

Community Centric Curriculum Slidecast Transcript

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Slide 1:

You all know the classic engineering story of implementing a water supply system in an underdeveloped village. The engineers implement these systems with the idea that they are leaving a lasting positive impact on the community. However, most of these designs aren't sustainable, and fifteen years later only a few of them remain. There must be a disconnect between engineers and communities and our goal is to better understand why.

Slide 2:

Our team set out to understand why this disconnect exists. We sought to gain an understanding of this gap through the analysis of socio-technical contexts in order to merge engineers and society through re-imagining engineering education. Our research and outreach this semester led us to recognize that this gap exists at Lafayette College and in order to combat this we created a 200 level community centric engineering course.

Slide 3:

Before we created the course, we researched the history of engineering culture and how our engineers came to be in the United States. The Cold War was a huge turning point in engineering history. More than ever before, the government was focusing on technological development which made engineering one of the most popular professions in the US. Engineers

were predominantly working on projects for the government which created a disconnect between engineers and society.

Slide 4:

The historical emphasis on the technical side of engineering since the Cold War has left a lasting effect on contemporary engineering culture. There is an apparent separation between engineers and the communities, customers, and societies that they design for. This culture creates engineers who ignore the outreaching social, political, and economic, consequences of the technologies that they design.

Slide 5:

Starting in the 1980s many of the top engineering programs recognized the divide that existed between engineers and communities. Schools like Harvey Mudd, MIT, and Purdue began to switch gears in their engineering programs, introducing more holistic engineering curriculum. Programs where students interact directly with end product users were created in order for students to better understand the entire design process.

Slide 6:

In framing our project, we looked into the Lafayette community as this is a community we are each a part of and can best analyse. Considering our student experience, we asked, How can Lafayette bridge this gap to develop the most equipped engineering graduates to tackle today's most pressing challenges?

Slide 7:

In bridging the gap between Lafayette engineers and society, our team determined that creating a community centric curriculum would be most efficient in redirecting Lafayette's engineers to be social agents. We asked ourselves: what is the most effective way of integrating this curriculum? How could we define success in a community centric curriculum for students and professors? And how could this curriculum change engineering culture at Lafayette?

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We looked at the Laf school newspaper to better understand the history of engineering curriculum at Lafayette. We found that within the Cold War era Lafayette was reforming in order to graduate more technically literate students. We realize we are in a new era of engineering curriculum reform and in order for us to compete with other schools we need to make changes that will allow our graduates to better understand who they are designing for.

Slide 9:

Our outreach entailed an engineering student and professor survey to better understand Lafayette's existing engineering culture. The word cloud pictured here shows what our engineers believe are their strongest non-technical skills: we do not see skills that show the ability to understand communities such as contextual listening or empathy. Overall, junior and senior engineers that we surveyed feel that they will impact communities in their professional careers, yet haven't been able to as an undergrad.

Slide 10:

In our survey for professors, we focused questions around their personal views and incorporation of community and non-technical skills in their teaching. Although professors defined community, these graphs show a larger frequency of higher ranking of the importance of non-technical skills than their impact on the community.

Slide 11:

In addition to formal surveys, we observed a 400 level “community engaged” mechanical engineering design course. The B.S. engineers in this course initially had a difficult time stepping back from their solution oriented mindset to get to know the community stakeholders. Our observations show that these Lafayette trained engineerings explicitly reflected contemporary engineering culture.

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While students and faculty clearly identified traditional non-technical skills, there was a lack of developed community-centric skills. In class, students are not challenged to think about their role in the greater community, which parallels with engineering faculty’s lack of prioritization of community-centric design. Since the results from the Lafayette engineering community prove there is a gap in the engineering curriculum at Lafayette College, what steps do we take to shift this mindset?

Slide 13:

The Colorado School of Mines has an established community centric curriculum which helped guide us in the creation of our proposed course. They have two unique minors that teach their students to focus on stakeholders involved in the design process as well as educating students on the impact of their work. We used the courses at the Colorado School of Mines as a basis to create the goals of our course.

Slide 14:

From our research and outreach we decided that a 200 level community engaged engineering elective would best mitigate the effects of engineering culture in Lafayette engineers. Because students and professors at Lafayette exhibit technically focused mindsets, we believe that a community centric class will help students understand why community perspective is important and will help students develop the skills necessary to create sustainable design.

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This course breaks down into two main sections. The first section will focus on a brief history in engineering, sustainable community development and contemporary engineering culture. sustainable community development relates most explicitly with community-engaged engineering, and supporting case study analysis will exemplify the necessity of this change in mindset.

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The second half of the class will focus on engineering ethics and how community centric design is important in all fields of engineering. A background in ethics will provide students with the perspective-based, non technical skills necessary to approach experiential engineering projects in the future. This course will be seminar based with a focus in literature and writing.

Slide 16:

The learning outcomes for our course involve:

- analyzing the contexts in which engineering and technology are built in
- recognizing the different ways that problems can be approached
- understanding sustainable community development and engineering ethics that go alongside it
- and understanding the non technical aspects of engineering

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Our team has identified three areas that need further analysis including:

- i. (1) Project Duration: We needed more time to develop a stronger and more end-product focused project.
- ii. (2) Survey participation was a challenge because of the attractiveness of survey and the support of the engineering division.
- iii. And (3) the limited number of faculty in the Engineering Studies program: constrains the implementation of this course

Slide 18:

We recognize the large setbacks to overcome before this course proposal is realized. This

project is testimony to the growing cultural demand for a holistic engineering education with community as a core value. The next steps for making this course possible for real implementation at Lafayette include, but are not limited to :

- a continuation of this project focused on course development through future Engineering Studies capstone groups and
- further communication with existent Lafayette initiatives and the engineering division.

Slide 20:

We believe that the foundations of this 200-level engineering course will help begin to bridge the gap between engineering and society and train Lafayette engineering students to become the social agents they are meant to be.

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