Operational Procedures for E-Learning Courses

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We stand at an important junction in higher education, a time in which educators are facing an unusually large number of challenges. The rapid expansion and growth of the Web provides stimulating new ideas in the delivery of instructional and educational courses. Learning Management Systems (LMS) are becoming quite popular as more organizations deploy them for enterprise-class use (Gartner, 2002). Vendors including SAP, PeopleSoft, and IBM will introduce their new LMSs in 2003. Many educational institutions are moving forward with plans to take advantage of these opportunities. Gartner (Harris, et al., 2002) surveys indicate that the adoption of some sort of e-learning by higher-education institutions is almost universal. Although not all classes employ e-learning, majority of them use the Web as a communication tool and as a resource. However, while the existing opportunities are appealing, there are many problems that need careful consideration. This paper outlines operational procedures that those responsible for developing and offering Web based Information Technology (IT) related courses at academic institutions will need to take into consideration.

From an academic point of view, delivering courses through the Web raises new questions regarding intellectual property, pedagogical methods, ethical issues, and course management. Some of the above issues have been addressed to some degree in distance learning programs, while others have been dealt with much early in correspondence programs. Although some of the experiences obtained from these types of programs can easily be mapped into web-based education, the Web and its related technologies bring in a whole new set of issues that must be considered. The issues presented below were arrived at by examining the experiences of pioneers and contemporary developers in the area of Web-based curriculum.

1. STUDENT ACCESS TO LEARNING RESOURCES

Even though institutional computing services are by and large on hand to host an IT based Web course, they may not be the best choice. Based on the context of material that is offered in web related courses, it may be more efficient to use commercial services with assurance of certain amount of support. Careful deliberation should be given to this decision, since students may be adversely impacted by inferior and/or undependable access to learning resources. Learning resources available for e-learning may include both electronic media resources available on the Web and published resources distributed on CD and paper.

2. COURSE EVALUATION

The development of an e-learning course is a milestone, not the final goal. Evaluation guidelines should be developed from the outset for the regular assessment. The evaluation process needs to address the following concerns:

- Who will take part in the evaluation process?
  - Teaching Faculty
  - Educational administrators
  - Students
  - Organizations which the program may impact
- What will be assessed?
  - Access to learning resources
  - Effectiveness of learning resources
  - Efficiency of learning process
  - Learner outcomes measured both quantitatively and qualitatively (number of students completed the course vs. the number of registered students; grade point average distribution, max, min, median; complexity and depth of students assignments, students course evaluation; etc.)
- How often the program will be evaluated?
  - Like with any product, there are several phases of product life cycle; evaluation during the first three semesters/quarters should be used as a constructive tool for the course enhancement and turning and not as an assessment of success or failure.
  - The content of evaluation must clearly separate the course evaluation (focus, content, media, resources, procedures, etc.) from the instructor's evaluation
- How the e-learning program will be compared to the traditional programs?
  - To make such comparison meaningful, it is important to clearly formulate and differentiate the expectations of students directed to traditional and Web-based programs; furthermore, it is important to define values and to help students develop their expectations regarding this new program.
  - It is important to recognize the features of traditional programs that are not formally supervised by the instructor but an important part of learning. For example, mutual assistance among students who meet face-to-face in the classroom setting, informal student-instructor interactions that provide comfortable learning environment for a student, and others. These features must be substituted or compensated in a Web-based program.

3. STUDENT/FACULTY INTERACTION

Technology-enabled learning has been around for more than 20 years. However, e-learning was made more relevant, feasible and powerful when its reach was extended by Web-based approaches. Students and faculty may interact in the following modes:

a. Synchronous or Real-time Communication – This approach includes:
- Video/Computer Conferencing
- Audiographic Conferencing
- Picture Phones
- Chat Sessions

b. Asynchronous or Time-delayed Communication – Asynchronous forms of interactions are allowing participants to communicate by leaving messages. Examples of this approach are:

- Web site
- FTP
- E-mail
- Cellular phone text messages
- Voice mail
- Fax

Depending on where e-learning students actually live, some universities will require a few on-campus sessions at which students can take exams and/or present their research results. It is advisable to use the lowest level of technology that will get the job done. This minimizes the time required for students to learn how to use technology and to reduce the cost. Also, provisions must be established for dealing with students with learning disabilities.

4. STUDENT/STUDENT INTERACTION

Modes of communication are similar to Student/Faculty interaction discussed above. Computer conferencing provides a basis for questions and answers and serves as a platform for sharing opinions and different point views about course content. Students can learn from one another and assess their progress based on fellow students' comments.

5. ACTIVE LEARNING

E-learning courses will emphasize active and independent learning contrarily to "passive" form of participation in a traditional classroom environment where merely "presence" is sometimes a substitution for learning. E-learning courses will be focused on two deliverables:
a. Self-testing that accompanies each module
b. Completing practice assignments designed to re-enforce and verify understanding of modules.

6. PROMPT FEEDBACK

E-learning courses will provide timelier feedback to students' questions and problems. This will allow:
a. Timely online consultation and responses to provide maximum flexibility for the students
    i. During online "virtual" class sessions more time allocated for questions-answers
    ii. A student can submit his/her questions online 7 days a week at the time when the problem arises and any time of a day. While in conventional classes, a student needs to visit a professor in person during specific hours on specific days.
b. Electronically documented online consultations serve with greater precision and are easier to follow, particularly for students with English as second language.
c. Documented online questions-answers are reusable and can be distributed electronically in collaborative learning environment to other students in a project group or in a class.

7. ASSESSMENT OF LEARNING OUTCOMES

There are several methods available to faculty to evaluate students' comprehension of course material, and advancement towards realizing course objectives. Similar to traditional courses, individual faculty members determine the variety of assignments they will use to assess students' progress and depth of knowledge. These may include projects, quizzes, research papers and exams.

8. SECURITY OF ASSESSMENT MEASURES

The toughest issue in assessing students' performance is insuring that student being assessed is the one who is taking the exam. It is hard if not unfeasible to reliably determine a student's identity when taking an exam over the Internet. If dependable identification is required to preserve course integrity, provision must be made to manage tests through a proctored arrangement. This may necessitate that students meet at times at a central place, or that arrangements be made at a reliable institution near the student's geographic area. Pennsylvania State University (Levine, 2002) offers a list of suggestions: faculty from any other accredited university, local high school faculty or administrators, or commissioned officers in the armed forces.

9. ADMINISTRATIVE SUPPORT

An essential element in IT course development is the presence of administrative support. This support is essential in guaranteeing availability of sufficient resources for successful implementation of the project. This support must be resilient enough to withstand early delays and problems in launching the program. An additional possible benefit of administration support is shaping the behavior of potential participants. Lacking administrative support, an IT Web based program may not get the chance to grow up into a meaningful endeavor.

10. FACULTY INCENTIVES FOR PARTICIPATION

Development and teaching e-learning courses are time-consuming processes.

Universities policies vary extensively on the issue of incentives. A few provide cash, some offer released time for course development, and others provide double credit for distance learning courses; i.e., one distance learning course to be the equivalent of two on-campus courses. Some universities employ on-campus instructors only on an overload basis. In some cases, this subject has been determined through collective bargaining. An educational institution may consider other incentives such as recognition, specialized and individualized training and technological support.

11. FACULTY TRAINING AND SUPPORT

Faculty participating in e-learning curriculum must have the attitudes, knowledge, and skills required to teach, advise, counsel, and assist such students. Technology creates opportunities for faculty to think about course content and make new decisions on how to present them. Faculty training and support is needed for course development and course delivery. E-learning course development brings up issues that most faculty members have never considered before. Technology now makes it possible to prepare the same lectures in many different ways. This can be viewed as a challenge or a concern. Universities need to pay attention to the following issues (Levine, 2002):
- Will instructional designers be available to help e-learning faculty?
- Will graphics and technology experts be on-hand during the course development process?

Information technology platform used at an educational organization for e-learning often includes tools built at that organization. These "in-house" developed tools help instructors and students to organize software tools, to illustrate intermediate steps of the software development, provide online training, etc. A new wave of software re-engineering popular in Europe and in the USA prompts professors to focus many student projects on practical issues of reverse engineering of Web-based systems for various industries. It is an effective component of Web-based industry-oriented training for both instructors and students.

Faculty group training can be provided through workshops. The main goals of these workshops are:
- To allow faculty to practice on the system(s) before they start teaching
- To discuss effective e-learning instructional techniques
- To give participants an opportunity to discuss the e-learning experience with faculty who have had a successful experience.

12. REMOTE ACCESS LABORATORY

In traditional courses, students' computer-related practical work can be accomplished at on-campus computer laboratories and on home computers. For Web-based courses, a course designer may consider three types of facilities: Web-based resources, remote access labs and home computers. Depending on the content of an E-learning course, the remote access computer lab may become one of the most complex issues in terms of its setting up, remote supervision, remote students' access,

and designing students assignments appropriate for remote access computer facility. At this stage of technology, remote access lab may not a feasible solution for teaching online courses with any content.

13. CLASS SIZE CONSISTENT WITH COURSE OBJECTIVES

Class size can be limited by the capacity of the professor to maintain an online collaborative study environment and by the capacity of the available learning and IT resources.

In summary, administrators setting up distance-learning curriculum will not be restricted by policy. Issues such as logistics, economics, and the desire to build up a wide-ranging base of institutional support are the new challenges to be met.

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