— Encourage foreign students to share their culture with classes, civic groups and others as a means of providing a meaningful way to learn about such cultures and as an appropriate avenue for enhancing the feeling of cultural acceptance among foreign students.
— Support or encourage faculty and graduate students involved in research that has a global perspective.
— Assign faculty with international experiences as research and/or dissertation advisors.
— Plan experiential and practical experiences appropriate to the technology level of student's homeland. Students from developing countries often cannot implement the latest technology. Student activities should involve teachings observed in less sophisticated, state-of-the-art agricultural situations.

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Computerized Animal Science for Undergraduates

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Introduction

Microcomputers are commonplace in all businesses, including agriculture. Computer knowledge is becoming increasingly important for competitiveness in business, education and research. Microcomputers in agriculture today are used to keep inventories, financial, and health records, production records, and budgets. All influence the management decision making process. Agriculture is also on the forefront of computerized information exchange among producers, researchers, extension personnel and other technology groups. Through computers, agriculturalists are able to reach more marketplaces, a larger clientele, and have direct access to large databases of information.

Many students in colleges of agriculture across the United States have limited experience in using microcomputer technology. Although grade schoolers are learning to use computers, current collegians have had little exposure to such technology. To function efficiently in the future agricultural world, today's student must obtain this technology.

Rationale

A recent survey of graduating Animal Science seniors at the University of Kentucky revealed less than 10% of them had experience with microcomputers. An even smaller percentage knew how to apply this technology to animal production. Most Colleges of Agriculture, including the University of Kentucky, require undergraduates to take an introductory computer science class, largely dealing with programming in various computer languages. Some students will have an interest in programming and should be encouraged, but others do not. Requiring completion of this type of course can affect the student's attitude towards computer technology in general, and can negatively affect their desire to learn to use microcomputers in the future. In the survey, the seniors also indicated a need for additional experience with microcomputers, especially in application to Animal Science. They believed this knowledge would make them more competitive in the job market.

Numerous colleges considered creating the ideal microcomputer science laboratory. Schlogin (1985) suggested such a lab be stocked with different makes and models of microcomputers, rather than with identical or similar units. In theory this approach is logical because it would acquaint students with a broader array of hardware. However, from a teaching point of view, it makes instruction extremely difficult if all students are working on different types of computers.

Students must learn the classroom theory, as well as application in the laboratory. Each graduating senior should have knowledge of existing software and hardware, and be able to use new developments in both areas.

Therefore, a special problems course, entitled **Computerized Animal Technology,** was developed to provide upper division students with microcomputer experience. This class was designed to accomplish the following objectives: 1) Computer Appreciation, so students can make logical decisions involving application of microcomputers in agriculture; 2) Computer Use in problem solving utilizing existing software without programming; 3) Software Literacy, to learn about software, its uses, limitations, and applications to animal production; 4) Computer Proficiency, to develop a broad understanding of hardware, computer operations, software, file structure, operating systems, and communication capabilities; and 5) Computer Phobias to help undergraduates overcome fear of computers.

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Course Application

The course was structured to provide microcomputer theory and "hands-on" application in animal science. Students began the first class by getting familiar with the microcomputer they used in almost every class thereafter. When the students were not using the microcomputer assigned to them, their instruction was provided by computerized projection equipment. And, when the class was keying in information on their units, the projected image of the teaching screen allowed them to see what their microcomputers should be doing. This technique facilitated instruction. The environment in which the student "learns by doing" builds confidence in themselves and the machine they work with.

The course was divided into three sections: 1) Technology of Computers; 2) Uses of Existing Software in Animal Production; and 3) Advanced Animal Production Software. The first part of the course was devoted to introducing microcomputers (hardware), computer terminology, and Disk Operating System (DOS). The internal electronics of the microcomputer were discussed, particularly the central processing unit (CPU). An analogy between the central nervous system in the human body and the CPU in the computer drove home the importance and basic function of the latter. Technological differences among makes of microcomputers were presented. Terminology was defined in an effort to start all students at the same level. Computer languages, such as FORTRAN and PASCAL, were not used nor taught in this course. How DOS operates the microcomputer, the power it gives the operator, and its commands were summarized. BASIC was discussed briefly but no emphasis was placed on programming. Once the initial introduction was completed, emphasis shifted to the application of microcomputers in animal agriculture. The remainder of the course was taught by "hands-on" use of microcomputers by each student. Software packages were applied to production situations to demonstrate how existing software can be used. Diagrams and flow charts of animal functions and management techniques were created with word processing software, in addition to more traditional uses, such as correspondence with clientele and merging of animal files. Students were assigned the task of preparing a resume and cover letter for potential employers. Database managers were used extensively during the course due to their tremendous application in animal science. For example, the class created animal record files, health records, buyer lists, production records, consignor list and business associate lists with the database manager. More advanced functions involved generating specific reports from existing files, customizing, merging, and cloning specific files for specialized functions. Spreadsheet programs were used to perform both simple and complex agricultural calculations, including performance testing information, simple correlations, sums of squares, and variances. Templates were developed for budget analysis and projections of animal production activities. The database management and word processing software packages used allowed for information exchange between the two. But, knowledge of both software packages was necessary before students could correctly complete assignments.

The final section of the course was devoted to software specifically designed for animal production. This work ranged from telephone modem hookups to national databases containing general or specific information to species specific management software.

Summary

Computerized Animal Technology emphasized "hands-on" application of microcomputer basics in animal science to prepare undergraduates for species production courses and the job market. Perhaps the greatest success in this course was dispelling some common myths, thereby eliminating the students' fears of microcomputers. One effective way to overcome the students' apprehension was to relate uses of the microcomputer to their everyday activities and interests. In turn, students are stimulated to use computers to creatively solve their problems in other courses. In turn they become more involved in the course. By the end of the semester, all students were comfortable using microcomputers.

The course is offered once a year with an enrollment of 28 students. Two students are assigned per computer. Student evaluation of the course concluded that the course was a valuable part of their education. The majority of the students stated that the material presented in the course was applicable to their other classes and could be used in other situations. Although some students felt the course could benefit from a written exam instead of all exams off a computer disk. The overall evaluation of the course by the students was that it increased their knowledge of microcomputers and stimulated ways in which they could use computers in animal agriculture.

Although this type of course is necessary now, it will require constant updating and re-evaluation because young people entering college in the future will have a more extensive microcomputer knowledge of more advanced technology. Then, microcomputer classes in colleges of agriculture will focus more on the application of computerized animal production technology.

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