CIS101 CBT Pilot Study

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Abstract

CIS101, Introduction to Computing, part of Pace University's core curriculum, is designed to teach a wide range of basic computing concepts and skills, including many current business applications, as well as the ethics of information technology. For most students, this course serves as a bridge between high school and college. Unfortunately, for many it is also the only computer-science course they will take at Pace. In an effort to maximize the efficient use of the university's limited teaching resources and to ensure that the course content of CIS101 is consistent across all sections and lays an appropriate foundation for more advanced study of computer science and information systems, the principal investigator conducted a pilot study substituting computer-based training (CBT) for the traditional, instructor-led laboratory that supplements lectures in the course. The study indicated that this substitution deserves much more attention from academics and administrators.

I. Introduction

Traditionally, CBT programs have been used for corporate training since they are lower cost and ensure a certain level of competency. The academic world has been skeptical of any computer-led training and little attention has been given to CBT until recently. Some institutions, including Stanford University, have turned to CBT as an alternative way to train their technical staff, faculty and students, i.e. Stanford University[1]. CBT certainly is tempting for program directors who run large information-technology programs. These IT programs are responsible for IT fluency, which is a top national educational need[2].

Many institutions and computer science and engineering programs with lab components are struggling with the following problems associated with introductory computing courses: Limited physical space (computer labs and classrooms); Limited access to physical facilities; Limited technical and technology support for lectures; Limited resources (software, hardware, accessories); Large lecture sizes; Large lab sizes (number of students in each lab and number of labs); Effectiveness of labs; Lack of support staff training (large number of student workers).

In an effort to maximize the efficient use of the university's teaching resources, to address these constraints and to ensure that the course content of CIS101 is consistent across all sections and lays an appropriate foundation for more advanced study of computer science and information systems, the principal investigator decided to conduct a pilot study substituting computer-based training for the traditional, instructor-led laboratory that supplements lectures in the course.

Another important factor supporting the use of CBT is that about 86% of traditional CIS101 students already have a PC and some Internet access at home. This population is desirable since it can substantially reduce the usage of the university's lab facility.

II. Pilot

The pilot was conducted in the spring 2000 semester for one CIS101 section. Students in the section were divided into three groups. One group participated in a traditional, instructor-led lab, while the second used computer-based training software from SmartForce, a leader in corporate computer training, in a university computer lab, under the guidance of an instructor. The third group was given the computer-based training software on CD-ROMs to use at home or elsewhere.

III. Results

The final findings indicate that CBT or Web-based CBT may be a cost-effective and pedagogically successful way to give students the hands-on skills that Pace has traditionally taught only in instructor-guided computer labs. The students who used the CBT software on their own at home performed the best on the final exam. The final analysis of the pilot shows that of the 61-student sample, experimental group 2 (CBT-at-home mode) performed better in the lecture portion of the final exam by 3.3 points and 7.6 points better in the application portion of the final exam. CBT-in-the- lab (experimental group 1 – the semi-traditional lab with CBT) did not do as well compared to the control group. Many students did not like this CBT-in-the-lab mode since it limited their learning to a specific time and place.

This study also implies that since teaching resources previously used to run traditional labs can be reallocated, it could be possible to reduce the class size of CIS101 lecture sections. It could also mean that foundation courses could be taught by using CBT, with a lecturer playing the role of facilitator. Can this model be used for other computer science and engineering programs?

Bibliography
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