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ABSTRACT

The National Coordinating Committee for Technology in Education and Training (NCC-TET) has developed these requirements to ensure that the National Information Infrastructure (NII) provides expanded opportunities for education and training. A number of national organizations have contributed to these requirements, which are intended to be used in policy formation and legislation. With regard to access, the requirements ask that all Americans have affordable access to the NII, that it be accessible in a variety of learning environments, and that public and private partnerships be developed to help ensure access. Both public and private information resources should be made available to schools of various types, libraries, and arts and cultural institutions. The second group of requirements is in the area of education and training applications. These eight requirements deal with coordinated activities, research and development, the dissemination of information, and evaluation of information applications. The third set of requirements focuses on technical needs, including transmission approaches, user needs, and issues of security and standards. (Contains 9 references.) (SLD)

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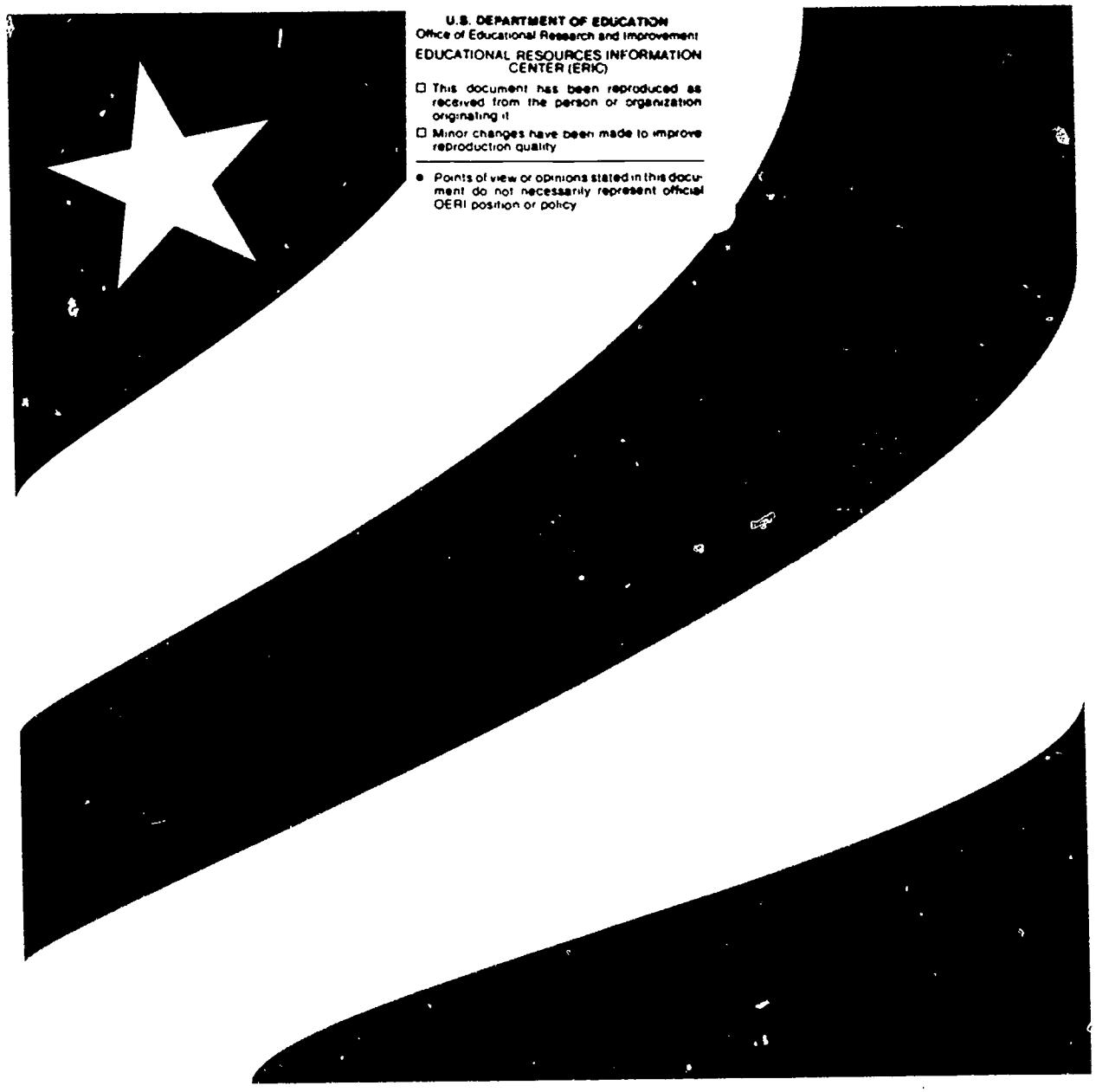
The National Information Infrastructure: Requirements For Education and Training



Prepared by the National Coordinating Committee on Technology in Education and Training (NCC-TET)

March 25, 1994

Executive Summary

Access Requirements

1. Ensure that all Americans have affordable access to the NII.
2. Ensure that the NII is accessible in a variety of learning environments.
3. Develop a variety of sustained public and private partnerships and funding mechanisms to support education and training uses of the NII.
4. Make public and private information resources available to schools, institutions of higher education, training institutions, libraries, and arts and cultural institutions.

Education and Training Application Requirements

5. Coordinate NII-related education and training activities conducted by federal departments and agencies.
6. Develop and disseminate NII guidelines for education and training applications.
7. Identify and disseminate effective education and training applications of the NII.
8. Integrate applications of NII and related technologies into education reform plans.
9. Develop quality education and training applications for the NII.
10. Conduct research on the education and training applications of current and emerging technologies.
11. Promote training, professional development, and technical assistance for educators as an integral part of the development of the NII.
12. Support ongoing evaluation of the effectiveness and impact of the NII to inform policy makers and educators.

Technical Requirements

13. Emphasize interactive, broadband transmission of voice, video, and data for education and training.
14. Provide seamless interconnection among all relevant information networks and services.
15. Guide the development of voluntary standards that promote interoperability.
16. Ensure that the NII is easy to use.
17. Develop comprehensive directories of information resources and "navigation" systems for locating these resources.
18. Support user collaboration.
19. Create adequate measures to protect the security of resources on the network.

Disclaimer: This position paper has been prepared and is being distributed in order to facilitate understanding of education and training requirements that must be addressed in the development of America's National Information Infrastructure. It represents a consensus of opinions held by representatives of national professional education, training, and trade associations participating in the NCC-TET collaboration and does not necessarily imply endorsement by organizational participants in the Committee process or government personnel who attended meetings of the Committee.

Introduction

The National Coordinating Committee for Technology in Education and Training (NCC-TET) has developed the requirements discussed below to ensure that the National Information Infrastructure (NII) provides expanded opportunities for education and training. National organizations representing education, training, government, defense, business, arts and cultural institutions, and libraries have contributed to the development of these requirements. They are intended as guidelines to be used by the Administration, Congress, state agencies, national and state organizations, and other education and training stakeholders to help shape future policy and legislation.

This is a time of unparalleled change in the United States. The growing integration of the global economy is placing enormous stress on our labor force requirements and education and training systems. In the aggregate, jobs of the future will be more complex and demand much more of employees. Lifelong learning will eventually become commonplace. This means that the education and training communities must accommodate an enormously diverse community of learners in a wide variety of contexts. The NII has a preeminent role to play in meeting the emerging needs of our society. As one commentator notes:

> *The promising vision of an advanced telecommunications infrastructure lies not only in its potential to help public and private institutions to prosper and survive. but also in its capacity to improve social. educational. and economic services for the vast majority of the nation's citizens. (Sheekey 1993)*

The education and training communities need an NII that allows interactive communication among teachers, students, and parents and meets the complex and diverse information needs of teachers and students. The NII must be able to support learning across a whole range of users and contexts while overcoming the barriers of time and distance. The NII must support attainment of the National Education Goals.

The requirements are grouped into three areas: access requirements, education and training application requirements, and technical requirements.

Access Requirements

Requirement 1. Ensure that all Americans have affordable access to the NII.

Rationale: Accessing the best and most recent information to do a job or perform a task must become a cultural norm by the end of the century. It is especially critical that schools develop this capacity. As Vice President Gore noted during his January visit to Los Angeles, "When it comes to ensuring universal service, our schools are the most impoverished institutions in society."

Almost 90 percent of K-12 classrooms lack even basic access to telephone service (Princeton Survey Research Associates 1993). When classrooms do have phone lines, schools are typically charged at the corporate rate for telephone service. Schools have not been the beneficiaries of the universal service policies that resulted in the delivery of basic service at affordable rates for most American homes.

An interim goal of providing at least one connection to every school building and educational site in the nation can be achieved almost immediately. The goal of connecting every home and classroom to the NII should be set for the year 2000. Populations (e.g., rural and poor populations) which have traditionally been underserved must have special attention paid to them with respect to both network access and information resources relevant to their needs.

Requirement 2. Ensure that the NII is accessible in a variety of learning environments.

Rationale: The applications on the NII should extend into homes and workplaces as well as schools, institutions of higher education, libraries, and arts and cultural institutions. The vision of the NII is one in which learning occurs in a variety of environments throughout the course of one's life. The NII should make it possible for individuals to gain access to the resources they need when and where they want access. The principle of "learning on demand" should guide the design of all NII-related education and training programs funded by the federal government.

Requirement 3. Develop a variety of sustained public and private partnerships and funding mechanisms to support education and training uses of the NII.

Rationale: It is clear that if our education system is to have universal access to a broadband NII, its use must be adequately subsidized in some fashion. Schools and other public service organizations would pay rates subsidized by private organizations using the network or tap into other revenue sources.

This may require a change in existing universal service arrangements. Currently, corporate users subsidize residential users. A revised model might require educational telecommunications to be subsidized by corporate users. We would, however, have to revise existing subsidy formulas to make them compatible with growing competition in the local loop. Future arrangements should require all telecommunications providers to contribute to universal service funds.

At the present time, rural schools usually pay more for access to information services because the nodes of information service providers are not located in local calling regions. *Universal service* must mean that all schools have affordable access to all information services, including high bandwidth resources.

To solve equipment and training problems, the federal and state governments could establish technology funds that could be used to help poorer districts defray the costs of purchasing the equipment or providing the training needed to use the network. Necessary requirements would

not only include the time online, but also the tools and materials (computers, modems, scanners, video cameras, ordinary cameras, VCRs, software applications, and printers, for example) that would be necessary to take full advantage of such an infrastructure. In the absence of outside funding, some districts would be far more able to use the resources of the NII than other districts.

State and federal funding is appropriate for education and training applications of the NII in a number of areas. These include planning grants, applications research and development, information clearinghouse activities for model programs, technical assistance programs, and training-related activities (in the development of materials, for instance).

Both state and federal governments should consider various forms of tax relief for producers to create software and programs and telecommunications providers to supply access, services, and equipment. Alternative sources of funding might be pursued. In an open, competitive telecommunications environment, schools could form statewide or even regional cooperatives with state and local governments and universities for purchasing telecommunications services. Their aggregate purchasing power would ensure that they received services at the lowest possible cost. Savings from such arrangements would be earmarked for special trust funds designed to allow districts to purchase services and equipment.

Another possibility includes renting (rather than auctioning off) the rights to new allocations of the electromagnetic spectrum to telecommunications companies. Revenues from such rental fees could result in billions of dollars to ready our educational institutions for the next century. Yet another alternative funding source could be a check-off box on telephone bills that allows rate payers to make donations to educational telecommunications projects.

Requirement 4. Make public and private information resources available to schools, institutions of higher education, training institutions, libraries, and arts and cultural institutions.

Rationale: The NII should include the information resources developed and maintained by both public and private sources. Educators and students are already using a wide variety of these resources. Teachers and students are now accessing data from the Jet Propulsion Laboratory- NASA space mission. Others are using the Internet to communicate with researchers or to search the catalogues of distant libraries. In California, teachers use software and video clearinghouses to select programs that align with state curriculum frameworks as well as national education goals and performance standards.

Education and Training Application Requirements

Requirement 5. Coordinate NII-related education and training activities conducted by federal departments and agencies.

Rationale: Many federal agencies and departments participate in grant programs and other activities that support the use of telecommunications in all disciplines. They include the Departments of Education, Defense, Agriculture, Energy, and Commerce (through the National Telecommunications Information Administration); the Advanced Research Projects Agency; and the National Science Foundation.

It is vital that adequate means be established for federal agencies to share information and coordinate planning, implementation, and evaluation of applications of the NII for the education and training communities. A national interagency council or task force could be established, for example.

Most federal educational telecommunications programs predate the formation of policy discussions and telecommunications industry changes that anticipate the NII. As a result, existing federal programs must be reshaped to prepare for radically new kinds of technology-based education and training environments.

Requirement 6. Develop and disseminate NII guidelines for education and training applications.

Rationale: The federal government has a legitimate and important role in the promulgation of national standards. National standards could serve a number of important functions within the NII context. Instructional standards would ensure that education and training applications of the NII help us attain the National Education Goals. To promote a teaching profession experienced in the effective use of technology, national teacher certification standards and credentialing requirements should be expanded to include applications of educational technology. Applications standards would work to maintain the quality of individual applications and facilitate their development. Standards should be developed with the ongoing advice of key stakeholders in the education and training communities.

Requirement 7. Identify and disseminate effective education and training applications of the NII.

Rationale: Effective educational technology and telecommunications applications should be developed, identified, and disseminated. An identification and dissemination process should be established and coordinated among the Regional Education Laboratories, the Department of Energy Laboratories, the National Science Foundation, and Department of Education programs. Existing dissemination systems such as the Eisenhower National Clearinghouse, ERIC, and the National Diffusion Network should be incorporated into this process.

Requirement 8. Integrate applications of NII and related technologies into education reform plans.

Rationale: One of the core components of the Goals 2000 initiative is that all states will develop comprehensive educational plans in support of the attainment of the National Education Goals. The NII (as it develops) and related technologies can be key supports for education reform. Serious

consideration should be given to educational technology in plans under development at the national, state, and local levels.

Careful planning is a prerequisite for the effective application of teaching and telecommunications in education and training. The national education reform agenda must ensure that states have the incentives and direction to develop technology and NII application plans. Plans should 1) involve education stakeholders in their design; 2) be guided by education and training needs of learners; 3) specify clear objectives related to national and local education goals; and 4) incorporate technology applications and practices that have been tested for their educational benefits.

Requirement 9. Develop quality education and training applications for the NII.

Rationale: The development of quality software and video programming is critical to the successful implementation of the NII in education and training contexts. Educational software and programming should support the National Education Goals and curriculum standards. Software developers and video producers should have financial incentives available such as tax incentives, low interest loans, and seed money to encourage development of products for the educational and training markets. As a condition of receiving incentives, software developers should be required to consult with experienced curriculum developers and practicing educators on the design and testing of programs. The educational technology application guidelines suggested above should be applied to this process. Ongoing dialogue between educators and industry will result in software that is well-suited to education and training needs for both learners and educators. To ensure that new technologies and applications address the needs of diverse and special needs populations, testing of software and programming should be conducted across socioeconomic, racial, ethnic, and gender lines.

Requirement 10. Conduct research on the education and training applications of current and emerging technologies.

Rationale: Educators need access to research findings for guidance in the selection of hardware and educational software. In numerous instances, school districts have made major technology purchases without reliable information about the educational benefits of these resources. Further research is needed to guide the development of new software and to determine the ability of existing technologies to meet the challenges found in education and training environments. Grants should be given for the study of what works under what circumstances for specific populations. Research findings should be made available to all educators over the network.

Requirement 11. Promote training, professional development, and technical assistance for educators as an integral part of the development of the NII.

Rationale: Staff development, training, and follow-up assistance is a prerequisite for effective and sustained applications of technology and telecommunications. Educators need opportunities to acquire the skills necessary to use telecommunications and other technologies effectively. Teacher training must not only be provided for equipment and software operation, but also for teaching strategies that incorporate the use of a variety of technologies.

Consideration should be given to the enormous training challenge represented by the NII. The skills and knowledge of people using the NII should be considered as important as its hardware and software. Funding for both the training of educators and the development of training materials should be provided.

Requirement 12. Support ongoing evaluation of the effectiveness and impact of the NII to inform policy makers and educators.

Rationale: Ongoing evaluations should inform stakeholders about access, adherence to standards, levels of use, and the impact of the NII on teaching and learning. The results of evaluation should be used to guide program improvements and to inform decision makers about the benefits and barriers of the NII in relation to education.

The continual improvement of educational and training applications on the NII depends upon ongoing evaluation. Evaluative criteria should be developed for the identification of promising practices and programs. These criteria should be used to evaluate educational and training applications of the NII in a wide range of diverse racial, cultural, and geographic environments.

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Technical Requirements

Requirement 13. Emphasize interactive, broadband transmission of voice, video, and data for education and training.

Rationale: The need for a broadband NII is extensively promoted for entertainment and commercial use, but not addressed as a critical need for education and training. Increasingly, educators are seeing the need to provide learning experiences in multiple media. A broadband network could be used to beneficial effect by delivering multimedia materials online to students at their workstations to support diverse learning styles.

Communication is currently limited to text and data in most instances. Interactive video will open new dimensions in the learning process that are not possible with voice and data transmission alone. However, broadband systems will be necessary to permit the use of interactive video in education. The ability to transmit voice, video, and data with relative ease across networks will extend teaching and learning beyond traditional school walls, opening the classroom to the world outside.

Requirement 14. Provide seamless interconnection among all relevant information networks and services.

Rationale: There are 71 satellite education networks worldwide. Roughly 60 networks are located in the United States alone (Hansell 1992). On the training side, the U.S. Army's Teletraining Network (TNET) uses digitized, compressed video to present 67 distributed training courses to over 30 sites. The Army Logistics Management College (ALMAC) has a Satellite Education Program (S.E.P.) delivering 20 distributed training courses to 79 sites (Redding and Fletcher, in press). Online services and electronic forums used by educators exist on a variety of electronic networks.

Existing resources could be leveraged much more effectively if education and training networks were interconnected and instructional programming were available across networks. The NII must become a seamless network of networks that links learners to information and communication. The barriers caused by incompatible technologies and isolated networks must be eliminated. New communication protocols and continued technological innovation should permit the easy exchange of information among diverse networks in a variety of media

Requirement 15. Guide the development of voluntary standards that promote interoperability.

Rationale: Standards that promote interoperability allow devices to connect easily with one another and permit software and hardware to be used in and exchanged across a variety of telecommunications and hardware environments. This lowers the cost of user training as well as hardware and software. Ultimately, this will lower hardware and software costs, create a robust market for education-related products, support equity of access, and eliminate one of the major barriers to the use of networking technologies.

Requirement 16. Ensure that the NII is easy to use.

Rationale: Research and development is needed to assure that user interfaces for education and training applications are designed to be easy to use and are as consistent as possible across computer platforms, individual databases, and information services. Today, the rich resources and networks of the Internet are a province of the few. In the general teaching population, only one-fifth of teachers are familiar with the Internet and only 4% have access to it (Princeton Survey Research Associates 1993). Over one-third of the K-12 teachers using telecommunications who were surveyed by the Center for Technology in Education did not even know if they had access to the Internet (Honey and Henriquez 1993). Teachers who do have Internet access report that complicated procedures are one of the major barriers to using it and engaging their colleagues in use of the network.

If the NII is to become truly universal and indispensable to our citizenry, it should be as easy to use as most household appliances. In this vision, the user takes center stage. "Knowbots," an idea first proposed by Robert Kahn, represents one of the most promising research directions at the present time. After being given a simple command in English, "the knowbot would 'travel' over the network, enter several computers it knows to contain this information, search around each using its syntax and conventions, combine the gleanings from these data stores into a single response, and translate it into a format understood by the user's computer" (Dertouzos 1991).

In this way, the enormous complexity of such a system is hidden from the user and the ease of use allows the user to build rapport with it. In the K-12 and training environments, many educators continue to experience considerable anxiety around computers and other electronic devices. An information and electronic service resource driven by friendly "electronic agents" would help to overcome this significant problem.

Requirement 17. Develop comprehensive directories of information resources and "navigation" systems for locating these resources.

Rationale: In part, resources and services appear fragmented because there is no comprehensive directory of available information over electronic networks. Users often are forced to resort to chance discoveries and word of mouth to locate relevant information sources. Better methods of organizing the many pieces of the information available to users are needed. A truly easy system of searching and accessing information on the network must be developed. Until this happens, the NII must have people available to serve as network guides.

Requirement 18. Support user collaboration.

Rationale: Since a premium will be placed on collaboration in the training and educational organizations of the future, the infrastructure's ability to support collaboration among users is a vital requirement. Contemporary efforts to encourage collaboration using electronic media are distinguished by several factors: collaboration in multiple modes and media, ease of use, easy retrieval and forwarding of sessions, and accessibility in the work environment (Brittan 1992).

A comprehensive directory is only the first step in addressing this need. People-to-people communication is open-ended, consists of a wide variety of data types (voice, text, images, graphics, animation, video, spreadsheets, documents, and gestures), and takes place in multiple contexts (Felde 1992).

Beyond establishing and terminating sessions, the NII must be able to maintain records of past sessions. After a session has occurred, it should be saved in the network in a form that allows the user to retrieve a record of interactions. The retrieval system should use subject or content references as

well as session references. For example, a user should be able to request the "record of the March 12 training on interpreting statistics." Moreover, it should also be easy to configure user groups. If several classes of students at geographically dispersed locations (or groups of individual students for that matter) wish to pursue a subject of common interest, it should be easy for them to arrange to work together online, share resources, and easily interact with a variety of connecting technologies. In other words, it should be easy to create collaborative learning communities.

Requirement 19. Create adequate measures to protect the security of resources on the network.

Rationale: The NII should have security systems adequate to protect the privacy of individuals, the confidentiality of documents, and intellectual property rights. The rights of privacy and confidentiality are cornerstones of our society. The NII will carry information that is sensitive to individuals and organizations. Government, business, and education must work together to guarantee the security of this information.

The NII should also have security systems capable of safeguarding intellectual property rights. This gives an incentive to software and video producers to develop and disseminate their works over the NII. The protection of intellectual property rights should be accomplished in a manner which safeguards the rights of right holders, provides them with appropriate and timely compensation, and allows protected information to flow over the network. Systems adopted to protect intellectual property should rely on the copyright law which permits the "fair use" of accessed over the network under some circumstances.

A balance must be created between the need for security and the need for open and free access to information on the network. Different levels of security should be established to allow material with varying degrees of sensitivity to be transmitted in the most effective manner.

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References

Brittan, D. (1992, May/June). Being there: The promise of multimedia communications. *Technology Review*, pp. 42-50.

Dertouzos, M.L. (1991, January). Building the information market place. *Technology Review*, pp. 29-40.

Felde, N. (1992, May). Multiplexing media. *IEEE Communications.*

Hansell, K. (1992, October). Satellite education networks. *Via Satellite,* pp. 32-33.

Honey, M. and A. Henriquez. (1993). *Telecommunications and K-12 educators: Findings from a national survey.* Center for Technology in Education of the Bank Street College of Education.

Princeton Survey Research Associates. (1993). *Communications survey.* Unpublished.

Redding, G.A. and Fletcher, J.D. (In press). Technical and administrative issues in distributed training technology. In Seidel, R.J. and P. Chatelier (Eds). *Learning without boundaries.* New York: Plenum Press.

Sheekey, A. D. (1993, November). Schooling and telecommunications. *Education Week,* pp. 24.

Task Force on Education Network Technology. (1993). *Achieving educational excellence by increasing access to knowledge.* National Education Goals Panel. Unpublished.

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Comments

The Committee invites comments and suggestions as to how these requirements might be achieved through independent and collective activities of public and private education and training stakeholders—locally, in states, and nationally.

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