

Partnering with Industry to Provide Technology Education

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Introduction

Purdue University's Statewide Technology programs were designed to extend the university's technology programs throughout the state of Indiana. Statewide Technology is a partnership between education, business, industry, and government: formed to meet Indiana's need for trained technologists. Local business/industry and government representatives helped plan, develop, and implement community programs selected from plans of study provided by Purdue University. The existence of these campuses throughout the state, depend on this working relationship with local business and industry.

Purdue University School of Technology, Columbus Campus, in continually developing ways to partner with local business/industry for continued technology education and development. This paper will detail some of these partnerships including:

- 1) *Technology in Action Days* is a new program developed to give high school students a chance to explore degree programs in technology at a local firm.
- 2) The *Mechanical Engineering Technology* (MET) Department is partnering with a local Fortune 500 firm to train students in their apprentice program.
- 3) A *Quality Course* offered by the Organizational Leadership and Technology Department is partnering with a corporate quality group at a local firm.
- 4) The *Computer Technology Department* (CPT) is partnering with a Fortune 500 firm to provide Oracle database training in the form of Purdue credit courses, made available to businesses in the local community.
- 5) The Columbus site has an *Industrial Advisory Board* consisting of members from local business, industry and the university.
- 6) The *Columbus Education and Career Counseling Project*, made up of community leaders from government, education and industry, was created to plan the community's workforce needs of the future, and how the local education institutions can satisfy those needs.

This paper will delve further into each of the above mentioned partnerships.

Partnerships

Technology in Action Days: In order to recruit students, an approach that was taken by Purdue School of Technology was to invite high school students to the campus to learn about the technology degree programs. This program was called, Technology Preview Days. This past year, 1998-1999, a partnership was formed with Cummins Engine Company, Inc. to help in this

recruiting effort. Instead of the students coming to campus to learn about the programs, they go to Cummins Engine Company, Inc. This program is called Technology in Action Days. By doing this, the students get to see first hand the type of jobs for which Purdue University technology Degrees will prepare them. They get to meet actual employees, some who are past and current students of Purdue.

In the fall of 1998 more than 200 students, representing 7 high schools, attended the Technology in Action Days. The students were between the 9th and 12th grades; with a majority of the students attending being sophomores.

The spring 1999 calendar is well underway, with 67 students already attending. Two more Technology in Action Days have already been added to the schedule.

The agenda for the Technology in Action Day is as follows:

- 1) Overview and welcome from the Site Director of Purdue University School of Technology and the Student Employment Coordinator from Cummins Engine Company
- 2) Admissions and financial aid information
- 3) Specific campus information
- 4) Cummins Technical Center Tour.

The last item that is discussed is the "Go For the Gold Award". This is a \$1000 scholarship, sponsored by Cummins Engine Company, Inc., that is given to two high school seniors who will pursue a course of study in a Purdue University School of Technology degree program on the IUPU Columbus campus. Typically, these students are given a summer internship the summer after completion of the freshman year, and during subsequent summers. This also leads to full-time employment upon successful completion of the degree program.

Mechanical Engineering Technology: One of the most successful partnerships is the Engineering Technician Apprenticeship Program. This partnership is between Purdue and Cummins Engine Company. The program has been in existence in varying degrees for over ten years. The Engineering Technician Apprenticeship Program offers Cummins employees 12 different tracks, which include:

- Chemical Technician
- Electrical Technician
- Engineering Model Maker
- Experimental Machining Technician
- Facilities Engineering Drafter
- HVAC Technician
- Instrumentation Technician
- Machine Repair Technician
- Mechanical Engineering Drafter
- Mechanical Engineering Technician
- Metallurgical Technician
- Tool Design Drafter

Each track involves 8000 hours, or approximately four years of on the job experience along with the course work provided by Purdue. A track consists of between 34 to 42 hours of course work

in math, English, physics, and School of Technology courses. All courses for the program are regular courses in the School of Technology program. Courses are in the regular schedule and available to general student population. In fact, most courses will have a mixture of students in the apprentice program and regular degree-seeking students. One benefit for students in the program is that Cummins will pick up the cost to run a course for their students if it is in danger of being cancelled because of lack of enrollment.

Course work is extremely important to the students because they must successfully pass all course work or they will be terminated from employment at Cummins. Cummins pays for tuition, parking, and books for students. Cummins has also been flexible in allowing students to schedule daytime courses and then make up the hours by coming in earlier or staying later at work. Upon finishing, the apprentice program students have approximately one-half to two-thirds of the credits necessary for an associate's degree. Some students do continue on to finish their associate's degree.

The Engineering Technician Apprentice Program is one of the longest running partnerships at the Columbus campus. It is also one of the most successful in terms of numbers, with as many as 100 students in the program at any time. The program has also proven to be a great success for Cummins and Purdue University.

Quality Course: The Organizational Leadership and Supervision degree program is designed to provide long-term educational emphasis on real-world work concepts and principles of enlightened leadership, rather than short-term supervisory approach. One of these real-world work courses is entitled Leadership Strategies for Quality and Productivity (TQM). This is a senior level course that focuses on how organizational leaders create an environment conducive to high levels of employee self-motivation, quality and productivity. The course is based on the teaching of Dr. W. Edwards Deming, a quality guru. Topics covered are variation, SPC, systems thinking, quality tools, tampering, Baldrige Award, Deming Prize, QS 9000, and ISO 9000. These topics are taught in a real-world work approach, by using actual case studies.

While prepping for this course, it was determined by the Assistant Professor that a partnership with a local company would enhance the quality of the course by keeping the material that is presented current. The Assistant Professor set up a partnership with a Fortune 500 company's Corporate Quality Department. The materials, knowledge, and expertise provided by this department have been invaluable.

For instance, the Corporate Quality Department provided the professor with the entire "Deming Library" of videos. These videos support the material from the textbook. This is a major contribution since the university could not absorb the cost of purchasing these videos. Besides the Deming videos, three videos on variation were also provided. These three videos support another textbook that is used in class.

In addition to the videos, the professor was provided with guest speakers to discuss the Baldrige Award (this company just went through a Baldrige audit), QS 9000 (they are QS 9000 certified), and Taguchi Methods. This provided the class with real life people who have been through the above. This allowed the students to hear first hand how it "really is" in the work place.

Lastly, the professor was provided with many booklets on quality, was permitted to take a class on a plant tour, and was provided with experiential learning materials that were used in class, i.e., an instrument to show variation in a system.

By creating this partnership, the students are assured that they are learning the current material in the area of quality. The professor knows that she is keeping her skills up to date and that she is teaching the current material. The community employers know that the students have the current quality skills required to be productive in the work place.

Computer Technology Department: The program, Cummins Advanced Information Technology Training (AITTP), is a partnership between Cummins Engine Company, Inc. and Purdue University. In this case, industry provided the university with much needed funding for additional lab hardware and software resources. The university provided industry with a more cost effective and a nearby source for technical training for its information systems personnel.

As with most universities with technology programs it is a constant struggle to provide state-of-the-art hardware and software. Hardware constantly needs upgrades to provide students with hardware and software that is utilized in industry. At Columbus, the budget for capital equipment is typically in the \$15,000 range. This is for all technology programs at the Columbus campus supporting approximately 300 technology students along with providing computer labs to help support the entire campus of approximately 1800 students.

Cummins Engine Company, a Fortune 500 company located in Columbus, IN, found an increasing need for Oracle developers and database administrators. Oracle is the current leader in database management system software. Individuals with Oracle experience are in very high demand throughout the United States. Finding it hard to recruit Oracle experienced workers, they decided they would like to retrain current valued workers and new hires out of college to fill the void.

Conversations about a potential partnership began in 1996 between the Site Director at Purdue University School of Technology programs at Columbus and management of Cummins Engine Company. Gradually, technical staff from Cummins, staff from Purdue at Columbus, and staff at the main campus in West Lafayette formed a partnership.

The result was a unique partnership between Cummins and Purdue University. The following solution was defined:

1. Cummins Engine donated 50% of the funds needed for the purchase of hardware and software required for a state-of-the-art lab. This was in the form of a grant to Purdue University Columbus. Cummins Foundation matched this grant for the other 50%.
2. Cummins made members of their technical staff available to provide assistance in the selection of hardware and software, and in the installation of the new lab components.
3. Technical staff from Cummins, along with the Director of Purdue Columbus, the Head of the CPT Department from the main campus, and full-time faculty in CPT from several Purdue locations, worked together to develop a curriculum of six CPT credit courses for the first phase of the program.

4. Purdue joined the Oracle Academic Alliance program that allows universities to acquire Oracle software at reduced rates for educational purposes.
5. Cummins paid a flat amount for the development and delivery of the required courses.
6. The initial offering of the program was limited to current Cummins employees or new Cummins employees.
7. The program was offered in a condensed format with each course being delivered in a one or two week format beginning in May 1997.
8. Cummins was responsible for recruiting and selecting candidates for the program.

Since the initial offering of the program in May 1997, there have been three additional offerings of the program. Evaluations by students, faculty, and management have been very positive. A new contract is to be prepared that will provide additional hardware and software and continue the program for an additional two years.

Several additional benefits of the program for Purdue University include:

- Providing additional salary for faculty (all courses are taught by Purdue faculty).
- Additional exposure of the campus in its drive to get a bachelor program for the Columbus campus. At the present time, Columbus offers an associate degree in Computer Technology.
- The program has placed several recent Purdue School of Technology graduates from both the West Lafayette campus and Columbus campus.

This cooperative venture between Purdue and local industry has proven to be a great success. It is truly a win-win situation for both partners. The partnership has proven to be a great way to address the needs of industry and university.

Industrial Advisory Board: The Purdue University School of Technology at Columbus sponsors an Industrial Advisory Board. Initially, this board was set up because two-degree programs, Mechanical Engineering Technology and Electrical Engineering Technology programs are required to have one for ABET accreditation. However, this advisory board does not limit its activities to those programs. Another reason for the existence of an advisory board is that the mission statement for the School of Technology statewide delivery of programs is “to provide a unique partnership between education and industry in developing and delivery of programs at statewide locations.” The current makeup of the board includes eight members from the Columbus area. These members are diverse in that they include a Vice President of Fortune 500 company, owners of small business, and engineers working in the Columbus area.

The board typically meets once a year. Now the board is used as a sounding board and for support of new programs or revisions in existing School of Technology programs that will be implemented at the Columbus campus. Although, the use of the advisory board is limited at this time, there is a desire to increase the role of the advisory board at the Columbus campus. At our sister campus in Kokomo, the advisory board has been used to raise money for the technology programs at Kokomo. Some potential uses for the advisory board include: involvement in the development of internships, fundraising for local scholarships in technology, soliciting donations of hardware, and a more active role in getting feedback on School of Technology programs at Columbus.

The Columbus Education and Career Counseling Project: The Columbus community, supported by the administrations of Indiana University, Ivy-Tech State College, and Purdue University, is requesting funding from the Indiana Commission for Higher Education. This funding is to help underwrite costs of planning a collaborative expansion of the programs offered and facilities located at the Columbus municipal Airport campus.

The goal of this project is to expand the educational opportunities and develop a comprehensive community-wide learning system that is driven by business, industry, and community needs. With the Commission's support, this project has the special opportunity and commitment to serve the Columbus area by utilizing the education capabilities of three major Indiana institutions in a new form of collaboration and efficiency which:

1. Serves the learning needs of the region's citizens through traditional two and four-year college degrees, vocational-technical certification, and continuing education.
2. Supports the economic vitality of the region. The community must be able to respond to requirements of its companies and institutions for employees who have ready access to programs offering specific skills training and personal development, professional and technical certificates and associate undergraduate degrees in those disciplines justified by local need.

A task force including the Chief Executive Officers of Columbus' major businesses and industry, regional hospital, Chamber of commerce, Economic Development Board, elected officials, and senior administrators of local colleges and public schools is cooperatively developing the program to support these objectives. This plan is for a facility/complex to be equipped with flexible, state-of-the-art learning laboratories, and a full-interactive electronic library.

This program is still in its infancy stage. However, the above mentioned task force meets regularly and progress is being made.

Conclusion

The partnerships that Purdue University School of Technology and local businesses/industries formed have been invaluable. These partnerships have strengthened the curriculum in the degree programs. They have improved the skills and knowledge of the professors of these degree programs. Lastly, they have prepared the students for the workplace by providing the most current and state-of-the-art information. These partnerships have proved to be a "win-win" for Purdue University and the community at large. Both Purdue University and the community should delve further into how to continuously improve these partnerships as well as creating new ones.

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