



A Case for Utilizing Outreach Opportunities to Improve Faculty Performance

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Abstract

Most companies in manufacturing and service industries have identified professional development as a means for their staff to improve operational performance and to develop a competitive advantage. However, many companies approach development via coordinated hourly workforce training or tuition assistance for salaried staff, leaving professional continuing education as an ad hoc endeavor. A win-win opportunity exists for academic programs to fulfill these professional development needs while simultaneously obtaining feedback and direction from industry about the knowledge and skills expected of their graduates. This paper provides an overview of how a college-industry partnership born of the complementary goals of academia and industry can be realized through faculty outreach.

1. Introduction

As educators of students in engineering and technology, most professors view the preparation of students for post-graduation employment in their area of study as a primary goal. In helping students prepare, many professors seek and utilize opportunities for the application of concepts via lab or homework assignments. This paper looks at how faculty can utilize outreach opportunities to help them develop applied classwork, homework, and lab assignments. The material presented in this paper is based on information and data collected from East Carolina University's (ECU) outreach and professional development programs with several different manufacturing and/or service companies. The paper will discuss the benefits of the outreach opportunities for the industrial partners, but will focus heavily on the benefits for the university.

Academic benefits discussed will include: 1) enhancement of the faculty's knowledge and skills through exposure to real-world problems, 2) exposure to publication opportunities, 3) enhanced visibility of the college's academic programs, 4) feedback on the college's academic programs and curriculum, and 5) employment and internship opportunities for students. A model for faculty engagement and industrial training and development is presented along with a summary of the benefits and challenges of completing outreach opportunities between industrial partners and faculty of a four-year university.

Initially, this paper will establish the case for the need for professional development for faculty. Next, it will evaluate how many companies approach professional staff development to improve operational performance to develop a competitive advantage. Finally, the paper will review data on how outreach opportunities provide a benefit to stakeholders, including students and the university.

2. Professional Development for Faculty

Professional development for faculty in their respective area(s) of expertise is imperative for the viability of any academic program and the success of the institution of higher education ^[1]. Professors are expected to understand the subject(s) that they teach and understand how to apply the material to real-world scenarios. While research suggests that most faculty members “are inherently self-driven learners” ^[1], some academic disciplines, such as pharmacy education, use accreditation councils that specifically advocate an effective continuing professional development program ^[1]. This paper posits that one of the most effective ways for engineering and technology faculty to obtain continuing professional development is through active and continual engagement with real-world problem solving and consulting projects. Through external, off-campus projects, faculty members gain experience and continuously develop their expertise, providing personal and institutional benefits.

According to a 2006 study by Anderson and Olsen, there are four factors that influence an individual faculty member’s perspective on personal professional development, including: 1) their development stage in the career cycle, 2) the institutional framework of their employer, 3) the need to access collaborative opportunities, and 4) the willingness to assume new responsibility. Faculty’s focus on professional development is typically formed into three primary objectives: 1) gaining experience in their own discipline, 2) teaching skills, and 3) research skills. Interestingly, teaching skills was the first priority, followed by research skills ^[2]. However, faculty rank may also influence the perceived need for professional development ^[2]. The professional development aspect for gaining experience was a primary driver motivated by external mobility. Additionally, a conclusion by Opre, et al., 2008, was that professional development tends to feed differentiation by faculty rank. Fixed term and tenure track faculty may be more inclined toward teaching skills and professional development, whereas tenured faculty members tend toward research oriented development ^[2].

While academic credentials are essential for academia, anecdotal evidence and experience with outreach programs suggest that client companies look for additional bona fides to bring in outside help for outreach projects. Specifically, information gained through numerous outreach projects suggest that businesses seeking external training and consulting through outreach value a professor’s industrial experience and industry related professional certification(s). They view these as enhancements to academic subject matter expertise. This seems to support the Opre, et al. ^[2] conclusion that fixed term and tenure track faculty participating in outreach programs are more inclined to pursue industrial related professional development over research related personal training.

3. Professional Development for Employees

Cervero ^[3] cites from Queeny’s 2000 *Handbook of Adult and Continuing Education* that while a great deal of planning and resources go into the process of obtaining a higher education degree, until the end of the 20th century, little thought was given to what happens to learning over the subsequent span of a forty year professional career ^[3]. One way to support the conclusion that professional development benefits individuals is to examine the growth of the Project Management Professional (PMP) certifications issued through the Project Management Institute

(PMI). As shown in Figure 1, since its inception in 1984, PMI has issued approximately 400,000 certifications, with 180,000 still “active” as of 2010^[4]. In addition to the growth of the PMP, there are a growing number of professional certifications offered and a corresponding growth in the certification training industry.

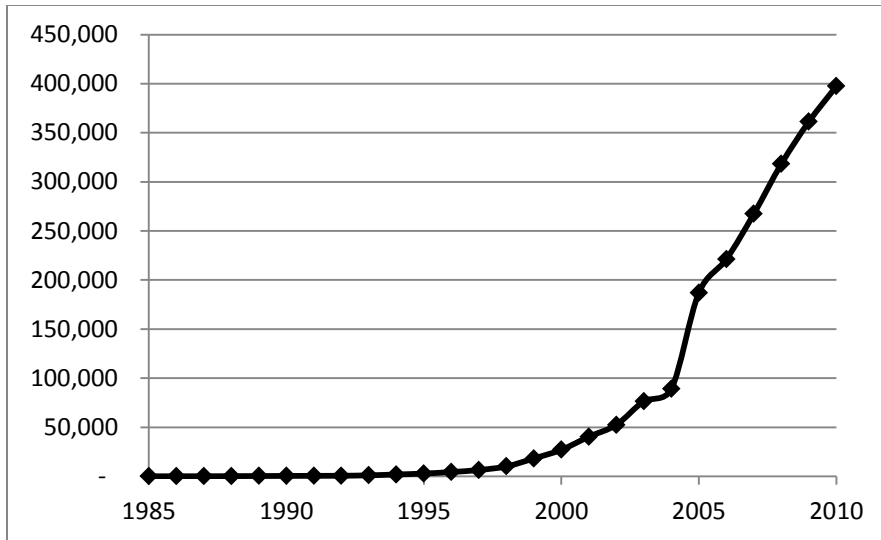


Figure 1. Cumulative PMP Certifications since Inception

Some corporations have taken the initiative to provide workforce training for professionals. According to the 2012 State of the Industry report from the American Society for Training and Development (ASTD), US companies spent approximately \$156 billion on learning and development in calendar year 2011. This was an average of approximately \$1,300 per employee for “large” companies. The top three topics included: 1) managerial / supervision, 2) process and business practices, and 3) industry specific content.

External training services, which include university delivered outreach programs, accounted for approximately 30 percent, up from 27 percent the prior two years^[5]. Training delivery had been constant for the past three years, with instructor led delivery accounting for approximately 72 percent of formal learning hours^[5]. ASTD also reports that external training requests, at a large number of employers, were primarily for customized programs related to new product launches, enterprise wide applications, and targeted business processes.

The case for professional development through faculty delivered outreach programs supports the adult learning theory that recommends training class attendees immediately apply the concepts and/or skills covered in the training^[1]. As an example, for one company who participated in the ECU-industry partnership, a class requirement was for the training to culminate with the development of an executable small project scope based on the course content. Development of the project scope, facilitated by the instructor, was a central part of the training agenda. Critical to the definition of the “small project” were the constraints of:

1) a 90-day completion horizon, 2) no capital expense, and 3) no information technology (IT) support. Training participants were divided into teams of four and presented their project scope to management at the end of the course. Management supported the projects by signing off on the scope and a 45-day review. After 90 days, the participants completed a final project

presentation. This approach demonstrated management’s commitment to professional development and the reinforcement-by-action concept to provide a win-win scenario for all stakeholders.

Other companies in the university-industry partnership utilized a 10 to 12 week training program to help employees develop and define projects that were based on problems identified by management. The employees were required to apply structured problem solving methodologies while defining and executing projects. The final project deliverable was quantified improvement that met a financial payback threshold.

4. Data Review

At ECU, a specific and dedicated administrative staff function was developed to assist with outreach and engagement opportunities. The Center for Innovation in Technology and Engineering (CITE) pairs faculty members from the College of Technology and Computer Science with local industrial partners, the goal being to match industry needs with the college’s resources. CITE is the primary liaison that most faculty members use to conduct outreach assignments. From 2006 to 2013, 240 projects were completed by several different faculty members in the College of Technology and Computer Science through the use of CITE. As shown in Figure 2, these projects were completed with multiple industry and community college partners. In a given year, an average of nearly 13 faculty members, representing approximately 17 percent of the College of Technology and Computer Science faculty, engage in outreach projects with an average of nearly 29 industry partners.

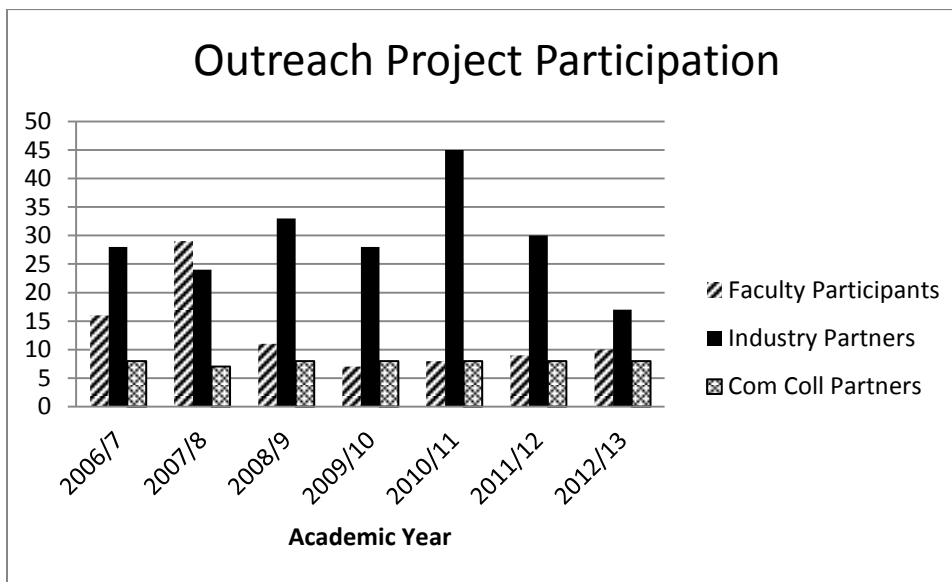


Figure 2. Outreach Project Participation

The types of projects completed by the faculty members primarily included training and improvement projects utilizing industrial engineering concepts, computer science concepts, supply chain and inventory management concepts, quality concepts, Lean and Six Sigma concepts, electronics, and technical writing. Figure 3 shows a summary of the types of projects completed during the seven year period for which the data was collected. The top ten types of

projects reflected in this data directly relate to a professional certification i.e., Lean Six Sigma certifications, Certified Manufacturing Technician (CMT), Computer Aided Design (CAD) certifications, Certified Supply Chain Professional (CSCP), Certification in Production and Inventory Management (CPIM), Certified Professional in Supply Management, Council of Supply Chain Management Professionals (SCPro), Red Hat Software Certifications, Programmable Logic Control (PLC) certifications, etc.

This data further supports the value of faculty to the professional development of employees as noted earlier in this paper and as presented in the next section of this paper. Similarly, this data supports the need for faculty to remain current in the emerging technologies, applicable methodologies, and professional certifications in their respective areas of expertise.

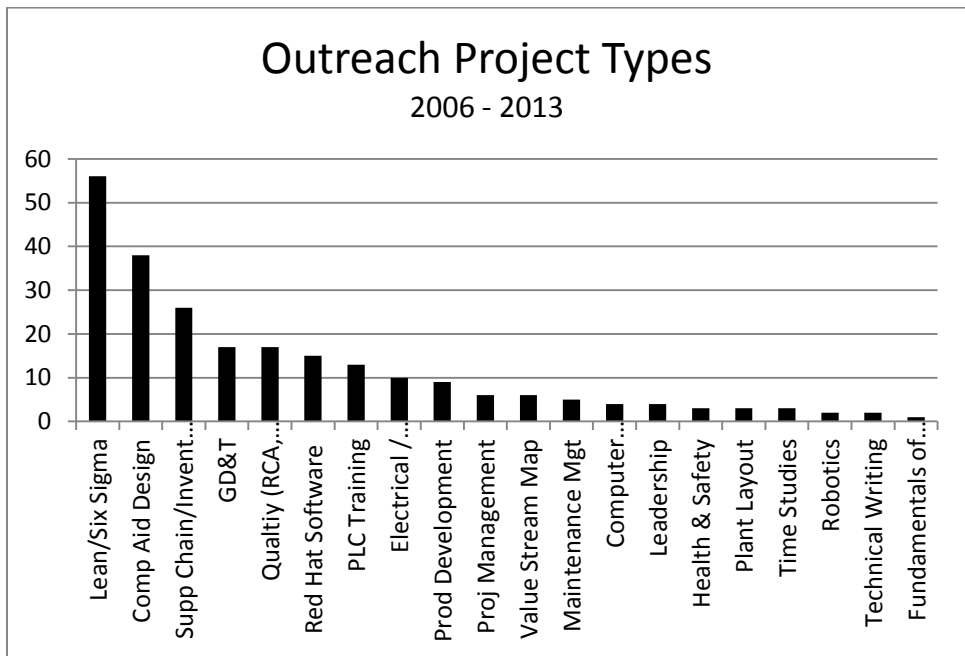


Figure 3. Outreach Project Types

5. Industrial Partner Benefits

In a review of continuing professional education from 1981 – 2000, Cervero points out that research tends to characterize the most frequent form of delivery for professional development as an “informational update” consisting of a two to three day course presented in a lecture format for large groups of professionals that sit at rows of narrow tables “taking notes that will never be read again ^[3].” This somewhat sarcastic stereotype resonates with many professionals, as witnessed by personal experience of the authors. To some degree, this perception has led to increased engagement with university outreach programs. A vital advantage to industrial outreach programs is the customization of training materials and delivery. In the world of professional associations, each profession has a generally accepted “body of knowledge” (BOK) that provides conceptual information and practices required for the profession. The BOK serves as the foundation for professional certifications and training, but its content is typically extremely broad and not intended to be a “how to” manual.

Most industry partners seek a more granular approach to training which can be delivered by university faculty through a process of dialogue and progressive elaboration. The benefit for the industrial partners is mutually developed and customized training programs that are focused and relevant to their needs. The customization allows for reduced training time and improved post-training benefits. This type of faculty developed and delivered training and/or workshop provides an alternative to standardized commercial training offerings. Additional benefits include:

- Knowledgeable trainers/subject matter experts
- Customized class material
- Cost effective, on-site, training delivery
- The use of in-house examples
- One-on-one training if requested
- Post training support

Key advantages and economic drivers for industrial partners to engage with faculty members for industrial outreach, as opposed to other commercial services, are primarily quality and cost. From a quality standpoint, research by Santos and Stuart found that, for most individuals, “training increased confidence and self-efficacy, improved competencies and skills”^[6]. However, a percentage of employees felt that training “made sense” during class, but translating the knowledge into application was difficult^[6]. At ECU, the most qualified faculty member is paired with the outreach partner. The faculty member is knowledgeable and/or is a subject matter expert in the area of interest. Typically, the training that the faculty member conducts is closely related to a course that he or she teaches and their research interests. Oftentimes, the faculty member holds a professional certification(s) in the area for the training topic.

Additionally, he or she typically has years of work experience in the training area and can clearly bridge the gap of understanding between theory and application. These assets aren’t guaranteed by a commercial alternative. In general, commercial trainers do not have the same breadth and depth of knowledge in the area of interest as that of a faculty member. Because of the university’s expectation and requirement for faculty to stay current in the subjects that they teach, they are continuously researching emerging technologies and methodologies.

Another benefit for the industrial partner is that the training is essentially customized, delivered on site, and the audience is from the same company. The discussions and examination of company practices may be undertaken freely, allowing for concepts to be discussed at length and in greater detail. Training quality is also improved when companies include cross-functional attendees and the training concepts are not related specifically to their area of responsibility. Larger and more functionally diverse groups provide fertile learning ground for cross-examination of concepts. Many of the training classes follow the pattern of: 1) introduction of a concept, 2) open discussion for practical company examples, 3) discussion on nuances of the methodologies, and 4) the “intersection of theory and reality”. In this type of training environment, the faculty’s role becomes one of a facilitator, rather than a lecturer; guiding the conversation and injecting theory as needed.

From a cost standpoint, the utilization of faculty in a training role is a cost effective alternative to subject-specific commercial training providers. Training classes offered through commercial

training providers are typically composed of pre-packaged material and are generally offered on a per-pupil basis, with additional costs incurred for on-site training. For projects completed through the CITE program at ECU, the fee structure charged to the outreach partner is typically at least 50 percent lower than commercial providers, making the training a much more economical option for industry partners. Additionally, given the regional nature of the university and corresponding economic development goals, training is generally set up on a mutually agreed upon “per day” fee and the number of pupils is limited only by logistics. Since training classes are typically offered on-site, companies may have larger groups, typically have greater participation, avoid travel costs, and continue business operations relatively uninterrupted.

Finally, an agile industrial outreach program is able to merge industry partner benefits for multiple aspects of human resource development. A tangential benefit to university outreach programs is more direct and regular access to university faculty, resources, and research as well as access to university students as employment prospects ^[3].

6. Academic Benefits

Many universities rely on fixed-term faculty to provide student instruction and these faculty members often have no research and/or publication requirements. A potential danger of not engaging in on-going research is that a technology and/or engineering curriculum could become outdated and faculty members’ knowledge could stagnate and become obsolete. Engagement with current industry professionals often entails highly focused and poignant questions. As a result, the faculty member who conducts outreach is required to develop and manage current and relevant course content and maintain a mastery of the subject matter contained in the BOK for the respective profession. The expectation of subject matter mastery can be motivation for non-research-oriented faculty to actively pursue professional development and professional certifications.

Additionally, faculty use engagement projects as opportunities to help them better understand the application of various subjects from the BOK to the areas addressed by the projects. As part of the training that faculty members conduct or the projects that they complete, the outreach activities also provide opportunities:

- collect data on the tools and methods that are most applicable to industry
- develop examples of real-world application of theory by the industry partners
- develop and expose students to actual industry applications via case studies, lab assignments, homework assignments, applied examples, and course modules that are based on real-world applications
- develop a better understanding of the core industrial needs for students seeking employment
- develop research concepts
- develop scholarly publications based on the projects
- advertise degree programs and/or certification programs in the college

Another tangible student-oriented benefit from industry engagement is the employment and internship opportunities that result for students. Although CITE or faculty members haven’t officially collected data on the number of industry partners who have contacted them about

employment or internship opportunities after the completion of a project, it is estimated that an average of 20 percent of the companies have made this post-project contact. For some degree disciplines, well over 20 percent of the companies have contacted the faculty about employment opportunities.

7. University Benefits

There are mission, academic, and financial benefits for universities that engage in faculty outreach projects. Research determined that between 1981 and 2000, there was an accelerated push for public universities “to play a larger role in the economic development of their state or region”^[3]. This acceleration has not subsided; and with the recent economic conditions in the United States, public institutions are continually pressed to provide economic production and not just academic production^[7]. By embracing the use of faculty for economic oriented regional development, universities are able to fulfill this mission. Cervero’s research concluded that industrial outreach provided benefits that extended beyond the accomplishments of meeting a mission goal. Academic benefits are realized through enhanced subject matter expertise, especially by junior faculty. These benefits include:^[3]

- mechanisms to secure research contracts
- faculty consulting opportunities
- means to secure student internship opportunities
- profits to subsidize other institutional functions

Additionally, the opportunity for research and publications by tenured and/or tenure track faculty members is substantial. Several industry partners established projects that led to publishable endeavors, which supports the research mission of the university. From a financial standpoint, the implementation of faculty engagement has resulted in scholarship funds and other financial donations to the college.

To summarize, the practice of outside consulting by faculty has many benefits for a university. In a 2004 presentation to the National Association of College and University Attorneys, Donna R. Euben of the AAUP Counsel discussed these benefits^[8]. Her list included the following:

- building the reputation of an institution
- enriching the classroom experience for students by providing faculty members with current practical experience
- providing faculty members the opportunity to engage in professional development
- helping to recruit and retain faculty members by providing them with the opportunity to engage in outside interests, thereby enabling them to identify new research scholarship topics and apply their theories to "real life"
- enabling faculty members the opportunity to earn additional compensation at little or no cost to the home institution
- creating opportunities for faculty members that may translate into employment and internship opportunities for students
- increasing the potential outside financial support for the institution—either directly or indirectly—through joint ventures and the activities and networking of faculty members in the larger community, including the business community

- contributing to the longstanding mission of the higher education community to share knowledge and learning with society at large and especially with the local community in which the institution is located

8. Conclusions

In this paper, a model for faculty engagement and industrial training and development was presented along with a summary of the benefits for the industry partner, faculty, and the university. When faculty members engage in projects with industry partners, the benefits can be substantial for all of the parties involved. Faculty can utilize outreach opportunities to benefit students by developing applied classwork, case studies, homework, and lab assignments, as well as facilitating employment and internship opportunities. Academic benefits realized include the enhancement of the faculty's knowledge and skills through real-world problem solving, exposure to publication opportunities, and direct feedback on the college's academic programs and curriculum.

In an increasingly competitive marketplace for new students, universities must exploit social networking, personal referrals, recommendations, and outreach opportunities as a means to attract new students. Outreach programs enhance the visibility of the college's academic programs and its reputation in the community. Although difficult to quantify and validate, greater value must be placed on increasing a university's reputation through faculty engagement. By continually injecting faculty to meet and educate hundreds of industry practitioners through multiple companies, the reputation of a university can only be increased through the use of outreach opportunities.

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