

GRADUATE COMPUTER EDUCATION: PAST, PRESENT AND FUTURE

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At Northwest Missouri State University, graduate computer education has existed since 1980 with the establishment of a Master of Science degree in School Computer Studies. This degree was designed specifically for teachers who were either currently teaching high school computer classes or were planning to implement computer classes in their schools. Since that first degree program, and based upon graduate student expectations and preparations, two significant revisions in curriculum and delivery methods have brought the program through the 1990's.

As we prepare for the 21st century, the interest in distance learning, Internet availability, curriculum topics, and modified student expectations are each having an impact on the next revision of this degree program. This paper will discuss the current issues of graduate level computer education using a twenty-year history to analyze the problems and to help prepare for the next generation of computer education students.

BACKGROUND

At Northwest Missouri State University, graduate computer education has existed since 1980 when the Department of Computer Science established a Master of Science degree in School Computer Studies. This degree was designed specifically for teachers who were either currently teaching high school computer classes or were planning to implement computer classes in their schools. The students, who completed this degree during the early 1980's, of which there were over 100, reveled in the curriculum which placed heavy emphasis on computer science. Also, their academic preparation and intense motivation allowed them to successfully complete the fifteen credits of programming courses, six credits of statistics, a three credit research component, a two credit seminar on computers and society and six credits of general electives.

At the time there were very few masters degrees offered in the Midwest that included such intense computer science courses. Fewer yet were available during the summer months and were specifically designed for high school teachers. This School Computer Studies degree served such a focused clientele.

PROGRAM EVOLUTION

During the middle part of the 1980's some of the students who entered the original School Computer Studies program were not as interested in computer science but were more interested in a combination of computer science and education. In an attempt to meet the expectations of this growing population, the department designed two alternative degrees which combined some computer science courses with an already established set of core education courses. This change in focus produced two degrees titled Masters of Science in Education-Teaching: Educational

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Uses of Computers and a degree titled Masters of Science in Education-Teaching: Using Computers in a Specific Discipline.

The difference between these two degrees was the amount of computer science. Since both degrees included the same twelve credits of graduate education courses and six credits of general electives, the remaining fourteen credits of courses were designed for the two different audiences. The first audience consisted of teachers who were quantitatively inclined. The Educational Uses degree included eight credits of computer science and six credits of computer education. The second audience was interested in less computer science and more computer education courses. The Using Computers degree included eight credits of computer education and six credits of approved electives not necessarily in computer education.

This two-way proposal met with moderate success and over 100 students successfully completed the modified programs. At the same time the enrollment in the School Computer Studies program was continuing to decline to the extent that the alternative programs had larger enrollments. After several years of small enrollments and a challenge to optimize the graduate offerings of the department, another curriculum revision was designed and implemented.

The department now offers two graduate degrees in computer education. The original School Computer Studies degree has been modified to contain a set of five core computer education courses totaling fourteen credits, six credits of electives, and twelve credits of graduate level computer science courses. This degree appeals to only a small group of students who have the interest in studying advanced computer science and computer education.

The modified Master of Science in Education-Teaching: Educational Uses of Computers degree contains twelve credits of graduate level education courses, six credits of general electives and the same fourteen credits of core computer education courses used in the School Computer Studies. Based upon the interests and the abilities of the students in the program, this combination degree meets the expectations of the students and the objectives of the faculty.

MOVING TO THE WEB

At the present time Northwest Missouri State University is entering the distance learning arena. Attempting to move a degree program to the web involves much more than simply redesigning course materials for delivery across the Internet. Much of the effort in such a move is highly political in nature. For both masters programs in computer education, convincing faculty in the affected departments that their courses can be moved to the web while still maintaining quality has been a challenge. Specifically, the courses associated with the College of Education require a longer development time because of the need to broaden the level of participation of its faculty members in online courses.

Due to the nature of the politics involved, the initial phase of moving courses to the web is being restricted to the core graduate-level computer education courses. These five courses cover the areas of software applications, programming, multimedia, networking and seminar/research.

Once fully developed all of these courses can be delivered on the World Wide Web using the course management software program CourseInfo from Blackboard, Inc. Some of the key features of this software package are:

- asynchronous communication (threaded discussions)
- synchronous communication (real-time chat and whiteboard)
- assessment tools and gradebook (quizzes, exams and project grades)
- collaborative work groups (group projects)
- content creation (syllabus, course description pages, lecture notes, PowerPoint presentations, tutorials, etc.)
- database reporting and course site statistics (tracking student usage)
- messaging system (e-mail notification and correspondence)
- online file exchange (between instructor and student and between students)
- online tutorial (training in the use of CourseInfo)

By moving to the creation of the online versions of the core courses in the CourseInfo system, we have found that the development time has been significantly reduced. This is primarily due to the fact that much of our course materials are already in electronic formats that are quite suitable for delivery in their present forms. This, therefore, enables us to concentrate more on revising our materials (versus creating them) to include advanced instructional technology features (such as multimedia, sound, and video). In the process we have also moved to place the course materials in modular formats so that we can more flexibly integrate the materials across several course offerings in the department.

Some of the other issues we've had to deal with include:

- textbook delivery—Have students purchase their textbooks through Missouri Bookstore Store Direct
- online testing—Focus more on project-based evaluations and frequent online quizzes
- faculty release time—Apply for funding from the campus faculty technology center for the hiring of adjunct faculty to provide full time faculty release time

CONCLUSION

Overall, the masters degree programs in computer education have been very successful in meeting the needs of their constituencies. However, the advanced study needs of practicing teachers continue to change. In order to meet these needs, the department is modifying the Master of Science in Education degree in order to comply with the National Council for Accreditation of Teacher Education and International Society for Technology in Education standards. This curriculum effort is continuing at this time. With the movement of our graduate programs to the World Wide Web and the updated curriculum, Northwest will continue to be positioned to meet the demands of graduate-level computer education students.