Creating a Successful Academic-Industry Partnership with Industry: Southeast Missouri State University’s Experience

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Abstract

Partnerships between academia and industry can be beneficial to both parties in many ways. Through such partnerships, new experiential learning opportunities for students can be initiated, professional development opportunities for faculty can be enhanced, and new technologies can be introduced to area industries and students. This paper discusses how to initiate university-industry partnerships, how to identify potential industries for partnerships, how to get the support from administration, how to put partnerships to work while fulfilling departmental needs, and how to avoid common pitfalls.

I. Introduction

Industries are continuously challenged to reduce production costs, increase productivity, improve product quality, and comply with environmental concerns. The competitive edge of industries can only be maintained through ongoing evaluation of the manufacturing practices and re-training of the workforce. With shrinking budgets, academic departments are challenged to find alternative ways to introduce new technologies to students, internship opportunities, and field experiences.

To achieve these goals, a unique partnership between industry and academia is needed. The creation of the Manufacturing Technology Resource Center (MTRC) at Southeast Missouri State University is one way to facilitate the changes needed by Missouri’s manufacturing concerns while providing means to educate students and industry employees about new technologies and their applications.

The mission of MTRC at the Polytechnic Institute is to introduce modern and energy efficient technologies to students, area manufacturers, and the public through continuous partnerships with industries. MTRC believes that continuous training and education of the workforce is one of the pillars of successful industry.

II. Initiating Academic-Industry (AI) Partnership

First, you need to identify a company or an organization that has strong ties with many industries in your area. One of the best candidates for this is your area utility company. Utility companies are interested in introducing value added services and increasing energy efficiency of industrial and commercial customers. Some utility companies are already helping industries to perform energy audits, reduce energy waste, etc. Area Chambers of Commerce will be able to provide a list of companies who are really interested in community development.
Once you have identified one or two major companies, contact their community development officers. Some utility companies employ fulltime community development officers. Other utility companies may have dedicated staff to help industrial and commercial customers through their sales department. Your project will have greater success if you can find a partner who has a strong interest in the well-being of area industry and has already allocated some resources for that cause.

Next, find out what the potential partners try to accomplish through their outreach efforts. Determine how you can support your partners’ effort while spending minimum resources. For example, universities already have classrooms, instructional media, and a faculty with expertise needed by the area industry. Do not discourage yourself if some departments in your institution already provide consulting to area industry. Focus on what you can achieve if you bring all these scattered activities under one umbrella. Every once in a while, public universities are subjected to some scrutiny because some public officers, within the university system or from outside, cannot find any homepage to browse the outreach activities of universities.

Always give high priority to your partners’ goals. Ask the question “what we can do for you?” first. You will receive “what you want” and more in the long run.

III. Getting Support

A list of “what you want” will be appreciated by your superiors, will be asked by the faculty, and will be useful in developing your mission and goals. Think of all the possibilities when you develop your list. If possible, get area industry involved in your project early on. Survey the members of industrial advisory committee, if it exists, and identify training coordinators of area industry. Visit those who are responsible for training and development to convey the university’s intentions. For example, at Southeast Missouri State University, we narrowed down the list to six major items: 1) Providing infrastructure to accomplish applied research, 2) Assisting area industries to test new manufacturing technologies, 3) Providing space for vendors to demonstrate new technologies, 4) Conducting workshops, seminars, and lectures, 5) Building new university-industry partnerships, and 6) Assisting students and faculty to conduct applied research. The following discussion may help you in developing your own goals.

IV. Putting the Partnership to Work

Every company needs some form of training for their employees in many areas such as energy audits, safety, workforce development, ISO9000, motor controls, project management, new manufacturing processes, waste management, material testing, etc. Some companies have to send their employees to distant locations for training. Imagine what a company would be able to save if the training is provided locally. This may require sending a faculty member to a specialized training with the expectation that he or she would provide customized training to a company. Many training programs offered by equipment manufacturers are tailor-made. After receiving the tailor-made training, your faculty member will be able offer customized training according to the need of a local industry for the same fee, but the industry saves money because no traveling cost is involved.

Some small companies are willing to experiment with new manufacturing processes or a new piece of machinery, yet they may not have the capital, space, or expertise to examine such
processes. Once you have identified similar needs, you may want to talk to manufacturers of the new machinery to demonstrate the process in your facility. You may be able to convince the manufacturer to leave the piece of equipment in your facility so that prospective users would be able to try out their product. These types of arrangements have many other benefits: some activities can be organized for students to experience the operation of the new equipment or the process, and faculty can develop some research activities around the process. For example, one may choose to collect processing time and down time of a new machine setup which is useful for the manufacturers as well as for new users. Another may be able incorporate the collected data to simulate the new machinery in a prospective buyer’s manufacturing facility using simulation programs such as Factor AIM™, Simfactory™, and Taylor II™. Another faculty may be interested in vibration and noise analysis using spectrum analyzer software. Using this approach, MTRC was able to acquire numerous pieces of equipment and software. Some companies have decided to donate the equipment to the university. The manufacturers, as well as the area companies, later hired a few students, who worked on the setup and demonstration of products.

Experiential learning and internships enhance students’ knowledge greatly. The departments are under pressure to come up with some sort of experiential learning activities for students before they graduate. AI partnerships open up many internship opportunities. Students at the Department of Industrial and Engineering Technology have conducted energy audits, facility planning, manufacturing simulations, PLC setup, and various other projects as interns and as a part of their senior research class. Instruments are available to evaluate the outcomes of these experiential learning opportunities.

At first, one partner may be enough to get your center going. Arrange a few short seminars for area industry personnel. Keep a guest book including spaces for title and affiliation of visitors. You will be amazed how much additional support may come when you are able to show who has visited your center and what you are trying accomplish. At one point, the MTRC had to decline a request for equipment donation because there were three similar products from three different manufacturers.

You don’t have to stay with one partner. Mail brochures to area industries, vendors, and other organizations. Spell out how they can become a partner and the benefits they will receive.

V. Avoiding Problems

You need to be as candid as possible about what and how much you will be able to provide. Ask the same from your partners. Settle all the misgivings early. When a big corporation spends thousands of dollars, you may feel some pressure, every once in a while, from the representatives of the company. It would be beneficial to both parties if you recognize that, as an education institution, you are not in a position to promote any particular product or service.

It is not that difficult to create partnerships, but it needs dedicated staff and continuing support from the administration to be successful. A faculty member with a quarter time release and a temporarily reallocated secretary may be able to barely set up a center. To set up seminars and workshops, arrange research projects, and identify the needs of area industry demands at least a full-time staff member or coordinator who has time and resources to visit area industry.
In the long run, the success of an AI partnership is dependent upon how well the faculty is involved in its core operations. Manufacturers will not donate new equipment if they are not integrated into traditional or customized training. If a chair or a dean desires the success of such partnership, then get faculty involved from the beginning.

VI. Conclusions

In conclusion, AI partnerships can be very beneficial to both parties. However, the continuing success of the partnerships is determined by the participation of faculty. In less than two years MTRC at Southeast Missouri State University has acquired close to three-hundred-thousand dollars worth of equipment and software including a powder coating machine, infrared curing units, a rapid-prototyping machine, motor control stations, power monitoring equipment, computer lab for instruction, reference books, manufacturing simulation software and more. The university has agreed to hire a fulltime coordinator to expand the operations. Recently, the Department of Energy’s Motor Challenge Program has selected MTRC as an Allied Partner.

Bibliography

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Athula Kulatunga is an Associate Professor at the Department of Industrial and Engineering Technology, Southeast Missouri State University. He was a founding member and the first coordinator of the Manufacturing Technology Resource Center, which is the outreach segment of the School of Polytechnic Studies. He received a BSET from Pittsburg State University, a MS from Eastern Illinois University, and a Ph.D. from Purdue University in West Lafayette, Indiana. He is certified by the Association of Energy Engineers (AEE) as a Certified Energy Manager (CEM).