

A Study of Rural Schools and Technology

by Joyce L. Lucas

This discussion illumines some of the benefits of technology and how it can be used to improve education in rural schools. It further suggests that school library media specialists are in a position to act as leaders or at least intermediaries in linking technology with the school community.

Introduction

Small rural schools are challenged to overcome geographic and financial barriers to provide students the same level of education as that afforded those in urban areas. Frequently, towns elect to consolidate their schools to compensate for meager course offerings. The spurious notion that bigger is better and that consolidation will ease the financial burden on taxpayers has only served to further endanger that way of life characteristic of rural areas. In small towns, community life is inherently centered around the school and when that school is closed, an important feature of country living is lost as well.

Today, as never before, it is possible to keep small rural schools in operation and also provide students and adults a nearly unlimited number of educational experiences. Conceivably, rural schools can become part of a global education system through the effective use of technologies. If these technologies also provide for adult learning, technology can help to bring community members closer together in perhaps a more enlightened atmosphere than ever before.

In October of 1992, at the National Congress on Rural Education, 458 education and civic leaders met to identify the needs in rural education and to formulate solutions to meeting those needs. It was suggested that technology is a possible solution to many of the problems facing these schools. Beckner and Barker (1994) highlight the following needs brought out by the Congress: "adequate funding, provision for special circumstances of rural education, staff development, adequate and qualified teaching personnel, administrator work overload," and "remedial education" (p. 12-13).

This author addresses just two of the needs highlighted by this Congress: staff development and providing for the needs of remedial learners. Funding is intrinsic to each of these areas and is discussed accordingly.

Staff development deserves primary consideration, for as Cole (1991) affirms, “professional development is at the heart of everything needed to make schools more active and lively” (p. 8).

Professional Development

Cole (1991) states that half of our schools are in small town and rural districts and that “rural America and its schools must be healthy if the nation is to prosper” (p. 11). The health of these communities will require that young people are given a reason and an opportunity to remain there. In his journey to rural areas across the United States, Cole found that people harbored the hapless credence that “schools are educating kids to leave” (p. 9). This is a well grounded belief, for truly the current model of instruction, to which many educators adhere, promotes those opportunities available in large urban areas and often ignores the creative abilities of students, who have the potential to make their town a prosperous place.

Cole (1991) depicts a typical scene in rural schools of “row after row of students reading aloud mechanically” (p. 8). He notes that students have little responsibility for their own learning and that too much emphasis is placed on worksheets. The National Congress on Rural Education suggests that teachers can become more effective if their access to information is improved (Beckner & Barker, 1994).

The Internet and interactive television can offer teachers an opportunity for continuing education. Neither of these technologies is new; however, it appears that schools in rural areas comprise only a small proportion of schools that have them.

A survey of 1,500 principals determined that only 35 percent of schools in the United States had Internet access. Fifty-eight percent of those schools had a population of over one thousand students. Only 30 percent of schools with 300 students or less had this access (Schroeder, 1995). It cannot be assumed that those small schools are in rural areas; however, it does indicate an unnecessary division between what is often referred to as the information “haves” and “have-nots.”

Internet

The Internet offers myriad opportunities for classroom teachers and others in the education community to broaden their views on education. It also provides teachers with materials applicable to today’s recommended models of instruction.

Electronic mail or e-mail is perhaps the most widely used function of the Internet. E-mail breaks down all barriers to communication worldwide. If one has access, it is possible to communicate with anyone on the Internet or those networks connected to it (Descy, 1993). It is not difficult to foresee the benefits to rural educators, and ultimately their students, if teachers are able to discuss with other teachers their lesson plans or perhaps just share the frustrations which educators experience daily.

There are countless LISTSERV discussion groups available on the Internet. Using e-mail, members post questions to the group. Once a message is posted, others can respond directly to the person sending the message or, if appropriate, to the whole group. LISTSERVs are tremendously useful for getting feedback on particular problems, for inevitably there is someone who has experienced a similar dilemma. For one who chooses to just browse, the LISTSERV is a wonderful way to become familiar with broader issues and to put individual challenges in perspective.

Choosing a LISTSERV is like selecting a book from a large library's collection, for there appears to be an equal number of LISTSERVs on any given topic and at all levels of specificity.

Discussion groups which focus on particular brands of computers or varieties of software are prevalent. Such groups as the Macintosh System 7 and Hypercard Discussion list are typical examples of those found on the Internet which provide practical and relatively inexpensive advice to computer users. There are jobline LISTSERVs for educators such as that provided by the American Educational Research Association known as AERA-L. One can find discussion groups on general topics in education originating from perhaps each state in the United States as well as those of national and international scope, such as Education Information or EDINFO-L (Descy, 1993).

There are enormous opportunities for learning which can be found by using the World Wide Web. The World Wide Web provides menus which guide the searcher through its vast array of resources. One very important World Wide Web site is the Teacher Education Internet Server. At this site, teachers can choose from the menu any number of curriculum areas. Research studies, lesson plans, and other general professional development information resources are located at this site.

Remote login or Telnet is another very useful aspect of the Internet. There are many databases which are only accessible through Telnet (Falk, 1994). This function allows one to view files on any computer on the Internet. With Telnet it is possible to communicate with other people and to interact with other computers in "real-time" (Descy, 1993, P. 32).

There are several very useful Telnet sites for educators, one of which is the Cleveland Freenet. This site is described as having "almost everything for the educator" (Descy, 1993, p. 32). Falk (1994) and others give detailed instructions on using the afore-mentioned functions as well as others such as Gopher and FTP.

Sources such as *The Internet Yellow Pages* (Hahn & Stout, 1995) provide addresses for many of these sites; however, this source is becoming quickly outdated. The newsstands are filled with Internet magazines which often give specific information on new sites which become available daily. Once online, most Internet sites will refer you to other similar locations.

The Internet is a bounteous source of information and is filled with professional development opportunities for educators. There are a few fortunate rural educators who currently have Internet access. An exploratory survey conducted by this writer elicited a response from a school librarian in Hyrum, Utah. K. Zeiray (personal communication, July 26, 1995) relayed that each of the classroom teachers in her school has access to the Internet. This was made possible through a seven million dollar allocation by the governor of Utah. Each school in that state either has or will soon have this access.

Bruce Miller and Janis Hull (1991) provide an important discussion which may prompt further studies on the issue of telecommunications and how it can be used to overcome the isolation of rural educators. This study describes nine professional development programs in rural areas of the Northwest. "Geographic and professional isolation, community attitudes, time, fiscal resources, and irrelevant opportunities" (Miller and Hull, 1991) were identified as factors which limit professional development. Telecommunications was listed as one of the strategies for overcoming these constraints.

Interactive Television

For many rural educators, travel to the nearest university or college for courses, workshops, or conferences is not practical. This distance that many would need to travel would require time away from their classrooms. Distance education via satellite television is a logical and viable solution to this problem; it appears that this is being recognized in many states. Miller, Putnam, & Schultheis (1992) report that "nearly every state" now "has at least some interest or involvement in distance learning" (p. 34). These authors attribute much of this achievement to the Star Schools program sponsored by the United States Department of Education. In addition to elementary and secondary level courses, continuing education courses for teachers and other adults in the community are made possible by this program. Computers, modems, and facsimile machines make communication with instructors practical (Miller et al.).

If afforded the knowledge and the appropriate tools, teachers can give students with special needs the additional help required to make them successful. Much educational software is designed to give students immediate feedback. When it is interactive, it can be used to encourage students to take an active role in their own learning.

Remedial Learners

Much research has been done on the cognitive abilities of students. Because information retrieval and synthesis have been identified as critical skills in all areas of the curriculum, this research is represented in the literature on school libraries. Kulthau (1987) prescribes consideration of methods that will foster the "use of information for learning" (p. 260). The all too common model of instruction, as described above with the classroom teacher or media specialist standing before a class of twenty or thirty students and delivering a lecture, is no longer considered effective. Only the most advanced students are able to gain sufficiently from this model.

The Internet, CD-ROMs, and other software formats offer students an opportunity to work interactively with a computer or with other students online. Much of the educational software is interdisciplinary in design, making it possible to learn concepts in context.

Internet

Several Internet sites were examined by this author and judged to be excellent sources for online learning. One example, which can be reached using Gopher or a World Wide Web browser, is called *Plants and Animals*. At this site, students are given illustrations, if their computer has graphic capabilities, and descriptions of plants and animals. They are asked to identify them and classify those that share common characteristics. This site would be appropriate for third through sixth grade students.

Other fascinating sites are the *Virtual Tourist* and *Virtual Tourist II*. These would be much enhanced if used with the proper software to support graphics, but can be a very educational and entertaining experience with text alone. From this site, students can choose locations from around the globe which have devoted pages to information about that country, state, or city. Information on parks, government, statistics, and more is found there. This explorer went to a few cities in Maine and located the names of a few recommended restaurants there. These are just a few of the countless educational Internet sites available to students. Those such as the *Virtual Tourist* help bridge the gap between rural children and the greater world.

In a survey conducted by the author using the LISTSERV LM_NET, rural school librarians were asked to respond to questions regarding student use of the Internet. Due perhaps to the fact that it was the summer season, only twelve responses were received. Although this small number of responses prevents this author from drawing any conclusions based on this survey, it did indicate that in those rural schools that were fortunate enough to have this access, it is not yet being used in the classroom. Only two out of the twelve responses listed any place but the school library as having Internet access. One librarian noted that the Internet was being used in the classrooms throughout her school, but that World Wide Web use was only possible on the library's terminal (K. Keck, personal communication, July 27, 1995).

It is evident that efforts are being made to bring rural schools onto the Internet. Unfortunately, it appears that medium and large schools are accomplishing this at a much more rapid pace. In those states where financial support is given from the state level, rural schools are being given consideration.

Oklahoma is currently carrying out plans to network the state's 18,070 schools. This network is designed to enable students in rural areas to partake in distance learning courses using the Internet and interactive television (Salvador, 1995).

Holland (1995) identifies a few good technology programs in rural schools which she refers to as "limited pockets of excellence." She writes that too many rural schools, "if they have computers at all" (p. 26), lack hard drives and inexpensive ways to access online services. Holland relates that it is "sad irony that technology, which could level the playing field for rural schools by exposing them to the resources available in mainstream America, is too expensive for many of them."

Although online services are desperately needed in rural schools, there are countless educational programs which can be used on stand-alone computers. Many of these programs are designed with remedial learners in mind. In fact, all educational software allows students to work at their own pace. CD-ROM software is particularly effective because it often provides colorful graphics which are accommodating to visual learners.

CD-ROM and Other Software

Many small rural schools cannot afford special services for those students who fall behind. Often these learners require visual and audio instruction as well as repetition, which is not always possible or practicable in a conventional classroom setting.

A study of education technology trends determined that there is an increasing amount of quality educational software being developed for both Macintosh and MS-DOS computers. This software is not limited to math as has been the past trend. Just a few examples of these software programs are discussed below.

Maus and *Maus II* are graphic novels of Art Spiegelman's chronicle of his parents' survival in a concentration camp. Designed for those in grades nine and up, this CD-ROM product includes audio tapes which Spiegelman's father recorded in the early 1980s. It is enhanced by comic strips illustrating scenes of the Auschwitz, or "Mauswitz," camp. This program is reviewed as "... the most powerful electronic book" the reviewer had ever experienced (Valenza, 1995, p. 35). The program is designed for use by individuals or small groups.

A somewhat lighter subject is covered by a software package entitled *Dino Park Tycoon Software*. This program is only available for use on Macintosh computers and is recommended for those in grades three through twelve. It is designed "to excite students about math, economics, and money management" (Fetherolf, 1995, p. 40). The reviewer describes this program as a simulation game where students establish a dinosaur park and in so doing develop problem solving and math-related skills. It includes a manual for teachers to guide them in constructing meaningful lesson plans (Fetherolf, 1995).

Administrative Concerns

It is estimated that to fully equip an existing classroom with computers, videodisc players, connection to the Internet, video projection systems, and all else needed to deliver distance education effectively will cost from between fifty to one hundred thousand dollars (Barker, 1993). It is obvious that these costs prohibit these technologies from being a reality in small schools without assistance from outside sources.

A few of the ways which some rural schools are dealing with these high costs were indicated in responses to this author's survey. Federal, state, and county grants provided for the most significant or widespread use of the Internet throughout individual schools. Internet access in one case was donated for one year by a local telephone company. In several cases, agreements with state university networks allow inexpensive, though often limited hours, of Internet access. Although these "piggy" back arrangements are much less expensive than using commercial vendors, rural schools must still absorb the expense of long distance charges.

This author's survey and the other literature on rural schools indicates that at present, schools with the technology are using school libraries and school library media specialists to provide the aforementioned technologies. A survey conducted by Classroom Connect, a newly published journal for school librarians, posted questions to five of the Internet's largest educational mailing lists. This study found that the school librarian or media specialist is "usually the building's Internet guru," a "one-person super user who teaches the rest of the staff how to get on the Internet and use it in the classroom" ("How School Librarians..." 1995, p. 6).

This seems a lofty compliment to school librarians, but in rural schools, particularly elementary schools, if there are computers, quite

often the library media specialist is responsible for their maintenance and for instructing others on how to use them. Continuing education is critical for these librarians.

Libraries are logical places for technology to be used for information retrieval and enrichment, but there is danger in isolating information access to only the school's library media center. It is critical that information skills be taught as an integral part of each school curriculum. Library media specialists will need to step outside their libraries and work with teachers and students in their classrooms, for that is where students will find meaning in the information searches they perform.

School Librarian's Role

In 1988, the American Association of School Librarians (AASL) and the Association for Educational Communications on Technology (AECT) published *Information Power: Guidelines for School Library Media Programs* (1988). This document recognized the need to offer students programs which will help them function effectively in today's information rich society. Its mission is "... to ensure that students and staff are effective users of ideas and information" (p. 1).

This mission puts in the hands of library media specialists the responsibility for "full integration" of the library media program into the school's curriculum (American Association of School Librarians & Association for Educational Communications and Technology, 1988, p. 2). In order to realize this mission, library media specialists must act as information specialists, teachers, and instructional consultants.

Most librarians would agree that the roles of information specialist and teacher are roles which are quite familiar. The third, that of instructional consultant, requires that the school librarian go beyond that of teacher and information specialist and work on school and district-wide curriculum committees. It is through this avenue that library media specialists can help teachers deal with an increasing "array of complex instructional and educational technologies" (American Association of School Librarians & Association for Educational Communications and Technology, 1988, p. 37).

This author does not suggest that the aforementioned responsibilities will be easily acquired. Wolcott (1994) feels that teachers have limited

expectations of library media specialists and that it will require assertiveness to make teachers see the benefit of the library media specialists' involvement in planning instruction.

This researcher, in her first year as a media specialist in a rural school district, asked to sit in on a social studies curriculum meeting. The stunned look on the teachers' faces will long be remembered. There was suspicion perhaps, but more significantly, a lack of understanding of why this was important. When given the opportunity to explain that the acquisition of library materials was greatly dependent on their curriculum, these teachers accepted the idea quite readily. This and subsequent meetings supplied opportunities to inform teachers of the resources available to them through the library media center.

The concepts of "information literacy, life-long learning," and "resource-based learning" (Wolcott, 1994, p. 164) are given great emphasis today, and thus partnerships with classroom teachers are becoming increasingly important. As was discussed, these concepts have not yet been adopted by many teachers in remote areas. This implies that in order to act as intermediaries between technology and teachers library media specialists must be able to communicate effectively with teachers and administrators the benefits to students which these concepts convey.

In his discussion on integrating computer-related technologies into the school curriculum, Wright (1993) relates that one of the greatest barriers to "the effective use of computer-related technologies" is not the technical barriers, but the fact that quite often the "school's program areas are viewed in isolation from one another" (p. 35).

Nowhere is this more evident than in the library media center. Too many school libraries teach library skills as a subject unto itself. Clearly this method has not been effective, nor is it logical. Students are not transferring information skills they learn in library class to other libraries, or more importantly, to situations in which these skills should be applied (Kulthau, 1987).

If classrooms can be equipped with computers and modems, there is great opportunity for the library media specialist to work collaboratively with teachers in the classrooms. The Internet and other computer programs must be viewed as part of the library's collection.

In 1992, Park wrote an influential article emphasizing the need for librarians to “change or redefine our relationships to this changing environment” (p. 746). His ideas are universal in scope and have prompted much discussion in library circles. Park equates the library profession to that of the surveyor, whose profession has been “marginalized,” or “relegated to a technician’s job” due to the development of new technologies (p. 746).

It would seem that school librarians are in a good position to alter this evolutionary course. In school there is a captive audience and if the “walls” (Park, 1992) can come down and views on librarianship become wider, the existence of the profession may be more critical to society than ever before.

Rural school librarians face greater challenges than those in more economically stable areas, for “as accessibility and deliverability of information is priced accordingly, we will see” further “discrimination based upon ‘information haves’ and ‘information have-nots’” (Park, 1992, p. 746). If librarians can keep pace with the changing formats in which information is delivered, the ultimate goals of the profession can be realized: “access to information and services to end users” (Park, p. 747).

Neuman (1990) recognizes the need for equitable access to technology for rural and other underprivileged learners. She presents a model which assists school librarians in “fostering equity” in their schools. Neuman proposes two levels which must be addressed: “general steps for equity” and “specific steps for equity” (p. 160-64).

The general steps recommended involve educating oneself regarding technology. Neuman (1990) prescribes becoming knowledgeable about the advantages and limitations of computer systems and further, providing decision-makers with information which can “minimize inequity” (p. 161). She recommends long-range planning to provide for “tomorrow’s students as well as today’s” (p. 161). Finally, Neuman emphasizes the need to be actively involved with committees in order to influence policy which will allow technology to overcome inequity.

Neuman’s (1990) specific steps for the library media specialist include measures to “enhance equity” both in the media center as well as beyond. She first proposes that the library media specialist assess the numbers and types of hardware and

software already available within the school. Secondly, the specialist must determine funding needs and sources and consider funding for new hardware and software in long-term plans. Next, several steps involve pursuing equity of access for individual groups within the school by identifying and removing bias. Finally, Neuman recommends that library media specialists use technology to promote equity.

One State's Example

The state of Nebraska has long struggled with issues of equity between its very large rural population and the urban centers. Four-fifths of Nebraska's population is comprised of those in rural areas. Nebraska's libraries have made successful strides in providing services to its rural residents. Lynch (1994) writes with deserved pride about the distance learning programs that Nebraska libraries have adopted.

In 1990, Nebraska purchased a satellite transponder for the specific purpose of providing statewide education. In addition to broadcasting continuing education courses for librarians and other educators, some of the NEB*SAT programs will be packaged into series for marketing purposes (Lynch, 1994).

The Nebraska Development Network has been working with the Nebraska Library Commission to "create and support community-based economic development" (Lynch, 1994, p. 7). They have developed a computer network called Nebraska ON-LINE. This network provides information and communication services to people throughout the state.

Nebraska's program is impressive, for it is a cooperative effort between libraries, businesses, institutions, etc., all working toward providing an equal opportunity for intellectual development and enrichment for all citizens of the state. As Lynch (1994) suggests, all states should "look to Nebraska."

Conclusion

As this author was struggling for a way to summarize this study, the daily newspaper arrived and provided some direction. The headline of the August 5, 1995, issue of the Oil City, Pennsylvania, *Derrick* read: "House passes historic phone, cable bill."

Legislation to rewrite the nation's telecommunications laws to allow competition between long-distance telephone companies and cable television providers may have dramatic effects on telephone rates, and ultimately benefit schools, libraries, and the public. Even if vetoed, as President Clinton has threatened, the fact that the chamber vetoed 305 to 117 in favor of this bill is an optimistic note for those who recognize the importance of telecommunications in today's society.

The current literature strongly suggests that the problems facing rural schools are being communicated, and positive steps are being taken toward remedying the lack of technology in many of these schools. The literature also indicates that school librarians must take a leadership role in order to help other educators deal with technology effectively.

Unfortunately, very little of this literature focuses on rural school librarians, who themselves face geographic barriers to learning and are asked to be leaders, computer technicians, and organizers of information in ever-changing formats.

Although rural educators face a long struggle before their students are afforded the same level of educational opportunity as those in urban areas, this author is optimistic for the future of rural schools.

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