Work in Progress – From ‘Live’ to ‘Online’: A Feasibility Study

Wenyi Ho1, Doug Hogan2, John Wise3, Thomas Litzinger4

Abstract – The web based training program developed by the National Education Group (NETg) was adapted to substitute for lectures in an introductory computer course. This change from a traditional lecture format to an online format was initiated in order to lessen graduate assistants’ teaching workload in the heavily enrolled general education computer skills courses as well as to enhance students’ hands-on experience in using computer software programs. This paper reports on our study of the feasibility of incorporating this adapted online program as a content delivery component. Students in an introductory computer course were given the option to complete the course requirements online without any attendance requirement. Analysis of outcomes showed no significant differences between the students who attended class only and the students who studied online only in their ability to complete the assignments. Analysis of student surveys revealed a dislike for the online format and a desire that face-to-face education not be abandoned.

Index Terms – Web based training, Online education, E-Learning, face-to-face instruction

INTRODUCTION

Many large universities employ teaching assistants to help with heavily enrolled service courses. While this provides employment for some engineering graduate students, the work is generally more tedious than challenging. Of particular interest to the computer science and engineering department at Penn State are the general education computer skills courses, such as those that teach students how to use the Microsoft Office™ Suite of applications (Word, Excel, Access, FrontPage, and PowerPoint). Because of the high number of students enrolled, these courses cannot be taught in a computer lab with hands-on activities. Instead, the course material is presented in lecture halls of more than 100 minutes each.

Thus, with its technical skill simulation and free accessibility to everyone at Penn State, the web based training (WBT) program provided by Information Technology Services, was examined to see whether it was suitable for those courses to utilize as an alternative delivery component. This work-in-progress paper gives descriptions and the preliminary results of a study on the feasibility of transforming a traditional lecture format to an online format adapted from the WBT program. The study focuses on three issues: (1) whether it is practical to adapt the WBT program to a computer skill course, (2) whether this online format is as effective as face-to-face instruction, and (3) the benefits and challenges perceived by students who study online.

PROJECT DESCRIPTION

In the spring semester of 2003, we conducted a comparative analysis of the WBT program and CMPSC 100 to examine the practicality of adapting the WBT program to this introductory computer course. The analysis showed that:

- WBT covers the courses in computer systems and the Microsoft Office™ Suite of applications.
- The WBT content is based upon the NETg Learning Object (NLO)[1], which contains all the information required to learn a specific skill: a learning objective, a learning activity and an assessment; this approach enables a customized lesson by identifying the course topics needed to accomplish a skill or carry out a task.
- Most of the learning objectives of CMPSC 100 can be found in the objective list for the WBT courses.
- WBT contains equivalent instructional components to those in CMPSC 100: a learning activity containing content presentation and skill simulations can substitute lectures, and the pre-and post-assessments can be used as the ongoing assessment of students’ learning progress instead of quizzes.

In the summer semester of 2003, 13 lessons were created, which correspond to one day of class for the first four subjects of CMPSC 100: two for computer systems, three Windows XP, four for Word, and four for FrontPage. By identifying the learning objectives specific to CMPSC 100, the original WBT program, which takes six-to-eight training hours for each major topic, was tailored to shorter lessons, from 60 to 90 minutes each.

In the fall semester of 2003, all the students in CMPSC 100 were required to attend the first two days of class for syllabus, the first-day organization, and introduction to the online environment. Then students were given the option to complete the course requirements online without attending the
lectures. At the start of the course, 71 of the 114 students at the start of the course agreed to participate in the research and gave permission to access their data: 31 attended class, and 40 chose to take the WBT lessons. However, as the course progressed, four students switched back to classroom, and another four stayed in class while working online. Besides, four students who took the WBT lessons dropped the course. At the end, 28 students used only the online format.

Students in CMPSC 100 were evaluated in four ways: homework exercises, projects, exams and class participation. All the students took the same exam, had the same project requirements, and did the same homework assignments. For those attending class, class participation grading was based on attendance, written activities, and volunteering in class. For those doing WBT, class participation was based on the amount of time logged in each WBT lesson. For the mixed group, it was based on both.

Data gathering during the first section of the course include:
- A pre-course survey and a post survey taken by all the students after the exam for the first four subjects
- Four short questionnaires taken by the students who used WBT after completing the WBT lessons for each subject
- A focus group for those who used WBT
- Grades on homework exercises, projects, and exams, and
- The amount time logged in each WBT lesson.

The analysis of this data aims to find out the impacts of the WBT lessons on students’ learning, the comparative perceptions of the two modes of instruction, and the perceived benefits and challenges of the WBT lessons.

**PRELIMINARY FINDINGS**

The content in the WBT program provided by Information Technology Services at Penn State is compatible with the general education computer skills courses, and is easily customized by its NETg Learning Object, but it has its limitation in covering all the materials specific to each course’s needs. For example, the WBT-only students were encouraged to attend one lecture on posting web pages because it included information specific to PSU’s systems, which is not covered in the WBT program. Also, although its simulation components provide students with hands-on experience in enhancing skills, it also entails a rigid interactive process. In fact, a common complaint about the WBT system is its inflexibility of accepting short-cuts as part of procedures to carry out a task.

The class-only group had higher grades on the homework assignments, the exam, and the project than the WBT-only group. However, the preliminary data analysis indicates that there were no significant differences in learning effectiveness. The use of the WBT lessons did not bring about a consistently positive impact on students’ learning although there were higher grades on most of the homework assignments for students who spent more time on the WBT lessons.

Analysis of the focus group data showed several positive aspects of this WBT learning environment in terms of Khan’s framework for E-Learning [2]. First, from a pedagogical dimension, students claimed that the WBT lessons were more adaptive to their individual needs based on their prior knowledge. Also, students appreciated the hands-on practice with the simulation component. Second, from a management dimension, students enjoyed the constant access to the information. Finally, from an ethical dimension, students’ learning styles were put into consideration so that students were able to choose their preferred mode of learning and to control their own learning pace. Those benefits were also stressed by those students who said they would still choose WBT.

While students felt positive about the WBT environment, they also pointed out that there are significant challenges to be faced with its use in a computer skill course. A lot of them feared procrastination because they were not disciplined to sit front of computers and actually do things. Most of them recognized that the system relies heavily on students’ motivation for it to work. This recognition may explain why the web-only students firmly expressed that having face-to-face interaction with the instructor is important for their learning in this course even though most students in the WBT-only group said that what they had learned from the first part of the CMPSC 100 course met their expectations, as most students in the class-only group did. Another drawback of the WBT format was student difficulty in explaining to the instructor what exactly their questions were via emails or instant messenger.

These challenges were also the reasons why almost half of the WBT-only group would not suggest that other students take the WBT lessons; nor would they choose the WBT lessons instead of the face-to-face instruction. At the same time, these challenges drew more attention from the class-only students to the advantages of the lecture format: the immediate feedback, and the social interaction with other humans instead of a computer. Almost everyone in the class-only group said they would prefer face-to-face instruction if they were to take the course again.

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**REFERENCES**
