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ABSTRACT

New technology, in the form of electronic connectivity, has opened up vast new arenas for educational development. Many administrators, however, have not been prepared for the sudden change brought about by such technology. The problem for school administrators is how to lead effectively without being overcome by the new information technologies. This paper provides guidelines for administrators and administrator educators for organizing activities that will allow the effective integration of digital communication technology into school settings. It discusses the five important program elements of hardware, software, curriculum, staff development, and control over access. (Contains 19 references.) (LMI)

Preparing Administrators for Connected Schools

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--Preface--

In recent decades information technologies have grown to become major portions of schools' instructional programs. In the past two years one of these technologies--electronic connectivity--exemplified clearly by networking and the Internet, has opened up vast new arenas for educational development. Administrators, however, have been woefully unprepared for this sudden change in the way schools communicate and learn. These new technologies have the potential to alter the structure of schools and have been only examined from the anecdotal investigations of enthusiasts who seek implementation in all areas of education.

School administrators, already besieged by demands for their attention, have little time to prepare for this new influx of skills and are often left asking "How can I effectively lead and keep from being swamped by these new technologies?" Some authors have indicated that while new information technologies will transform education, they will only do so after major conflicts with the educational establishment (Snider, 1996). Effective administrators will not battle with technology, but prepare for it. Institutions and organizations that

prepare school leaders must incorporate these new skills into their curriculum. Issues relating to the technology, budgeting, access, use in the classroom, must be resolved by effective building and district leaders if their schools are to participate in the next wave of educational technology enhancements--connectivity.

This paper is designed to provide a simple guideline for practicing administrators, and those who prepare practicing administrators, to organize activities that will allow the effective integration of digital communication technology into school settings. It sets out a formula for effective connectivity:

$$H(SC)^2 = \text{Effective Connectivity}$$

In this formula

H = Hardware.

S = Software.

C = Curriculum.

S = Staff Development.

C = Control.

--Five Steps to Preparing Administrators--

"H" is for Hardware.

School administrators need a grasp of the technical requirements for the connectivity. Before dealing with specifics, administrators must

realize that connectivity is an on-going expense; not a one time investment. In their budgetary role, school and district administrators must recognize it is not sufficient to make significant one-time capital expenditures and expect they have resolved the equipment needs to get their schools and classrooms connected. Constant updates, planned replacement, improved wiring, and a host of other details demand a regularly budgeted line item for connectivity.

What specifics must be accommodated in the hardware aspects of connecting schools? Much of the equipment required by connectivity is highly technical and should be left to those who specialize in its acquisition and installation. Administrators need only enough understanding of technical requirements to supervise the process. What components of the hardware requirements will be necessary?

1. Computers. Most current computers will be able to work as communication devices on both local area- and wide area-networks. Many changes are taking place in this technology, so administrators need to insure these devices are up-to-date and compatible with installed network wiring.

2. MODEMS. If the school plans to use phone lines for communication outside the building the computers will need to include MODEMS. These devices convert digital information coming

from computers into analog information for transmission via phone lines and back to digital for computers at the other end. Communication speed is dependent on the slowest device used, which is often the MODEM. Schools should purchase the fastest MODEM currently available for existing local phone connections. MODEM speed is measured in thousands of bits per second--kbps. A current minimum standard should be 28.8 kbps or 28,800 bits per second.

3. Connection. If the "devil is in the details," the complexity of connectivity is in the wiring. Establishing a local wiring scheme with different types of distribution devices (hubs, bridges, and routers) and the transmission medium (twisted pair wires, 10 Base-T ethernet, fiber optic and microwave) is a complex subject, best left to technicians. This topic often impacts on facilities and there are some good resources becoming available for school administrators. (Anders, 1993; Apple Computer, Inc. 1993). School leaders must know enough about this topic to insure school goals are met.

"S" is for software.

Depending upon the needs of the school and the district, available software allows for electronic mail over local networks and wide area networks, Internet browsing, and file sharing. Some of these software packages may come installed on the computers. Others may have to be purchased separately and still others may require contracts

with service providers.

What software is required? For local connectivity, the most common are file sharing and electronic mail packages. Some of the more recognized brands of file sharing software are Windows NT, Novell, OS/2 and AppleShare. This software allows sharing of computer information over network wires and the sharing of network resources such as printers.

Electronic mail has quickly become an integral part of school communications and involves the ability to send and receive messages. Some common brands are Quick Mail, MicroSoft Mail and First Class.

For connectivity to larger areas, software designed for access outside the building may require a service provider. Some of the more common service providers for connectivity are America on Line, Prodigy, and Compuserve. If school plans include an active research agenda on the Internet, web browsers are a necessity. If publication via the Internet is anticipated by the school administrative team, software which helps develop Internet pages is available. Either the school will need to set up its own machine for this or contract with another agency for space to store web pages.

"C" is for curriculum.

School administrators planning to use technology for connected

schools must determine how it is to be implemented into the curriculum. Three models seem to provide a framework: research, collaboration, and publication.

Students conduct research with both local and distant information sources (Burry, 1993). These research activities can be conducted locally over shared CD-ROM devices via a network. Distance research activities via the Internet provides a spectacular opportunity for students to have access to a world of information resources. The opportunities for such research abound (Harris, 1994).

Collaboration using technology is one skill of creative workers in the 21st Century (Schrage, 1995). Collaboration locally can be conducted over local networks with students from different classes sharing files, simulating learning activities and working together on projects. In distant arenas students have found great opportunities for collaborative learning using electronic mail and the Internet (Novellie, 1993).

Finally, schools have entered into electronic publication by developing web pages that provide a wide variety of information about the school or the district including curriculum guides, homework assignments, activities, policies, teacher and administrative profiles (http://www.yahoo.com/Education/K_12/).

"S" is for staff development.

A critical need for the successful implementation of connected learning strategies by teachers is staff development. Teachers must grasp the potential of electronic connectivity to implement it in their classroom instruction (Wagner, 1996). Even though the National Council for Accreditation of Teacher Education announced "...more demanding standards for the use of technology in schools of education" (Wise, 1995) administrators still must deal with an established teaching corps and new teachers who may be ill prepared to use the new connective technologies in the classroom (Barksdale, 1996). Building the networks and technology infrastructure is only the beginning of the solution. The real difficulty in an information education structure is managing it after the construction is done (Weiss, 1996). Teacher training is crucial in the development of the Information Superhighway. (Kopp & Ferguson, 1996). There seems to be four crucial aspects to the staff development phase of preparing school for connectivity: skill development, concept development, "hot-line help" and "on-time on-target and on-going" delivery.

First teachers must gain skills that allow them to become active participants in electronic connectivity, collaboration, publication and research. Administrators must lead in this endeavor either by gaining

the skills along with their teachers or demonstrating these skills for them.

Once the skills necessary to effectively use electronic connectivity have been acquired, teachers must work in teams using connectivity to develop thematic plans and concepts for student learning. These can be lesson plans, cooperative exercises with other classes or schools, research activities or authentic publications.

Hot-line help is crucial for this staff development program.Connectivity, either locally or in the world-wide sense, is a complex environment, fraught with dangers and difficulties. Help for teachers struggling to master both the skills and concepts will need to have immediate and accurate support from people who know both the technology and education.

Finally staff development must be:

On time--when the teachers are ready for it.

On target--what the teachers need.

On going--unending.

Anything less than these standards leaves teacher getting information before or after they need it, over their heads or inappropriate. Administrators wanting to lead in connecting their schools must be prepared to initiate and conduct staff development activity along these lines.

"C" is for control

Networking and connectivity for schools is a new area for administrative concern. In the past information control by administrators had been enforced by controlling the access of people out side the school to students and controlling communication between students. Schools have maintained a defensive attitude best expressed by The Last Little Citadel (Hampel, 1986). Administrators used librarians or book selection committees to control access to information resources available to students and maintained efforts to control educational environments by limiting access of the public to school property. Silent witnesses to this effort has been "Drug and Gun Free School Zone" and "Visitors are Required to Register at the Office" sign carefully posted by each school. There are good reasons for these efforts.

Networking and information connectivity are diametrically opposite to the contact limiting strategy practiced by schools. Internet access gives students contact, via computers to all sorts of information--the good, the bad and the ugly. From school computers students can log on to great literature, recent photos from the Hubble Telescope, or research institutions at the highest levels. They can also connect to pornography, illicit drug sales, or hate literature. Administrators who "fling open" the school electronic doors need to prepare for this new

environment. Failure to prepare the staff, community and students for connectivity regulation will flare into a major local issue the first time a student brings home unacceptable materials from school networked computers.

In order prepare for this issue administrators must examine four factors in the control of access to communications technology .

1. What computers will be connected to the district network; all or a few? All gives the students and faculty more opportunity for research and communication, but presents problems with supervision. Few, limits the research opportunities, but provides for greater supervision.

2. What controls will be placed on student and faculty access to the Internet both in terms of research and publication? There are electronic tools that limit research topics, but one suspects they will have marginal effectiveness. Also, what will be published if the school chooses to use the Internet to advertise? Who will assure quality publication about the school and maintain student expectations of privacy.

3. In connected environments do students have an expectation of privacy? Will student electronic mail and mail privileges be limited by the school administration? What policy standards will be enforced?

4. What standards of privacy and conduct can the faculty expect

for their electronic communications. Is the electronic communication a medium to create a district-wide, high speed gossip and slander vehicle? Will administrators have and exercise rights of supervision of faculty electronic mail.

The greatest safeguards for the effective control of information technologies and connectivity are the common sense and supervision of well meaning and thoughtful administrators. Failing to prepare to control this medium is to prepare for failure. Some good policies have become available as models for administrators in their districts (National School Boards Association, 1995; Ryder 1997). However school administrators must engage in the process of developing their district policies for connectivity control (Ross, 1996). Simply adopting another district's policies without considering location circumstances, involving the district patrons, teachers and students is a formula for heartache.

--Conclusion--

Administrators returning to school to learn about establishing information connectivity or those in educational leadership problems, must grapple with five issues to effectively lead their programs. Departments of Educational Administration and Leadership should be prepared to provide guidance and information on these five issues; hardware, software, curriculum, staff development and control. The

depth of this understanding does not have to be at the network engineers level, but administrators must be sufficiently versed in the technology to effectively communicate, direct, lead, and supervise the installation of these technologies. Failure to be equipped with these skills leaves administrators at the mercy of highly technical enthusiasts, who may have little or no understanding of the educational process.

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