Where Do We Go from Here? One School System's Look at Past, Present and Future Uses of Technology

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Change is all around us—in our work places, our homes and our schools. As noted in *Information Power: Guidelines for School Library Media Programs*, "Change—rapid and pervasive—may be the single most important characteristic of life in the twentieth century."[1] Nowhere is this more apparent than in the development of technology and its uses in our society. But technology and its components are expensive, constantly changing, and somewhat intimidating to the novice user. How then can we incorporate knowledge of these developments and their uses into the public school setting where a majority of the staff is still afraid of computers? On what uses should we concentrate, and how can we familiarize reluctant faculty and staff with the incredible versatility and range of technology? Is it really necessary to include technology in public schools anyway? Again, quoting from *Information Power:*

> *All aspects of education are significantly influenced by major technological advancements. The complexity of instructional technologies can, at times, overwhelm educators seeking ways to integrate them into the school curriculum. By assuming a leadership role in the use of technology in the school, the library media specialist promotes effective use of instructional technologies and facilitates their full integration into the curriculum.*[2]

These questions and concerns cannot be answered simply or all at once. In the Durham County Schools we have used a combination of long-range planning and support at both the school and the system level to introduce new technologies and to incorporate them into the curriculum.

Development at the School Level

At Neal Middle School in 1979 we began with a solitary Apple IIe computer and three adventurous souls (one media coordinator and two math teachers) who were willing to experiment and proselytize. We found that we had our administration's full support, an absolute requirement for success. We formed our own school-based computer committee and began to do some long-range planning and to establish some basic rules to which we still adhere today. For example, we stated that we would purchase no software that had not been previewed by someone on the committee. We concentrated on establishing a computer lab in our media center that would have twenty computers available to students and two computers that were reserved for teachers. We gradually increased our number of computers by selling cookies and using various funds (such as state computer funds) that became available to us.

But when the amount of hardware began to increase, we were faced with another ongoing problem: software — that is, how to preview software, how to afford to purchase all the software needed and, most importantly, how to use all the software programs without infringing on copyright laws. At first, software publishers made it extremely difficult, if not impossible, to preview software. In Durham County we circumvented some of these problems by using Media Evaluation Services in Raleigh. Our Media Processing Center also told us if another school in the county had a piece of software in which we were interested; we could then borrow it from that school for preview purposes. Central-level Media Services also established a software preview library that is now available to all county personnel. In recent years, the publishers' restrictions against preview have relaxed greatly, and it is now relatively simple to obtain a preview copy of software.

Another major problem was having enough copies of a piece of software to use with an entire class. If we wanted to buy twenty copies of a disk that cost $29.00, then we had to pay $580.00. Today, of course, there are a number of alternatives to spending an entire software budget on

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one program. First, there are lab packs. These usually consist of five to ten copies of the program disk at a prorated price. Another possibility is becoming a member of MECC (Minnesota Educational Computer Consortium). The MECC software has dramatically improved in the past few years, and members are entitled to multiple copies of any program (if the members furnish the blank disks to be copied). A third alternative is available primarily through Sunburst Communications, a major educational software publisher. On certain of their packages, Sunburst grants permission to download the program and move it to another computer. One needs to be careful, however, to check the documentation to be sure about each separate program. A fourth way of solving the software dilemma is the use of public domain software. At Neal and in Durham County as a whole we have made extensive use of the FrEd programs, i.e., FrEdWriter, FrEdSender, and FrEdMail.

We are very proud of the software collection we have built at Neal. We have purchased a number of commercially prepared programs and used the MECC software extensively as well as some of the public domain software. We have encouraged the interest in and use of software in all areas of the curriculum. As a result, our computer lab is used by teachers in every discipline: home economics, special education, business and music, as well as the more traditional academic subjects such as language arts, social studies, math, and science. We also make a number of utility programs available to our faculty and staff, i.e., *Print Shop*, *Crossword Magic*, *Puzzles and Posters*, *Super Print*, *Slide Shop*, *Super Sign Maker*, and *Grade Manager*.

A third area that we continue to work on is the attitude and awareness of the faculty. At Neal Middle School we began with outside consultants who came in to do workshops for our faculty; then the Durham County Schools began to offer workshops; finally, we began our own training workshops. The school level workshops have been the most popular by far as we concentrate on the state Level One Computer Competencies. We include a competency workshop in our plans biennially and have been very pleased with the results as our teachers learn to use utility programs and become familiar with software in their areas. We also publish newsletters concerning new materials and updated bibliographies.

With the formulation of the Durham County Schools' Technology Plan, our Computer Committee became the Technology Advisory Committee. The media coordinator serves as chairperson and all areas of the curriculum are represented. The committee works closely with the administration as we plan for future developments. For example, when Neal became a middle school instead of a junior high school, we had a great deal of input into decisions about the new classroom building and the purchase of equipment. As a result, there is a separate computer lab in the new building and the number of computers has almost doubled.

So what are the results at Neal Middle School ten years later? First of all, we now have two computer labs: one in the media center that is available to the entire school and one used as a classroom for teaching computer literacy. We have seventy computers, some stationed in classrooms and others on carts that can be moved from one classroom to another. Our lab in the media center is in almost constant use by teachers across the curriculum, and our workshops for teachers remain popular. This year the county purchased for each school a computer with printer and modem to be used for telecommunications. Each media center has been equipped with a dedicated phone line and we are now learning about bulletin boards and electronic mail. These developments have come about because of continued long-range planning and support, both at the school and central office levels.

Development of the System Level

The entire set of challenges as presented in *Information Power* is applicable to system-level media and technology personnel. However, the implications of providing "leadership and expertise in the use of information and industrial technologies"[3] relate most directly to system-level responsibilities. By providing "leadership and expertise in the use of ... instructional technologies,"[4] a support base is formed for the school program.

The school community is greatly influenced by developments in technology. It is the obligation of the system-level media and technology personnel to investigate, evaluate, and determine the general direction of that influence. School system personnel must strive to be proactive in implementing technologies, although planning for this quickly changing area is often uncertain and at times develops into an educational guessing game.

Durham County, like all other school systems in North Carolina, developed a computer plan as

one of the requirements for receiving monies appropriated by the State Legislature in 1984 for the purchase of computers. This plan served the system well for several years. System-level support was given to each school as it planned for the incorporation of computers into the instructional program. Direction of the program, hardware and software selections, personnel concerns, and other decisions were made at the school level, but not all schools were as committed as Neal to a well-organized, appropriate plan for the use of computers. Inequities began to surface as the computer program in each school developed. These inequities, concerns about implementing the *North Carolina Standard Course of Study*, and the rapid development of technologies appropriate for education led administrators to take a close look at the entire computer/technology area.

There were questions to answer. How would the newer technologies such as CD-ROM, interactive video, and hypermedia be used in the classroom? How could present inequities be corrected and future ones be avoided? Who would manage the use of newer technologies? How would staff members be trained? Who would pay for new hardware and software? How would the effectiveness of each technology be evaluated? Principals were especially concerned about investing school budgets without first knowing how useful a technology would be in educating students. System-level and school personnel were in a dilemma about which direction to follow.

Media Services staff members examined the old computer plan and found it offered little help in answering these questions. A committee composed of three people from Media Services, two elementary principals, one middle school principal, and one high school principal was formed. The committee's challenge was to determine the present status of technology in Durham County Schools, to address the questions surrounding the future uses of technology, and to chart a course for the school system.

The committee's work resulted in a document which outlines "a systematic, non-fragmented approach to incorporating technology into classroom instructional programs"[5] and which gives direction in eliminating the inequities in the existing program. The plan supports the individual school program by providing overall direction and establishing minimum expectations, but does not limit extended program development at the school level. (A copy of the plan can be obtained by writing Durham County Schools, Media Services, 3507 Dearborn Drive, Durham, NC 27704.)

The plan format lists possible educational objectives and defines a five-step process for considering various uses of technology. The five steps assist school media coordinators in evaluating, selecting, managing, and using both existing and emerging technologies. The plan ensures that each technology is evaluated on its educational merits and on how well it will support and enhance the curriculum. Awareness, application, development, implementation and evaluation are the five steps. Each step is defined and expanded through these areas: support/training/strategies, resources/costs, person(s) responsible, completion date, and evidence of completion.

Developing **awareness** of the various forms of technology is the first step to potential implementation. The plan outlines possible methods for keeping school personnel informed of the developments in technology. The **applications** step involves close examination of the instructional program areas that can be strengthened, enhanced, and expanded by the use of a given technology. This step is designed to identify possible uses of a technology in the classroom. We have depended heavily on information provided by the State Department of Public Instruction in this step of the plan. Does the technology have a valid place in a school is a question we must continuously answer.

Once a possible application is identified, the plan calls for an experimental project to help in the **development** of an effective use for the technology. The experimental or pilot project concept has been used with much success by Computer Services in the State Department of Public Instruction. We chose to use the same process. The pilot project concept serves as a model and provides experts within the school system on whom others can rely and furnishes data for future decision making. Most of these pilot projects are funded by the system and are not the fiscal responsibility of the individual school. The success of the pilot projects determines whether or not full-scale implementation will occur. This **implementation** step includes the purchase of hardware and software, the training of personnel, and the consideration of necessary facility needs. **Evaluation** procedures are incorporated into each step and are also an overall step in the plan. Continuous examination is essential to provide the best instructional programs for our students.

In addition to the five-step process for evaluating various forms of technology, the plan discusses personnel and budget implications. The

plan places decision making in each school with the Technology Advisory Committee. The commitee serves as the link between equipment and materials and the implementation of ideas. The plan does not address all technology concerns of the school system or of individual schools. Media personnel have much to do to keep all members of our school community informed. Special consideration must be given to providing school board members, parents, and administrators with a true picture of what we are doing with technology and what our future plans include. A well-informed audience is a receptive audience.

At present the plan addresses computer-assisted instruction, telecommunications, online retrieval, school television, interactive video, CD-ROM, and hypermedia. The stage at which a particular technology was being used at the time the plan was implemented determined which of the five steps would receive the most emphasis. Many teachers continue to use computers only for drill and practice. The awareness and implementation steps are the focus as these teachers' needs are addressed. Although televisions and VCRs are older forms of technology, few teachers are applying them to the effective use of School Television in the classroom. By using the five steps outlined in the plan, a process is now in place for encouraging more teachers to use School Television.

Little more than a year has passed since the superintendent and his Administrative Team approved the plan and offered support for implementation. There are projects in each step of the plan. A modem, computer, printer, and telephone line are now in each media center for various telecommunication developmental projects. One junior and one senior high school have piloted the use of Dow Jones online retrieval services and will implement its use this year. Media staffs and selected faculty members at two high schools have received training in the use of Dialog retrieval services. They will begin pilot projects this year. Workshops at the system level are offered on the use of specific computer programs as a way to determine appropriate application of these programs. Plans are underway for a day-long Technology Fair to foster awareness of the latest developments in technology. Central office staff, school board members, principals, and three teachers from each school will be invited to this event. Several teachers are piloting level one interactive video. One school is studying the applications of level three interactive video for instructing English-as-a-second-language students and is in the process of organizing a pilot project. The science coordinator is investigating possible applications of interactive video to enhance science instruction. A group of social studies teachers has created a series of possible applications for various uses of technology in their instructional program. They plan to pilot their ideas this year and share their successes with other social studies teachers next summer. The plan has given Durham County Schools a framework within which to operate and has provided a direction in which to progress. The plan is working.

Staff development will continue to be an important technology issue. Inservice activities must be sufficiently diverse to keep staff informed about new developments, to provide training for application, and to facilitate changes certain to occur through the use of technology. We need to investigate more thoroughly the changes in planning, budgeting, and instructional methods essential for the successful implementation of technology. In a recent article in *Educational Technology*, Christopher Dede warns us of a common error in assessing technology. We must give close attention to

> understanding its eventual impacts and consequences. Emerging instructional technologies may lead to a new definition of human intelligence; partnerships between teachers and intelligent tools; and a dramatic shift in the goals, contents, methods and clients of schooling.[6]

Are we prepared to facilitate "acceptance of [technology's] indirect effects"?[7]

School and system-level media personnel must work together to encourage and support innovative uses of technology and yet maintain a sense of direction. Through the implementation of our Technology Plan, we in Durham County are pursuing creative and effective uses of technology. We will continue to evaluate and rework our plan, set new goals and provide an atmosphere in which changes brought about by technology are accepted.

References

1. *Information Power: Guidelines for School Library Media Programs* (Chicago: ALA, 1988), p. 3.
2. *Ibid.*, p. 10.
3. *Ibid.*
4. *Ibid.*
5. Durham County Schools Technology Task Force, *Technology Plan.* (Durham: DCS, 1988.)
6. Christopher Dede, "Planning Guidelines for Emerging Instructional Technologies," *Educational Technology* 29 (April 1989): 10.
7. *Ibid.*