THE IMPACT OF A TECHNOLOGY-RICH ENVIRONMENT

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ABSTRACT

The lottery funding for technology in the state of Georgia has reshaped the directions of K-12 schools and redefined education at all levels. The use of technology has improved information access and provided new means for information retrieval.The impact of technology integration on teaching and learning is evident in many of Georgia's schools. The discrepancies in the allocation of state funding across school levels and among regions, however, have widened the gap between the "information rich" and the "information poor."

This paper describes the impact of Georgia's Technology Initiative on information access, teaching, and learning. It will address key issues for creating a technology-rich environment and provides recommendations for technology implementation.

INTRODUCTION

Technology offers new means for teaching and learning. Many public schools are integrating technologies into instruction and information services to equip students and teachers with proficient information access and computer skills and to prepare them to meet the challenge of the information age.

Since 1993, US$ 1.5 billion has been spent on hardware, software, positions, and training in all educational institutions and libraries in the state of Georgia, of which lottery funds have contributed over fifty percent (50%). Technology integration across the state is best manifested by the Georgia Library Learning Online (GALILEO), a system wide online service for shared reference databases, universal material borrowing, and unlimited access. PeachNet, the statewide telecommunications network for education, is the backbone for making GALILEO a reality. GALILEO is an example of using appropriate technology for resource sharing across educational institutions in a University system and for providing global access to information. Today, GALILEO has over 125 reference databases of which 57 are available from OCLC FirstSearch, 18 from GaleNet (Gale Research), 47 from Cambridge Scientific Abstracts, five from UMI (University Microfilms International), and additional ones from Academic Press, Encyclopaedia Britannica Inc., and government agencies (GALILEO, 1997).

The Georgia Statewide Academic and Medical System (G-SAMS), a statewide distance education system, is set up in 370 locations throughout the state (Barry, 1996). It supports course offerings and the broadcast of many instructional programs. Access to Georgia Public Television (GPTV) and the Public Broadcasting System (PBS) also support a variety of instructional programs.

Technology training is provided through nine educational technology training centers established by the Georgia Department of Education. Three of these centers are located in colleges and universities and six in Regional Educational Service Agencies (RESAs). Additional training is

provided by host software and hardware vendors and by local schools through in-service and pre-service programs.

This infusion of technology in Georgia's K-12 schools has had a marked impact on information access, teaching, and learning.

IMPACT ON SCHOOLS

A study conducted by Georgia State University's Applied Research Center revealed that the lottery funds have enriched schools with varied technologies. This is evident by the following statistics. In the 1995/1996 school year, forty-nine percent (49%) of schools were equipped with distance learning equipment, compared to fifteen percent (15%) in the 1992-1993 school year (before the lottery funding); forty-one percent (41%) of the classrooms were networked with computers, compared to two percent (2%); over three percent (3.6%) had modems, compared to less than one percent (0.5%); seventy-two percent (72%) were equipped with televisions, compared to sixty-two percent (62%); and eleven percent (11%) had telephone connections, compared to five percent (5%). The study also showed that the number of computers increased from 1.1 per classroom to 2.2, and that all media centers had automated their card catalogs using microcomputer-based automated systems. (Dolan, Jones & Henry, 1996).

In 1996, the percentage of hardware purchases funded by the lottery amounted to thirty-five (35%); the creation of Local and Wide Area Networks (LANs/WANs) by fifty-one (51%), and other technology purchases by seventy-seven (77%). In fact, lottery funds have provided schools with the financial stamina to match local funds, raise donations, and write grants for technology purchases. Schools were required to purchase furniture, rewire buildings, secure additional telephone lines, and provide for peripheral equipment needed to support technology implementation.

Information Access

The heavy use of technology is apparent in media centers, which have become the hub of information where access to online public access catalogs (OPACs), a variety of CD-ROM databases, instructional software, and the Internet is centered. Schools with these resources have enriched media centers' collections and improved information services. Teachers and students can locate a wider variety of resources, are provided with new means of information retrieval, and no longer feel isolated from colleagues and the rest of the world. Indeed, worldwide access to information has broken the isolation barriers, especially in rural areas.

The concentration of technology in media centers has dramatically increased the centers' use and demands on media specialists' time have soared. Besides being the primary person for providing instruction in locating and retrieving information and managing the media center, "The media specialist [in many schools is] the person most likely to identify established school decisions, equipment availability and scheduling, and data resources." (Dolan, Jones, & Henry, 1996, p. 33) The media specialist also became the troubleshooter for technology problems within and outside the school building. These additional tasks have created a challenge and problems for many media specialists who have to constantly keep up-to-date with changing technologies and find the time to participate in training programs to upgrade their knowledge and skills. Despite the creation of the technology specialist position for K-12 schools, many media specialists' responsibilities have converged with those of the technology specialists. This is due, in part, to the roles and responsibilities of the technology specialist which are poorly defined.

In light of the changing roles of the media specialist, the Georgia Committee on Redefining Media Specialists' Roles was created in 1996 by a group of media educators and media specialists. Members of this Committee are in the process of finalizing these roles.

Another use of technology is concentrated in computer laboratories and classrooms. Access to a variety of instructional software packages, word processing, games, reading and writing and other software programs is made available to many networked computer stations located in laboratories and classrooms. Networking these resources has provided teachers with the benefit of integrating their use into instruction without leaving their classrooms.

Teaching

Technology funding has greatly increased the potential of instruction. Teachers are eager to integrate technology into instruction, but they are frustrated because they lack the time needed to participate in technology training, to keep up-to-date with new technology, and to integrate the technology into their instruction. Many teachers are using combinations of voice, video, and data systems on a daily basis. However, others are limiting their use to word processing, drill and practice, or game playing. The discrepancies are due, in part, to differences across the state in the way school systems have embraced technology and supported training. Those schools that provided and continue to provide the facility infrastructure, the training, the staff development support, and technical support that teachers need have seen total integration and successful use by teachers and students. Those schools that lack this support have been less effective. Many school systems in the north Georgia region, for example, have received the highest amount of lottery funds for technology and have contributed a high amount of matching funds on technology expenditures. This resulted in making these systems' laboratories and classrooms better equipped with networked computers, distance learning facilities, televisions, and telephones than those in other regions. In fact, nine out of 21 schools identified as model technology schools across the state are in north Georgia, accounting for 43% of the total number.

Learning

Students are often more motivated than teachers to use the new technology. This is because many students are more computer-literate than their teachers. Students' increased technological skills are preparing them to meet the demands of higher education and the workplace. In fact, the use of computers has renewed student interest and motivation in school. Students learn faster and enjoy helping each other with technology. Many students are visiting the Atlanta Zoo or practicing French with students in France via video conferencing equipment. Many have viewed art exhibits over the Internet or chatted online with archeological experts. However, these types of activities are more likely to be seen in elementary and middle schools than high schools. Most high school students do not obtain sufficient time and lack the training to use available technology. In general, Georgia's high schools have less hardware infrastructure and teachers are less likely to use technology in instruction.

Providing a technology-rich environment is a challenge by itself. It requires commitment of personnel and financial resources, a solid infrastructure, and sound training programs. Indeed, "No state, education experts say, has done more to boost technology offerings in its public schools than Georgia." (Barry, 1996, p. 34) Nevertheless, these offerings have raised many key issues and concerns that need to be addressed.

ISSUES AND CONCERNS

The major barriers to technology innovations in K-12 schools in Georgia concern training, information access, funding, and infrastructure. Although a variety of training programs is available at both the local and state levels, many teachers cannot take advantage of them because they find it difficult to adjust their teaching schedule. In addition, the financial stipend awarded to teachers who attend the training and the reward for their time are insufficient. This is exacerbated with inadequate administrative support for release time from teaching duties. In addition, teachers who are motivated to use the technology are frustrated as they find it hard to keep abreast of the changes in software and hardware.

The many roles and responsibilities assumed by media specialists are interfering with the level of information service they provide to their users. These information professionals are serving not only as information providers and managers of their media centers, but also as trainers for using a variety of technologies, planners for implementing new technologies, and troubleshooters for software and hardware problems.

The fluctuation in state funding for technology has created fear and frustration among school personnel. In 1995, for example, US$25 was appropriated per each full-time school student, compared to US$2 in 1996. In 1997, the amount rebounded to US$20 (Barry, 1996). This imbalance in appropriations has made planning for new technologies and upgrading existing software and hardware difficult.

The lack of a strong technology infrastructure is evident in many schools. The scarcity of telephone lines, for example, is hampering equal access to information and communication with the outside world. The lack of adequate space has created problems in placing computer stations in appropriate environments, setting up computer laboratories, and making computer stations accessible in classrooms.

Despite these problems, the state of Georgia has gone a long way down a "ten mile road." To overcome current and future technology integration problems, schools should boost and support training, clarify the roles and responsibilities of media specialists and technology specialists, raise additional funds for technology, and maintain a solid infrastructure.

RECOMMENDATIONS

The following recommendations are made for improving the implementation of technology in Georgia's schools. These recommendations may also apply to other schools that are in the process of planning to create a technology-rich environment.

Training

Training is an essential component of technology implementation in any environment. A key to successful training is adequate administrative support and teachers' involvement in planning the training schedule.

Technology training should be evaluated on a continuous basis to assess the level of teachers' acquisition of knowledge and skills, and to gain insights into areas of strengths and weaknesses. Formal and informal evaluation sessions can be scheduled to reach this goal.

Providing immediate technical support is essential for expediting recovery from hardware and software problems so that access is not hampered. Immediacy in solving problems will ease frustration and encourage the continuous use of technology. Each school building should have a knowledgeable and skilled technical support specialist. A teacher with advanced knowledge and skills may be appointed as a liaison for solving minor problems and communicating concerns. When a problem is beyond the liaison's expertise, a technology specialist or technical support staff member is called upon to solve it. Teachers using new technologies may feel intimidated by their lack of knowledge and skills. Having a peer teacher serve as a liaison may help teachers overcome this problem and encourage them to use the technology.

Information Access

Information access is central to the media specialist's role. By having many responsibilities, however, this role cannot be fulfilled effectively. Therefore, redefining the roles of the media specialist in Georgia becomes essential. The document being drafted by members of the Committee on Redefining Media Specialists' Roles should provide a clear description about what media specialists' roles and responsibilities are, and in the meantime, should assist with defining the roles of technology specialists. Troubleshooting hardware and software problems within and outside a school building, for example, should be the responsibility of the technology specialist rather than the media specialist. The role of the media specialist in this area may be confined to the media center rather than the whole building. It is only through role clarification that media specialists will be able to fulfill their roles as information providers, managers, and instructional consultants.

Funding

State funding for technology should be a long-term commitment. Similarly, matching the lottery funds with local funds and with those raised from other sources should continue.

Under-equipped schools should initiate aggressive fund raising programs to bridge the gap between their "information poor" citizens and the "information rich" citizens in model technology schools.

Infrastructure

The backbone for technology implementation is adequate telecommunications, wiring, electrical outlets, telephone lines, modems, and space. With the exception of PeachNet, the state's

telecommunications network, most schools suffer from these problems of access to an adequate technology infrastructure.

Updating or replacing existing wires and outlets, increasing the number of telephone lines, acquiring additional modems, redesigning school buildings and/or acquiring new space are necessary for successful implementation of technology. Regardless of the richness in hardware and software, technology integration becomes futile without a solid infrastructure.

If we are committed to equip K-12 students and teachers with proficient information access and computer skills and to prepare them to meet the challenge of the digital revolution, we ought to create a technology-rich environment that is conducive to teaching and learning and that provides equity in education among all students, regardless of grade level or region.

REFERENCES

Barry, Tom. (1996). Soon, it'll be the 4 Rs - reading, 'riting, 'rithmatic - and RAMs. *Georgia Trend*, 12(4), 34-35, 44.

Dolan, K. A., Jones, J., & Henry, G. T. (1996). *Two miles down a ten mile road: Instructional technology and the impact of lottery funding in Georgia*. Atlanta, GA: Council for School Performance.

GALILEO. (1997). The long, but short history of GALILEO [On-line]. Available: http://www.valdosta.peachnet.edu/galileo/history.html.

GALILEO. (1997). A vision of one statewide library: GALILEO [On-line]. Available: http://www.valdosta.peachnet.edu/galileo/vision.html.

GALILEO. (1997). GALILEO database listing [On-line]. Available: http://www.galileo.database_listing. html.

Perisho, D., & Costello, R. W. (1996). Voice, video, data, and education: Planning a building's technology infrastructure. *T.H.E. Journal*, 24(5), 76-79.