

## SECTION V: An Achievable Vision

### Making Tomorrow Happen With Today's Technology

Tempting as it may be, we will refrain from ending this report with a future vision, or visions of how networking may or may not transform learning in schools, homes and communities by 2000 or 2010. Our goal here is more immediate. It is to provide guidance to schools, and the communities that support them, regarding what they can begin accomplishing today — using today's technology and even some of yesterday's that they may have been wondering what to do with — to achieve the type of school-home-community networking described in Section III of this report.

Before we begin, let's review the reasons why school-home-community network connectivity should be a priority of every school's technology planning:

**BETTER TEACHER-PARENT COMMUNICATION/COOPERATION** — school-home networking can facilitate efficient, effective parent-teacher communication regarding...

- Curriculum and learning goals;
- The relevance of specific homework to those goals;
- Suggested computer-related home learning experiences;
- Regular student progress reporting;
- Teacher-parent-student cooperative evaluation and selection of learning resources.

**INFORMATION DELIVERY AND EXCHANGE** — (e-mail and online discussion) school-home-community networking can provide schools and other community organizations with an inexpensive, efficient and reliable means of delivering information to parents and the community schools exist to serve. Such as....

- School announcements, schedules, etc.;
- Online discussion of school-home-community issues such as health, drugs, teen pregnancy, parenting, TV, environmental, civic, neighborhood, etc.

**INCREASED STUDENT LEARNING OPPORTUNITIES** — school-home-community networking may be employed to achieve learning connectivity for:


- Students who choose to spend more time than is available at school in exploiting the learning potential of online and CD-ROM sources, based on both the schools curriculum goals and a learner's particular interests, abilities and insights;
- Online at-home mentoring, monitoring and peer tutoring programs via school and community volunteers;
- Home-bound students and absentees, via online homework assignments and distance-learning classroom participation;
- Across-school and at-home online professional development and curriculum planning for teachers and teaching aides;

- School-sponsored adult education programs for parents and other community members via online distance learning and, in some cases online staff development for teachers and teaching aides;

And, perhaps, for:

- Students who are being home-schooled, but whose parents are unable to provide instruction in a particular curriculum area. (Presenting an opportunity that some schools may wish to explore as a means of enrolling home-schooled students as a special category of learner within the school community.)

**ONLINE CSC SERVICE** — Online Enlisting/Matching/Rewarding Community Service Volunteers Via Community Service Credits — Online management of a community-wide credit system through which those who voluntarily provide services to others receive one Community Service Credit (CSC) hour for every hour of service.

 Community service credits, or "Time Dollars" (Cahn, Edgar. "When Money is Time," Op Ed Page, The New York Times. Jan.9, 1993) is a local tax-exempt currency based on the voluntary exchange of human services in which one hour of service performed by one person (e.g., providing training in computer use) is equal to one hour of service performed by another person (e.g. helping in a school or library, shopping for a home-bound neighbor, being a hospital volunteer, providing childcare or eldercare, etc.) without reference to the actual rate of pay for such work (i.e., one hour of legal service = one hour of house cleaning service).

CSCs may be used by a school-home-community network to:

- Provide a means for families who cannot afford to buy a computer and or pay for training to earn them with CSCs;
- Enable the network to reward those who through their volunteer work as computer trainers and mentors, managers of the CSC system, network developers and trouble shooters, fundraisers, enable the school-home community network to sustain itself with a minimum outlay of money;
- Build intra-community relationships across all social and economic levels of community members (i.e., "haves" and "have-nots" working to support the growth of a learning-and-earning community on the basis of cooperation and mutual support).

**INCREASING COMMUNITY SUPPORT** — effectively used, all of the above applications of school-home-community networking can help increase community-wide support for a school's technology program and the implementation of technology to increase learning opportunity for all learners.


#### Basic Decisions in School-Home-Community Networking

Assuming that a decision has been made to create school-home-community-wide networking, there is an initial decision to be made. Should a school begin with a school-home voice-messaging system (with or without e-mail capability) or, should a school move directly into developing a school-wide computer network that extends to students homes and the community?

In order to make this decision, information is needed about the current and planned acquisition of home computers and connectivity by students families. Begin by gathering information about how many students' families already own a home computer/modem/phone and how many students' families are planning to acquire such technology in the near future, etc. (see Appendix A for an example of a simple, one-page survey form that is being used by schools for this purpose). We suggest that teachers and teaching aides also fill out the form.

The information gathered with this form will enable a school to create an At-home Technology Profile for the entire school community. This profile will help in deciding how to design a practical approach to achieving a universal school-home communications network. If there are few computers in homes of students and teachers, a school-home voice-mail network would seem the correct initial network choice. If this is the decision, be sure to acquire a system that already is, or that soon will be, e-mail capable.

If, on the other hand, the At-home Technology Profile indicates a high penetration of computers/connectivity in student and teachers homes, then the decision moves to consideration of the school-home-community networking strategy described below. When deciding on this route, the number of students whose families are likely to be financially incapable of purchasing a computer in the foreseeable future should be assessed. When this has been done, a community-wide strategy of the sort described needs to be developed to assist these households to acquire the technology they will need to participate in school-home-community networking

 Do not assume that all low-income households will have telephone connectivity. First, discover whether this is the case, then engage the help of appropriate local social service agencies and the local phone provider to help solve the problem; nationally over 15 percent of low-income households lack telephone access. However, the issue of achieving universal phone and e-mail access for all Americans receiving increasing attention (Anderson, 1995) and, as more schools and communities become engaged in addressing it locally, their concern will aid in appropriate state and national action. As mentioned in Section II, we believe that an appropriate solution for such connectivity could be a low-cost wireless modem.

Assuming that a decision has been made to move ahead with school-home-community computer networking, the first step is to adopt a networking design that focuses on the creation a local information infrastructure (a local community "hub" or "inner-net") that connects with the National Information Infrastructure via the Internet. This means that the local hub or inner-net should have both BBS and Internet functionality, as described below regarding recommendations about ways the Internet can be extended for achieving school-home-community networking with BBS-like functionality).

If, however, a local BBS already exists in the community, if at all possible, build upon its established capabilities, especially if it has been organized as a local nonprofit resource. It may be related to the local library, or to a county library system, or to a social services network. It might also be an independent volunteer organization.

In any case, every effort should be made to create a single integrated, community-wide network, and to avoid duplication of effort, competition and confusion among members of the community. Schools should not set themselves apart, electronically, from their community. For instance, if a nonprofit BBS-type community network already exists, or a local commercial Internet provider also manages a community BBS, a serious effort should be made to build a nonprofit sector into such a service — provided the BBS proprietor agrees to free access for low-income households with children, or even others in the community, who cannot afford to pay monthly service fees.

If a Web-based hub rather than a BBS-based hub is being considered, some important trade-offs are part of that consideration. The most important of these trade-offs is that with the Web-based option it will be difficult to replicate all the features of a BBS. If even one or two highly valued BBS features such as "chat mode" can't be replicated, the trade-off may be considered too great, and a BBS-plus Internet connectivity may be the best decision.

But the technology is in rapid evolution. In this regard, the following two comments from 1994 and 1995 by Frank Odasz, a pioneer in community networking are worth attending to:

"For most schools and communities, the choice is not between distributed bulletin board systems and full Internet access. Both serve different but related needs and are needed to fully empower communities (Odasz, 1994)"

While a local BBS can be an economical first level for a community network, WWW conferencing systems and continuing advancement of programming environments, such as Java, will soon make it possible to have the best of both Internet and Internet features. (Odasz, 1995)

In personal conversation with Frank Odasz we have come to realize that he and other pioneers have crafted the use of BBSs for a level of community involvement not yet attainable via the Internet. To aid in the discussion the following figure: *Comparing Computer Bulletin Board Systems with Internet Systems for Networking* was prepared to help the Internet Community, the BBS-based Communities, the School Community, the Library Community, the Municipal Community, the Home Community and others to more quickly converge on what some have begun to call WebBBSs.

Indeed, as we have discussed in the Online Teleconferencing part of Section II, the Internet tools have made their most important advances for community-like activities in the areas of forums and teleconferencing. Another important area of advance is in the construction of MOO (Multi-dimensional Object Orientations) and enhancements such as Chaco's Pueblo (Greening, 1995) that provide a virtual environment, including graphical interaction, to engage learners and involve citizen participation.

In the comparison chart the reader will find many references to how BBSs provide a better sense of unity and monitoring than the Internet. While we are not espousing "Big Brother" monitoring, we do recognize that many BBSs have dedicated SYSOPs (System Operators) who monitor chats and forums to ensure that they adhere to local standards for civility. Indeed, the issue about cyberporn (Bray, 1995) have received the highest attention at both national and local levels. While software can provide some security, software will never be foolproof. Chats, forums, and other forms of interaction intended for children and young learners require supervision.

We anticipate that within a couple of years, there will be an Internet BBS facility that will have the following characteristics:

- Facilitate a sense of close community — both geographic and "communities of interest"
- Enable participants to inquire about the "profiles" of others, to know whether they are currently "online," and be able to determine if they are available for discussion
- Provide Forums that enhance the geographic community, including bridging among homes, schools, libraries, and municipalities
- Provide chat facilities, such as chat rooms or "environments" in which people can have discussions for learning and entertainment
- Provide linkages to community bulletin board information about events, opportunities, and facilities
- Encourage Community Service Credit volunteerism using volunteer brokers and a credit banking system
- Provide ways in which local "innovators" can improve the environment. In a MOO, these are "object extensions" that people can build. (Better tools are needed to permit non-programmers to build extensions.)

#### Building an Inclusive, Equitable Learning Community

If school-home-community networking is to strengthen the educational values and skills needed to sustain not only the American economy, but American democracy as well, there must be a commitment to creating inclusive, not exclusive learning communities. From a practical standpoint, this means that every school-home-community network committed to inclusiveness is also committed to achieving at-home equity of access for students whose families cannot afford a home computer and connectivity.

## Comparing Computer Bulletin Board Systems with Internet Systems for Networking

Feature	Via BBS	Via Internet	Comparison
Chat	Easily identify who is in community; easily drop into a chat session, in pairs or groups	Chat available using an IRC client. User must have IP access to internet.	Difficult to drop into local chat on Internet. IRC is a chat around the world on many "channels"; censorship problems
Forums	Local forums are in an easily accessed menu. Discussions can have topics and threaded messages	Web pages may be made dynamic using a number of third party products, allowing users to read and leave notes	Becoming comparable. Designer must pay attention to achieving sense of a local community since open to everyone
Email	Local email requires knowing person's login ID; Internet mail requires ID and domain. Good mail editors.	Email available either through a shell account or via client software using IP access to the Internet	Comparable. Somewhat easier to email a person on a local BBS because ID is easier than full Internet address.
Free Software	Areas of BBS are grouped according to type of program. Downloading of files is done via a telecommunications protocol	Internet archives of software are available using shell tools (ftp, lynx, etc.) or using Netscape using IP Internet access	Major BBS's still have an edge on providing access to shareware. Internet archives are sometimes poorly organized
About Others	Easily identify who people are by a menu item or command with person's ID (easily leads to Chat (above))	Finger command is implemented by some systems but many do not implement this capability of learning about a person	BBS clearly have an edge. Internet MOO's, MUD's and WebBoard provide personal information such as BBS's do
FidoNet	Discussions are conducted across BBS's using night calling or via Internet	Usually only by Interneting to a BBS that is on FidoNet	Distinct edge to BBS's, however, newsgroups may take over and antique FidoNet
Newsgroups	Newsgroups are a menu item. User can read newsgroups and respond	Using a shell account, a newsreader can access messages and permit posts. Using Netscape, graphical, requires an IP address	Comparable. Netscape provides better display of groups, graphically, unless the BBS has graphical interface, e.g. RIPS CRIP
Offline mail	KWK mail facility enables users to send and receive mail when telephone call is metered	Eudora and other email systems provide offline sending and receiving mail using a client and an IP connection (SLIP/PPP)	Comparable for those having SLIP/PPP access. Some Internet shell accounts do not provide offline reading and writing
Bulletins	Separate menu item maintains bulletins of interest to the community	Web pages serve as places to put bulletin-like information	BBS have the edge — this was their original intent. Web pages integrate pictures, raising their appeal
Doors	Extensions of BBS's such as a community service credit bank can be programmed and easily added as an extension	Extension made by add-ons to Netscape including audio, video, and Java (accesses and runs programs on client machine)	For audio/video the Internet has the edge. For programmed extensions such as job banking, BBS integration still easier
Unity	Years of evolution have provided a seamless sense to a BBS system. Good statistics and monitoring capability for SYSOP	Different functions require running separate clients, no good monitoring for a SYSOP	Internet provides very poor sense of unity. It was not designed to feel like "one place"; BBS "feel" friendlier. BBS also provides monitoring, personal censorship

*Source: Center for Information, Technology & Society*

Earlier we stated that, given "the temper of the times" neither government nor business will produce the estimated \$23 billion needed to provide all poverty-level school children and their families computers and

connectivity. If we are correct in this assessment, then it is left to schools and communities to address the growing disparity between "information haves" and "have-nots." While this growing disparity, may seem to be as structural and permanent as the school-home computer disparity mentioned earlier, hopefully, it can be eliminated. (Komoski, Virtual Ghetto, 1995)

Based on the computer industry's likely sales of home computers to families during the next four years, it seems reasonable to assume that by 2000, all but the poorest families will have purchased a computer to "help their children do better at school." If schools and communities are unable to figure out how to enable their poorest families to acquire a computer and network connectivity, our nation's "virtual ghetto" may, indeed, begin to become as structural as its physical ghettos have become.

#### Step One: Paying for Inclusive Community-based **Technology Training** for Any Family

Current efforts to address this disparity by providing access to "information-have-not" students and their families at schools, libraries and community centers should be applauded as important first steps on the way to building an inclusive learning community. In a community that is building an inclusive school-home-community network, such training should be available to all who sign up for it. Those who can afford to pay for such training with money should be allowed to do so; those who haven't the ability to pay money for their training may pay in Community Service Credits (i.e., one hour of training for one earned CSC hour).

As mentioned above, community-based training for families is an essential element of school-home-community networking, especially for those who cannot afford to purchase the technology and training they need to gain for at-home access. Some suggest that libraries can provide this access. But outside-of-the-home, limited access to technology — essential as it is in helping families to become technology literate — can never match the benefits, convenience and time of *at-home access*. Schools and their communities need to take a practical next step to move beyond outside-of-home access to achieving in-home access to computers and connectivity for all "have-not" children and their parents.


#### Step Two: Enabling all Families to Acquire Home Computers

A family that cannot afford to purchase a computer (i.e., a family who children are eligible for free school lunch or who meet other locally-established criteria) should be given the opportunity to earn a home computer after 1) completing the training provided in Step One above, 2) after paying for that training with earned Community Service Credits.

The following is a suggested "to do list" for moving ahead to build an inclusive, equitable school-home-community network within a school community:

- Establish a community-wide policy board and advisory board with a relationship to the school district's technology planning committee;
- Appoint a network coordinator and a systems operator (SYSOP) (while these may be volunteers, ideally, they ought to be persons in the employ of the school or the library). If, however, there is a local Internet service provider/BBS operator who is interested in working with the school-home-community network, there may be an opportunity for a complementary relationship;
- Unless the school district has already acquired Internet connectivity, carefully review all options. If the public library is providing free Internet access to library card holders (as increasing numbers of local and/or regional libraries are doing), offer to join with them in underwriting this essential service;
- Develop a clear mission statement as a complement to, or an extension of the school district's long-rang technology plan;

- Establish a local education foundation, or if one already exists, enlist it to become the legal entity under which the local school-home-community network will be organized and governed, and through which local and other fundraising activities may be carried out;
- Enlist a group of community volunteers who are interested in the concept and operation of a nonprofit school-home-community network that will become the operating arm of the network;
- Make older, unused school-owned computers available to low-income families (either as loaners (e.g., Indiana's Buddy Program), or to be earned via a learn-and-earn-technology program (e.g., the LINCT model mentioned in Section II of this report);
- Establish a community-wide and/or regional program for soliciting donated, used computers from businesses and households that are replacing older machines;
- Acquire used computers from federal, state, county and local government agencies. A Presidential Executive order of November 1992 (Bush, 1992) establishes a mechanism that enables schools to acquire used government computers for use in elementary and secondary schools;
- See if one or more local banks will provide low-interest loans to low-income families specifically for home computer/connectivity purchases;
- Enlist computer literates from the community as volunteer (earning CSCs) trainers from among computer literate parents, computer-savvy high school students and teachers, local techies who may possibly be recruited from a local or regional chapter of the recently formed National Tech Corps mentioned in Section II or through CompuMentor, which is based in San Francisco but has a nationwide cadre of local computer volunteers willing to work with nonprofit organizations and schools in need of technical support;
- Enlist additional volunteers to assist with acquiring an ongoing supply of donated used computers. Organizations with established local and regional credibility such as The United Way, Rotary etc, should be approached to assist with outreach to businesses and government to acquire, warehouse and distribute computers to community training sites in schools, libraries, churches, etc.

 For a LINCT Coalition planned pilot project in five neighborhoods in New York City's Harlem, sponsored by the New York Urban League, The United Way of New York will provide outreach to businesses to acquire used computers, equipment warehousing and equipment pick-up and distribution services.

- Establish a program for ongoing equipment maintenance and repair services. Although communities in which such programs exist are managing to sustain this work with volunteers, we strongly recommend that this part of the work of school-community networking be incorporated into local high school and/or community college programs. This may be done either as formal tech-prep courses or as projects of school computer club activities (i.e., the "computer shops" referred to previous sections in this report).


None of the above is simple to accomplish. But all of the above activities are being accomplished in various communities committed to achieving equitable, universally-accessible school-home-community networks. However, as important as such grassroots, community-based action is for achieving universal access to school-community networking, the work of such efforts could become much easier to accomplish through a reliable flow of donated business and government computing equipment.

Needed: Nationwide Coordination for Providing Community Networking Efforts with Earnable Computer Equipment for Underfunded schools and Low-Income Families

Throughout this report we have stressed the need to develop practical approaches to achieving equitable school-home-community networking. An essential element in achieving that goal is ensuring that those schools and homes which lack equitable access to computers and connectivity are able to acquire them. As described above, a practical way of achieving this is for each network to work to establish a reliable flow of used computers that may be installed in school and community learning centers and learned-and-earned by low-income families. While this is proving practical in many communities with many computer-using businesses that regularly upgrade equipment, there are many other communities in which this is not the case. Is there a practical solution for such communities?

The solution proposed by the LINCT Coalition is a national redistribution program of the 10-14 million used, but usable computers, printers, etc., that are being replaced each year by America's more than 10 million computer-using businesses (Aeppel, Gartner Market Research, 1994) plus an estimated additional 1-2 million used computers a year being generated by the country's almost 40 million computer-using households. The nation-wide redistribution program envisioned by The LINCT Coalition, while formidable, is considered to be practical, based on the experience of Non-Profit Computing Inc. a LINCT Coalition member organization. Non-Profit Computing Inc. has been redistributing used computer from businesses and households for over a decade. An based on this experience, the major problem is not one of redistribution, itself, it is a problem of awareness and commitment by the nation's businesses to donate a significant portion used equipment to redistribution programs such as Non-Profit Computing Inc.

The LINCT Coalition points out that "a significant portion" need only be 10-20 percent of the 15-20 million used computers being generated by businesses each year. With such a commitment and an appropriate redistribution program in place, within two years the program would be able to provide the nation's 10-15 million lowest-income families with an opportunity to earn themselves a home computer through the type of community-based Learn-and-Earn programs described above. Within the same two years, such a nation-wide equipment-redistribution program would also have generated enough used computers to supply all of the nation's estimated 20,000 underserved schools, libraries and related community-based volunteer agencies with more than enough computers to meet basic equipment needs. The "know-how" exists to make this happen. The question is one of awareness and commitment, and, of course, the resources required to organize and to manage the redistribution system.

 The LINCT Coalition has suggested to the current administration that it extend the present Federal used-computer distribution to schools beyond its math and science focus to enable schools to provide such equipment to community training centers and to low-income students whose families are willing to learn-and-earn a computer via school-home-community technology training programs, as called for in the LINCT Coalition model for achieving "electronic equity" at the grassroots level. This could add an additional flow of used equipment to the potential flow from businesses described above.

Also, many used PCs are being shipped overseas. (Aeppel, 1994) Given the value of these machines to our own country and the increased usefulness of these machines as Internet browsers, we may wish to adopt national policies to keep these machines in circulation, here.

Once the feasibility of a community-managed program for acquiring used computers is established, and/or computers are being acquired, a complementary program of training sites can be established at after-school centers located in schools, libraries and other publicly accessible sites such as community centers and church facilities, etc.

The school-home computer structural disparity discussed in Section II and the at-home social disparity among the nation's "haves" and "have-nots" present schools and communities with an enormous challenge. Public schools, along with public libraries are their community's tangible evidence of longstanding



American belief: equitable access to learning and information is fundamental to life in a democracy. How well public schools, libraries and their communities respond to this information-age redefinition of their historic missions is critical to the future of the democracy they have helped to build.

If public schools and libraries fail to sustain free access to appropriate technology and learning and information resources for those who cannot afford to pay for them with money, America may find that it has lost the means of providing its citizenry with the very educational opportunities that ensure its strength.

### Practical and Specific Projects

In the spirit of providing practical and specific guidance for school and home-school networking fifteen project areas are suggested. In discussing the projects it is imagined that the technology planning board might draw on the "causal diagramming" aids presented in Section IV.

#### 1. Schools Aid Parents in Selecting Home Software and Internet Materials

As described extensively throughout the report, parents are moving quickly to purchase computers and software for their children. Schools can view this as an independent activity or, more cooperatively, can interpret their role vis a vis the student and parent as a facilitator of at-home learning that helps schools meet their curriculum goals.

Elements of the causal model include student achievement, parental assistance in terms of "useful" software, student activity in using the software, teacher—parent communication about curriculum objectives and communication about corresponding software selection.

Many states belong to the States Consortium for Improving Software Selection (SCISS) which provides all schools within the state with access to a database of over 18,000 K-12 educational software products. The EPIE Institute which maintains this database provides training and assistance in how to use the database to "align" the curriculum with educational software. Available on CD-ROM, the database can be annotated by teachers as they discover software programs that they find useful in teaching.

If the database is made part of a web page (e.g. Massachusetts, MCET), the annotations can be shared with parents via the Internet.

While the process of "aligning" software resources with a teacher's curriculum objectives is a daunting exercise, the teacher could start by searching the EPIE database, reading software descriptions and the EPIE surveyed ratings of reviews the software has received, and then reviewing the software asking parents and students to help evaluate the software. The software, if it were found to be useful, could then be purchased with a home-school site license. (EPIE provides a software evaluation program on request; EPIE also encourages teachers to share their evaluations with EPIE to help build a nation-wide evaluation resource for other teachers (and parents) to consult.

#### Linking Home-bound Students Into Homework Assignments

Schools expend considerable funds to meet the needs of home-bound students. There are many ways that a school might involve a home-bound student in on-going classes via networking. One way is to assign a "buddy" to the home-bound student. The buddy might summarize the classroom activities by taking notes and relaying these via e-mail or voice-mail. One use of networked classroom machines could be to place the buddy in contact with the home-bound student in "real-time" (via keyboard from the classroom to the home student's computer). Such an activity might improve both student's learning as the activity encourages the buddy and the home student to pay more attention to material. (As an on-going example, LINCT is currently (1996) assisting with a peer tutoring project, using reading software and home-to-home e-mail mentoring, in five elementary schools in south Chicago)

Parlant, Homework Hotline, and other companies provide teachers with voice-mail systems that can be used to communicate with the home-bound student. If there is an installed base of computers in students' homes the school may make use of the web enhanced ways of conferencing (see Online Computer Teleconferencing in the Tips part of Section II including Homeworks™).

A positive side-effect of working with home-bound students is each situation represents a tiny "distance-learning" experience. Schools can begin to experiment with distance-learning tools and these experimental uses can give rise to more diverse ways schools might provide training to others outside of the classroom.

#### School-to-Work Projects

Businesses are increasingly networked, providing opportunities for networks between schools and businesses to develop. Job bank databases for intern and graduation job-placement can be built. The movement toward "electronic student portfolios" provide prospective employers with information about students; just as business web pages can provide students with information about businesses.

The Computer Shop and Tech-prep activities described in this report can provide students with experiences not only relevant to continued education but as a path into many technical jobs.

In drawing the causal diagram for schools and homes, the inclusion of local businesses will be another important "compartment" of the model. Links to improved self-esteem, on-the-job learned skills, and improved social skills in the workplace are all vital components of the model.

#### Home-Schooling Resource Links

Traditionally home-schooling is seen as parents "opting-out" of the local school system. In some parts of the country, however, there is an economic incentive for schools to work with home-schoolers and actually paying for learning materials. If home-schooling parents enroll their children as home-schoolers within the school districts, under such an arrangement the district receives state ADA (Average Daily Attendance) funding — a portion of which is provided to parents for materials (e.g. California).

With improved home-school networking, the possibilities for greater aid and cooperation between schools and parents increases. There are many specific networking solutions that can be tried. School web pages that contain detailed curriculum information can help guide home-schoolers (and regular schoolers alike), especially if the pages include names of materials and links to other useful sites.

Parents often need to ask questions to home-school, thus leading to the need for ways parents might leave e-mail questions by subject area and know that teachers assigned to cover e-mailed questions will answer their questions.

Further, while aiding the home-schooling parent may be the impetus for such communications, other parents who want to help improve their child's performance in a particular subject can also make use of the service. One networking possibility is to create subject forums on a community BBS or using a local set of "newsgroup" items that can be accessed via a threaded newsreader.

Another source of assistance could be semi-retired and volunteers in the community who wish to become more involved in schooling. Perhaps with some pre-screening, these people can serve as on-line mentors. (See the CSC discussion above, and below.)

#### Learning Disabled Conferences

The Internet has been identified by the learning disabled as a place for information and support. For example, the blind use special terminals that read from the screen, enabling them to conduct much fuller lives.

Support groups are often more effective when people personally get to know others face-to-face. While it is possible to get to know people on the Internet, the limited communication and distance, make social gathering difficult or impossible.

The need for local community, around issues related to disabilities, or any other area of common interest is a matter of debate and uncertainty. Some people are content to make "virtual" friends via e-mail and/or chat, while others prefer face-to-face situations. Many of the attributes of community such as helping, visiting, shared experiences, volunteerism, etc. encourage the formation of local networks to encourage local community.

#### Special Education Home-School Assistance

While the reasons and needs associated with special education are varied, there are basic behavioral reasons to believe that improved home-school communication will improve performance and attitude.

The causal diagrams provided in Section IV showed a rudimentary model of learning in relation to factors affecting self-esteem. Even learning problems with a physiological etiology can be improved by "corrective feedback."

Schools and social workers should expand the vision of the home-school model to encompass the timely advice and guidance of trained MSW (Masters in Social Work) professionals. Overall costs to schools, families and society can be reduced when a "system" is made to work. Closely networked people leads to an improved system.

#### Parent Talent/Vocation/Technical Assistance Sharing/Mentoring with School Learning

Parents possess many talents, and occasionally students benefit from these talents when a parent volunteers to work with the drama club or another parent comes to speak before an audience about an anthropological expedition.

These will become "old-fashion" ways of sharing as networks provide alternatives.

Already volunteers are mentoring students "online." Using an environment such as a 3-D enhanced MOO (Multiple Object Orientation) a parent can invite students and others to a presentation where slides appear on the computer screen in each person's home rather than on a projection screen in an auditorium.

While full motion picture video to the home will remain restricted to cable, including community access, modem/computer access can provide access to "Nintendo" like graphical worlds. Attendees can be "seen" in the "virtual environment" and messages can be typed that are either directed to the entire audience or as "whispers" to others.

How some of these communication tools will be actually used to involve parents are yet to be fully explored. Other modes, such as a BBS chat session, have been used by parents, teachers, and students across the country for many discussions. (When a participant types a message, it appears to all the others connected to the same "session" with a identifier such as: "Sharon says ...")

#### Teachers as Parents for Better Schooling

Many teachers are also parents. As both teachers and parents they understand the learning needs of their children and the possibilities (and limitations) of schools and networks.

Teachers who put on their "parent hat" think differently about schooling. This is a useful way to encourage teachers to think about the uses of networking technology.

Teachers, as parents, can form online discussion groups to discuss the technology plan currently guiding school efforts. Or they may want to form a home networking committee of their school's PTA. PTAs can use networking to promote greater focus on the improvement of children's learning, both at home and at school.

#### Parents Involved in Textbook/Teaching Resource Selection

The process by which states and localities "adopt textbooks" is a complex affair that includes state-level adoption committees, in 26 states that usually have "parent appointees."

As parents begin to make use of the Internet and the many educational software resources, they will become more informed about these resources. With this experience, parents will want to assist in identifying teaching resources for schools and can bring a diversity of opinion.

Some computer teleconferencing software includes voting. States and schools will want to consider new ways debates over materials can be conducted and ways voting may be useful.

#### Parents Involved in Library/Learning Resource Selection

As parents become more aware of learning resources they will become increasingly interested in helping libraries make acquisition decisions. Many CD-ROM based softwares can be either made available via the community network or by library loan. (Since CD-ROM copying is not readily available and is also very expensive, libraries can be much less concerned about matters of copyright.)

#### Parents Involved in Curriculum Enhancement

Many parents today accept public schooling or opt for private schools. More affluent parents move to communities with the "better schools."


This study suggests that, through improved networking and communication, more parents will want to be involved in their child's learning. Indeed, a rewarding part of raising a child is in seeing the child grow, educationally, and feeling some pride in that process.

With networking technologies schools can offer greater diversity of learning. Whether they do, in part, depends on whether parents want them to.

"Authentic learning" holds the promise of improved learning and schools, mirroring their local culture, will venture toward authentic learning when parents are more encouraging. (The barriers discussion in Section IV described how "conservative" parental values can stand in the way of technology-based school reform.

#### Parents Involved in School Board Decisions

Similarly, parents can become more active in school board decisions. Clearly a very active parent can often become part of the school board, but the learning community that is envisioned would involve many more parents than those on the board.

 Many of the activities described are done as part of a "PTA." Indeed, the PTA may be the place to expect many of these activities to devolve from. Networking communication has a way of changing relationships and patterns. Rather than a PTA as an entity, we prefer to focus on the aims of PTAs as guidance for the construction of improved home-school networks.

### CSC (Community Service Credit) Exchanges for School/Home Inequities

In Section II the activities of LINCT (Learning and Information Networks for Community Telecomputing) were described including the use of CSCs. Based on the successful concept of Time Dollars implemented in hundred's of communities across the country, people exchange volunteer-like services and receive credits: one credit for one hour.

A primary mission of LINCT is to solve the equity problems described in Section III. Low-income families can earn a computer by "learning to use the computer" and volunteers from the community are encouraged to help by earning CSCs.

While many of the computers are donated machines and cannot run modern educational software, they are 1.) capable of providing a basic set of computer tools including wordprocessing, spreadsheets, and basic-skills program such as to learn typing, and 2.) they are ideal communications machines capable of accessing the Internet (see the discussion of low-end computers as exploration machines in Section II.)

Schools and libraries may wish to address the equity problems described in Section III, and include a LINCT component to their home-school-community design.

**LINCT Coalition**

**Home-School-Community**

**Computer Connectivity Survey**

Do you have a home computer? Yes \_\_\_\_\_ No \_\_\_\_\_

When did you purchase (acquire) it? \_\_\_\_\_

What kind?

- Apple \_\_\_\_\_
- Macintosh \_\_\_\_\_
- Apple II \_\_\_\_\_
- IBM/compatible \_\_\_\_\_
- 486/Pentium \_\_\_\_\_
- 386 \_\_\_\_\_
- 286 \_\_\_\_\_
- XT \_\_\_\_\_

Do you have a telephone? \_\_\_\_\_

(if so) Do you have a modem? What speed is it?

- 28.8 \_\_\_\_\_
- 14.4 \_\_\_\_\_
- 9600 \_\_\_\_\_
- 2400 \_\_\_\_\_

Do you now subscribe to an online service? What service?

- Prodigy \_\_\_\_\_
- America Online \_\_\_\_\_
- CompuServe \_\_\_\_\_
- Other \_\_\_\_\_

Are you planning to purchase a computer?

- When? Within 3 months \_\_\_\_\_
- Within 6 months \_\_\_\_\_
- Within 12 months \_\_\_\_\_