MEPP: A Case Study in Online Education
by Greg Kearsley

In May 2001, the first cohort of 22 students graduated from the Masters of Engineering in Professional Practice (MEPP) program at the University of Wisconsin (UW) at Madison. These students had just completed two years of study (a total of 10 courses) primarily in a Web-based online environment, except for two on-campus sessions, each of which lasted less than a week. According to the graduates, this learning experience was rewarding and contributed to significant professional development. Not only does the program allow students to complete a graduate degree in a more convenient manner than traditional on-campus classes, but it also provides a high quality outcome. This case study examines how the MEPP program has been successful in a variety of ways.

Students

MEPP students are typical distance learners: working adults with busy professional, family, and social lives. All students have full-time engineering jobs, and most travel extensively throughout the US and often visit Europe and Asia. The majority of students who enter the program are mechanical or electrical engineers in mid-career with large manufacturing corporations. They are interested in earning a graduate degree to advance their professional skills and employment opportunities. Standard admission requirements for the program include a BS in engineering, at least four years of...
professional experience, and a minimum 3.0 undergraduate grade point average. In addition, applicants must convince the counselor and admission committee in their application that they have the necessary motivation and focus to complete a challenging course of study.

By virtue of this selection process, MEPP ensures that the students it accepts have a high probability of completing the program. In fact, only two students in the original cohort dropped out of the program, one of whom returned as a member of the second cohort. MEPP students are well-qualified, motivated, and also demanding; they expect a lot from the program, given the time and money that they invest. A large majority of the students also receive at least partial financial support from their employers to participate in MEPP.

Curriculum

First and foremost, a successful online graduate program must feature a well-targeted curriculum that provides the skills and knowledge relevant to the students' needs. The 10 courses in the MEPP program were created after a literature review and a needs assessment conducted during the program's initial planning. The needs assessment asked employers in which competency areas they would like to see their engineers obtain additional or advanced training. When asked why they chose to apply to MEPP, many applicants note that the program offers a much more focused and applicable curriculum for engineers than other MBA-engineering programs that they have considered.

Our evaluation data suggest that the selection of courses and their content represents an appropriate response to the needs of this audience (see Exhibit 1). All of the courses are initially pilot-tested with non-MEPP students and are revised each time they are delivered, so the refinement process is continuous. Furthermore, the MEPP program has an advisory committee that consists of senior engineering managers in large corporations who review the curriculum and other aspects of the program on a regular basis to ensure that it remains relevant to industry needs.

Faculty
In addition to a strong curriculum, a strong graduate program must have exceptional faculty. **MEPP faculty members** are not only experts in their realm of engineering but are also comfortable teaching in an online environment. This requires mastery of all of the software tools and the delivery system used in the program as well as a solid understanding of the distance learner's experience.

The MEPP faculty consists of members of the University of Wisconsin College of Engineering as well as members of other universities and organizations. One of the advantages of online courses is that faculty, as well as students, can be remotely located. We have faculty members who travel extensively and continue their teaching activities from locations all over the world.

Our focus on constantly updating faculty (and staff) members' knowledge of the delivery system and software tools that the program employs has proven to be more challenging than updating the students' knowledge since faculty roles demand a more intimate knowledge and a wider variety of skills in general. We have used both formal training sessions and one-on-one tutoring for this purpose, but the most effective means appears to be self-education. Consequently, one of the characteristics of exceptional online teachers is their constant ability to learn how to use new software tools on their own.

**Staff**

The success of any distance education program depends largely on its staff, especially in terms of their experience and dedication. MEPP staff includes a program director, platform manager, webmaster, system analyst, instructional designers, a technical editor, a counselor, and an administrative assistant. Note that these positions are part-time duties; all MEPP staff have other professional responsibilities. In addition, the college provides graphic and video support as needed.

The concept of having a project team for a graduate degree program is unusual in a traditional academic context (but routine for distance education efforts). Faculty are not used to having to work with a large team to develop and deliver a course, and this unfamiliar process requires some accommodation. The clear definition of the roles and tasks of each team member is necessary to avoid confusion and inefficiency. In addition,
a great deal of management time and effort must be devoted to the coordination of team members and their activities.

**Institutional Context**

A successful distance education program needs a supportive institutional setting. MEPP is offered by the Department of Engineering Professional Development, which has been providing continuing engineering education for many years. The department has considerable experience in implementing and managing programs, although MEPP was its first online degree program. Furthermore, the College of Engineering backed the program with financial, faculty, and staff resources. UW has a long tradition of distance education and is receptive to innovative programs like MEPP.

Teleconferencing services for MEPP receive support from UW-Extension's Instructional Communication Services (ICS). In a typical week, students participate in two hours of synchronous teleconferences; these may be audio-only or may also include real-time graphics accessed via the Web and PlaceWare. Students frequently use these same teleconferencing tools to facilitate their work on group projects.

The program also receives support from the College of Engineering’s Wendt Library. The full resources of UW-Madison's libraries and affiliated universities are available to MEPP students through a combination of direct access to online resources, electronic delivery of documents scanned upon request, and express mailing of other materials.

**Delivery System**

A successful online program must have a reliable and powerful delivery system. MEPP uses the WebCT system as its main course delivery tool, which is supplemented by a teleconferencing system (currently PlaceWare) and a groupware system (currently DocuShare). After the first year of the program, UW-Madison adopted WebCT as its campus-wide online delivery system—a choice that represented a mixed blessing for MEPP. For example, when upgrades are made by the university IT group to the delivery system that change its behavior or appearance without notifying users in advance, this causes considerable frustration on the part of students and faculty. Similarly, unscheduled maintenance that takes the delivery system down on the weekends when
most students do their course assignments is not appreciated much by anyone. The main advantage and disadvantage of this choice is the same: the university IT group now handles all system maintenance and support. In general, an online program needs to control its own delivery system to ensure a high degree of reliability, continuity, and support for its student clientele (who tend to differ in many respects from on-campus students).

The most problematic aspect of course delivery for all concerned is the Internet connection, especially the speed (bandwidth) possible. Since the courses are Web-based, having a fast connection makes all course activities go more smoothly—and having a slow or unreliable connection has the opposite effect. The fact that our students and faculty tend to travel a great deal further complicates this issue. Unfortunately, this is not an issue that the program has any control over; rather, it is an individual matter for each student or faculty member to address. What we have done, however, is add network troubleshooting techniques to the initial networks skills course that students take, and we are vigilant in providing technical help to students who experience problems with any aspect of the delivery system.

**Course Design and Development**

Creating online courses is a major undertaking that requires a strong team that consists of a subject matter expert (usually the faculty member who will teach the course), an instructional designer, a technical editor, a webmaster, and a course manager. In addition, if new software tools are to be employed, the assistance of a system analyst may be necessary. Graphics and multimedia elements may also necessitate a graphics or multimedia developer's assistance.

In the case of the MEPP curriculum, the instructional model emphasizes making the course activities as work-related as possible to maximize the relevance of the program. All of the courses involve projects requiring students to work together in teams. All activities are scrutinized to make sure that they address the goals of the course and have significant "real-world" value.

While most of the development takes place for the initial offering of the course, all courses require revision each time that they are offered (i.e., textbooks and software
change, new topics are introduced, or assignments are replaced). So, course development is an ongoing program task for faculty members (who are compensated separately for course development) and the rest of the course development team.

**Program Management**

Even though MEPP is not a large program, it requires a significant level of management to coordinate all staff and faculty members while also ensuring that all tasks are completed. At any given time, two cohorts (first and second year students) are taking courses, while the next cohort is going through the admissions process. Course and program materials are in a constant state of flux; student problems of one sort or another frequently need attention; and the delivery system requires ongoing vigilance. For further discussion about the student support aspects of MEPP, see Al-Ashkar (2000).

A considerable amount of effort must be devoted to ongoing marketing and promotional activities, both to attract new students to MEPP and also to publicize the program. The program must continue to be both financially and politically viable within the University, and this involves many presentations to administrators as well as constant scrutiny.

The effects of sound management manifest themselves in the program's smooth operation and a minimal amount of frustration for students, faculty, and staff. Finding a strong program director to provide the necessary leadership and coordination is critical. So far, the program has been blessed with excellent management.

**Evaluation and Quality Control**

From the beginning, MEPP has emphasized the need to collect data and use this data to improve its program. Prior to their first full-scale offering, all courses are tested as pilots with small groups in order to discover problems in the course content and to prepare the instructor. Students provide evaluations at the end of each course, and these evaluations help the instructor plan revisions for the next offering. We also administer a student completion survey at the end of the program to assess the students' overall impressions.
Other Outcomes

As well-planned and implemented as MEPP is, we have encountered some surprises. We did not expect students to be so eager to continue with the program after graduating, but we are now preparing follow-up courses and workshops for alumni. We also did not expect the teleconferences to be such a key element of the courses and have recommended to faculty that they become weekly events. Since engineers tend to be rather solitary, we did not anticipate how strong the cohort bonding would become or the extent to which students insist on doing course work in a group mode. We learned from students how valuable the annual one-week residency is in cementing relationships with each other and faculty members and in building confidence and energy for the courses in the year ahead. We were pleasantly surprised that faculty were willing to spend so much time interacting with students—even though it made their course workload very heavy. Finally, we did not anticipate the significant difficulties of maintaining a stable and reliable delivery system or the complexity of the technical support required.

Conclusion

It is not possible to single out one factor for the success of the MEPP program; rather, its success seems to be the cumulative result of accomplishing many tasks well. On the other hand, failing with any one of the above elements would likely have doomed the program. The lesson from this case study is that you have to do most things right to succeed with online learning programs.

The challenge for the program now is to maintain the high standard of quality that has been established across subsequent cohorts of students and changes in faculty, staff, and institutional priorities.

References


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