

An Alternate Learning Approach for the Engineering Management Program at the University of Tennessee at Chattanooga

**Dr. Neslihan Alp and Dr. Phil Kazemersky
University of Tennessee at Chattanooga**

Abstract

This paper describes the importance of the alternate learning approach, which is Web-based course delivery in the Engineering Management (EM) program in the College of Engineering and Computer Science at the University of Tennessee at Chattanooga (UTC). The EM program at UTC rests on the principles of bridging the gap between engineering and business. This program provides a wide variety of aspects in engineering management such as quality, reliability, product design, human resources, cost analysis, technology, and strategy. The program has a high demand from engineers who are currently working in the Chattanooga and surrounding areas. However, increasing work demands, necessity for travel, and/or relocation and job changes prevalent in the business environment make participation more and more difficult for individuals. Therefore, the EM program wants to offer an alternate and innovative learning environment for those individuals who want to enroll in this program.

I. Introduction

The Engineering Management (EM) Program is a very challenging Master of Science program in the College of Engineering and Computer Science. It is not limited to managing engineers but includes the management of engineering and technical processes, services and products. The program is designed for engineers, scientists, and technologists who have moved or expect to move into areas of managerial responsibility. It has been a strong performer within the College and has had high demand from engineers currently working in the Chattanooga and surrounding areas. The EM program is designed principally to reach those individuals in the workforce. For example, the courses are delivered one night a week per course to minimize travel to campus. Since the need for advanced and/or continuing education is increasing, especially in the engineering and technology fields, the difficulty of traveling to campus places significant stress on individuals trying to further their education.

This paper emphasizes enhancing the EM program to address the above issues by extending the program's reach to parts of the community and region not presently served and increasing the flexibility of program delivery. To do this, we must reach individuals who want to enroll in this program or continue in the program through alternate and innovative learning environments.

II. The Objectives of the Alternate Learning Approach

The objectives of the alternate learning approach are focused on three different areas:

Students and Program Quality

- Extend the MSEM program to individuals not presently reachable, who may be located in Chattanooga and surrounding areas or outside the current regional area.
- Offer students both traditional and non-traditional EM program with equivalent quality and integrity.

Quality and Learning Environment

- Improve both quality of teaching and the learning environment by providing educational opportunities for a diverse student body.
- Serve as a pilot program for moving other programs to Web-based and learning modules delivery methods.

Needs of Industry

- Provide a rapid response to industrial and commercial educational needs.

III. The Advantages and Disadvantages of the Alternate Learning Approach Through the Web

World Wide Web (WWW or Web) education refers to any form of learning/teaching that takes place via a computer network. The Web provides educators with an outstanding opportunity to deliver courses, or to supplement existing courses, using a networked computer.

Advantages of Web-Based Courses:

- Once developed, courses can be delivered at any scale. This creates the opportunity for improved course quality.
- The pace, path, and depth of learning can be adapted by the student to suit his or her background, level of aptitude, and schedule.
- Interactive Web-based exercises offer more opportunity for repeated experimentation and practice than is available with traditional course delivery.
- The networked nature of the Web brings traditionally isolated distance-education students-into a community of communicating peers through the use of bulletin boards, chat areas, and shared workspaces.

- Courses can be delivered at any location through computer and network/modem connection access. This is an advantage for all students but is a special advantage for physically challenged students or those students for whom travel to a common campus is otherwise difficult.

Disadvantages of the Web-Based Courses:

- Less student-instructor interactions.
- Students should be more motivated to keep up their work.
- Difficulties of offering exam questions through the web because of the lack of the security through the system.
- Students should have a computer with a network and they have to be able to use the computer with different software programs.

IV. Course Delivery Techniques

There are three different delivery techniques to offer the courses through the Web and these are:

- Using an external source to prepare and implement the on-line courses
- Using the web delivery techniques; such as the Web Course in a Box, WebCT, etc.
- Using the combination of these two

There are some advantages and disadvantages of using the above techniques.

- External Source: Courses can be developed and implemented by using some help from an external source, such as a computer-consulting firm. These types of firms can be helpful during the implementation stage, but all work should be done by instructors. These consulting firms can be helpful for people who don't have enough computer knowledge.
- Web Delivery Techniques: These types of techniques are very useful to deliver the courses in the same format. Web Course in a Box, WebCT, Black Board, and etc. are some examples of these techniques.
- Combination: In some cases, it is useful to combine these two methods because it might be useful to change the format of the Web Delivery Techniques according to the course structure.

All of the above techniques have different pros and cons based on the instructor's computer knowledge, willingness to use the full or partial web techniques, and the structure of the course. Therefore, the techniques that will be used to deliver the courses are different from each other. The followings are the different types of delivery methods that might be used to offer the on-line courses (Novak, 1999):

- Highly web-based courses
- Limited web-based courses
- Supplement web-based courses

In the highly web-based courses, there will be no need to come on campus to take the course, so all the course materials including the exam questions, homework assignments, project, etc. will be done through the web.

In the limited web-based courses, there will be a need to meet once, twice, or three times per month to discuss the course subjects, and the exams will be given in class by the instructors.

In the supplement web-based courses, the course will be mainly on campus, and the class information will be provided through the Web. Therefore, if a student is missing the class, he/she can find all the class information through the Web.

The above delivery methods might include the followings (Chopra, 1999):

- Media
- Live interactions
- Video tape
- Audio files
- Exam questions
- Electronic mail
- Chat room
- Conferencing system

V. The Expected Results

As a result of offering the alternate Master of Engineering Management through the Web, the followings are expected by the College of Engineering and Computer Science at UTC:

- Enhanced instructor-student interactions via the Web,
- Increased use of technology in current courses, where practical,
- Identification and development of courses for EM delivery over the Web,
- Identification of new courses for the EM program,
- Introduction of course learning modules to the EM program,
- A certificate program supporting the needs of industry, continuing education, and individuals exploring the EM program.

VI. Conclusion

According to this paper, the followings are the highlighted conclusions of the alternate MSEM program:

- It will provide the student an opportunity to obtain a quality education while promoting excellence in teaching and learning through improved instruction.

- It will serve to enhance faculty performance and development through new challenges in teaching and learning environments.
- It will help to attract and retain quality faculty through a demonstrated commitment to innovative approaches and learning environments.
- It will apply new technology throughout the entire program.
- It will afford the community a program that supports the needs of employers and provides educational opportunities for a diverse student body.
- It will help economic development of the region by embracing the assets of technology, improving potential partnerships, and enhancing the learning environment.

In addition, the alternate MSEM program will address local, regional, and national needs, as pressures for life-long learning must be balanced with work and personal life demands.

Summarizing, the responsiveness of this alternate learning approach to meeting the knowledge needs of employers and their employees will strengthen UTC's perception and support within the community and contribute to promoting closer relationships with business. Indirectly, it will energize faculty development through the recognition of efforts and encourage the faculty to expand their current contribution to engineering management, UTC, the community, and region.

References

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Bibliography

NESLIHAN ALP

Dr. Neslihan Alp is an Assistant Professor in the College of Engineering and Computer Science at the University of Tennessee at Chattanooga. She obtained her BS in Engineering Management, MS in Industrial Engineering from Istanbul Technical University, and Ph.D. in Engineering Management from University of Missouri-Rolla. She worked as a Post Doctorate Fellow at the University of Missouri-Rolla for 2 years. Her research interests are in operations research, project management, production, management, distance education, and web course development process.

PHIL KAZEMERSKY

Dr. Phil Kazemersky is an Associate Professor of Engineering, Director Engineering management, Manufacturing and Industrial Engineering, and director of the Cranston B. Pearce Center for applied Engineering at the University of Tennessee at Chattanooga. He received his Ph.D. and MS at the Ohio State University and BS at the Worcester Polytechnic Institute. He has conducted research on technology application, assessment, and implementation. He has 18 years experience in the electric power industry and its related research projects.