

Employing Industrial Partnerships *to* Increase Preparation *of* Students *through* Undergraduate Research

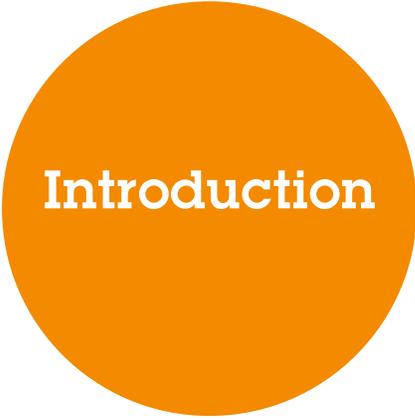
DEVELOPING THE 21ST
CENTURY WORKFORCE

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The Association of
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Introduction

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Students today have been inundated with multimedia influence since before they started primary school. Accordingly, colleges and universities have made flashy images and videos to attract students to their programs. Much like the way that a website gets more visits by highlighting the singularly most interesting aspect of the page, some of this recruitment material demonstrates what is a highlight in a program rather than what is the mode. This is not necessarily a bad thing. In fact, it is a great way to show students what they can do and what they can achieve if they apply themselves. However, students may become disenfranchised and/or frustrated when their experiences do not match that “highlight reel.” At the opposite end of the spectrum, if a student feels these experiences are too frequent, they can easily be lost to other “easier” programs, begin to skip classes, or perhaps worse, drop out of school altogether. Not all moments in a student’s collegiate experience can be picturesque. In fact, keeping the attention of millennials is a constant challenge that many faculty and programs face. Students who have been raised among constant stimulations tend to have higher demands for that attention. Furthermore, they have a greater ability to search for other options, and quickly.

Another complication from the distractions bombarding students is its effect on what they see as relevant during their coursework. Some students have commented in class, “I can learn this from YouTube, why do I need to show up for class?” Although, as faculty, we understand the basis behind why they need to be there, it can sometimes be difficult to develop a convincing argument to a jaded and cynical group. Students see the value in an internship because it is related to their field; it is experience that they cannot get from the classroom or from the internet. Internships are one of the most valuable things that student can do to develop their career while they are students. It builds their resume as well as their expertise. An opportunity may be available to create classroom experiences that mimic the internship experience.

This paper describes a partnership between Eastern Illinois University's Applied Engineering and Technology program and an International Paper cup producing facility in Shelbyville, Illinois. By capitalizing on industry contacts and alumni relationships, students at Eastern and International Paper were both able to benefit from the interaction and the outcomes. Eastern students were able to develop a verifiable project that can be a highlight on their resume, and International Paper was able to get a project completed that would have otherwise continued to sit idle.

Description of Problem

Throughout the United States, many technical programs suffer from stagnant or dwindling numbers. Often, students find it difficult to engage in academic-based communities that have been repeatedly shown to increase retention. (Schneider, Bickel, and Morrison-Shetlar, 2015; Gomez, 2013) Moreover, students sometimes find the job market to be competitive, especially if they do not have previous work or internship experience. Failure to engage students, who are either new to the technology field or have not had the opportunity to work in their desired profession as an intern, may be ignoring a large portion of students who have great potential to contribute. When students do not see the value in what they are doing, or feel excluded, they can begin to lose focus and hope, and may leave the technical program for another major or quit college altogether.

Background

A recent graduate of Eastern Illinois University's Applied Engineering and Technology program accepted a position at the International Paper cup production facility. Soon, he gained the responsibility of heading up special projects. Like most facilities with high production and many employees (more an 1100), there were many projects that had been on the "to do" list long before he acquired the position. Also, like many facilities, priority had to

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be given to the projects that carried the biggest impact, such as developing a new product's manufacturing line. Even though bigger projects require most of a manager's time, the smaller projects do not disappear. International Paper referred to these projects as "back-burner" projects. They were important and would aid in safety and productivity, but their nature did not lend them to be as critical as many other projects. Many of these were the projects that had been on the project list for considerable time.

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The Special Project Manager sought out the help of Eastern's Machine Design class. International Paper provided a list of "back-burner" projects that, through his experience at Eastern, the Eastern alum knew were within the capabilities of our laboratories and faculty, and able to be completed in a reasonable time. In discussing these several projects, the faculty member and Special Projects Manager decided on three projects that could fit these criteria, as well as what projects might be the most valuable for their facility. Information about the project goals was summarized and presented to the Machine Design class. This also served as another opportunity to present an applied research process to the students in the course.

Approach

One of the goals of the machine design course at Eastern is to develop a project from the initial need though evaluation and re-design. When the projects were presented to the class, it was presented as a project for a grade. In addition to a grade, it was presented as the relevant project that it was and the impact that it could have on future employment opportunities. Students immediately began to see the importance of the project as a line on the resume for having created something for a company that has an actual impact: not just a hypothetical "imagine if..." project. The project was even

used as a competition. The winning proposal would have the opportunity to spend a semester executing their idea from prototype through evaluation and redesign as an independent research course. The project proposed was a specific material handling device for heavy, narrow rolls of bottom stock for cups and tubs.

As the students set out to develop their idea, questions began flooding in. Fortunately, many of the questions could be handled over email with the project manager at International Paper. As students got further into their project proposals, they began to see the value in communication, something many students struggle with. After students drew their ideas for the projects, they had to create an evaluation plan to determine the measures of effectiveness of their product.

When the project proposals were completed, they were presented to the class and sent to International Paper for selection. The winning project was “funded” by International Paper to execute in the following semester. The student was able to work with International Paper in choosing material, parts, and equipment while he constructed the device. The evaluation feedback loop ensued, and a usable device was eventually developed and used in the production facility.

Outcomes

The term research is often associated with scientists in lab coats dropping metered doses into test tubes. At least, that is how a lot of students in applied engineering have a tendency to view it. The applied research process is often excluded from this image. Generally, applied research provides more immediate



Outcomes

solutions than basic research does. Because of this more direct outcome, the development of the research process is sometimes over-looked. This applied research process met two direct student needs: relevance and outcomes.

The project idea delivered to students got them through what is usually the most difficult part of the research process for students: finding the idea. After the idea was delivered, it was up to the students to develop the research.

Without knowing they were creating an applied research proposal, students became engaged in creating ideas that they hoped they could develop. The relevance of working with an actual production facility further encouraged the innovative process.

Students commented throughout this project that they were more interested in that particular project than many of the others that they have been assigned throughout their college careers. The student who won the competition was eventually offered a job from International Paper. With word of this spreading, other student began to see the importance of becoming engaged in activities with industry. This project was a boon to the program and opened the door to other projects to increase student involvement in their educational process.

Furthermore, when the winning student is able to produce a presentation for an on-campus research symposium, it has a few positive results. The Applied Engineering and Technology program gains interest and recognition within the campus community by having tangible output that enhances the students' experience and develops industry relationships. Also, the student presenting the work takes ownership of her product and can use the presenting experience as further demonstration (on her resume) that she can take an applied research project from idea to results to dissemination.

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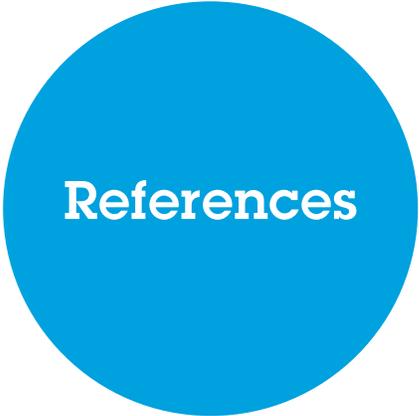
Summary

Students strive for relevance and something from their educational experience that they cannot “get on YouTube.” It is our charge as educators to provide an environment that facilitates those opportunities. The Applied Engineering and Technology program at Eastern Illinois University has taken advantage of relationships with local industry to enhance the integrative learning opportunities of its students. The local industry can get “back-burner” projects completed and are more inclined to hire students. The program keeps students interested through relevance and a developed applied research process. Most importantly, the students are better prepared to execute projects when they enter industry.

References

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References