

2005 -2006 Annual Report

M.S. in Technology Management

Division of Applied Science and Technology

College of Information Technology and Engineering

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M.S. in Technology Management  
2005-2006

**I. Assessment Activities**

**A. Program Goals**

1. Maintain a curriculum that is up to date and effective, with new courses added and old courses deleted as needed. Focus on meeting the needs of the students, offering high quality courses that improve students' skills and effectiveness on their jobs, increase their opportunities for advancement, and prepare them for further education.
2. Track specific student outcomes, including
  - Evaluate a company's financial status
  - Demonstrate the ability to work successfully in a project team
  - Provide professional presentations
  - Know how to weigh the cost/benefit of technology decisions
  - Be able to write a comprehensive project proposal
  - Develop and execute an applied technology project and present the results orally and in writing
3. Review the program annually regarding courses and Areas of Emphasis. Obtain feedback from program faculty, including adjuncts, in order to improve the content of courses.
4. Promote faculty development so that they keep current with activities in the field of Technology Management. This will be in the form of professional organization membership, conference attendance, and the publication of journal articles.
5. Attract qualified students into the program. Maintain a high level of student retention. Maintain or grow student enrollment.
6. Reach out to the surrounding community in the form of local organization membership, leadership, and participation. Increase the awareness in the community of the Technology Management program through its students and its faculty.
7. Develop objective means of measurement. Methods may include benchmarking and program certification from an independent organization.

## **B. Learning Outcomes**

1. A key form of input came in talking with current students and current employers. Students are looking for education and skills that will help them move up the organizational hierarchy, or to obtain a better position with another employer.

Feedback was also obtained by talking with local companies, both current and prospective employers. Employers were generally very favorable regarding the coursework that was required in the program. Employers were interested in their employees having opportunities to make oral presentations, because presentation skills were considered to be of great importance. Also, the opportunity to work on projects in teams was thought to be a valuable learning experience by employers. Some companies were also interested in their employees learning project management skills. Our existing program offers many opportunities to practice all of these.

The following modifications were made to the Technology Management curriculum during the past year.

- a. A new area of emphasis was approved in Information Security. All required courses are currently available, and our first graduate with the new area of emphasis may graduate as early as December 2006. There is a high level of student interest in this area of emphasis, and the new courses have received strong support among the students who took them.
- b. The approval of two new permanent courses was received. TM 668, Computer Integrated Manufacturing, is now an approved course in the Manufacturing Systems area of emphasis. TM 664, Health Informatics, is now an approved course in the Information Technology area of emphasis. Both courses were taught during the 2005 – 2006 academic year.
- c. A planning committee made up largely of community representatives addressed the approved (but never offered) area of emphasis in biotechnology. This work included focus groups of potential employers in West Virginia. The outcome of this work was that a biotechnology emphasis would not be appropriate because there are no current or anticipated jobs in the area in this field. However, an emphasis in Health Care Technology would have great appeal to the health care industry in both Huntington and Charleston.
- d. A planning committee made up of CITE faculty and administrators from the University of Charleston's new School of Pharmacy developed a plan to encourage pharmacy students to enroll in a cooperative Pharm.D. / MS in Technology Management offering.

2. Specific student outcomes have been identified for tracking, as shown in Section A. These are tabulated in the student outcomes table at the end of this report. Several of these outcomes were identified due to input from employers, who look for increased skills in these areas. For the most part, our students are doing well. Two areas tend to be new to many students: a) giving technical presentations, especially using high tech equipment such as computers and video cameras, and b) working together in teams.

Group presentations are required in several courses, but individual presentations are required in TM 630, Quality and Productivity Methods. These presentations are often given in video linked classrooms where students must present not only to a live class, but also a remote location using computers and video cameras. This is often the first time students have presented in front of a camera, which can be difficult for some. During the past year we increased the challenged by having a class that was live on the internet, and most students presented from a remote location via the internet.

While many employers want our students to have experience working in teams, many students have their first real team experience in our courses. This is especially true of international students. The experience can range from extremely good to bad, depending on the contribution of the team members, just as it is in real life. The greatest difficulty occurs when a student does not adequately participate, and other people need to carry a larger burden (just as it is in real life). The most honest assessment of team contribution comes from the team members themselves, and this assessment is used as part of the TM 620 project grade.

Others areas of student assessment include financial analysis, cost/benefit analysis of decisions, and proposing, executing, and presenting a project.

2. The CITE Faculty Course Assessment Report was tried again with improved results. Among those that used the form, it was regarded as a useful exercise to focus on what items could be improved. Student feedback is usually delivered long after the course is finished, and after this form is filled out. Several changes were made to courses as a result of this feedback system, including changes of textbooks and revisions of material covered. I will continue to request its use among all adjunct faculty and all CITE faculty teaching TM courses.

3. Several activities occurred this year to support faculty development. Neal Lewis attended the annual conference of the American Society for Engineering Management in Virginia Beach, VA in October 2005. In addition, a journal article was published in *Pharmaceutical Engineering* titled "The Staging Option and Drug Development."

The program coordinator is a member of the International Association for the Management of Technology (IAMOT), American Institute of Chemical Engineers (AIChE), and the International Society for Pharmaceutical Engineering (ISPE).

4. During academic year 2005-2006, 15 new students joined the program. Of these 15 new students, twelve are registered for classes for fall 2005. Student retention continues

to be is high. Nine new students joined the program in August 2005. During the past year, fifteen students graduated from the TM program, which is believed to be an all-time record.

The program currently has 48 active students, including those enrolled in class at Alcon Laboratories. This number includes 7 students who are in the process of completing their capstone requirements. The number of active TM students has been relatively stable over the past 3 years. Student enrollment is monitored during the registration period, and students that have not registered approximately one week before classes begin are given a reminder, either by email or by phone.

5. Several companies were visited during the school year in order to develop community relations and to provide employers with information regarding technology management and the College of Information Technology and Engineering. These companies include Alcon Laboratories and Toyota. Several areas hospitals joined discussions about the program, including CAMC and St. Mary's. The campus at West Virginia University – Parkersburg was also visited, as well as the University of Charleston.

The TM coordinator has become active in the Charleston chapter of the American Institute of Chemical Engineers, and holds an office in that organization. The coordinator was also a guest speaker at the West Virginia chapter of the Project Management Institute.

6. The certification of technology management programs was explored during the year. The American Society for Engineering Management (ASEM) offers a 'certification' of engineering management and management of technology programs. Budget funds were requested for the academic year to pursue ASEM certification, but funding was again not received. We will continue to request funding in the future.

### **C. Results**

The Technology Management program is healthy, and is maintaining roughly steady enrollment while a number of other graduate programs are facing declines. We continue to attract qualified students from the region, have a high retention rate, and are graduating people in record numbers. However, recruitment of new students is a priority item, or we will face declining enrollments.

The number of TM classes offered has increased, and we continue to have adequate enrollment in classes. Qualified adjunct instructors are available to teach classes, and we are increasing the use of adjuncts as additional classes are being offered.

We have been working with the LEAP intensive English program for international students, and have offered provisional admission to some of those students pending the successful completion of their English language studies.

We are also working with the University of Charleston (UC) to recruit pharmacy students in the new Pharm.D. program at the UC. A new area of emphasis, Pharmacy, has been requested as part of the effort with the UC School of Pharmacy.

A curriculum assessment occurred in 2005-2006. The current technology management curriculum, including the areas of emphasis, was reviewed. Benchmark universities included the University of Maryland, University College; Stevens Institute of Technology; Portland State; Indiana State University; and Marquette University. In general, the program continues to be structured appropriately. One item that needs adjustment is the Professional Certificate; at the current 24 credit hour requirement, it needs to be decreased to 15 credit hours. Only one person in the history of the program has ever obtained the TM Professional Certificate.

The Information Security area of emphasis was approved this year. There has been significant interest in this area, although enrollment has not changed as a result. We need a method of advertising this addition.

The Biotechnology area of emphasis has been approved for several years, but never implemented. A planning committee was assembled, focus groups of potential employers were conducted, and the committee recommended that Biotechnology not be implemented. The reason is that there are no jobs, either present or anticipated, in the region. However, Health Care is an important field and the area hospitals were very interested in a Health Care Technology emphasis (which is not the same as LCOB's Health Care Administration). This will be further pursued.

Marshall University offers an MBA degree at the Bharatiya Vidya Bhavan, Bangalore (BVBB), a college in Bangalore, India. BVBB has requested that Marshall University expand the current program and offer our M.S. degree in Technology Management, including our area of emphasis in Information Technology. This work was put on hold until North Central Association, our accreditation agency, could assess BVBB. This was completed in late spring 2006

Many of the TM courses are video linked between Huntington and South Charleston. The plan to test an alternative delivery method, where we would have one class that is also available live on the Internet, resulted in our broadcasting TM 630. Of the 18 people registered for class, two people regularly attended the live class in South Charleston and three people regularly attended the video linked class in Huntington. Others attended in various locations, including at home and at work. The course proved to be very popular, and we are extending the test by offering TM 660 on the Internet using Breeze software during the fall 2006 semester.

## **II. Plans for the Current Year**

The cooperative plans with the University of Charleston's School of Pharmacy will be pursued. The Pharmacy area of emphasis has been requested and is currently with the Graduate Council. The TM program coordinator is scheduled to speak with Pharmacy

students this fall; the UC administration is expecting a strong interest, and wants to limit the number of pharmacy students to ten. If we recruited ten pharmacy students from UC, this would represent a major increase in new students, but well within our ability to accommodate.

Once the Pharmacy area of emphasis is approved, the Health Care Technology area of emphasis will be planned in detail. As it currently stands, the new emphasis of 4 courses will require two new courses to be developed. One course, Health Care Informatics, already exists. The second course would be HCA 600, The Health Care System, offered by the Lewis College of Business. LCOB is interested in working with us on the area of emphasis, and the course will be available to CITE students. The Health Care emphasis will replace Biotechnology, which will be eliminated.

We will again check on interest from BVBB in Bangalore, India. Now that North Central has accredited the college, we should be permitted to explore the possibility of offering Technology Management in India.

The Technology Management Professional Certificate needs to be modified, decreasing the required credit hours. At 24 hours, the certificate is too long, and is not doing its job of recruiting people into the program. Most professional certificates are 12 to 18 credit hours, and the TM certificate can be decreased to 15 credit hours.

There is interest in offering the Technology Management degree in Beckley, WV and in Parkersburg, WV. The WVU-Parkersburg campus has a distance classroom, and could be linked with our video network. We need to decide which type of technology we are going to pursue in the future: video-link with equipped classrooms or pursue classes that are live on the Internet. Discussions regarding technology strategy will be held with interested parties.

### **III. Assistance Needed**

As new courses are added to the program, increased use of current faculty and adjuncts will be required. No permanent staffing increases are required, but increases in the adjunct budget will be needed in order to offer some of the courses, particularly in the health care area. The work with the UC School of Pharmacy recruits students into existing classes, and does not require additional staffing.

If the partnership with BVBB in India becomes a reality, significant resources will be required. This partnership will require the support of the entire CITE faculty, and will require numerous faculty to participate in teaching courses in India during the summers. Management of this program may require the addition of one faculty member. We will also be interested in testing our distance learning technologies to hold live classes with India without leaving the classrooms of West Virginia.

We have been dependent on the video link between Huntington and South Charleston for half of our core courses. The video link continues to have technical difficulties and we

do not have the appropriate support after regular business hours (which is when we have all of our courses). An alternative delivery format was tested using Breeze software to transmit classes live over the internet. While the new format can work, it requires even greater technical support than the video link. Some WebCT-based “e-courses” have been conducted, but these tend to exhibit less student satisfaction than either the video link or live internet classes. All of these options have significant problems, and strategic decisions need to be made regarding what platform we want to use in the future. The status quo is not acceptable. Discussions have been ongoing with the Vice President of Information Technology.

#### **IV. What we have learned through this process.**

The assessment process serves to monitor the relevance of the technology management program to its students, the student’s employers, and the regional community at large. The program is on track, but needs to stay flexible in order to meet the changing needs of its customers. Continuous feedback is needed in order to stay abreast with changing technologies and changing customer expectations.

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September, 2006

<b>Component / Course / Program Level</b>					
<b>Student Outcome</b>	<b>Person or Office Responsible</b>	<b>Assessment Tool or Approach</b>	<b>Standards/Benchmark</b>	<b>Results/Analysis</b>	<b>Action Taken</b>
Evaluate a company's financial status	TM 612 instructor	Test questions on Exam 1.	Class project and test answers to designated questions show a quantifiable understanding of a company's financial status.	Students did very well on the exam. Will focus in on the last two questions which are focused on results interpretation	Begin tracking results of last two exam questions.
Demonstrate the ability to work successfully in a project team	TM 620 instructor	Student feedback of team members	Verify that all students were contributing members of student teams.	2004 result nearly led to a formal grade appeal, but tool will continue to be used.	Remind students at midterm that their peers would be reviewing their contribution
Provide professional presentations	TM 630 instructor	Oral presentations in front of cameras	Professional presentations based on business expectations.	Results vary with the individual. Presence of cameras (due to video link and internet) is especially difficult for people not used to high tech. delivery modes.	Students were tested using presentations over the internet, with most students at home or work.
Know how to weigh the cost/benefit of technology decisions	TM 612 instructor	Questions on Exam 2	Requires the understanding of the time value of money.	40% were below a grade of 90.	

**Component / Course / Program Level**

Student Outcome	Person or Office Responsible	Assessment Tool or Approach	Standards/Benchmark	Results/Analysis	Action Taken
Be able to write a comprehensive project proposal	Advisor	TM 699 proposal	Professional proposal is required before student can enroll in TM 699	Results vary with the individual. Some students require multiple versions before acceptance.	Discussions about Capstone project were started in TM 600, during the students first year in the program
Develop and execute an applied technology project and present the results orally and in writing	Capstone Advisor	TM 699 Capstone report and presentation	Must pass a committee within the College	93% did not require further work past the presentation.	CITE graduate faculty is discussing how to best prepare students for the capstone. We are looking at course modifications in order to take a more uniform approach across the various CITE programs.