

Partnerships with Industry
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Abstract

Providing effective training in the manufacturing industry requires large capital expenditures for machinery. The productivity of manufacturing equipment has significantly improved with the integration of computers. Computer Numerical Control (CNC) designers continue to implement the latest microprocessors to improve processing time and features of metalworking machinery. Expensive CNC manufacturing machinery soon becomes outdated and unproductive in as little as three years. The challenge to provide training with the latest high technology manufacturing and metalworking machinery, with limited capital, prompted York Technical College to create the Institute for Manufacturing Productivity (IMP) and industry partnerships.

Introduction of the Organization

York Technical College opened in 1964 as a Technical Education Center and began with 70 students enrolled in seven programs all housed in one building. The College has grown in the past three decades from the initial enrollment to over 4,000 credit students in more than 60 credit programs. The College campus has also grown from one building to thirteen. In 1974, with the addition of Associates in Arts and Associate in Science degrees, the York County Technical Education Center became York Technical College.

In addition to offering academic programs, the College provides continuing education for approximately 11,000 area residents and more than 250 businesses. This translates to about 325,000 contact hours of continuing education annually.

In October 2001, the College opened the Institute for Manufacturing Productivity. The mission of the Institute is to produce a globally competitive workforce in the manufacturing industry for the benefit of the local, state, and national economies and for workers desiring to enter high skill, high wage occupations. The Institute builds upon industry partners whose products and missions are designed to yield significant improvements in manufacturing productivity.

Statement of the Problem/Initiative

The challenge for York Technical College is to provide effective manufacturing training with high technology CNC machinery while current capital funds are scarce and future capital funds are expected to be scarcer. Simply stated, “How do we obtain and continue to obtain the latest state-of-the-art high productive manufacturing tooling and equipment without enough money to buy the machinery and with future expectations of budget reductions?”

Design

Instead of procuring CNC manufacturing equipment that will become obsolete in as little as three years, York Technical College considered another model of funding the constantly changing technology. The model came to fruition by examining alternative ways to add value to the manufacturing machinery supplier industry. Adding value was discovered by learning of their needs. Two needs of a major CNC equipment supplier were:

- ❑ The need for an attractive applications laboratory to demonstrate the latest technology to potential customers and,
- ❑ The need to expose their products and solutions to the manufacturing industry.

These two needs were required in the environment of a slow economy. Therefore the requirements must be supplied to the manufacturing machinery supplier at a very low cost.

The design method is to supply value, other than money to procure the equipment, to the manufacturing machinery firm. In return, the machinery firm will consign the latest high technology tooling and equipment to York Technical College. The solution is the Institute for Manufacturing Productivity (IMP) with manufacturing machinery suppliers as partners– a Partnership with Industry.

After the concept phase, York Technical College and the first key industry partner, Okuma America Corporation, designed a 20,000 ft² addition to the current 10,000 ft² Machine Tool Technology laboratory. The addition contains an attractive lobby where York Technical College and the industry partners can display catalogues, literature, and sample products. The lobby's primary functions are:

- ❑ To recruit potential manufacturing students,
- ❑ To put existing industry in touch with the partners who can assist in productivity improvements.

The lobby has a full-time receptionist whose responsibilities include registering and scheduling continuing education students of the IMP. Adjacent to the lobby is a conference room for conducting training and sales meetings, as required.

The manufacturing laboratories in the 20,000 ft² additional facility include:

- ❑ CNC Programming (complete with simulators matching the machinery in the CNC Metal Cutting lab)
- ❑ CNC Metal Cutting
- ❑ A Lean Manufacturing Cell
- ❑ Electrical Discharge Machining (EDM)
- ❑ Metrology

- ❑ CAD/CAM
- ❑ Heat Treating
- ❑ Surface Preparation
- ❑ Special Projects lab
- ❑ Electrical and Mechanical CNC maintenance (complete with over 20 sub-assemblies and 5 fully operational CNC machine tools)

The existing Machine Tool Technology laboratory was renovated to match the new addition. The existing laboratory contains:

- ❑ Manual Machining
- ❑ CNC Laser Cutting
- ❑ Plastic Injection Molding

Implementation

The implementation process established a win-win policy - the agreements or contracts with the industry partners must be of benefit to the company and to York Technical College. The financial simulations of the relationship must show positive cash flow for both the partners and York Technical College. The win-win policy also includes selecting partners that do not compete in the market, but complement the specific manufacturing process the Institute chooses to establish and maintain. The first manufacturing process chosen was metalworking. York Technical College selected and invited companies whose products and services are also designed to yield significant improvements in manufacturing productivity. These tooling and equipment companies are also world-class globally competitive suppliers.

When designing the contracts with each partner it was necessary to start “with a clean sheet”. Business objectives the potential partner wanted to accomplish were analyzed and discussed. Primarily, the business objectives analysis resulted in answering two questions; “How can York Technical College assist the company by improving their sales, and/or reducing their operating costs?” At the same time, the partners would allow York Technical College to use their latest manufacturing technology and replace the technology as new designs and developments become available for the market. The Institute for Manufacturing Productivity essentially contains “living technology”. This occurs because the consigned machinery is new and for sale. As the machines are sold, each one is replaced with a new model. The layout of the manufacturing laboratory is designed to allow any one machine to ship without disturbing the others.

Lastly, although the contracts with each partner contain different aspects of the win-win policy, the format of the agreements was standardized as follows:

1. Purpose of the Agreement
2. Industry Partner Requirements
3. York Technical College Requirements
4. Terms of the Agreement
5. Changes to the Agreement
6. Termination of the Agreement
7. Appendices

Another common element of all the partner agreements is a management meeting held at least annually where York Technical College and the Industry Partner meet to discuss

progress toward business objectives, develop action plans, and change the agreement if necessary.

Benefits

The Institute for Manufacturing Productivity has over 12 metalworking industry tooling and equipment partners who provide the latest high technology manufacturing systems, tooling, and fixtures. The machinery is fully operational and available for York Technical College to train students in both credit and continuing education programs. The industry partners use the equipment for customer applications, manufacturing engineering, and sales demonstrations. When the partner's machine or system is sold and shipped from the IMP, it is replaced with a new machine. The technology of the IMP is dynamic – always providing the latest state-of-the-art machinery. The machinery is consigned to York Technical College at no cost, and there is no charge to the partner for housing the machinery or for personnel space when conducting demonstrations or supporting Institute activities. The industry partner gains an attractive applications “show room” laboratory with fully operational new machinery, and York Technical College gains the use of manufacturing machinery that never becomes obsolete. The partnership is a win-win for both industry and education. As a result, the IMP at York Technical College has equipment valued at more than \$3,000,000 that never becomes outdated and industry has a great training, demonstration, and applications facility that reduces cost and promotes profitability.

Finally, an added benefit of the IMP is the industry partnerships providing significant solutions to the challenge of recruiting and developing skilled faculty. Since the partners are the companies who develop the next-generation manufacturing machinery and

processes, York Technical College faculty are continuously trained with the latest manufacturing technology as machines are sold and replaced from the IMP. York Technical College also has access to partner trainers and engineers, who are proving to be excellent adjunct and full time instructors, as well as providing professional development instruction for existing faculty.

Retrospect

One element of the IMP that may have been improved concerns the facility design. An additional room to house noisy equipment such as an air compressor and chiller for the Electrical Discharge Machinery has been added. Therefore, when designing manufacturing training laboratories, it is important to consider where auxiliary machinery will be installed, operated and maintained, especially if the equipment creates an environment contrary to teaching and learning.