Challenges in Teaching Computer Applications

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Abstract

Given that good teachers will continue to meet the challenge of keeping up with the latest technology, the focus of this paper will concentrate on the ingredients needed to provide an environment to train students to meet the challenges of a variety of business computer environments. Specifically, the paper will report on an experiment that has been conducted over the past two years to train students to fit into a variety of applied business computer positions.

Background

Most new courses come into being because of a need and their certainty is a need for an applied business computer course. Formal student surveys over the past decade as well as administrative, advisors, and company feedback all indicated that there was a strong need to tie current business/economic courses to the tools of modern computer technology. In addition, more emphasis in recent years has been given to the ideas of system approach to learning, that is, the ideas a problem based approach or experiential learning as an instrument of discovery. It was also obvious that students who had applied computer training along with their business and economic background had a larger number of more desirable cooperative education positions while in school and greater options and higher paying job offers upon graduation.

The demands for business/economic trained students, however, is complicated by the fact that requests are for a large variety of both agricultural and non-agricultural positions, for firms from a few people to many thousand, and from companies who used a variety of computer technologies that ranged from one or two small micros to several state of the arts networks and mainframes. A single course in micros or in mainframe usage would not meet the skilled needs of employers. A reasonable solution would be to design a curriculum or specific option with several blocks of needed courses for both micros and mainframe applications, but such an alternative would be very costly. The option chosen was to design a course that used a minimum amount of programming, along with a series of learning modules so that students without formal programming experience could learn both applied micro and mainframe techniques via the same micro/terminals as rapidly as possible and spend the majority of their course time in solving applied business/economic problems. Although this solution involved a large amount of preplanning and course preparation, and also a large amount of lab time, once the course was ready, the tutorial nature of the lab could be adequately handled by teaching assistants. Instructor's time could be spent on class preparation, individual student problem evaluation and counseling.

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Course Design

In an effort to teach a course to help students to use computer tools to analyze, interpret and present business data, five course objectives were delineated. All objectives were to be achieved using the tools of both micros and mainframe computers to: (1) understand the purpose and operation of spreadsheets, databases, graphic analysis, word processing and telecommunications; (2) create spreadsheets and be able to modify databases, (3) use spreadsheets, databases and graphic analysis to interpret and make business decisions; (4) communicate problem results via word processing, computer graphics and telecommunication media; and (5) set up and use several communication protocols to transfer files between micros and mainframe computers.

The course was designed as a "capstone," mostly for senior business/economic majors, in the sense that those students having had the business and economic skills would concentrate on using these skills along with computer tools to solve problems. The lecture was one hour per week and concentrated on developing the concepts and tools that would be needed and used to solve problems. The lab was three hours of hands-on-work and covered the most-used computer business tools, that is: spreadsheets, databases, word processors, graphics and communications. Labs were set up as an intensive learning experience with a lab assistant to student ratio maintained at 1 to 7, with the instructor periodically helping in the lab and in maintaining close student contact via class, problem evaluations and comments, office hours, and electronic mail.

The first part of the course was devoted to the use of microcomputers. The Lotus package of Symphony was used as the analytic tool. The class first worked through a series of learning modules *and then* was assigned five problems using the package. The problems were changed each semester, but involved the same areas of national income accounts, competitive firm decision making, tree replacement production decisions, database management surveying and telecommunication. The second part of the course used mainframe computers and involved three packages: 2020 spreadsheets, Focus database, and Word Perfect word processor. Students were again assigned a series of tutorials for the mainframe computer tools and instructed how to use the mainframe via their micro/terminals. The five problems covered in this section were: cost simulation model, imperfectly competitive firm, labor productivity, database

development and modifications, and document preparation and reporting. Each problem was designed to use at least one computer technique and also to apply a business/economic concept.

Although the same problems were given to all students they were informed that innovative designs, interpretations, and presentations were as important as obtaining the correct answers, and all problems were graded accordingly. Since the emphasis in the class was on problem solving, 70 percent of the final grade was given to this function. The remaining 30 percent was divided between the midterm and final examinations which were used to test students on the computer concepts learned.

Several ingredients were found to be very helpful in developing the environment for this course. First, the computer lab environment was kept as homogeneous as possible. That is, all students worked on Digital Vaxmate which could be used as both a microcomputer and terminal connected to the mainframe. This shortened the equipment-learning curve and allowed students to work from any micro/terminal. Second, the course was designed in advance in terms of lectures and lab assignments. Additionally, lab teaching assistants were required to work all the lab problems out in advance, and were, therefore, available and knowledgeable to answer student questions. Three, the time needed to learn how to use techniques in both micro and mainframe sections was considerably shortened using learning modules. In some cases, these were standard company-developed modules and for others, tutorials were developed as needed to illustrate concepts. Four, the course was designed with a one-hour lecture per week, at which theory and techniques were covered as well as an introduction to the lab problems. The use of short lectures allowed a maximum amount of time to be spent in the lab with students spending almost all of this time in hands-on-learning. All students were required to come to the lab with an advanced plan for setting-up and analyzing the problems. It was emphasized that there was insufficient time in the lab to plan what they were going to do once they arrived. Five, student

Table 1. Question 1. Were the course objectives adequately presented and did the instructor fulfill these objectives during the semester?

	Responses*										
	0 Objectives not outlined at all.	1	2	3	4	5 Objectives were mentioned.	6	7	8	9	10 Objectives were very well presented.
Classes											
F'87						1		4	17	13	7
S'87							1	7	14	10	8
F'88			2					1	6	3	18
Total			2			1	1	6	37	26	33=106
% of Total			1.9			.9	.9	5.7	35.0	24.5	31.1=100%

* Total students in all three courses 124. Overall response return 85.5 percent.

enrollments were controlled by listing the course as needed permission of instructor. This allowed a homogeneous class of students to be selected who had the required business and economic background so that time could be spent on computer tools and their application to a business decision environment. Although all students had an introduction level computer course, no programming or other computer skills beyond a general knowledge of computers was required.

Current Study

The current study was conducted to evaluate a new course in applied economics for the purpose of improving the teaching of the course and to make it as relevant and useful to students as possible. Within this context, two specific objectives were delineated to: (1) evaluate students' feedback on this new course designed to solve business/economics problems using micro and mainframe computer tools, and (2) analyze selected career goals of students who have elected the above optional course.

The two objectives were achieved by analyzing a series of optional end-of-semester survey questions over the past three semesters that the course was taught. Surveys were student-administrated and sealed in an envelope and kept until after the final course grades were posted; at that point, the questionnaires were returned to the instructor. Comments by numerous graduate students, teaching assistants, faculty, advisors and business contacts were also used to supplement formal surveys by students.

Data Presentation

Objective 1: To analyze the first objective, four survey questions were used on the course objectives, lab, learning experiences, and the overall strengths and weaknesses of the course. Tables 1-3 illustrate the first three questions and show that, overall 85 percent of the students answered these questions and that over 90 percent of all respondents rated the course in the top three categories out of ten.

More specifically, using the top three rated categories (8 to 10), 90.6 percent felt the course objectives were fulfilled, 92.6 percent said the lab assignments were helpful in furthering the course objectives, and 90.6 percent stated that the overall learning experience was good or excellent. Probably most significant was the fact that 45.4 percent of the students rated the total learning experience as excellent (category '10').

By quantitatively evaluating the course objectives and lab experience, respondents rated the course very high. This rating was further reinforced by comments from other students, faculty and employee groups from which feedback was obtained. Demand registrations also confirmed this rating, by the fact that the demand exceeded the available course's capacity, which is limited by lab space.

In terms of rating the course on its strengths and weaknesses, responses were much harder to categorize

because of the open nature of the questions and the fact that less responses were received. Four major strengths, however, were listed by 10 percent or more of the respondents. They were: Gives strong understanding of several applied business application tools (17.9%); good hands on experience (15.1%); applications to business world (12.3%); and practical (12.3%). In terms of the weak points of the course, the only item listed by more than 10 percent of the respondents was that there was a shortage of available computers in the lab (31.1%).

It was satisfying to note that the items listed as the strengths of the course by respondents were the very items sought in the course objectives. On the other hand, shortage of lab space continues to be a problem, but should be remedied with the introduction of a campus-wide fiber optic network later this year.

Objective 2: The second objective was delineated in an effort to see if there was any relationship between the career goals of students who elected to take the course in applied business decision computer tools. Three questions on the questionnaire were used to pinpoint this objective: (1) initial program of study, (2) planning to do advanced degree work, and (3) type of job-seeking. Again, the nature of the open ended questions proved difficult to analyze.

The results showed that 59.5 percent of the students initially started their careers in two curriculi — Business/Economics (34%) and Computer Science (25.5%). This same group of respondents sought a wide variety of business-related jobs with no one category accounting for more than 8 percent of the business classifications although 14.1 percent of the students had accepted jobs before graduation. In terms of advance degree work, 74.5 percent of the students said they planned to take some advanced degree work.

It would appear that the students who elected this course were strongly oriented to quantitative business areas, and yet, within the broad category, there is a large diversity of specific career goals. It is further noteworthy that students seem well aware that a career today is a total lifetime learning commitment and they seem to understand the need for further advanced degree work.

Summary and Conclusions

In an effort to evaluate and improve the environment of a new course to provide business/economic students an applied computer course in business decision tools, students' evaluations were analyzed over the past three semesters. Evaluations showed that students overwhelmingly felt that the course had fulfilled its objectives, that the lab further helped in supporting the course objectives, and that the learning experience of the course was good to excellent. Furthermore, respondents rated the strengths of the course as teaching an understanding of applied business computer tools, hands on experience, applications to the business world, and practical nature. On the other hand, they felt that the major weakness of the course was the shortage of available computer equipment in the lab.

Table 2. Question 3. Degree to which job assignments helped further course objectives?

	Responses*										
Degree to which lab assignments helped further course objectives?	0	1	2	3	4	5	6	7	8	9	10
	Poor		Fair			Satisfactory				Good	Excellent
Classes											
F'87					1			2	9	16	11
S'87								3	6	14	14
F'88	1			1					5	9	14
Total	1			1	1			5	20	39	39=106
% of Total	.9			.9	.9			4.7	19.0	36.8	36.8=100%

* Total students in all three course 124. Overall response return 85.5 percent.

Table 3. Question 5. My learning experience for this course was.

	Responses*										
	0	1	2	3	4	5	6	7	8	9	10
	Poor		Fair			Satisfactory				Good	Excellent
Classes											
F'87					1			1	14	6	17
F'87							3	2	7	12	13
F'88					1	1	1		3	6	18
Total					2	1	4	3	24	24	48=106
% of Total					1.9	9	3.8	2.8	22.6	22.6	45.4=100%

* Total students in all three courses 124. Overall response return 85.5 percent.

Three factors seemed to be apparent in terms of students who elected this course. Almost 60 percent started their college programs in business, economics or computer science programs. Second, almost three-quarters of the students planned to take some advanced degree work. Finally, as expected, most students planned careers in some business field, but there was a noticeable lack of any concentration of any one or several fields of specialization.

Epilogue

This course evolved out of the need for micro and mainframe computer training as applied to business decision making. Out of necessity, due to limited resources, the technique tools of both were taught in one course. This study indicated that the course has been highly successful in meeting and fulfilling the needs of a number of students. On the other hand, it is felt that the current course doesn't go far enough in meeting the demands that many companies have. Students being trained for today's and tomorrow's jobs need a more in-depth training and a better technological knowledge of the elementary techniques that they have been taught. Areas of spreadsheets, databases, graphic analysis and telecommunications should all be expanded as well as learning how to develop and use computer micros. A more broad base curriculum option that would expand into these areas along with a practicum (perhaps a cooperative education experience) would offer a great deal to future business analysts and managers.

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Microcomputer Instructional Modules With Batch-File-Driven Menus

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Abstract

This paper presents techniques found useful by the author to assist with microcomputer instruction. The rationale, along with a procedure for installing lessons onto a diskette are discussed. Batch-file-driven menu systems are introduced which can be used to automate the printing of lessons and to display messages for the microcomputer-using student. Methods are given for installing sounds in these batch file menu systems to get the attention of students.

Introduction

From the time when microcomputers were introduced in the late 1970's, their use has rapidly increased in the fields of agriculture, education, and extension. Most states have taken steps to adopt this changing technology. Mississippi now has Tandy Radio Shack TRS-80 and MS-DOS compatible microcomputers in every county extension office. Most Mississippi vocational agriculture teachers have IBM-PC Junior microcomputers. Farmers are using microcomputers for decision making and record keeping. Agri-scientists are using microcomputers for research, teaching, and reporting.

In the Department of Agricultural and Extension Education at Mississippi State University a course is offered in the "Application of Computer Technology to Agricultural and Extension Education." The enrollment has been a mixture of undergraduate and graduate students. Up to half of the students have been from other countries. Most of the students have a background in agriculture, agricultural education, or extension education.

Agricultural educators need skills in using software programs that are already written instead of developing programming competencies (Bowen, 1984; Sutphin, 1984). This course, therefore, is designed to educate students in microcomputer applications such as word processing, spreadsheets, database management, BASICA, and MS-DOS. In 1987, the process was begun to place the lab lessons on microcomputer diskettes. Now, with the suggestions of several semesters of students, disk-based lessons have been developed for the lab sections of the course taught at Mississippi State University.

Why disk-based?

Occasionally a student will need to miss a lab meeting. Since the material is on the disk, the student can print the appropraite work sheet and follow the steps for the lesson that was missed. This frees the lab instructor to provide assistance as needed without requiring a "repeat performance" of the lab lesson thus increasing the efficiency of the instructor's time (Becker & Shoup, 1985).

The disk-based lessons provide some degree of individualized instruction. The lessons were designed with the field-based student in mind. Vocational agriculture teachers and extension agents have used the disks off-campus to teach themselves microcomputer applications.

It is possible to have a variety of student learning activities going on simultaneously in a microcomputer lab with the printed lessons. Students that need to make up a lab lesson can be in the lab with other students working individually on separate projects.

Some students in a class will have more microcomputer skills than other students and want to explore more advanced applications of the software. Students have also used this shareware software for class assignments requiring skills beyond those taught in the lab. Advanced lessons on most of the modules permit students to learn on their own as their needs increase.

Occasionally it is necessary to use a substitute lab instructor. With the lessons already prepared on the disk and ready for the students to print out, it is easier for the transition to another instructor.

Construction Methods

These modules are designed around a batch file technique for automating repetitive DOS commands

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