A College of Education's Technology Journey -- From Neophyte to National Leader

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Abstract:
Technology is integral to education and learning in today's world. It is especially important that teacher educators and pre-service and in-service teachers are taught by faculties who are competent users of technologies that enhance the learning process. This paper describes, as a possible guide to others, how one College of Education built its computer infrastructure and technology expertise. Essential in this process were a commitment in the part of the Dean, significant funding, technology training sessions, and the expertise of technology specialists. The integration of technology throughout this College has positioned it to become an innovative leader infusing technology into its educational programs.

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to National Leader

Technology pervades society and impacts everyone's life in innumerable ways. International corporations, banks, airlines, and most other businesses could not imagine operating in today's world without technology. Not only is technology highly valued for the instant and comprehensive information it provides, but also, in our Information Age, it is imperative for economic survival. School and college graduates, in order to live and work successfully, must be computer literate, according to the International Society for Technology in Education (ISTE). To stress the importance of having technology knowledge and skills, ISTE developed the National Educational Technology Standards for Students (2001), which provided a framework of linking performance indicators at four developmental levels in schools. These goals encompass basic operations, cultural issues, tools for productivity, communication, and research, and technology for problem solving and decision-making. Despite these lofty goals, in reality, our educational system lags far behind in its utilization of technology.

The Office of Technology Assessment (U.S. Congress, 1995) in its report "Teachers and Technology: Making the Connection" stated that only 3% of the instructional rooms in schools in the United States were connected to the Internet, although 35% of the public schools have some access to the Internet. Despite the limited, yet increasing, availability of technologies in schools, most teachers surveyed in this study incorporated little or no use of computers in their instruction. This report also stated that most teachers have not had adequate training to prepare them to use technology effectively in their teaching, especially in integrating technology into the curriculum.

Six years later, a remarkable transformation has occurred. The National Center for Education Statistics (Jones, 2001), in its survey found that 99% of full-time, regular, public school teachers have access to computers or the Internet in their schools. Only one-third of these teachers, however, report being prepared to use computers and the Internet in their instruction. The author suggests that teacher readiness hinges on more funding, technology training, and administrator support for instructional technology.

Sheldon and Jones (1996) posited that the critical factors in the integration of technology into the school curriculum include time, training, technology, and teacher-type tasks. Georgia, through its Framework for Integrating Technology into the Classroom (InTech), is working to eliminate these four barriers for teachers and to collaborate with some colleges of education to focus on technology-enhanced learning and improved schools for the twenty-first century (Georgia Department of Education, 2001). Advances in technology-rich classrooms for those teachers and professors who have completed InTech programs are beginning to be identified (Cearley & Lumpkin, 2001). However, in most schools, despite the millions of dollars spent for Internet connectivity and computer hardware and software, most children continue to be taught through traditional methods, many of which could have been found in schools over half of a century ago.

Rizza (2000) reported that the comfort levels with the technology of pre-service teachers along with their feelings of competence did improve over time. Yet, their perceptions of their knowledge about computers remained constant. According to Brooks and Kopp (1989), the lack of technology utilization in schools can be blamed, at least partially, on colleges and universities for failing to prepare pre-service and in-service teachers to utilize technology as a tool to enhance student learning. Beyerbach, Walsh, and Vannatta, (2001) and Clark, Martin, and Hall (2000) report on the use of strategies to better prepare pre-service teachers to confidently and competently infuse technology into

their instruction. As schools and colleges of education have enhanced their instruction and modeling of technologically enriched programs of study, graduates of these programs have entered school classrooms more confident in their ability to use technology as an effective instructional tool.

Sammons (1994) and Solomon (1994) indicated that the amount of time required to infuse multimedia presentations into instruction took an inordinate amount of time for faculty, especially when considered alongside of their heavy teaching loads and expectations for other scholarly productivity. Lack of knowledge and abilities to use emerging technologies often limited technology use to specialized courses, according to Kerr (1990). Traditional instructional methods may continue, stated Bynum and Cashman (1993), to pervade colleges, and specifically their teacher preparation programs, because some faculty do not value the benefits of technology for learning. Thus, lack of equipment, time, knowledge and skills, and perceived value exist as barriers to the integration of technology into teacher preparation and advanced teacher education programs. Hill and Somers (1996) and others have supported these four reasons why more effective educational delivery systems using technology have not been implemented by colleges.

A College of Education's Technology Journey

The College of Education at State University of West Georgia during the past decade has moved from having minimal technology to becoming one of the national leaders in higher education in the support of student learning and faculty productivity through the infusion of technology into instruction. This journey describes how one large program (over 1500 undergraduate students and over 1500 graduate students) addressed each of the four barriers its faculty faced in order to help graduates raise their students' achievements through technology-enhanced learning.

Getting the Hardware and Training

Early in the 1990s, Dean Evelyn Fulbright envisioned that technology would be increasingly essential to the preparation of undergraduate and graduate students in education. Through her leadership the College equipped a 30-station, networked, Apple IIe student computer lab and provided Apple/Macintosh workstations for the few faculty and staff who were willing and interested in using computers. Matthew Clay, who currently serves as director of Education Technology Services for the College, provided leadership in the development of the College's computer network and expansion in the use of computers by faculty and staff throughout the decade of the 1990s and into the new century.

The College chose to install Apple and then Macintosh computers because their icon-based system made them easier for faculty and staff to become computer literate. Also, these computers were easier to support technologically. Another factor in this decision, made in 1991, was that the College educated pre-service teachers and in-service teachers for schools that mostly had adopted the Apple/Macintosh platform. Until the mid-1990s, the College exclusively purchased Macintosh computers for faculty and staff.

Dr. Barbara McKenzie, based on a needs assessment, organized the College's first technology training sessions in the mid-1990s to help faculty and staff learn how to use technology to assist them in their instruction. The importance of determining and meeting the needs of faculty and staff for technology training continues to be an essential aspect of the College's leadership in the infusion of technology into instruction. Table 1 provides data that demonstrate the number and breadth of these training sessions. While these initial classes focused on the learning of basic hardware and software, throughout the decade the level of proficiency of these courses increased dramatically. Currently, most College technology training classes have increased inclusion of advanced skills and the learning of software packages that can enhance teaching and research. Table 2 includes a representative list of the

topics for these technology-training sessions that were taught by faculty and staff who generously shared their expertise to ensure that all faculty and staff had the knowledge and skills to use technology to meet their job responsibilities.

Faculty in the College beginning in 1994 began to provide statewide leadership in the development and delivery of distance learning courses via the Georgia Statewide Academic and Medical System (GASMS). The faculty creatively and innovatively designed and delivered courses and helped promote effective instructional strategies via this videoconferencing format with colleagues on campus as well as throughout the state. Beginning in 1997, College faculty began to develop and teach courses entirely on-line using WebCt software. Because of positive feedback from students about the convenience and cost savings of asynchronous learning, these web-based courses have replaced several of those previously taught via GSAMS. Table 3 provides data for the number of courses that were taught 50% or more using GSAMS or WebCt between the fall of 1996 and the summer of 2000 in the College of Education.

During the 1996-1997 academic year, the College for the first time provided every faculty member with an up-to-date computer and all requested software for teaching and research. One major stimulus to increased faculty use of technology was the commitment by Dean Angela Lumpkin who was committed to the infusion of technology into instruction. Shortly after her arrival in July of 1996, and as evidence of this major change, she announced to faculty and staff that all College communications would be conducted via email. Another significant occurrence was the installation in the summer of 1996 of the College's first five multimedia (smart) classrooms in the Education Center. These multimedia classrooms (which by 2000 has increased to 18) allowed faculty to have in-class access to up-to-date workstations connected to the Internet, LCD projectors, and videocassette recorders. A parallel stimulus to increased faculty use of technology was the permanent placement within every

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classroom in the Education Center, Education Annex, and Health and Physical Education Building of overhead projectors, videocassette records, and slide projectors. This ease of access to instructional support equipment encouraged faculty to use a variety of instructional strategies and media.

Equipping Classrooms, Offices, and Computer Labs

A key to expanding the number of multimedia classrooms and ensuring that these were upgraded on a regular basis was identifying resources to support technology. In the absence of a line item for technology and with no technology fee being paid by students, the College had to make some difficult budgetary decisions. This was especially challenging when the College, which had been historically under funded, needed to add faculty in order to have its classes at educational sound sizes. The College had to prioritize technology in its purchases, with some of these funds coming from lapsed faculty salaries when faculty resigned at times that precluded searches or when faculty left during the year. Some prior activities of the College were not continued and other opportunities not pursued in order to ensure that the appropriate technology support existed. Other redirected dollars came from graduate tuition differential payments that the College was allowed to retain. Critical in this process was Dean Lumpkin's successful championing for technology and increased funding for the College. Table 4 contains data about the College's allocation of internal resources to support technology, which amounted to over one million dollars over four years.

Initially, the decision was made to upgrade student computer labs and to resign these computers to faculty. However, the challenge remained to upgrade the computers for students, faculty, and staff every 2-3 years while meeting the needs of an increasingly technologically literate faculty, including those hired into new faculty positions. By 2000, every faculty member in the College had the hardware and software he or she had requested to meet their individual instructional and research needs. Importantly, between 1996-2000, the College committed to building and maintaining a network

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and the infrastructure required to support the over 400 faculty, staff, and student computers and their infusion of technology into the teaching and learning process.

One illustration of the evolving technological knowledge and skills of students relates to whether there should be minimal requirements for their expertise in this area. Media faculty began in the middle of the decade of the 1990s to offer an introductory instructional technology course, which education majors could elect to take. In 1998, this course became a requirement for all pre-service teachers based on the rationale that every future teacher must be able to incorporate technology into their lessons. By 2000, several of the departments had transitioned into more of an infusion model where students were expected to demonstrate through course assignments their expertise in technology to enhance learning.

The student computer labs (which increased from 2 to 4) are open for drop-in use as well as for instruction for over 70 hours a week. Other changes made to enhance the efficiency and effectiveness of the student computer labs include having readily-identifiable student lab assistants on duty during class hours for troubleshooting and ensuring that lab rules are posted and enforced so that computers were maintained with proper settings and for optimal operational use. Instruction in these computer labs is aided through the use of Smart Boards and software that allows the professor to control student computers and transmit information and images. In the fall of 2000, the University was finally allowed to charge students a technology fee, with the funds designated to help defray the costs of upgrading student computer labs. Also, in 2000, the College funded a digital video editing lab that included 6 iMac DV's with a CD-ROM burner, a PC-based system with Adobe premier and a CD-ROM burner, and digital video cameras for instructional and drop-in use.

Beginning with the fall semester of 2000, all West Georgia students were required to have "ready-access" to a computer. The University Technology Planning Committee recommended the ready-access plan rather than following some other institutions in the University System of Georgia that were requiring students to purchase campus laptop systems. West Georgia's plan required students to have ready-access (personal, roommate, friend, or computer lab) to a computer. This access must meet minimum hardware and software standards posted for students: http://www.westga.edu/~srfguide/student/ComputerAccess.pdf   To date, this plan has worked successfully.

Technology Support and Training

A major contributing factor in the exponential expansion of technology in the College of Education has been the support provided by the technology staff. Education Technology Services (ETS), which was established in 1998, has grown to four full-time professionals. These individuals install hardware and software, troubleshoot problems, teach group and one-on-one technology training sessions, manage the network, develop and maintain web pages, and recommend purchases and advancements in the area of technology. The overwhelmingly positive comments about the work of these technology specialists have verified the importance of helping faculty, staff, and students overcome the barrier of lack of knowledge and skills and the technological challenges that exist when dealing with hardware and software. Among the goals of ETS is a commitment to continuously make technology utilization seamless and productive.

With the hiring of the fourth ETS specialist in 1999, the College committed to developing web-based tools. The College's Intranet provides a secure site that allows faculty to access standard report forms, directories, ETS services, and technology training sessions. Faculty can use this Intranet to easily update their personal web profile. Other management tools include a task

manager to expedite requesting and scheduling technology maintenance and support, an on-line equipment checkout calendar, and a procedure for requesting a computer upgrade or software.

Another service provided by ETS in 2000 that signaled to faculty the importance of technology was its technology needs assessment. The faculty were asked to list any unmet needs so that ETS could address these concerns. ETS responded within months in meeting all of these needs.

Between 1996 and 1998, the College's Technology Committee conducted two surveys of faculty and staff in order to determine their needs relative to hardware, software, and support. The Technology Committee during 1998-1999 developed the College's first Technology Plan. Within two years, most of its seven goals were achieved, including a 95% (of the 85 faculty) utilization rate of technology infusion into classes. Another outgrowth of that committee's work was the identification of technology mentors. These faculty and staff members voluntarily share their expertise with colleagues, thus helping to foster a supportive environment for technology.

In preparation for campus visits from the National Council for Accreditation of Teacher Education (NCATE) and the Georgia Professional Standards Commission (PSC) in the spring of 1999, the College, under the leadership of Associate Dean Carolyn Scherm, provided all of its reports and supporting documentation in an on-line format. Unfortunately, members of both Boards of Examiners still requested paper copies of all information, even though all documentation including handbooks and College of Education course syllabi were available on the Internet. At that time, West Georgia was one of the few institutions nationally that attempted to conduct a paperless review process. Even though the College's goal of complete technology-based documentation was not achieved, members of the NCATE and PSC teams praised the College for its effective infusion of technology into instruction. Several members of the visiting teams applauded the College for the

availability and utilization of technology by its faculty and students and were especially effusive in their praise of several technology-based exhibits.

External Grants and Technology Center

In 1998, the College of Education was awarded a grant by the Georgia Department of Education to establish the West Georgia Educational Technology Training Center. Through the Georgia Integrating Technology in the Student Centered Classroom (InTech) Framework, the work of this center, under the direction of Curt Cearley, recognizes that instructional redesign is best accomplished through a professional development activity that simultaneously builds teacher skills in five interrelated areas of proficiency. Georgia's Five Critical Areas for technology professional development target improved student achievement through (1) a focus on Georgia's Quality Core Curriculum (2) using modern technological resources (3) to propel new designs for teaching and learning and (4) classroom management strategies, which result in (5) a new and enhanced classroom pedagogy. During 1999-2000, several faculty from the College of Education and students (in a pilot project) participated in InTech training with positive outcomes as technology infusion into instruction increased.

The InTech program has been named as one training methodology that will satisfy the technology certification requirements mandated as part of the Georgia A+ Education Reform Act of 2000 for all holders of renewable certifications. So, the West Georgia Educational Technology Training Center and the College of Education began providing InTech training to all West Georgia's student teachers during their internship experiences in the fall semester of 2000. This program is ensuring that the College's graduates are well prepared to focus the power of technology on the teaching and learning process for Georgia's students.

In 1999, the College received a one-year capacity building grant ($173,882) for preparing Tomorrow's Teachers to Use Technology from the United States Department of Education (USDOE). The focus on this grant was the infusion of technology into undergraduate teacher preparation courses taught by faculties from the College of Education and the College of Arts and Sciences. In 2000, the College received a 3-year implementation grant ($1,193,884) from the USDOE. One of the primary goals of the second grant is the development of a video-streaming project that permits the real-time observation of school classrooms by pre-service teachers in partnership with four regional school systems.

Conclusion

In reflecting on the challenges faced and successes achieved by the College of Education at State University of West Georgia, it is noteworthy that each of the four barriers listed by Hill and Somers (1996), e.g., lack of equipment, time, knowledge and skills, and perceived value, were addressed and removed. The College of Education provides all faculty members and classrooms with hardware, software, and Internet connectivity. As faculty resources for the College more nearly approximated its enrollments, teaching loads of the faculty for the academic year were reduced from nine courses (on the quarter system) to seven courses (on the semester system), thus helping to address the time issue. In addition, a course reduction was provided to each faculty member who initially developed and taught an on-line course. The technology training sessions provided the faculty with the knowledge and skills they needed to feel comfortable and competent in the integration of technology into their instruction.
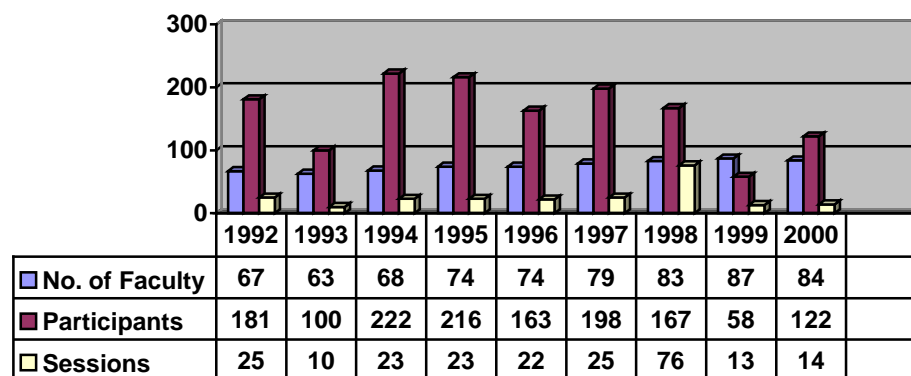
The high level (95%) of utilization of technology by the faculty, such as through the use of various software packages and the Internet in classes, and the effectiveness of the use of technology, as verified during the NCATE and PSC visits, attest to the increased value associated with technology as

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an effective teaching tool. The question remains, however, have West Georgia's students learned more and thus been better prepared as teachers and other educators? Student survey data indicate that just the use of technology adds little to their learning. Anecdotal evidence, however, suggests that the infusion of technology increases student learning.

The College of Education continues to lead in the infusion of technology into instruction. Among evidences of its emerging national leadership are the delivery via GSAMS of Georgia's first graduate program in administration and supervision in 1998-1999, leadership in the delivery of distance learning courses via WebCt in several academic areas, the offering of InTech to all of its interns and many of its faculty members, the development of a video streaming project in collaboration with four school systems, and the daily infusion of technology throughout its undergraduate and graduate teacher preparation programs.

Table 1
By Year, Number of College of Education Faculty, Technology Training Classes, and Participants

	1992	1993	1994	1995	1996	1997	1998	1999	2000
◻ No. of Faculty	67	63	68	74	74	79	83	87	84
◼ Participants	181	100	222	216	163	198	167	58	122
◻ Sessions	25	10	23	23	22	25	76	13	14

*Number of faculty is the total number of faculty in the College of Education
**Participants are the combined total attendees in all technology training sessions; this number includes faculty, staff, and graduate research assistants

***Sessions refer to the total number of technology training sessions offered in the academic year that ended in each of the years listed

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Table 2

Sample of College of Education Technology Training Sessions (Year Offered)

- Basics of Videodisc (1992)
- Creating Newsletters using PageMaker (1992)
- Editing ½" Videotapes (1992)
- How to Integrate Technology into the Curriculum (1992)
- Introduction to SPSS and Statview (1992)
- Multimedia using Hyperstudio (1992)
- Accessing ERIC through the Modem (1993)
- File Management (1993)
- Producing Computer Slide Shows (1993)
- Distance Education (1994)
- E-Mail/Intranet (1994)
- Galileo (1995)
- Multimedia Applications in the Classroom (1995)
- Planning, Delivering and Evaluating Distance Education Classes (1995)
- Web Page Development (1995)
- BANNER (Student Information System) Training (1996)
- How to use the Multimedia Classrooms (1996)
- MAC PowerPoint Study Group (1997)
- Netscape Calendar (1997)
- Search Strategies on the Web (1997)
- Web Page Development Study Group (1998)
- Windows95 in a Nutshell (1998)
- The Basics of Using the SMART Board (1999)
- MailSpinner (Checking your e-mail on the web) (1999)
- Windows2000 Basics (2000)
- SPSS Basics (2000)
- SPSS Advanced (2000)

Table 3
GSAMS and WebCt Courses Taught by College of Education Faculty

Years	GSAMS	WebCt
1996-1997	10	0
1997-1998	21	7
1998-1999	12	25
1999-2000	13	25

Table 4
Expenditures for Technology by the College of Education

Years	Equipment	Software	Repairs/Maintenance	Total	College Budget
1996-1997	$219,391	$23,900	$3,127	$246,418	$6,129,003
1997-1998	$221,448	$26,927	$3,207	$251,582	$6,912,481
1998-1999	$273,373	$14,996	$1,821	$290,190	$7,183,550
1999-2000	$315,299	$17,193	$2,707	$335,198	$7,704,840
Total				**$1,123,388**	

*In addition, the College received software grants from Microsoft as follows:

1995-1996	$ 8,000
1996-1997	$25,000
1998-1999	$50,000

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