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ABSTRACT

Several courses taught in the School of Education at South Carolina State University utilize a variety of technologies in conjunction with cooperative learning and collaborative problem-solving to deliver content, while modeling effective strategies for using technology. Faculty and students work together to determine a methodology that is effective. As technology should be integrated as a natural part of the education process, it was felt that all educators should be aware of the functionality of technology through an integrative approach. The use of technology in graduate and undergraduate programs is focused primarily on word processing, databases, statistical packages and spreadsheets, the Internet as a research tool, e-mail as a tool for communicating, and presentation software as a part of classroom instruction and class projects. In addition to student-to-professor interaction, students are encouraged to use e-mail for student-to-student interaction. Many assignments given via e-mail ask students to evaluate the utility of identified World Wide Web sites in assisting them in understanding and developing concepts and projects. CD-ROM sources and advanced research services are available in the libraries. It is the belief of a core group of faculty that technology will allow the school to improve existing instruction, maximize use of current resources, and target new student markets. (AEF)

Starting From Ground Zero: Integrating Technology in Education Programs

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In teaching, new ideas and teaching methods cycle in and out of favor more frequently. Integrating them solidly into practice, however may still take several years (Brown & Henscheid, 1997). The idea of using technology in some schools of education has been articulated, but has not always been put into practice. One reason may be a long-standing assumption that when students take a basic course in technology they are prepared to use the concepts as a part of their training in education.

Current technology has allowed us to simplify our lives, become critical consumers of information, and bring the world a little closer to home. Technology allows university faculty to access information and expose students to ideas, issues, and resources beyond the geographic boundaries of their actual location. However, simply placing technology in front of pre-service educators and administrators will not ensure that they use this medium of information acquisition to effectively instruct students or improve the quality of their work.

There is an effort to provide educators with the skills they will need to become knowledge navigators who will pilot their schools and classrooms to the very edge of human knowledge. Educator explorers will reach out and touch experts in the community, in the nation, and around the world as pioneers on the knowledge frontier, and as "hands-on" practitioners. In order for educators to be able to do this, it is necessary for programs that work with educators to incorporate the use of technology as a part of programs being offered.

Several courses being taught in the School of Education at South Carolina State University are utilizing a variety of available technologies in conjunction with cooperative learning and collaborative problem-solving, to deliver the content of the courses, while modeling effective strategies for using technology. Faculty members from a variety of disciplines collaborate on effective methods of presenting information to undergraduate and graduate students using appropriate technology.

Students enrolled in these courses are required to engage in activities that allow them to use existing technology (i.e. wordprocessing, databases, Internet searches, presentation packages) as a part of the learning process. Faculty members present information in the courses using the kinds of technology that will enhance the learning process. Faculty members and students work collaborative to determine methodology that is effective and those areas that are ineffective.

Background Research on Standards and the Use of Technology

Several factors were considered when exploring the possibility of integration of technology in education courses in School of Education. As educators begin to explore how technology will be used in the area of education, it was imperative that issues of relevance are addressed. If teachers' primary use of a computer is to be a reward for students to play computer simulated games or to be used as high tech drill and practice sessions, then less expensive methods may need to be considered. All educators, from administrators to classroom teachers, must resist the urge to give in to the public pressure of having students work on computers because of high visibility media attention or for other non-academic reasons. Higher education programs must be careful not to perpetuate the "use of technology for technology's sake" mentality among its graduates.

While the promise of educational technology promotes sense of both enthusiasm and urgency among public officials and academicians, a key element of the educational process is often absent from these discussions – faculty development. Faculty must include current technologies in their curricula, thereby empowering graduates with the knowledge and understanding of appropriate and productive use of technology. Scholars have advocated integrating computer elements throughout the courses in undergraduate programs (Scherer, 1985, AACTE, 1985; Berger & Carlson, 1988; Billings & Moursund, 1988; Bitter & Yohe, 1989; Callister & Burbules, 1990). Course work in these programs, however, needs to be redesigned to integrate technology in both methods and foundations courses so the technology is

used in relevant contexts (Todd, 1993). An initial investigation indicates that most faculty members do not have the technical skills to achieve these goals. There also is very little motivation to acquire the necessary technical skills to integrate or require the use of technology in current education courses.

Therefore, as technology should be integrated as a natural part of the education process, it was felt that all educators should be aware of the functionality of technology through an integrative approach. Kovalchick (1997) suggests those elements from both competency-based models and integrative models are blended into a reflexive approach in which students use technology as both learner and teacher. In this way, preservice teacher education students and students working on advanced degrees in administration are challenged through direct experience to generate personally relevant conceptions of technology. When examining the uses of technology, it was imperative to consider the proposals made by Duffield (1997) in that technology should be integrated into existing courses and not seen as separate from the subject areas.

Primary Uses of Technology

The school of Education at South Carolina State University offers initial certification programs at the undergraduate and graduate (masters) levels in Early Childhood Education, Elementary Education, and in the secondary areas of English, History/Social Studies, Industrial Education, Mathematics, and Science. The graduate program in Educational Administration offers certification to school principals, district level coordinators, and superintendents. The Educational Specialist Degree and Educational Doctorate Degree are offered through the Department of Educational Administration.

The uses of technology as a part of these programs is focused primarily on the use of: wordprocessing, databases, statistical packages and spreadsheets, the Internet as a research tool, e-mail as a tool for communicating (student to student and student to professor) and presentation software as a part of classroom instruction and class projects. As in many other programs, only a small proportion of faculty is utilizing technology. These faculty tend to be "innovators" or "early adopters" rather than "mainstream" faculty (Frayer, 1997).

The use of technology in the School of Education corresponds with the *1996 National Survey of Information Technology in Higher Education.* This report by Kenneth Green notes that the percentages of college courses using various kinds of information technology resources remains relatively low. Table 1 indicates the percentages of technology use in college courses as well as the kinds of technology that is currently in some courses in the School of Education at South Carolina State University.

Table 1.
Uses of Technology in University Programs

Technology	% from National Survey of Information Technology	Utilized in Education Courses at S.C. State University
Multimedia	11%	
E-mail	25%	X
Presentation Handouts	28%	X
Commercial Courseware	19%	X
CD-ROM Materials	9%	X
Computer Simulations	14%	
Computer Lab/Classroom	24%	X
WWW-based Resources	9%	X

The Department of Teacher Education provides an undergraduate initial certification program. All education majors must take two courses entitled Introduction to Education (ED 199) and Socio-Economic Geography (GEO 305). Introduction to Education is a survey of current education issues and exposes students to the field of education, while Socio-Economic Geography allows students to study geographic concepts within the context of educational areas. The National Standards are utilized in order to make the connection between public school instruction and instruction at the university level. The use of technology as a tool is also a major component of these courses. Students are required to use a computer based wordprocessing package to complete all written work. In addition, all students have e-mail accounts and the professors poses multidimensional questions via e-mail. Students are required to respond via e-mail and the evaluation and comments on the assignments are provided to students via e-mail.

In addition to student to professor interaction, students are encouraged to use e-mail for student to student interaction to facility the communication process as a part of cooperative learning activities. Student groups are required to develop, write and deliver group research projects. The research projects must flow as if one person wrote the paper and the group process is held in equal value to the group outcome. Therefore, students send copies of their parts of the project to other group members for comments and review via e-mail. Some groups chose to use a presentation package, such as Powerpoint ®, to present the major points of their project.

Many of the assignments given via e-mail ask students to evaluate the utility of identified web sites in assisting them in understanding classroom concepts, developing class projects, and collecting necessary educational information. Students visit and evaluate web-sites as an integral part of learning critical aspects of the courses in

general and their relationship to the students' specific areas of study. The emphasis in these courses is certainly not the use of technology. However, students are not only exposed to and required to use technology, they are also given any training they deem necessary to complete identified tasks. If future teachers are expected to integrate technology into their teaching methods, faculty must model the use of technology in courses.

Certain courses at the graduate level naturally lend themselves to the inclusion of technology or already contain technology components. In these courses, Educational Research and Data Analysis (EAR 710), Advanced Data Analysis (EAR 803) and Survey Research (EAR 804), students use the Statistical Package for the Social Sciences ®(SPSS-X) and Microsoft Excel ® to organize and analyze research data. Students also use current databases on CD-ROM to collect relevant literature on current issues in education.

To develop the use of technology in the Department of Educational Administration, a CD-ROM based law library, that is housed in the South Carolina Institute for Research in Education (SCIRE), is being utilized to supplement the current course in School Law (EAM 738). Students are able to search for actual court cases that pertain to education policies, procedures and regulations.

Faculty members utilize the advanced research services available in the Miller F. Whittaker Library on the campus of South Carolina State University. MIL-LINE is the library's integrated online library system. It allows users to access the library electronically from offices and laboratories using the campus VAX system. Library holdings on MIL-LINE include books, state and national documents as well as CD-ROMS. CD-ROMS on MIL-LINE utilized by School of Education faculty as a part of undergraduate and graduate courses are, Book Review Digest, Education Index, ERIC, and Statistical Abstracts.

Future Plans for Technology Integration

Programs that are in the infancy stage of using technology can, because of technology, use the experiences of other educational programs. The information highway allows faculty members to read about the activities of other institutions of higher education, and benefit from their work. In order to address the needs of educators and administrators there are several plans being developed to effectively integrate technology in education courses at South Carolina State University. These plans include: the addition of hardware and software to facilitate the use of technology by professors; faculty development in the area of effective use of technology; and the development of innovative methods of delivering information in education.

One of the classrooms used by School of Education faculty is being converted to accommodate the needs of faculty members who are making technology an integral part of their courses. Although the classrooms were specifically designed for methods courses, faculty members who are proposing innovative uses of technology in their courses are being invited to use this classroom. Technology that is included in the design of the classroom are; mounted television sets, a teacher computer station with a projection unit, several student computer stations, and Internet connectivity. This classroom is adjacent to an eighteen station computer lab. The proximity of the computer lab facilitates the process of students being trained to use specific pieces of hardware or software as the need arises during the course.

A university wide project has been initiated to provide resources that will allow faculty, staff, and students to use campus-wide Intranet and Internet tools to improve academic instruction and student services. The Multimedia Development Institute (MDI) has been established to assist faculty in the design and development of an Intranet of web-based applications, including courses, course materials, and student services information. This Intranet will also include some commercial applications as well. To insure adequate access to this Intranet and to the Internet, an open student lab will be established. Faculty participants in the MDI will receive multimedia development systems and appropriate training for the development of appropriate courses or modules within courses that integrate technology into the learning process. In addition, an Internet security firewall will be established to provide data integrity and ensure confidentiality of student information.

Faculty members are working towards creating asynchronous learning environments, i.e. learning that is time and place independent. These methods would serve the needs of a growing diverse population of individuals and professionals whose needs extend beyond the traditional boundaries of the university setting. Ideas and strategies that are implemented need to be evaluated and analyzed to determine their effectiveness.

It is the belief of a core group of faculty members that technology will allow the School of Education, to improve existing instruction, maximize the use of current resources, and target new student markets. The primary barrier to integrating technology into the programs in the School of Education appears to be in the connection between, what faculty members do, and ways that technology can improve this process. However, with more faculty development being provided, the enthusiasm and drive of a core group of faculty members serving as the catalyst for change and the acquisition of resources to support the use of technology this barrier can be overcome.

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