted by windows?

Kerns: Well it's going to be choppy images. You know, chopped up images. But there's no reason that it couldn't work. It could also be abstracted in some sort of sequential occurrence because you have measured spaces. There's nothing to say something couldn't morph into something else in six panels or how many windows you have. And that's visually fine because you can follow it back. You know the evolutionary curve or something. That's one possibility that always works. When you have an architectural program that's regular like that.

It's kind of hard to do a traditional image within that context because it's so broken. To me it would be not either or. Well let me put it this way. What you want is visual coherence. You don't want it to be something stupid. And so, my other question is, does the work of art there have to be panels with paint? Could it be something made with light? Could you do and get funded a beautiful neon piece that could weave its way through the window pattern? And would be stunning and different. I don't think--I mean the traditional means of a panel addresses one thing but it's not going to stand out. I mean even though you walk towards that space and you see it coming up, it's so regular; it's going to be hard to put a coherent image there. But, do you know the work of Stephen Antonakos? I'll show you the spelling.

Olivia: Yeah we were actually originally--before we thought about murals--we were thinking about light, especially since engineers are always working all through the night. We thought that would be a really cool thing to have.

Kerns: Well I'm just thinking the power of the metaphor is so complete. You know, you shed light on a problem, in darkness you move towards the light. I just like the idea of the metaphor. And the metaphor of light is much more informative because it's inclusive. You don't shine a half a light.

Stephen Antonakos is this artist and--let's see, that's him. He's a friend of mine. And he did things like this sort of image, where there'd be a panel and backlit. How killer you would have something. And here's what I suggest: he was a visiting artist here in the mid 2000s and he's also done many many pieces around the country. In fact, internationally. If you go to Tel Aviv Airport there's a big one on the building. He's done all sorts of things. So, yes it would kind of be a knock off but I think you could proceed and these are just stunning and they're spiritual and they're connected. But what he works with is

geometry. Now here's a thought: those twelve paintings sitting right there of mine were bought by the Integrated Science Center to hang.

Olivia: Yeah, I saw that.

Kerns: Okay, that's pretty cool. So there they are--here take look. Some of these images, or this idea of the octopus mind and the cell mind--it's pretty abstract. But I'm working on some paintings now that would translate beautifully into light. Now suppose, if you really wanted to do a mural--come here for a second. Just guessing the spaces between the windows is maybe four and a half or five feet by whatever, here's an idea. Imagine making panels with imagery, you know something like that. You know, more defined, okay? And light emanating out of it with little holes in it? You know, light coming out in different colors? Lights all around the edges. And if you wanted to, we could--how many are you?

Olivia: Four.

Kerns: And they're all seniors?

Olivia: Mm hm.

Kerns: And when do you have to have this design? By the end of the year?

Olivia: By the end of the semester.

Kerns: Oh, okay.

Olivia: Yeah, quick.

Kerns: It's quick. And who's going to help you do it--execute it?

Olivia: Um--

Kerns: Well you have a lab up there right? You have a place you could build the panels and install them?

Olivia: We're actually--

Kerns: Or is it just a proposal?

Olivia: It's just a proposal.

Kerns: I think it's a beautiful idea. If you wanted to, we can come in here with the four of you someday and we could talk about and I could lead you through the process of taking some of these biological imagery and imagine a painting like this, with the little parts that are connected. Here, this is about emergent theory but imagine that lit as--light coming through holes. Blue light, yellow light, pink light, green light. It could be stunning. So, here take a few images. I really think you could do a proposal and some drawings and the mechanics and light you guys could do in an instant.

Olivia: Yeah.

Kerns: And propose it and look for some money and do it in the spring and [...] as your legacy.

Olivia: That would be great.

Kerns: Why think so fricking small? With paintings [...]

Olivia: No, you're right. Especially since--

Kerns: I mean these are complicated images right now because they're paintings. But that could be simplified into a beautiful structure. It doesn't have to be this. It could be other things. It could be engineering principles: metal bending and all sorts of things. But I just see these with pores of light and light emanating. It'd be very cool. And the panel work would be outdoor material, which you could identify as engineers that would stand up. You build the panels, install the lights, you run some electrical wires and you turn it on and off on a timer. It'd be killer.

Olivia: Yeah, and I think engineers would latch onto the technical aspect.

Kerns: Of course they would. They would love that. Because the metaphor would be in attunement with the idea that knowledge lights the way. Knowledge defines human capacity. It'd be fantastic. The other idea I had when you said it, is imagine no rectangles and imagine shapes hanging on the wall like that. Install them. You know, metallic shapes manufactured and installed with lights in them. That'd be really cool.

Olivia: Yeah. Do you mind if I take a picture?

Kerns: No. But if you use any of it, I want in on the design because it's my idea.

Olivia: Absolutely.

Kerns: But I'm just saying, you could make a killer thing here if Ben [?] would pursue it.

Olivia: Okay.

Kerns: Alright? You want to take that?

Olivia: Okay.

Kerns: And you can just roll it up. It's just stupid shapes and you know--and there are other ideas in play but these are more painterly ideas but... The other thing you could do is something called backlight film. This is a sort of film you see in a bus kiosk. And so you put backlight in it and the image could just be there. But I love this idea of projecting out from a panel board. Maybe you even use some sort of word imagery. I don't know but maybe there's some sort of common word like consilience that is spelled. You know, like join the ideas.

Olivia: Okay, thank you. Those are great ideas. So I'm going to show this to my group and then we'll--

Kerns: And the other thing too, if you look at these things in a room, these are pretty intense. Imagine on the side of that building, oh my god it's perfect.

Olivia: Yeah.

Kerns: You have irregularity, you can have the images scale change. All sorts of things. And here's a building he did and it just has the shape on it. Some of these things are--look, Port Authority in New York. Pretty interesting. So, you would not be copying because you'd be using a panel with biological or engineering imagery/structure. So you have a hell of a lot to report back.

Olivia: Definitely.

Kerns: That's delicious. Smart work.

Olivia: Yeah, it is.

Kerns: And you know what would happen? If Cohen got excited about that and you said we're going to do the plans and maybe there's a group next spring that can execute this, you have engineering labs so you can build it in house. If you can build a racecar you can build that. Rectangular panel with lighting on timing.

Olivia: For sure.

Kerns: It's just the front image and I can help you with that. It'd be pretty awesome. And the other thing is, it enjoys the kind of connectivity of image to the Integrated Science Center where those paintings are going to be. They're in that book.

Olivia: Can I take this with me also?

Kerns: Sure.

Olivia: Okay, that's awesome. So, like I said, I'm gonna take all this back to the group and we can find a time to come--

Kerns: Yeah, I don't want to hear from you unless you want to do it. Because I'm so--I mean I am kind of grumpy this morning. Sorry about that.

Olivia: No, that's okay.

Kerns: But I've got a lot on my plate and I--at this point in my career--I'm only interested in what's going to be done. Chitchat is very easy around here, as you well know.

Olivia: No, I get that.

Kerns: Yeah, I know you do.

Olivia: We don't want to waste your time.

Kerns: And engineering is very unwasteful. And I know if you guys find this interesting, the next thing we talk about is imagery and develop some images and then measurements and scale and the shapes don't have to be rectangles they could be biological or they can come out of ideas in engineering. You know, all sorts of images. There's probably enough imagery out there to generate the whole thing but you want it to be connected to

this sort of art side thing that's going to happen. And talk about attracting people. Talk about softening the shell of that building. Wow, very powerful.

Olivia: Yeah, we think so. I mean it's in desperate need of something.

Kerns: It needs something and so I don't think you go a little bit, like paint some horses or something. Screw that. Let's do something really big. And then you go to the Pres. or the dean or what's his name, Scott Hummel, who's an old friend of mine, and say, we want to do this. It'll cost us $26,000 and we'll build most of it in-house. You don't have to pull a number out of the air--think about panels and stuff and you'll just need plan ops help to install. And you've got a brick surface there. So you're just drilling in the anchors. And it's not going to be heavy. At best it's a piece of bent neon behind it or maybe it's some other lights. And maybe the panel itself has a sort of door function to it to open it up and replace lights. You know, that's a design problem. How do you maintain it? But, wow, what a great idea.

Olivia: Yeah, that's awesome. Thank you, you've been so helpful so I really appreciate your time.

Appendix C: Student 4 Interview
Conducted by Roberto Quinteros

Student 4 is a junior Psychology and Gov/Law double major and is also a student tour guide for the Lafayette admissions office.

Roberto: What is your impression of Lafayette's engineering culture and what would you like to see change if there are necessary changes?

Student 4: I think the engineering culture at Lafayette is relatively interdisciplinary, which is what I say on my tours. I never thought I would step foot in Acopian, yet I was able to take some classes from an engineering professor as part of my First Year Seminar, which was interesting considering an FYS is considered a writing class. Having that experience made me realize that being an engineer is far more than just building stuff in a lab, and since my experience freshman year, I have learned to appreciate just how versatile the discipline can be. However, I don't think that is advertised enough, and I think the school should work much harder to promote engineering studies classes, and other business-related engineering courses, to students outside of the department because I think they offer valuable academic and life skills that go unnoticed at this school.

Roberto: What do you look for in a learning/study space?

Student 4: My biggest thing in a study and learning space is LOTS of natural light. By now, I have found my ideal study spots on this campus, such as the third floor of New Oeschle and the top floor of the gym--both of which have a great amount of natural light shining in all day. I hate working in rooms with no windows because I need to have a sense of time and not feel like I'm trapped in a small basement (hence why I don't like to study in Acopian).

Roberto: What makes some buildings on campus feel more inviting than others?

Student 4: The amount of open space and natural light is what draws me to some building over others on this campus. For example, I like New Oeschle far more than Pardee because Pardee lacks big tables (seriously, the desks in Pardee are designed for 6 year olds). Pardee also has far less light coming in through the windows, and is either too hot or too cold. Overall, I think if the school is looking to keep the old buildings on this campus, which they should, an effort needs to be made to make the old buildings more user friendly so student's don't feel like they are trapped in a different decade.

Roberto: If Acopian felt more inclusive, would you be interested in using it as a study space?

Student 4: If Acopian was advertised as a less intimidating and more welcoming environment to students of all majors, I would definitely study there. Right now, Acopian

just reminds me of late nights and headaches based on what I've heard from my engineering friends, so it's one of the last places I would consider studying. However, if there were ways to create larger, more open, and more inviting study spaces in Acopian, I would definitely use the building more...after all, it is the only building open 24 hours.

Appendix D: Engineering Student Panel
Conducted by Nia Holland

Nia: What is your impression of Lafayette's engineering culture and what would you like to see change?

Student 6: The engineering culture at Lafayette seems to be one where engineers take pride in their engineering degree and in the prestige of our engineering program. Another, less healthy, aspect of the culture is that all the engineers seem to be trying to act like they have the hardest life. Everybody is comparing their workload, exam difficulty, and how many hours a week they spend in Acopian to try to make it seem like they have to work the hardest in their major.

Nia: What do you look for in a learning/study space?

Student 6: I enjoy having comfortable seating and lots of windows in a study space. I also like a good mix of places conducive to working alone and spaces that are good for group work.

Nia: What makes some buildings on campus feel more inviting than others?

Student 6: The buildings on campus that seem most inviting to me have lots of windows/ natural lighting and many open spaces.

Nia: How much time do you spend in Acopian?

Student 6: All my classes are there and I primarily study there, so probably around 25 hrs a week

Nia: What is your biggest complaint about the space?

Student 6: Most of the spaces are very closed off or only have windows that are awkwardly out to the hallway instead of outside. There are limited study space options and not nearly enough space for some majors (ex. Mech E lounge way too small for # of students in major). If professors reserve labs for class it can be hard to find an open computer even. I sometimes use the Computer Science (5th floor) labs and rooms just because they are the only rooms with good natural lighting/ a decent view.

Nia: Would a more inclusive and inviting Acopian appeal to you/improve your experience of working and studying there?

Student 6: Honestly, being more inclusive to other majors does not strike me as a benefit because the space is already quite limited just with engineers using it. There would need to be space added if the goal was to make it inclusive for all majors. If it got more crowded without adding space I'd probably start studying elsewhere. Being more inviting would greatly improve my studying/ working experience though. If that improved, my 25 hrs a week there might feel less prison-like.

Nia: Do you have any big ideas for an installation piece on the exterior of Acopian?

Student 6: Not particularly, something that makes the place feel less dull but also isn't so different that it takes away from the architectural consistency that the college has going right now. Also ideally something that ties into engineering/ acknowledges the majors using the building.

Nia: Would you be interested in an art project that can be incorporated into the interior as well?

Student 6: Anything that can improve the interior would be greatly appreciated.

Nia: What is your impression of Lafayette's engineering culture and what would you like to see change?

Student 7: Overall, the engineering program has a very good reputation. However, sometimes it feels as though the students are overworked.

Nia: What do you look for in a learning/study space?

Student 7: I like a study space that is quite, open, and has a lot of light, preferably natural lighting.

Nia: What makes some buildings on campus feel more inviting than others?

Student 7: The outer appearance as well as the atmosphere inside of the building makes some buildings more inviting than others.

Nia: What ideas or elements might you like to see incorporated in an Acopian art project?

Student 7: This isn't a specific idea, but something bright to add color to Acopian. It might include different aspects from each discipline of engineering.

Nia: How much time do you spend in Acopian?

Student 7: Right now, I only spend about 4 hours a week in Acopian simply because of my class.

Nia: What is your biggest complain about the space?

Student 7: Acopian is very dark.

Nia: Would a more inclusive and inviting Acopian appeal to you/improve your experience of working and studying there?

Student 7: A more inviting appeal would definitely improve my studying experience in Acopian.

Nia: Would you be interested in an art project that can be incorporated into the interior as well?

Student 7: I think adding an art project would lighten up the mood inside of Acopian instead of it simply being a place where people feel overwhelmed.

Nia: What is your impression of Lafayette's engineering culture and what would you like to see change?

Student 8: I think the engineering culture is very supportive and unified, perhaps even to the extent of not including other majors. All the professors and department heads do the best they can to allow students to succeed while still holding really high standards.

Nia: What do you look for in a learning/study space?

Student 8: Good lighting (even natural light), not a ton of distraction, but somewhere comfortable with computer and printing resources.

Nia: What makes some buildings on campus feel more inviting than others?

Student 8: Natural lighting and tables for collaboration

Nia: What ideas or elements might you like to see incorporated in an Acopian art project?

Student 8: I think making the overall space more inviting and less "scientific" and miserable (for lack of a better word) would be good. Potentially more color and natural lighting and "homey" collaborative feel.

Nia: How much time do you spend in Acopian?

Student 8: Barely any except for actual classes in the building.

Nia: What is your biggest complaint about the space?

Student 8: It kind of feels like a dungeon, it's dark and really bland.

Nia: Do you have any big ideas for an installation piece on the exterior of Acopian?

Student 8: I mean it is nice that engineers have their own space to do their work, but collaboration with people in other majors is important as well. Something colorful and aesthetically pleasing.

Nia: Would you be interested in an art project that can be incorporated into the interior as well?

Student 8: Yes.

Nia: What is your impression of Lafayette’s engineering culture and what would you like to see change?

Student 9: I like the engineering culture at Lafayette. I like that students do work together and lift one another up. We check in on each other. We understand each other's struggles. I also like that there is frequently free pizza somewhere.

Nia: What do you look for in a learning/study space?

Student 9: In a learning space, I like a warm feeling. I like a clean room physically and in terms of thought, I like professors and peers with diversity of thought, open to solving problems in more than one way. Most importantly, I appreciate a learning space in which

no one is condescending and everyone is willing to learn something from those around them. Professors and students alike can always learn something new.

Nia: What makes some buildings on campus feel more inviting than others?

Student 9: Some buildings are more inviting based on appearance and based on interactions. Appearance wise, I find buildings with comfy couches or big glass windows more inviting. In terms of people, I find buildings where students hold the door more inviting. I know that is very specific, but manners say a lot about a person, and people make up communities.

Nia: What ideas or elements might you like to see incorporated in an Acopian art project?

Student 9: I don't know what this project is. If it is simply a project to incorporate art/artwork in Acopian, I would love to see more pictures of happy students, not just students doing research. I would love to see expressive art.

Nia: How much time do you spend in Acopian?

Student 9: 6-8 hours/week day; 4-9 hours some (most) weekend.

Nia: What is your biggest complain about the space?

Student 9: It is a little dreary. With all of the work and all of the time spent there, it would be nice to have the building a little more modern and have more windows (please, please, someone put more windows in Acopian that look outside. It is very sad studying with very little view of outside. In the ChemE fish bowl on the second floor, there is a window that looks over to a brick wall. Who thought of that? It is the saddest thing and I spend 2-4 hours each day in that room.) My biggest complaint is just the scenery.

Nia: Would a more inclusive and inviting Acopian appeal to you/improve your experience of working and studying there?

Student 9: A more inclusive environment in Acopian could definitely improve working and studying there. I don't see my non-engineer friends most days. I almost exclusively work in Acopian because of some of the software, and because I need easy access to my professors. My non-engineering friends work in the library and pardee which is just not feasible to me because I need access to those resources. Seeing other students in Acopian

could help relieve the stress of only seeing the sometimes (most of the time) very exhausted engineers. Some new faces might be refreshing.

Nia: Do you have any big ideas for an installation piece on the exterior of Acopian?

Student 9: I was unaware that anything was being installed.

Nia: Would you be interested in an art project that can be incorporated into the interior as well?

Student 9: Yes.

Nia: What do you look for in a learning/study space?

Student 10: I like big tables with a lot of table space. It would be nice to have comfortable chairs too.

Nia: What ideas or elements might you like to see incorporated in an Acopian art project?

Student 10: There could be more student projects on display.

Nia: How much time do you spend in Acopian?

Student 10: I spend about 10 hours a week in Acopian.

Nia: What is your biggest complaint about the space?

Student 10: My biggest complaint is that sometimes when people are working on group projects they get loud. There should be a place to reserve rooms to work in like the library. There should also be a quiet room for people who want to get work done by themselves.

Nia: What is your impression of Lafayette's engineering culture and what would you like to see change?

Student 11: Engineering culture at Laf is fine. I would like to see more classes with other majors or a requirement to take more classes outside engineering. But I know it's impossible cause it's already impossible.

Nia: What do you look for in a learning/study space?

Student 11: Quiet. Accessible. Spacious

Nia: What makes some buildings on campus feel more inviting than others?

Student 11: Accessibility, areas to sleep, space to spread out.

Nia: What ideas or elements might you like to see incorporated in an Acopian art project?

Student 11: Some form of interaction and light.

Nia: How much time do you spend in Acopian?

Student 11: Too much.

Nia: What is your biggest complain about the space?

Student 11: I like it. Wish there was food here.

Nia: Would a more inclusive and inviting Acopian appeal to you/improve your experience of working and studying there?

Student 11: I already enjoy working there.

Nia: Do you have any specific design ideas for an installation piece on the exterior of Acopian?

Student 11: Nope.

Nia: Would you be interested in an art project that can be incorporated into the interior as well?

Student 11: Sure, why not? I could look at it at three am when I'm delirious from sleep deprivation and in need of motivation from beauty.

Appendix E: Psychology Student Panel
Conducted by Nia Holland

Nia: What is your impression of Lafayette's engineering culture and what would you like to see change?

Student 12: I assume it is very prestigious and also competitive amongst the engineers. I don't know anything to say I want to change it.

Nia: What do you look for in a learning/study space?

Student 12: Secluded, quiet, few number of people, as less distractions as possible.

Nia: What makes some buildings on campus feel more inviting than others?

Student 12: Openness, bright, new. also having areas to sit to either study or just hangout.

Nia: What is your impression of Lafayette's engineering culture and what would you like to see change?

Student 13: I think that there is a school attitude that favorites engineers and the engineering program

Nia: What do you look for in a learning/study space?

Student 13: Comfortability- so that i can envision myself spending long periods of time there.

Nia: What makes some buildings on campus feel more inviting than others?

Student 13: I like the glass windows/ doorways and visibility in you get from newer buildings such as new Oechsle and Skillman

Nia: If Acopian felt more inclusive, would you be interested in using it as a study space?

Student 13: Yes, especially at times when the library closes.

Appendix F: Professor Toia (art) Interview Transcript
Conducted by Olivia Guarna on November 8, 2018

Olivia: Okay, so, I wanted to talk about our capstone project, which I think you've talked to one of the groups already for another one. But our project is making a proposal or design for an art installation on the exterior wall of Acopian that faces Markle. And I can show you a picture of that, but it's just a brick wall that has a lot of windows. Um, so I wanted to get your thoughts on a few things. One, we had a design idea, which is kind of falling apart right now, but I talked to Professor Kerns yesterday and he gave us another idea so I think now what our plan for the project is, is to flesh out three or four different design ideas and why they work or don't. So, I can talk through the ones that we have so far and also if you have something totally new that you can think of that'd be great but certainly no pressure to do that. But also I just wanted to ask you some questions about the feasibility of doing anything and also I know you have a lot of community connections to Easton, so I wanted to talk a little about that also. But anyway, so like I said we're working on an art installation for Acopian and the idea is to bridge—we're looking at the engineering culture at Lafayette and the ways it could be more inclusive and interdisciplinary and how that building—a lot of people feel is not at all inclusive.

Toia: Yeah.

Olivia: So we think art would be a great way to connect different communities. I don't know if you have any thoughts on that or how much you know about the engineering department here.

Toia: Well I've worked with a lot of the engineers so I know, you know, a general idea. And I've done some classes that kind of worked with students so, I have a pretty good idea of what goes on there and how things are run. Let me see an image of the space, because I think that's important.

Olivia: Uh huh. Yeah so actually I just met with Professor Veshosky and he was telling me about some trip you did in New Orleans.

Toia: Oh New Orleans, that was crazy. Really interesting. Talk about culture shock and watching people trying to make things work.

Olivia: So, that's the space. And we've been toying with ideas that might be able to be incorporated into the interior also but I don't know if that's going to be possible for this project right now.

Toia: Do you have any specific locations in this space that you're thinking of or are you thinking about you know, from top to bottom, or roof or any—

Olivia: Um, I don't know. So our original idea was, after talking to some engineers, they were saying that they really want something colorful on that wall. So we were thinking about murals and then one idea that we came up with was doing an image of a cutaway of the building so that you can see into the interior and having different classrooms but it would be really unconventional activities going on in there. But with the windows, we're thinking that the space is too interrupted to do something like that. So I don't know how a mural would work or it would probably end up if we wanted to go down that road, it would have to be a more abstract image—

Toia: Right.

Olivia: That could work with, you know, um—

Toia: So, tell me a little bit about some of your ideas.

Olivia: So that was one. And then when we talked to a few engineers—

Toia: I'm sorry, let me back up. The mural's a pretty obvious one. The question really is, are there any other ideas.

Olivia: Right, so we talked to some engineers. They said they wanted to see moving parts would be cool.

Toia: Typical engineers.

Olivia: Yeah. And then they were like "gears" and I was like okay, also typical engineers.

Toia: Oh god.

Olivia: And then they were like, paint gears and then paint the names of the different departments on them. So I was like, okay there's an idea. At the very beginning we were thinking about doing something with light because one of the problems with that building

is that engineers stay there all night and it seems like the work culture is kind of miserable there.

Toia: Yeah.

Olivia: So, some kind of light installation would appeal to the people who are working there at night. And then yesterday when I was talking to Kerns, he was talking about doing panels that are irregularly shaped or rectangular panels with some kind of imagery that's probably abstract—he was actually showing us some of the things he's working on—but that connect to biological or engineering themes and then have them backlit with colored light, neon light, either coming with holes in the panels coming through or just like emanating from around the edges, which I thought was pretty cool. Um, I don't know. We really just want something that will stand out from a distance. The wall—obviously it's not the front facade but it has a lot of visibility from the surrounding areas so we definitely want color, we're thinking about light.

Toia: So, but no one really travels between Markle and there. There's no—it's like a dead man's land.

Olivia: It's really just the approach coming—if you're walking on high street in the direction of Acopian. Or if you're coming from the library you can see that wall. But you're right. Unless you're going to the parking lot.

Toia: Right. That's right cause it's just a driveway that's in between the two. It's just a drive that goes down behind Markle right?

Olivia: Mm hm. So are you also feeling like the mural is kind of a boring idea?

Toia: Uh, yeah. Especially on brick. It's just such an easy—

Olivia: I know; it's so obvious.

Toia: It's a bit obvious. I would think that a changing light installation that just breaks up onto the space, that's the kind of interesting—the nice thing about that is number one, when you talk about light and, you know, at night, to activate that space with light would be really nice. You can do LED lighting and I think the nice thing about light is that there are so many facets of it that address multi-departmental issues. You can talk to psychology and sociology about what colors influence mood change and heightened awareness and make people happy. Especially in the winter when it's so dark. You can

talk about fluctuating patterns that enhance one's awareness. And you can—I think the most important thing is—the way that engineering students typically work (I'm sure Kerns talked about this) is that they are task and goal oriented and most engineering students at this stage in their life have fairly limited creative ideas, right? So you want to talk to everybody else in the college about what ideas they have and what they would like to see and then let the engineering department serve those ideas. Saying, okay this is what we want to do. We want to do these lightings or we want to do this moving thing and here's what you guys need to do. You need to design how this moves and write some software that allows this to happen to this. But don't give them the creative side; give them the problem solving side to fix. Cause that's going to give them a sense of collaboration and an expanded experience. It's going to open up their minds and eyes to collaborating with people beyond the engineering concerns. They don't necessarily have the vision yet, you know? And they need it. They need to understand that they are designing things for people other than themselves.

Olivia: Um, yeah. I agree. Also I think the light—that technical aspect is something that they can latch on to.

Toia: Oh yeah, no once you give it to them they'll be like, oh that's cool! You know, and then you give them the parameters of what those things might be. And the thing about light that's so wonderful is um, number one no one complains about illuminating surfaces, you know. Number two there's a huge amount of flexibility, especially now with LEDs and Arduino. You can really easily and fairly cheaply do a hell of a lot. And then there's also projected light. LEDs do one thing. You know, they can change but they don't project light well. But there might be an option to do something that projects light as well. And those are the kinds of things you can talk to more than one person about. You know, get some ideas from a number of different departments. But I would. I'd talk to psych; I'd talk to sociology. And then once they can kind of use statistical data and empirical data that says these things make you happier or these things enhance creativity, you know, then you can take all of that empirical knowledge and fit it into some type of structure that benefits everybody. And maybe it's both outside and inside.

Olivia: Yeah I think there are cool ways that that could be used in the interior also.

Toia: Even just like a meditation room. You know? Like if there was just a place where you could go that light just flooded the space and slowly changed, just a little room that had some pillows in it and you could just go and zone out for fifteen minutes—

Olivia: Yeah for sure.

Toia: Especially in the middle of the night when you need that, you know?

Olivia: Yeah, the interior of that building is honestly so horrible.

Toia: It's this crazy maze.

Olivia: Yeah, and it feels so institutional and all the furniture is like a hundred years old, which is fine but... One other idea that I was thinking about is incorporating plants or other organic materials.

Toia: Yeah.

Olivia: Which honestly might work kind of well with some light thing.

Toia: Yeah. Maybe that meditation room is like a growing plant room.

Olivia: Yeah.

Toia: Yeah, that's a great idea.

Olivia: My original idea was actually, my high school after I left, but has in the library put in—I don't know what they call it—

Toia: Vertical garden?

Olivia: Yes, exactly.

Toia: Yeah. I mean that could actually work on the outside too.

Olivia: Really?

Toia: Well, I mean, that's kind of tough because that's a northeast-facing wall so you don't get the kind of sun you really want on it. But you can—if it's simple plants that don't need direct lighting. Even if it's just—you've got all those windows, right? So what if they were just some simple vertical columns coming out.

Olivia: Do you have any idea how expensive that is?

Toia: What, vertical gardens?

Olivia: Yeah. Not like a number but very expensive or very inexpensive?

Toia: Depends what you're trying to do, it really does. I think the irrigation becomes the biggest expense. So you pump the water up and bring it down; it's tougher.

Olivia: Yeah, but I love that idea for an interior space also. Like, it's so little. It doesn't even have to be big but it does a lot to change the space.

Toia: I mean the other way you could do it is to plant some vines and train them to go up.

Olivia: Okay, the other thing that I wanted to talk to you about was who is going to be completing these projects if they ever get off the ground? We were talking about having students involved but also that students don't necessarily have time to make high quality work when it's not for one of their classes. So we were thinking about the ideas of having to hire artists. Do you think, well, I don't know exactly what I'm asking. Do you think artists in the Easton community would have any interest in what's going on on our campus?

Toia: Not really.

Olivia: Yeah, that's what I figured.

Toia: I mean, if there's money in it for them. If it's like a job, then yeah. And you could definitely—but like anybody, if you're going to commission somebody to do it, you kind of relinquish the control. So what are the students doing then? You know? I mean there are certainly people out there who you can probably engage with who are local. And then there's more professional artists who do just that kind of thing. Like if you're talking about a vertical garden or if you're talking about a light installation. You know, there are certainly some big name artists out there or some ones that are younger and are just getting going that you could hire to help you. None of those are going to be cheap.

Olivia: Do you think if we tried to do the project mostly in house it would come out looking crappy? Or do we have the capacity to make some kind of light installation.

Toia: I think a light installation is easier in that, no matter what, you're going to need to hire someone to construct it. Maybe you can get students to write the software and the students can design what happens there, but you're going to need some professionals to

install, get the right materials, do all the hardware hookup. But that's also the kind of thing that, if someone writes the software, it exists forever, and you hire the people to install once you've got the money to do it. You know, so the students' work would be designing it and writing whatever software is necessary for whatever kind of programming you want. And then that exists, right? And then writing a proposal for the college to say, we need $40,000 to do this project. Maybe it takes two years to get the college to come around and find that money. But then you just hire the person to do it.

Olivia: Yeah, okay.

Toia: I mean, your guys job—and I think also if you're—what class is this?

Olivia: Engineering studies capstone.

Toia: With who?

Olivia: Cohen.

Toia: Right so Ben, I mean Ben's great. Ben's like, he's there. He's going to be around. He's got great ra ra cheer power, you know. He's really good with you guys. And he'll see a project through. So if it's, you know, if he knows that there's going to be another engineering capstone that he's going to do a year down the road, you guys doing the final designing or maybe, you know, get it as far as you can and then pass it to the next class so that, yes you're right, you need a professor to keep it going. And a year long project's a lot more realistic than a semester long project.

Olivia: Yeah, it's kind of hard to accomplish a lot in the amount of time that we have.

Toia: It is, but if you have a professor who can keep it moving, then he can help shepherd it in the right direction.

Olivia: And, um, do you know anything about or can you speculate about the interest that the college might actually have in funding a project like this?

Toia: I don't think that's outside the realm of possibilities. Especially if it's—if you're showing that it's really like, a whole bunch of disciplines—really interdisciplinary, you can tap on all these different resources that are giving you input and being part of the process, it's really—

Olivia: Yeah, that's true. I guess, yeah. Because one of their biggest selling points for engineering is that we're in a liberal arts school and we're interdisciplinary so I guess it could actually show that.

Toia: Yeah, absolutely.

Olivia: Okay.

Toia: I love the idea of the plants growing too. I think that there's a lot of opportunity for that being kind of multi-dimensional. You could have both an exterior one and an interior one. It's kind of interesting to have both. They share the common bond.

Olivia: Yeah, a little continuity.

Toia: But you're exposing it to the outdoors and the indoors. If you go outside of the engineering—like, how many people outside of engineering would walk into Acopian? Other students need to be going there too. So it's really nice to kind of bring some of engineering outside of it but it's also really nice to serve the students inside too.

Olivia: Yeah, I think the challenge I'm seeing right now is just getting people to break away from the idea that it has to be like an image. Like that's the only path for the installation, but—

Toia: Do you know Villareal? He's an artist; write his name down. Villareal. He does these super intense light installations. Like he did one across the Bay Bridge in San Fransisco and he used traffic patterns and motion sensors to count and dictate whatever the patterns were happening on the vertical LEDs that were happening on the bridge.

Olivia: Wow, that's so cool.

Toia: I mean, across the entire span. It was about a 16 million dollar project or something like that. But it was--but I mean the Bay Bridge is huge. Leo Villareal, look up light installation on Bay Bridge and you'll find it. But if you can show examples like that to someone, that'll get everyone really excited. You know, like we can do something like that? Absolutely. So that kind of investigation will help you and just kind of handing that off to someone. That could be really dynamic.

Olivia: Okay, thank you so much for your help.