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ABSTRACT

This report provides recommendations for a comprehensive telecommunications policy for Florida that focuses the state's technological resources on the accomplishment of specific educational goals. The recommendations are based on a review of the relevant literature, a survey of approximately 950 community college and university faculty, and a consultant's analysis of the state's telecommunication capabilities. The report outlines five broad principles to guide the state's efforts: (1) funding for technologically delivered instruction should be targeted toward courses and programs that will increase system capacity and ease access pressures; (2) increased educational opportunities brought about by technological innovation should not be limited to only those who can afford computers and other devices; (3) the state should lease access to telecommunications networks rather than develop them itself; (4) all future funding requests should specifically address how the resources will be used to address specific education goals; and (5) initiatives utilizing technologically delivered instruction should be able to demonstrate effectiveness in broadening access or enhancing academic performance through documented research. Twenty specific strategies to accomplish these principles are discussed. Four appendixes contain a copy of the consultant's report, survey data, membership of the Statewide Telecommunications Task Force, and relevant state legislation. (MDM)

STATEWIDE TELECOMMUNICATIONS

TASK FORCE

Report and Recommendations by the Florida Postsecondary Education Planning Commission

December 1995

POSTSECONDARY EDUCATION PLANNING COMMISSION

The Postsecondary Education Planning Commission, initially created by executive order in 1980, given statutory authority in 1981 (SS 240.145 and 240.147, Florida Statutes), and reauthorized by the 1991 Legislature, serves as a citizen board to coordinate the efforts of postsecondary institutions and provide independent policy analyses and recommendations to the State Board of Education and the Legislature. The Commission is composed of 11 members of the general public and one full-time student registered at a postsecondary education institution in Florida. Members are appointed by the Governor with the approval of three members of the State Board of Education and subject to confirmation by the Senate.

The major responsibility of the Commission is preparing and updating every five years a master plan for postsecondary education. The enabling legislation provides that the Plan "shall include consideration of the promotion of quality, fundamental educational goals, programmatic access, needs for remedial education, regional and state economic development, international education programs, demographic patterns, student demand for programs, needs of particular subgroups of the population, implementation of innovative educational techniques and technology, and the requirements of the labor market. The capacity of existing programs, in both public and independent institutions, to respond to identified needs shall be evaluated and a plan shall be developed to respond efficiently to unmet needs."

Other responsibilities include recommending to the State Board of Education program contracts with independent institutions; advising the State Board regarding the need for and location of new programs, branch campuses and centers of public postsecondary education institutions; periodically reviewing the accountability processes and reports of the public and independent postsecondary sectors; reviewing public postsecondary education budget requests for compliance with the State Master Plan; and periodically conducting special studies, analyses, and evaluations related to specific postsecondary education issues and programs.

Further information about the Commission, its publications, meetings and other activities may be obtained from the Commission office, 224 Collins Building, Department of Education, Tallahassee, Florida, 32399-0400; telephone (904) 488-7894; FAX (904) 922-5388.

POSTSECONDARY EDUCATION PLANNING COMMISSION

STATEWIDE TELECOMMUNICATIONS TASK FORCE

Prepared in Response to Specific
Appropriation 573
of the
1994 Appropriation Act

December 1995

TABLE OF CONTENTS

EXECUTIVE SUMMARY

In proviso language accompanying Specific Appropriation 573 of the 1994 General Appropriations Act, the Postsecondary Education Planning Commission, in cooperation with the Commissioner of Education, was directed to:

recommend a clear, comprehensive telecommunications policy that focusses the State's technological resources on the accomplishment of specific educational goals. The creation of the policy should be the work of a nine member task force with broad experience in educational technology and implementing new technology in the workplace.

A nine member task force with broad experience in educational technology and implementing new technology in the workplace was established. Appointments were made by the Governor (3), the Speaker of the House of Representatives (1), the President of the Senate (1), and the Chairman of the Postsecondary Education Planning Commission (1). In addition to recommending a statewide policy, the Task Force is also responsible for reviewing the ***State University System Master Plan*** to ensure that any distance education initiatives are consistent with statewide telecommunications policy.

Task Force appointments were completed by September 1994. Background information concerning telecommunications policies in other states and an inventory of educational technology/telecommunications resources available in Florida was collected and analyzed. The related work of current and past task forces was also examined. The Task Force collaborated with an ongoing study of technology use in public schools by utilizing the same consultant group, the Center for Educational Leadership and Technology (CELT), and matching its efforts to save effort and reduce cost. The Task Force met five times to discuss technology policy issues, hear from several presenters and direct the efforts of consultants and staff. As a part of its work, the Task Force conducted an examination of available research on distance learning and its uses in education, a survey of the state universities and community colleges to ascertain what types of telecommunications capabilities are present in the systems, a survey of approximately 950 community college and university faculty members and administrators in an effort to better understand their experiences using technology, and an analysis of the State's telecommunications capabilities.

Because of the short time period between the task force appointments and the due date for the report, a preliminary report was completed in February 1995. The Task Force identified a number of complex and ongoing issues related to the acquisition and utilization of emerging telecommunications services and products. The initial recommendations covered four broad themes: *Access, Infrastructure, Support Services, and Funding*.

The Task Force has found that the State possesses considerable telecommunications resources which might be more effective with more collaboration and cooperation among the agencies involved. Further, the Task Force has recommended that any future technology-based postsecondary programs focus their efforts on the overriding issue for the State - *providing additional capacity to the system to ease access pressures*. All technology/telecommunications requests, at a minimum, must describe how the appropriation will be used to address specific educational goals. The acquisition of technological hardware, while important, is not the overriding issue for the State. The Task Force recommends increased attention on the need for development of programs and materials for transmission and provisions for training

students, faculty and others in the use and application of new technologies. Finally, in terms of funding, the Task Force urges the State to maximize its bargaining position through increased coordination of purchases when purchasing or leasing telecommunications products and services.

Through the development of key guiding principles and specific strategies, the Task Force has identified a set of broad policy recommendations and actions which can provide the basis for the continued formulation of state policy as it relates to technology and telecommunications services.

Guiding Principles:

A. Funding requests for technologically delivered postsecondary instruction should be targeted toward courses and programs that will increase the educational system's capacity and ease current access pressures.

B. The State should philosophically dedicate itself toward ensuring the widest possible technological access to increased educational opportunities such that participation is not dependent upon ownership of telecommunications equipment. *No individual or group should be limited by the affordability of personal computers and other telecommunications tools.*

C. The State should fully utilize its bargaining position and continue to lease access to telecommunications networks from private vendors as cost effectively as possible rather than developing them itself. *Competition within and among industries should be encouraged in delivery systems through public bids.*

D. All future requests for funding the use of technology to deliver instruction should, at a minimum, specifically address how the resources will be used to address specific educational goals. *The requests should include: (a) Information which describes the educational significance of the program or service in addressing state educational priorities. (b) The target population for the program. (c) The program content to be transmitted. (d) The support services (such as training for instructors) to be provided.* (Now contained in Chapter 95-403, L.F.)

E. Initiatives utilizing technology to deliver instruction should be able to demonstrate effectiveness in broadening access or enhancing academic performance through carefully controlled and documented research.

Specific Strategies:

1. A single entity should serve as the coordinating body for distance learning services across all sectors of education. *The organization structure and placement within the Department of Education should be the result of a review conducted by the Commissioner which would ensure that this entity can meet the demands of the entire education community and effectively coordinate its activities with other state agencies.*

2. An Alliance for Statewide Telecommunications should be established as a federation of state agencies to maximize the use of state telecommunications services and capabilities. *Initial efforts should include a statewide inventory of equipment and capabilities conducted by the Division of Communications, Department of Management Services, a coordinated plan for scheduling and shared use, and a common marketing plan for the sale of unused capacity to private business and industry.*

*3. **Any future expenditures to modernize or expand the Florida Satellite System should be conditional upon a time-phased plan for the generation of revenue for modernization, staff support, and maintenance through the sale of its telecommunications capabilities to both the public and private sectors.** Such modernization should also be directly linked with any effort to equip regional sites with teleconferencing capabilities.*

*4. **The Florida Distance Learning Network should encourage increased use of public broadcasting stations for the delivery of instructional programs.** Continued funding as part of the state education budget should be predicated upon the utilization of their unused capacity during the early morning hours for instructional programs which are targeted toward the State's educational goals.*

*5. **The Florida Distance Learning Network (FDLN) should develop a business plan for the use of the state's new satellite transponder.** The plan should include the marketing of satellite services to educational institutions, state agencies and private business and industry.*

*6. **The Legislature should identify or establish a dedicated, recurring funding source for the development of technologically delivered educational courses and programs.** Possible sources would include reverted funds, revenue generated by the sale of unused capacity on the satellite transponder, or utility rate refunds. The fund should be structured as follows: (a) Funding would be available to all educational entities, public and independent; (b) The programs developed from this fund would be marketed statewide with a portion of any profits from the sale or use of such programs going to the source institution and personnel involved in its creation and a portion being returned to the fund for further program development. (c) The fund should be overseen by the Florida Distance Learning Network which would set program priorities, distribute funds, assure the production of quality products and produce an annual status report describing the number of projects funded and accounting for the sharing of proceeds.*

*7. **The State University System Board of Regents and the State Board of Community Colleges should establish fiscal policies which clearly describe how funding and services will be processed for students enrolled in distance learning courses and programs.** Such policies should include provisions for shared funding among the institutions involved in instruction which crosses conventional service areas and basic student support and library services to be provided to remote students.*

*8. **The recognition of distance learning courses for degree or certificate credit should be facilitated through the common course numbering system.***

*9. **The State University System, State Board of Community Colleges, and Department of Education should encourage the use of the State's technological capabilities, including the Florida Information Resource Network (FIRN) and Florida's public broadcasting stations, to expand student support and library services for all technologically delivered programs and courses.** Technologically delivered programs and courses should incorporate data network access, library access and voice messaging in their service plans.*

*10. **The Department of Education, the State University System Board of Regents, and the State Board of Community Colleges should establish a series of incentives to encourage the effective use of educational technology by faculty.** Such incentives as release time or*

credit for training and course revision and increased workload credit for technologically delivered instruction depending upon the class sizes involved should be considered.

11. At least twenty percent of the total funds appropriated for new technology programs or initiatives should be earmarked for training both faculty and student learners in their use and application.

12. The results of the review of intellectual property rights issues by The Joint Committee on Information Technology Resources should be used in the establishment of policy for the Department of Education, the State University System Board of Regents, and the State Board of Community Colleges regarding the development and repeated use of technologically delivered educational instruction and course content in distance learning.

13. The Department of Education, the State University System Board of Regents, and the State Board of Community Colleges should review current funding formulas such as those for capital outlay and library support to rectify any potential disincentives for the utilization of educational technology.

14. The design of technologically based programs of instruction should include the use of technology with the lowest total life-cycle cost that meets their requirements and enough flexibility such that periodic adaptation of the content and delivery at a reasonable cost is possible. *Original program development costs must be recouped over the life span of the instructional program.*

15. Any cost savings from courses and programs which use distance learning technologies for their delivery should be retained to address unmet educational priorities.

16. The Florida Information Resource Network should increase its efforts to deliver enhanced educational services, while supporting the operational needs of the data network.

17. The Florida Information Resource Network should investigate the possibility of reducing its costs by bidding out its need for telecommunications services in conjunction with similar services needed by SUNCOM.

18. The Division of Purchasing, Department of Management Services, should establish a workgroup of Library Directors and Information Resource Managers from the various state agencies to develop recommendations concerning a more coordinated approach to the purchase and utilization of telecommunications products and services. *The work group should specifically address how state agencies can work more closely together when purchasing telecommunications equipment and information products and services to further decrease costs, improve the state contracting process, and clarify policies and procedures in this area.*

19. Florida should develop a plan for migrating towards the use of digital video.

20. SUNCOM should adopt the ITU H.320/T.120 standards for videoconferencing to maximize compatibility with non-state entities.

Continued caution is urged in this area because of the speed at which technology changes and the costs involved. The Task Force stands ready to provide any assistance necessary in this complex area.

I. INTRODUCTION

Investments in educational technology are problematic for state policymakers because of the size of the investment required and the speed at which technology changes. Many of the new initiatives in educational technology have occurred in the K-12 sector. However, community colleges and state universities in Florida are quickly increasing their development and use of educational technology and telecommunications services to enhance teaching and learning. In order for the State's investment in educational technology to be maximized, the acquisition and use of technology and the creation of new initiatives and programs in the secondary and postsecondary sectors should be coordinated. Currently several states, including Georgia, Minnesota, Nebraska, South Dakota, Oklahoma, Oregon, Kentucky and North Carolina, have begun work toward a more coordinated approach to educational technology. If the educational experience is to be viewed as a seamless continuum from kindergarten through graduate school and beyond, discussions and pilot projects concerning staff training, acquisition of equipment, data transmission and networking standards, instructional methods and technology based curricula should involve all of the sectors. A comprehensive state policy for the acquisition and use of technological resources would provide a needed basis for collaboration and coordination among the educational sectors and business and industry.

In the ***1982 Master Plan for Florida Postsecondary Education (1982),*** the Commission recommended that a statewide invitational conference be convened to discuss ways to ensure policy development for educational technologies such as computers and other telecommunications devices. Subsequently, the Commission completed studies on a statewide satellite network (1985) and library automation (1988), which led to the establishment of the Florida Satellite Network (SUNSTAR) and the Community College Library Automation System (CCLA). In its 1990 study, ***The Florida Public Broadcasting System***, the Commission questioned the cost effectiveness of funding future educational telecommunications services without the guidance of a comprehensive state policy. The ***Master Plan for Florida Postsecondary Education (1993),*** called for a comprehensive telecommunications policy which would focus the State's resources on specific educational goals and provide guidance for funding and planning. In proviso language accompanying Specific Appropriation 573 of the 1994 General Appropriations Act, the Postsecondary Education Planning Commission, in cooperation with the Commissioner of Education, was directed to:

recommend a clear, comprehensive telecommunications policy that focusses the State's technological resources on the accomplishment of specific educational goals. The creation of the policy should be the work of a nine member task force with broad experience in educational technology and implementing new technology in the workplace.

A nine member task force with broad experience in educational technology and implementing new technology in the workplace was established. Appointments were made by the Governor (3), the Speaker of the House of Representatives (1), the President of the Senate (1), and the Chairman of the Postsecondary Education Planning Commission (1). In addition to recommending a statewide policy, the Task Force is also responsible for reviewing the ***State University System Master Plan*** to ensure that any distance education initiatives are consistent with statewide telecommunications policy.

Task Force Activities

Task Force appointments were completed by September 1994. Background information concerning telecommunications policies in other states and an inventory of educational technology/telecommunications resources available in Florida was collected and analyzed. The related work of current and past task forces was also examined. The Task Force collaborated with an ongoing study of technology use in public schools by utilizing the same consultant group, the Center for Educational Leadership and Technology (CELT). This avoided duplication of effort and greatly broadened the scope of the analysis at minimal cost. The Task Force met five times to discuss technology policy issues, hear from several presenters and direct the efforts of consultants and staff. As a part of its work, the Task Force surveyed the state universities and community colleges to ascertain what types of telecommunications capabilities are present in the systems. In addition, approximately 950 surveys were mailed to community college and university faculty members and administrators in an effort to better understand their experiences with technology.

Because of the short time period between the task force appointments and the due date for the report, a preliminary report was completed for submission. The Task Force identified a number of complex and ongoing issues related to the acquisition and utilization of emerging telecommunications services and products. This final report includes an examination of available research on distance learning and its uses in education, the postsecondary and secondary school survey data, an analysis of the State's telecommunications capabilities, and policy and planning recommendations to guide future expansion of the use of technology and telecommunications services.

The activities of this study were coordinated with several other studies of technology and telecommunications in Florida that were conducted during the same timeframe.

- The Florida Department of Education, Bureau of Education Technology, conducted a comprehensive survey and study of the use of technology in K-12 public schools. The Center for Educational Leadership and Technology (CELT) conducted the K-12 study under contract to the DOE. To ensure continuity across the two studies and maximize the use of information across K-12 and postsecondary education, PEPC also contracted with CELT. CELT released its final report in March, 1995.

- The State University System (SUS) Distance Learning Task Force was charged through proviso language in the 1994 Appropriations Bill with developing an addendum to the State University System Master Plan for Distance Education. The Commission staff attended the meetings of the SUS Task Force and reviewed documents generated as part of their study. In addition, SUS Task Force members attended Commission Task Force meetings. With the assistance of Dr. Robert A Bryan, Chair of the Task Force and Interim SUS Distance Learning Coordinator, and Dr. Michael G. Moore, Principal Consultant, the SUS Task Force generated the Master Plan Addendum in January, 1995.

- The Postsecondary Education Planning Commission received a grant from the State Higher Education Executive Officers and the Fund for the Improvement of Postsecondary Education to collaborate with the sector boards, institutions, students, and faculty to design a process that would allow students enrolled in a Florida public community college or university to use distance learning and other technology to complete critical courses which

meet the State's general education requirements for the associate of arts degree and the baccalaureate degree.

Education Policy and Technological Change

Instructional technology can be used in Florida to further several public policy agendas:

- increase student access to education
- reduce time needed to obtain a degree by allowing students to take required classes via distance learning that would normally not be available
- reduce the demand to build additional postsecondary education classrooms

Technology can help the state achieve these goals. However, costs will be excessive unless duplicative services are minimized, highly effective programs are produced, and programs are delivered in the most cost-effective manner.

Instructional technology is changing rapidly. Over the next several years video programming is expected to migrate to digital technology. Digital video makes editing faster and effectively increases the number of channels available on existing satellite, cable TV, and ITFS systems. The industry is expected to conform to the Motion Picture Expert Group (MPEG) II standards for pre-recorded programs and the International Telecommunications Union (ITU) H.320/T.120 standards for live video conferencing.

Much of the cost of digital video today results from the need to convert the signals to analog for viewing on standard television monitors. Such conversion costs will be eliminated over the next five to ten years as new televisions based on the digital high-definition television (HDTV) standards become common. Many new technologies recently deployed in at least some areas of the country could be used to deliver digital video signals.

- Technology developed originally at Bell Labs for telephone companies, called asynchronous transfer mode (ATM), promises to integrate the transmission of voice, data, and video over the same high-speed channels.

- Cable TV operators are preparing to deliver 500 channels of programming into homes by combining fiber optic cable, their existing coaxial cable, and digital video.

- Direct satellite broadcasters are beaming digital video signals into homes today.

- "Wireless cable" operators are making arrangements with educational organizations to convert their ITFS channels to digital and deliver the institution's signals along with many others into homes.

In May 1995, significant changes in Florida's regulation of telephone companies (Chapter 95-403, L.F.) were passed by the legislature. For the first time, competition is allowed in providing local dial tone. However, this change makes it all the more important that the needs of education in general and distance learning in particular be coordinated to ensure they are effectively addressed. This can most effectively be made at a statewide level.

Today it is difficult to tell which competing technology or industry will dominate, or which combinations of technologies will provide the best combination of cost and performance. However, it is possible to predict that the real

winners will be the customers who will have new services at effective prices due to the unprecedented competition due to deregulation and the new technical alternatives. The unprecedented trend in the growth and changes in technology concern the inverse relationship between cost and capability. As computers and other forms of technology increase in speed and capabilities, gradually the cost for these items decreases. Over time technology tends to be better and cheaper. What remains to be seen is whether education and the workplace can take full advantage of potential offered by improvements in technology.

The first step in developing Florida's plan should be to articulate the state's educational goals. The second is to establish processes to identify existing programs or develop new ones that address the educational goals. In identifying these programs, special attention must be paid to:

- what should be taught
- to whom should it be taught
- how should it be taught
- how will it be supported

These efforts will define the technology and telecommunications services required. The technological infrastructure should be developed to support these programs. However coordination with other education sectors and state agencies is needed to:

- eliminate duplication
- become highly cost-effective
- improve coordination among sectors

The most difficult barriers to achieving these goals are likely to be jurisdictional and organizational. In contrast, the delivery infrastructure should simply use the most cost effective delivery systems available.

The 1995 Legislature enacted the Education Facilities Infrastructure Improvement Act. This legislation, FS 464.506, enacts a number of the preliminary recommendations of the Task Force. Through this act, the Legislature established the Florida Distance Learning Network to exercise responsibility for statewide leadership in coordinating and enhancing advanced telecommunications services and distance learning in public education delivery systems. Specifically, the legislation enacts in whole or in part the following recommendations from the preliminary report of the Task Force:

- provides for a single coordinating entity for distance learning services (Preliminary Report #6);

- specifies that all requests for educational technology grants should specifically address how the resources will be used to address specific educational goals (Preliminary Report #3)

- specifies that at least 20 percent of any funds awarded be used for training both faculty and student learners in the use and application of he products developed (Preliminary Report #11);

The legislation also includes a number of references to coordination and cooperation among state agencies and private business as well as the efficient use of the state's technological resources. A needs assessment report and a statewide inventory of existing technological resources is specified in the legislation as a precursor to the development of a plan for using technology to improve the delivery of and access to education. These are issues of central concern to the Task Force.

Recent discussions on the use of technology for the delivery of educational programs and services have almost exclusively focussed upon the concept of distance education delivery systems. While there is a growing market for the offering of educational programs and services away from the campus and at times which are more convenient to the learner, the use of technology within the traditional classroom has received as much attention. In the last five years more attention has been directed toward the use of instructional technology within the K-12 classroom. In most cases this attention has been driven by networks of creative teachers, the increased availability of software and other resources for K-12, the growth of the Florida Educational Technology Conference, and encouragement at the state level. Postsecondary education has not received the same encouragement, does not participate as heavily in the FETC, and it does not have a wealth of existing educational computer courseware and other technological resources available in the marketplace.

The lack of focus on the use of instructional technology in the classroom is of concern to the Task Force. Before quality distance education programs and services can be developed, teachers and faculty must be skilled in the use and application of instructional technology in the classroom. Once a level of expertise, program quality and proven effectiveness is achieved, the more complex process of offering programs for credit via technology may be more safely launched. Distance education programs have great promise and potential for the future of all levels of education. Because, in most cases, public schools colleges and universities have not fundamentally restructured the learning process despite the availability of microcomputers and other forms of instructional technology for the last decade, continued caution is urged. Although, as will be discussed in Section II, the state possesses some impressive components necessary for a successful integration of technology into the learning process, problems with a lack of availability of technological resources, training, and program or course material have understandably slowed teachers and faculty members embrace of technology.

II. POLICY AND PLANNING RECOMMENDATIONS

Through the development of key guiding principles and specific strategies, the Task Force has identified a set of broad policy recommendations and specific strategies which can provide the basis for the continued formulation and application of state policy as it relates to technology and telecommunications services.

General Guiding Principles

Access to the postsecondary educational system has been at the forefront of policy discussions for several years. Space for more students in the State University and Community College Systems, given current budgetary constraints, is at a premium. Current projections of Florida high school students suggest that postsecondary education can expect the number of high school graduates to increase from its 1993-94 level of 88,646 to approximately 123,359 by the year 2003-04. This represents an increase of 35,000 students or 39 percent during a period when available funds for construction (Public Education Capital Outlay) are falling further below projected demand. With no significant increases in funding to add faculty and teaching space, postsecondary education institutions will have to look for ways to increase the educational system's capacity within current fiscal boundaries.

The use of distance education technology, can increase access. Through telecommunications, Floridians can access information and educational programs from their homes, workplace or community. Individual courses or entire degree programs can be delivered to greater numbers of students both in and out of state at times and locations convenient to them. Several vendors, including the Public Broadcasting Service, either have plans or are currently offering postsecondary degree programs using distance learning technologies. Technologically delivered instruction can be a valuable option for students who otherwise would delay completion of a degree program because they were unable to get desired coursework when needed.

A. Funding requests for technologically delivered postsecondary instruction should be targeted toward courses and programs that will increase the educational system's capacity and ease current access pressures.

Because technological access only comes through the purchase of the proper equipment, network connections and possibly course matriculation, it can be out of reach of many Florida citizens. Funding a minimal level of technology-based educational access for all will mean providing access to hardware and information resources (such as computers, satellite dishes and Internet or FIRN) in addition to matriculation costs. Equal opportunity for access to technologically delivered instruction can be a problematic and costly proposition. Surveys of students receiving instruction via computer or utilizing the Internet indicate that few minorities and women are represented among the current users. Cost and access to the hardware and software necessary has been cited as a significant factor in limiting technology's appeal. As a result, funding of technologically based educational initiatives must take into account the potential benefits and unforeseen restrictions implied in some types of delivery. While every home does not contain a personal computer, just about all have televisions and most have a videocassette recorder. Rather than becoming involved in funding one type of technology or program, the State should support the widest possible access to increased educational opportunities in the most effective

and cost efficient manner possible. The availability of technology based educational programs and services must not be limited to those able to afford the equipment and training necessary for access.

B. The State should philosophically dedicate itself toward ensuring the widest possible technological access to increased educational opportunities such that participation is not dependent upon ownership of telecommunications equipment. *No individual or group should be limited by the affordability of personal computers and other telecommunications tools.*

Staff in colleges, universities, and schools should primarily focus on delivery of education rather than support of technology. The hiring of support staff dedicated to specific technologies makes it difficult for institutions to switch to more cost-effective technologies in the future. Staff once hired for one purpose are difficult to re-deploy into other areas. In those cases where it makes sense to evaluate "make versus buy", staff costs should be calculated at their full costs. The full costs include salary, benefits, employer FICA and general overhead (space, utilities, office equipment, etc.). To minimize calculations for general overhead, institutions could use the overhead rate negotiated with the federal government for federal contracts.

Because there is no one technology today that can provide superior and cost-effective service in all situations, the state should be technology neutral in its approach to delivering telecommunications and distance learning services. The state should determine a level of service and features required and publicly solicit competing proposals from:

- within industries (different telecommunications companies)
- among industries (telephone, cable TV, satellite, wireless)

For example, if an institution wishes to provide in-service training to teachers in schools, proposals should be solicited from cable TV operators, phone companies, ITFS vendors, and others for proposals on how to deliver the service at the lowest cost. Further all sectors should investigate the greater use of cable TV for distance learning. The increased competition of including cable TV as an option for delivery of distance learning should result in lower costs for delivery. Cable TV may require the use of pay-per-view technology to ensure only students enrolled in the course can participate.

Currently, a mixture of telecommunications systems, which include fiber, computer telecommunications, cable and public broadcasting via satellite or ITFS systems, are available to educational institutions and state agencies within Florida. Further, a number of states have, through their public service commissions, established low educational rates and access requirements which must be provided by telecommunications companies. Other states such as North Carolina and Tennessee have built fiber networks which link state institutions and agencies at considerable capital and operating costs. The most cost efficient method seems to be to lease or purchase access as it becomes necessary from an ever increasingly competitive marketplace. The Florida Information Resource Network and the Division of Communications within the Department of Management Services have effectively utilized this approach to provide telecommunications networks and services at reduced cost. Because Florida's state government and educational institutions are large customers who require considerable telecommunications services, some

advantageous rate competition among private vendors for state business is foreseeable.

C. The State should fully utilize its bargaining position and continue to lease access to telecommunications networks from private vendors as cost effectively as possible rather than developing them itself. *Competition within and among industries should be encouraged in delivery systems through public bids.*

Interest in the potential of educational technology has led many states to appropriate millions of dollars toward the acquisition of hardware, software, and the construction of telecommunications networks. Perhaps the primary issue too often left for discussion after capital outlay monies have been spent concerns what these telecommunications capabilities will actually transmit and whether or not students can be positively affected. Florida possesses considerable resources in both network capabilities and computer hardware and software which can be used for the transmission of educational programs and services. What is lacking is more investment in high quality educational programs and courses of study which can be used to achieve realistic educational goals regardless of the method of delivery.

D. All future requests for funding the use of technology to deliver instruction should, at a minimum, specifically address how the resources will be used to address specific educational goals. *The requests should include: (a) Information which describes the educational significance of the program or service in addressing state educational priorities. (b) The target population for the program. (c) The program content to be transmitted. (d) The support services (such as training for instructors) to be provided.* (Now contained in Chapter 95-403, L.F.)

The widespread use of new technological methods for teaching in higher education has raised questions concerning the effectiveness and cost benefits of various applications of technology. Specific questions frequently asked included:

1. Do students in higher education settings using computer-assisted-instruction learn as much or more than students in traditional classes?

2. Do students in higher education settings using interactive videodisc (IVD) instruction learn as much or more than students in traditional classes?

3. Do students in higher education settings using distance learning (off-campus instruction) learn as much or more than students in traditional classes?

4. Can telecommunications increase the access of students to higher education?

5. Do some types of populations (ages, socio-economic subgroups) benefit less to a lesser or greater degree from the use of technology?

To address these questions, a preliminary computerized review of research was conducted to identify trends in the research. The study conducted was not intended to be exhaustive or definitive, but was conducted to highlight major findings to date in the literature. Given the many variations in programs that use technology as a delivery medium, it is difficult to generalize within the broad categories of interest. Some trends, however, are evident in the studies reviewed.

Overall, a considerable body of research documents the effectiveness of computer assisted instruction in increasing academic performance of students in higher education

settings. Research also substantiates the effectiveness of interactive video instruction in increasing academic performance of students in higher education settings. Emerging technology is reducing the production costs for these courses and increasing the capabilities of institutions of higher education to disseminate courses in many remote locations. Although evidence exists that documents some effective distance learning programs, more research is needed to investigate the variety of delivery methods used and possible impact on student learning. Distance learning courses have been used effectively with all ages and many types of populations and content areas. More controlled research studies, however, are needed in this area. No findings were identified that indicated some types of populations cannot benefit from using technology and telecommunications. Evidence was identified that documented the effective use of technology for remedial programs in higher education.

Further controlled studies in this area, however, are needed to identify factors most likely to increase access and barriers to implementing programs increasing access.

To summarize, instructional technology and distance education programs have in many circumstances proven to be effective in equalling or exceeding student achievement in traditional classroom settings. Clearly, the research is sporadic and much more controlled evaluation is needed. Yet, as state policymakers provide funding for instructional technology and distance learning programs they should feel confident that such initiatives will enhance educational achievement and/or provide increased access.

E. Initiatives utilizing technology to deliver instruction should be able to demonstrate effectiveness in broadening access or enhancing academic performance through carefully controlled and documented research.

Specific Challenges and Strategies

A number of challenges and specific strategies are discussed below which, when considered as a whole, will provide a solid framework for continued development of a comprehensive telecommunications policy for the educational sector and the state.

Many state agencies such as the Department of Management Services, the Department of Health and Rehabilitative Services, the judicial system, and the Division of Communications possess telecommunications equipment and capabilities which may have the potential for increased use through collaboration. Similarly, a considerable number of programs and initiatives which utilize technology in the delivery of educational programs are underway within the Department of Education. Production facilities, satellite uplink and downlink capabilities, program development, operational and training expertise, are all strengths which education can offer as a participant in a broad-based telecommunications system for Florida. Purchases of new telecommunications equipment or monies for new initiatives should not duplicate existing resources or programs without significant justification. One method to achieve this goal involves the establishment of a more formalized collaborative arrangement for the technological delivery of educational programs and services.

Many organizations in Florida are involved in the production and delivery of distance learning. The state needs some mechanism for coordinating these separate and independent distance learning providers to eliminate unnecessary duplication and to facilitate the recognition of credits awarded by one

organization by the others. Funding and cost issues such as which institution get the state funds associated with the student and which provides support services, must be addressed in a coordinated and systematic way.

A single coordinating organization should coordinate:

- policy development
- program development
- scheduling
- delivery systems

It should also:

- encourage cross-institutional program development

- use competitive bid for program development

- allow public and private providers to bid

- review program content for quality and effectiveness

Previously, the Florida Remote Learning Service (FRLS) provided a coordinated approach to the delivery of educational programs and services utilizing telecommunications technologies. The mission statement for FRLS specifically described its coordinating role in providing distance learning programs and services to public schools, community colleges, state universities and the citizens of Florida. With the enactment of the Education Facilities Infrastructure Improvement Act, the 1995 Legislature established the Florida Distance Learning Network to exercise responsibility for statewide leadership in coordinating and enhancing advanced telecommunications services and distance learning in public education delivery systems. The role of this new coordinating body should continue to evolve consistent with the recommendations and strategies proposed by the Task Force.

Strategy:

1. A single entity should serve as the coordinating body for distance learning services across all sectors of education. *The organization structure and placement within the Department of Education should be the result of a review conducted by the Commissioner which would ensure that this entity can meet the demands of the entire education community and effectively coordinate it activities with other state agencies.*

The Postsecondary Education Planning Commission recommended the creation of the Florida Satellite Network or SUNSTAR in 1985. The usage of the system by all state agencies and educational institutions was noted as being extremely important if the network was to meet its potential and help improve the quality of state government. In addition, the network would charge private customers a higher rate for its services and thereby generate revenue that would be placed in a trust fund for operating expenses. Since its creation, SUNSTAR has not been utilized by many state agencies on a frequent basis. While the market among business and industry for teleconferencing services remains high, some educational institutions and private vendors now offer these downlink services as well. The Florida Satellite Network primarily provides multiple site downlink broadcasts of teleconferences and meetings to large statewide audiences. With the purchase of a satellite transponder by the Department of Education, SUNSTAR will no longer have to purchase satellite time from other vendors and an increase in revenue potential is possible. Currently, SUNSTAR satellite dishes are, for the most part, outdated, with few replacement

parts and not prepared for digital service. The SUNSTAR dishes should be modernized or replaced if the sites are to be fully used. The cost of new digital dishes would be $2500-$3000 per site.

The creation of the Florida Satellite Network was based upon the concept of maximum collaboration such that one state satellite network would be created for use by education, all state agencies, and private business. In 1991, the Legislature authorized the establishment of a satellite network within the Department of Health and Rehabilitative Services at a projected cost of $304,000. Currently, the HRS system consists of 44 downlink sites located in regional offices, state mental hospitals, and county health units. For the most part, this system appears duplicative of the existing Florida Satellite Network. However, the system envisioned by HRS would be utilized primarily for curriculum delivery. Similarly, the Department of Corrections has plans to purchase 31 satellite dishes for education and training purposes. In a broader sense, the concept of a single statewide satellite network is still viable and attractive from an economic and marketing standpoint. With proper planning and cooperation, SUNSTAR and the HRS networks can be complementary and mutually supportive. Theoretically, a single satellite network building on existing telecommunications resources, such as satellite dishes, telephone bridges, teleconferencing equipment, and uplink capabilities, present in Florida's state agencies would increase the State's overall capacity through closer collaboration and cooperation and provide the structure for a unified marketing plan and referral system for the sale of unused capabilities to private business in the same way SUNSTAR does now. Such a structure would not require any additional bureaucracy but could be created as a federation of state agencies dedicated to the promotion of more effective use of existing technological resources. Such an alliance would require an inventory of existing resources and capabilities and agreements for centralized scheduling and fee structures. Membership in the alliance would depend upon telecommunications capabilities, availability of facilities, and the level of services which could be provided by an agency. The alliance would provide an increased capacity for revenue generation, an inventory of teleconferencing resources and services.

Such an alliance could be initially created with the Florida Distance Learning Network (FDLN) at the hub providing transponder and broadcast access, as well as institutional grants for programs and infrastructure training. The spokes of the alliance would be made up of state agencies with a state purchased telecommunications infrastructure and capabilities such as the Department of Health and Rehabilitative Services, the Department of Corrections, the Department of Community Affairs, and the judiciary. A logical starting point for the alliance would be development of a statewide inventory of existing state owned satellite downlinks and uplinks, transmitter towers, and other major capital investments.

Strategies:

2. An Alliance for Statewide Telecommunications should be established as a federation of state agencies to maximize the use of state telecommunications services and capabilities. *Initial efforts should include a statewide inventory of equipment and capabilities conducted by the Division of Communications, Department of Management Services, a coordinated plan for scheduling and shared use, and a common marketing plan for the sale of unused capacity to private business and industry.*

*3. **Any future expenditures to modernize or expand the Florida Satellite System should be conditional upon a time-phased plan for the generation of revenue for modernization, staff support, and maintenance through the sale of its telecommunications capabilities to both the public and private sectors.** Such modernization should also be directly linked with any effort to equip regional sites with teleconferencing capabilities.*

Public broadcasting stations provide programming that ranges from popular series and educational programs from the Corporation for Public Broadcasting to reports covering the Legislature during the session. Often the distinction is made between public broadcasting stations and instructional television. Instructional television (ITV) usually involves the delivery of educational programs or courses for a designated audience. Public broadcasting is viewed as having a wider mission which includes many other popular offerings, in addition to educational programs. Florida provides partial funding for 13 public broadcasting stations. Yet, in most cases, Florida's public broadcasting stations are underutilized for instruction.

Often, during the hours of midnight through 6:00 am, these stations are not on the air. Since Florida's public broadcasting stations provide approximately 99 percent coverage of the state with their combined signals, this represents 6 hours per night or 42 hours per week which could be used for the purposes of delivering instruction to any household with a television set and video cassette recorder. Although the stations receive state support through the state funded Florida Community Service Grants, some additional funding may be necessary to offer overnight instructional programming. The feasibility of such service and any additional funding needs should be examined in cooperation with the Florida Distance Learning Network Board of Directors.

Strategy:

*4. **The Florida Distance Learning Network should encourage the increased use of public broadcasting stations for the delivery of instructional programs.** Stations funded through community service grants provided by the Department of Education should make their unused capacity available (e.g. midnight to 6:00 a.m.) for instructional programs which are targeted toward the State's educational goals.*

Satellite delivery of programs should continue today as the most cost-effective system for statewide delivery of the same program to a large number of individual sites. Digital technology is increasing the capacity of satellite delivery systems allowing simultaneous broadcast of multiple channels on a single transponder. However, satellites may not always be the best method of delivering courses to multiple sites. As an example, if the cost to lease a satellite transponder ($200,000/month) is instead applied to a North Carolina Information Highway type connection ($4,000/month), it would provide 50 sites with at least two broadcast quality two-way video circuits and high speed data. It is unlikely that such technology will be widely deployed in Florida during the next 10 years.

Florida should continue its plans to use its new satellite transponder but should require that a business plan be developed for the new transponder to ensure its effective use. If the state is unable to develop and deliver sufficient course material to fully utilize the transponder, it could lease some of the time to other organizations. With a $10 million cost and a potential 10 years of operation, the state could lease the entire transponder out for about $2.4

million a year, resulting in a 21% return on investment assuming no increase in monthly income over the life.

Strategy:

5. The Florida Distance Learning Network (FDLN) should develop a business plan for the use of the state's new satellite transponder. *The plan should include the marketing of satellite services to educational institutions, state agencies and private business and industry.*

Funding initiatives for educational technology have often focussed on the acquisition of telecommunications equipment and services. The development of programs for broadcast, which might include anything from a one hour seminar to entire course sequences and degree programs, can be extremely labor intensive and costly. In many instances telecommunications equipment is acquired long before educators have decided what educational programs will be broadcast, developed or acquired. Presently, a wealth of companies, including the Public Broadcasting Service, are developing and marketing educational programs for sale to states and local public television stations. The Legislature appropriated $12.7 million for the purchase of a satellite transponder during the 1994 session. The transponder is located on Telstar 401 just as those owned by Georgia, Louisiana, South Carolina, the Public Broadcasting Service, and the National Technological University. With access to a transponder, educational programs can be broadcast statewide, nationally, and internationally. With such technological capabilities, the challenge remains to develop high quality educational programming for broadcast.

While in some cases it is more cost efficient to purchase an existing program, such prepackaged programs may not be as effective in addressing specific statewide goals. In many instances, there is a need to develop courses and programs. However, program development often requires significant investments of capital even when collaborating with private business or another state. Few institutions can free the financial resources necessary for such ventures even when the finished product can be sold to generate revenue beyond the initial investment required.

One possible source of funding for programming involving the use of telecommunications technology is unspent general revenue. In 1993-94, the Department of Education (including the State Board of Community Colleges and the Board of Regents) reverted $3.79 million in unexpended general revenue. These are funds which remain unspent by December 31 following the year they were appropriated. In recent years the practice has been to return these funds to the general revenue pool for subsequent appropriations or inclusion in the Working Capital Trust Fund. A percentage of such reverted funds could be used to support program development for instruction involving the use of telecommunications.

The satellite transponder represents another possible source for funding program development. Satellite time is currently a scarce commodity that can prove costly when purchased. Prices for transponder time have recently climbed to $1,000 per hour due to high demand and launch failures. In many cases, time is not available even at this price. Through the sale of unused satellite time, the State can realize a return on investment in the transponder that can be used as a dedicated revenue source for funding program development for instruction as well as infrastructure needs.

A third option involves using utility rate refunds, as was done in Georgia, to fund the development and acquisition of technological programs, services, and equipment.

The legislation (Chap. 95-403, LF) which established the Florida Distance Learning Network specifies that the Network will have the authority to:

- Secure and administer funding for programs and activities of the Florida Distance Learning Network, from federal, state, local, and privates sources and from fees derived from services and materials. The board of directors shall also have the power to solicit, receive, hold, invest, and administer any grant, payment, or gift of funds or property and make expenditures consistent with the powers set forth in ss. 364.506-364.514.

The FDLN will coordinate the use of the state's satellite transponder and other advanced telecommunications capabilities. As a result, revenue from a variety of sources including the sale of satellite time should be available to support the development of technologically delivered programs and courses. Since current budgetary procedures require that any requests for new initiatives, such as distance learning programs, be funded through existing resources, a dedicated revenue source is even more important if the state is to encourage course and program development in this area.

Strategy:

6. The Legislature should identify or establish a dedicated, recurring funding source for the development of technologically delivered educational courses and programs. *Possible sources would include reverted funds, revenue generated by the sale of unused capacity on the satellite transponder, or utility rate refunds. The fund should be structured as follows: (a) Funding would be available to all educational entities, public and independent; (b) The programs developed from this fund would be marketed statewide with a portion of any profits from the sale or use of such programs going to the source institution and personnel involved in its creation and a portion being returned to the fund for further program development. (c) The fund should be overseen by the Florida Distance Learning Network which would set program priorities, distribute funds, assure the production of quality products and produce an annual status report describing the number of projects funded and accounting for the sharing of proceeds.*

Currently, many postsecondary institutions have designated service areas within which they maintain their authority to remain the sole provider of educational programs and services within their respective systems. Education will face increased competition from private and public providers of educational telecommunications services and programs. Through advances in telecommunications technologies, these historic service areas have become transparent. Although these service areas are still an issue in the State, much of this discussion is a direct result of concerns over the potential for lost revenue. Just as has been done in other states, institutions must work out cooperative service and revenue sharing arrangements. Through closer collaboration, these institutions will improve their ability to offer programs and services at reduced cost and thereby remain competitive in what will be a global technological marketplace. The State has implemented a common course numbering system throughout the state universities and community colleges, with reciprocal agreements on the transferability of courses. Although such a system was designed to allow a student attending one institution to transfer to another with as many credits as possible, it could be

further utilized to allow a student attending one institution to take courses from other institutions via distance learning technology that would count towards a degree or certificate. If for-credit distance learning courses are to become sufficiently common to impact some of the state's high priority needs, such recognition of credits must become automated.

Strategies:

*7. **The State University System Board of Regents and the State Board of Community Colleges should establish fiscal policies which clearly describe how funding and services will be processed for students enrolled in distance learning courses and programs.** Such policies should include provisions for shared funding among the institutions involved in instruction which crosses conventional service areas and basic student support and library services to be provided to remote students.*

*8. **The recognition of distance learning courses for degree or certificate credit should be facilitated through the common course numbering system.***

Delivery of such services as counseling, tutoring, financial aid, library services, registration and advisement to remote learners can be problematic at best. Many courses today need computers and /or access to library resources. People using distance learning in remote locations should not be barred from these essential tools for educational achievement. Because not all learners possess the skills necessary to take full advantage of opportunities that technologically assisted or delivered programs offer, many remote students will require more contact and assistance than normal. Data communications can be used to distribute materials, coordinate sites, assign and collect homework, continue discussions between course broadcasts and survey student satisfaction upon completion. Since Florida has already provided for access to its library systems and many institutions utilize telephone registration, many other support services should be offered such that students can access them at locations and times which are convenient to them. Just as in other states, Florida's postsecondary institutions can expand their support services through the use of centralized and regional support centers, toll free numbers for voice and FAX responses, and electronic mail.

Strategy:

*9. **The State University System, State Board of Community Colleges, and Department of Education should encourage the use of the State's technological capabilities, including the Florida Information Resource Network (FIRN) and Florida's public broadcasting stations, to expand student support and library services for all technologically delivered programs and courses.** Technologically delivered programs and courses should incorporate data network access, library access and voice messaging in their service plans.*

Survey data provides an instructive picture of which technologies are most prevalent within education and their use. Within secondary education videotaped programming and video emerge as the dominant technology, while in postsecondary education computers and interconnected data networks were most prevalent. A majority of secondary and postsecondary institutions reported the availability of video production capabilities, televisions and videotape recorders and cable television hookups when needed. However, the possession of satellite dishes and related technologies was almost completely dominated by postsecondary institutions. In terms of

technologies use, survey data indicates that a majority of teachers in secondary schools and postsecondary faculty utilize computers and calculators on a weekly basis. As might be expected, public television and VCR's were also used weekly by a majority of secondary teachers. The survey data further indicates that while students may use word processing, computer aided instruction, spreadsheets, databases and telecommunications programs to varying degrees, a wider variety of these programs was being employed in K-12 instruction. The most often used application program by postsecondary students was word processing software. Although secondary students also made use of word processing software to an equal degree, computer aided instructional programs were the most often utilized application in the secondary schools.

These survey data suggest that a wider variety of instructional technology is being employed in K-12 education than within colleges and universities. Similarly, technology is not used extensively for instruction in postsecondary education at this time. Although a number of institutions are employing technology to enhance their efforts in the classroom, the majority of faculty members appear to be utilizing computers for word processing and activities that support instruction rather than as a part of the actual classroom.

At the postsecondary level encouraging the use of technology to enhance the teaching process is made more complex because of the large number of teaching assistants and adjunct faculty employed. In order to incorporate technology effectively in the delivery of educational programs, fundamental revisions of an educational program content are often necessary. Further, to increase the use and acceptance of technology by faculty and other instructional personnel, a system of incentives will have to be created. Such incentives should include such things as release time or credit for training and course revision and increased workload credit for some technologically delivered instruction depending upon the class sizes involved. Innovative and effective uses of technology in the classroom might be included as a consideration in the awarding of Teaching Incentive Program funds for salary enhancement at the postsecondary level.

Strategy:

10. The Department of Education, the State University System Board of Regents, and the State Board of Community Colleges should establish a series of incentives to encourage the effective use of educational technology by faculty. *Such incentives as release time or credit for training and course revision and increased workload credit for technologically delivered instruction depending upon the class sizes involved should be considered.*

Acquisition of technology often outpaces the creation of training programs for its users. Results from the faculty survey suggest that little technology is being utilized in the post secondary classroom. The majority of faculty indicated that they primarily use computers for word processing on a daily basis (69%), calculators on a daily or weekly basis (65%), and videocassette recorders or monthly (48%) a few times a year. Further, although most students entering the education system have been exposed to technology to some degree, many will require training in its use and application in order to get the most out of their educational experiences. A recent report by the American Association of State Colleges and Universities indicates that more than two-thirds of the 230 institutions surveyed either have or are considering computer-competency requirements for students. Yet, only a fifth had similar standards for professors. The

report also noted that computer access for the ever-growing number of part-time faculty is a problem, with issues of technology integration, faculty development and campus wide communication quickly emerging. The investment needed to provide the hardware and training necessary to use computer-based learning materials remains a major obstacle for many institutions. Currently, 30 percent of the funds received as a part of a School Technology Grant within the Department of Education must be used for training.

Strategy:

11. At least twenty percent of the total funds appropriated for new technology programs or initiatives should be earmarked for training both faculty and student learners in their use and application.

In order to fully reap the financial benefits of technologically delivered instruction, course content, once developed, will need to be used repeatedly for some period of time. With today's technology, a broadcast of a faculty member's lecture or scholarly material can be taped and preserved and watched over and over. In many instances, private vendors of educational programs, such as Mind Extension University, will pay a flat fee to a course lecturer and then offer the program repeatedly. However, most faculty would like to control the ultimate disposition of any broadcast of their course material. The issue of intellectual property rights over course content is still being debated nationally among lawyers, faculty unions, and the federal government. The control of program content, its use and ultimate dissemination by an educational institution utilizing telecommunications technology, must be settled if distance learning is to be widely utilized in Florida. The Joint Committee on Information Technology Resources is examining the issues associated with intellectual property rights related to the development and repeated use of technologically delivered educational instruction and course content in distance learning and based on this examination can provide alternatives for consideration by the State University System, State Board of Community Colleges, and the Division of Public Schools by January, 1996.

Strategy:

12. The results of the review of intellectual property rights issues by The Joint Committee on Information Technology Resources should be used in the establishment of policy for the Department of Education, the State University System Board of Regents, and the State Board of Community Colleges regarding the development and repeated use of technologically delivered educational instruction and course content in distance learning.

The cost of technology for education is high and its capabilities ever changing and expanding, thereby making equipment rapidly obsolete. Current formulas for funding and replacement policies do not adequately address such items as computers and satellite dishes. Funding formulas are often based upon such things as student usage of building square footage while equipment replacement policies are based upon the life cycle of such office equipment as typewriters. Although they will utilize library and other support services, students enrolled in a distance learning course from their homes often do not impact current funding formulas since they rarely generate any presence on campus.

Strategy:

13. The Department of Education, the State University System Board of Regents, and the

State Board of Community Colleges should review current funding formulas such as those for capital outlay and library support to rectify any potential disincentives for the utilization of educational technology.

While telecommunications offers a means to extend the reach of the education enterprise, it may not bring about any real reduction in expenditures. Yet, when compared to the costs of adding more buildings and faculty to serve projected enrollment increases, using telecommunications technologies to deliver educational courses and programs to more of Florida's citizens is attractive. The acquisition and support of the technology and the provisions necessary for training, technological support, and curricular revision will likely overshadow any initial savings. In the long term, it is possible that more students can be served for less money. The state should use the technology with the lowest total life-cycle cost that meets the distance learning requirements. The life-cycle cost should include purchase and installation, training, maintenance, staff support to monitor or maintain or manage the equipment over the useful life of the equipment. Using technology should bring about economy of scale advantages once the infrastructure costs are made. Telecommunications and educational technology have the potential to greatly influence the future of education in the State. Many of our educational institutions are developing new and exciting uses for technology as new capabilities are discovered or added. Innovation and creativity that produce sound results, increased numbers of students served or significant cost savings should be actively encouraged. Funding for such courses and programs should not penalize institutions that are able to reduce the cost of the delivery of instruction through technological means.

Strategies:

14. The design of technologically based programs of instruction should include the use of technology with the lowest total life-cycle cost that meets their requirements and enough flexibility such that periodic adaptation of the content and delivery at a reasonable cost is possible. *Original program development costs must be recouped over the life span of the instructional program.*

15. Any cost savings from courses and programs which use distance learning technologies for their delivery should be retained to address unmet educational priorities.

The Florida Information Resource Network has been described as one if not the most advanced educational data communications network in the nation. FIRN was originally created as a data network for the timely transmission of student, staff and finance data. School districts funding formulas are based on the data collected and transmitted via FIRN. Billions of bytes of data are transmitted monthly over the network, student transcripts, ACT/SAT test scores, financial aid needs analysis data are just a few examples of the types of information transmitted daily across the state. Since its creation, FIRN has expanded to become a provider of educational services and training materials for students and teachers. Currently, the network operates a World Wide Web Server that supports a variety of training materials and other "instructional" applications used by teachers and students. Since FIRN provides local or toll free dial up access from any area of the state, the network is a critically important tool in providing educational programs and services to public employees, teachers and students.

Currently the Florida Information Resource Network's (FIRN) Internet service arrangement with BBN Planet (formerly the Southeastern University Regional Area Network - SURAnet) provides relatively low prices for school districts, community colleges' and universities for Transmission Control Protocol/Internal Protocol (TCP/IP) networking services. However, the old regional National Science Foundation (NSF) sponsored networks such as SURAnet will not be supported by NSF in the future. FIRN should investigate the possibility of bidding out its TCP/IP services in conjunction with similar services needed by SUNCOM, as long as an educational rate is established and "open access" is maintained for education.

Strategies:

16. The Florida Information Resource Network should increase its efforts to deliver enhanced educational services, while supporting the operational needs of the data network.

17. The Florida Information Resource Network should investigate the possibility of reducing its costs by bidding out its need for telecommunications services in conjunction with similar services needed by SUNCOM .

As technology becomes more popular, the potential for unnecessary redundancy becomes more likely. Several states have established a coordinating body for technology and telecommunications services and equipment. In Florida, technology procurement committees exist under the auspices of the Information Resources Commission and the Board of Regents to review all technology expenditures over $500,000 for sole source providers and $1 million for others to ensure that they are compatible with agency strategic plans for information resources. Further, the Joint Legislative Committee for Information Resources and Technology has also actively encouraged state agencies to work more closely together in the acquisition of technological resources. Although the State contracts for the purchase of telecommunications products and services at reduced rates, not all of the state agencies and educational institutions have collaborated on their purchases. In addition, as information becomes more widely available via computer, libraries will have to contend with a paradigm shift from information acquisition (buying a book or journal for use by patrons) to information access (paying for the right to access a book or journal a limited number of times). In order for libraries to continue to offer access to knowledge regardless of ability to pay, budgetary provisions will have to be made to license information access for patrons. Since such licenses are often negotiated annually and dependent upon the potential number of users, utilizing the State's buying power will play a critically important role in reducing costs. The State of Florida has considerable bargaining power because of the volume of services and products purchased by state agencies. Increased coordination and collaboration in the use and purchase of telecommunications services is in the State's long-term financial interest and should be actively pursued.

Strategy:

18. The Division of Purchasing, Department of Management Services, should establish a workgroup of Library Directors and Information Resource Managers from the various state agencies to develop recommendations concerning a more coordinated approach to the purchase and utilization of telecommunications products and services. *The work group should specifically address how state agencies can work more closely together when purchasing telecommunications equipment and*

information products and services to further decrease costs, improve the state contracting process, and clarify policies and procedures in this area.

Video is becoming another data stream that can be transported over a wide range of terrestrial and satellites delivery systems. The trend towards digital broadcasting, particularly over interconnect networks, is accelerating.

Florida already uses digital video in SUNCOM videoconferencing. Florida should plan to move digital video first for networks connecting principal program distributors and local distributors, i.e., the interconnect networks. The state should follow national and international standards to ensure interoperability with the widest range of equipment.

Strategy:

19. Florida should develop a plan for migrating towards the use of digital video.

The Department of Management Services and the Department of Education have established a videoconference room within the Florida Education Center for use by education and other agencies. Other locations operated by the Division of Communications include Tampa, Orlando, Jacksonville, Miami, West Palm Beach and Ft. Myers. Five additional locations are planned for FY 1995-96.

The videoconference system provides live two-way video and audio conferencing between two or more sties. The current equipment allows up to eight sites to participate in a single videoconference. The videoconferencing system can be used for meetings, professional training/distance learning and other agency specific uses. Organizations lease the videoconference sites or provide their own.

Full motion digital video can require connections of tens of millions of bits per second. Compression can be used to reduce the bandwidth required. However compression beyond a certain point results in an increasing reduction of picture quality. Thus there is an inherent relationship between speed and picture quality. All other things being equal, the higher the speed of connection the better the quality of the picture. Although videoconferencing can be achieved using speeds as low as 112 kbps, effective use for distance learning usually requires speeds of at least 384 kbps.

The SUNCOM videoconferencing system uses compressed video over dedicated terrestrial point-to-point and multi-point lines. The SUNCOM has adopted the International Telecommunications Union (ITU - formerly CCITT) H.261 standard for videoconferencing. It uses 384 kbps (1/4 T1), 768 kbps (1/2 T1) and 1.544 mbps (T1) connections for videoconferencing. The H.320 standard has become the defacto standard for most teleconferencing systems today. The state videoconferencing systems should migrate to the H.320/T.120 standards for videoconferencing (note that H.261 is one component of the H.320 standard) so it can be used with other public and private organizations not connected to SUNCOM throughout the state and nation. Further, as ISDN becomes more widespread, dial up videoconferencing should be explored for locations with only occasional videoconferencing needs. By using an inverse multiplexor, three ISDN lines can be tied together to provide picture quality equivalent to the existing dedicated 1/4 T1 service.

Strategy:

20. SUNCOM should adopt the ITU H.320/T.120 standards for videoconferencing to maximize compatibility with non-state entities.

III. CONCLUSION

Although the Task Force final report emphasizes the State's strengths in telecommunications and suggests an overall direction for the development of key programs and infrastructure for a more complete system, much work remains. With the passage of the Education Facilities Infrastructure Improvement Act, which established the Florida Distance Learning Network the lack of coordination of distance learning programs and services within education can be addressed. However, before a comprehensive planning document can be completed, a number of issues remain for discussion and resolution.

Below is a partial listing.

- How can planning for instructional technology that cuts across all educational sectors and all state agencies be assured? What about system compatibility?

- What types of programs and courses need to be developed to enhance learning and increase access at the postsecondary level. What are the programs and courses most urgently needed for secondary education, postsecondary education, vocational education, and economic development?

- What types of programs are currently being offered in the state?

- Will the process of competitive grants for distance learning initiatives be continued? Will they address established educational and state priorities? Can their cost be justified by proven success?

- When the state takes possession of its transponder, how will its usage and sale of excess capabilities be managed? Can the transponder generate enough revenue to support the ongoing technological needs of education and the Florida Distance Learning Network?

- How will the Florida Satellite Network be modernized? Will the sites include teleconferencing capabilities?

- With the potential deregulation of the telephone and cable industries in the state, what new policies are needed for leasing telecommunications services?

Both the survey data and the consultant's recommendations have been integrated into the policy recommendations of this final report. However, a number of supporting documents and data resources are contained in the appendices of this report. Among them are:

- Survey forms and tables depicting the results of the Task Force's data collections activities.

- The consultant's report to the Task Force which provides a description of the states's technological infrastructure and a listing of activities of selected states as it relates to the development of technology policy.

Because of the possible problems and promising possibilities of instructional technology and the speed at which it continues to change, the Task Force and the Commission should continue to follow these issues and work with the Florida Distance Learning Network.

APPENDIX A

CONSULTANT'S REPORT

1. INTRODUCTION TO FLORIDA'S TELECOMMUNICATIONS INFRASTRUCTURE

Florida has an extensive telecommunications infrastructure that has been constructed by many different organizations at the state and local level over many years. Today Florida's distance learning organizations provide schools, higher education, businesses, and other public entities with more than 10,000 hours of video-based instructional programs per year.

Distance learning is more than just remote instruction. It should expand learning opportunities. Distance learning is not just for student instruction. It is also used for staff development and training and for home bound students. In addition, higher education delivers specialized instruction to business and industry work sites.

A recent survey of K-12 schools performed for the Florida Department of Education provides some insight into the use, problems and benefits of distance learning that may be true for all of Florida's education sectors:

- Seventy-eight percent of responding schools do not use distance learning, although about half reported the classroom use of public television or cable TV weekly or more often
- Scheduling is a problem due to varied class schedules across sites.
- Mode of delivery includes satellite, cable, microwave/ITFS.
- The need for distance learning varies from district to district.
- Ability to participate in distance learning varies from school to school and district to district.
- Smaller schools do not offer courses due to small enrollment and lack of available teachers.
- Although most teachers are comfortable using TVs, VCRs, and computers, they are not comfortable using camcorders, CD-ROM, videodisk, telecommunications, and satellite/distance learning equipment.

The Postsecondary Education Planning Commission foresees, by the year 2000, an additional 16,000 students will enter Florida's higher education system for which there is no room. By 2010 the increase will total 40,000 above today's enrollment. A glimpse of the future problems can be seen today. Although successful community college students are guaranteed places in the state universities, they cannot get into many degree programs which are at their maximum. Distance learning can increase the educational systems capacity and ease access pressures by:

- delivering identified "bottle-neck" courses to reduce the elapsed time needed to graduate
- avoiding or postponing the need for constructing additional classrooms through the use of existing facilities at other locations

Distance learning also holds the promise of improving education through competition on a course-by-course basis on a national scale. It will bring experts from around the state or nation into the classrooms when needed.

This chapter reviews Florida's principal distance learning organizations, their oversight organizations, and available technology. It then reviews approaches for delivery of distance learning in other states. Finally it makes recommendations on the steps to be taken to improve the effectiveness and minimize duplication of Florida's programming and delivery systems.

1.1. Introduction to Distance Learning

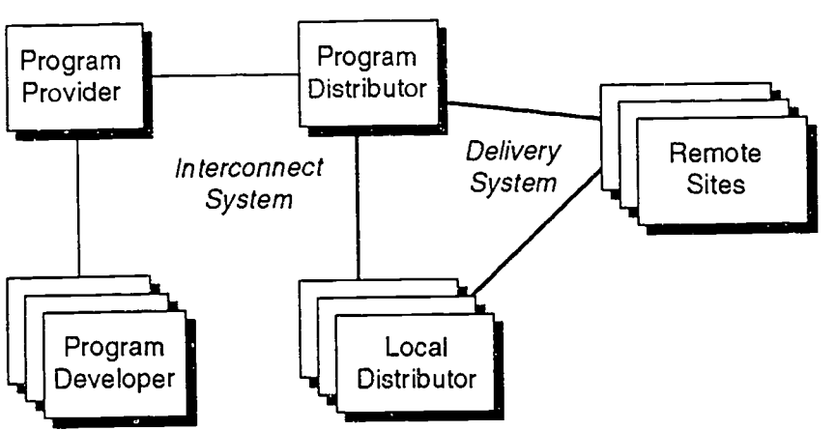
The term distance learning is broad, encompassing many different purposes, technologies and techniques. This section reviews some of the major elements in distance learning in order to establish a context for examining Florida's resources.

Figure 1 diagrams the major components of distance learning.

- Program developer - person or organization which develops the course and materials.
- Program provider - person or organization which originates the course and materials. This location may also have students for some types of distance learning.
- Program distributor - organization that distributes the program either directly to sites or to local distributors over the interconnect system. This could also be the program provider.
- Local distributors - some broadcasts require local distributors to get the signals to the intended audience. For example, many programs are transmitted by satellite to school districts, which then transmit over ITFS to individual schools because the schools cannot directly receive the satellite signals
- Interconnect system - connects program distributors to program providers and local distributors. A good interconnect system will allow any site to be a program provider.
- Remote site - where the students/learners reside
- Delivery system - connects program providers to local sites, optionally through local distributors.

These are connected through delivery systems, such as satellite, ITFS/microwave, leased lines, cable TV, etc. Although the delivery system is characterized as direct delivery, local delivery, and interconnect, there is wide overlap in possible technologies for delivering the services.

Figure 1: Major Components of Distance Learning



Distance learning has many dimensions, as shown in Table 1.

Table 1: Dimensions of Distance Learning

Purpose:	• credit towards a degree • meet certification requirements or licensure requirements, such as for nurses and teachers • non-credit • education of general public
Courses/Programs:	• Existing courses unmodified for distant learners - "candid camera" approach • Existing courses modified to better take advantage of medium • Courses designed specially for distance learning
Coverage:	• Statewide audience • Targeted towards sites in one or more regions • Intended for one or more specific sites
Audiences:	• higher education students enrolled at the institution • students enrolled at other state university or community college campuses • learners from other organizations, such as teachers receiving in-service training, prisoners, or human resource personnel • special courses designed for business/industry • others
Time-Frame:	• Live - teaching and learning occur simultaneous • Time Shift - teaching and learning occur at different times
Interactivity:	• None - students view/hear instruction • Limited - one-way video/audio with student audio talkback • Two way - video/audio with instructor • N-way - Each site sees/hears all other sites
Delivery systems:	• satellite • cable TV • ITFS • fiber optic cable • leased lines • dial lines • combinations of above
Signals:	• in analog or digital form • trade-off between quality of signal and bandwidth • could be compressed in any of a variety of techniques • could involve scrambling / encryption
Learner Location:	• state university • community college • school • hospitals • library • prisons • business • community facilities • homes
Funding:	• student counts towards FTE funding for the institution • wholly supported by student or business charges • other

1.2. Impediments to Distance Learning in Florida

The *Addendum to the State University System of Florida 1993-98 Master Plan* points out several serious non-technical impediments to distance learning in higher education:

- Lack of understanding about the concept and terminology of distance learning that leads to ambiguity and anxiety about it, and a perception by many that it will abolish or replace traditional classroom-based instruction.
- The regulations controlling federal financial aid and VA benefits limit access to distance learning programs and exacerbate inequities. For example the 9 credit hour requirement for eligibility effectively bars distance learners from financial aid.
- The accreditation process continues to focus on campus-based learning, faculty-centered teaching and classroom-based instruction as measurements for reviewing and evaluating programs.
- The capital outlay formula should be changed in order that consideration be given to an updated definition of space that recognizes the emerging role of technology in delivering instruction. For example one educator indicated that classrooms used to originate distance learning programs need to be about 40% larger to make room for cameras (typically three, with one dedicated to documents) and other equipment..
- The fee structure for distance learning should be different form that of traditional students and there is a need for new inter-institutional collaborative initiatives and new policies to facilitate new fee structures and external contractual arrangements for resource/facilities sharing. Additional funds for increased enrollment lag two years behind.
- Distance learning activities must be appropriately recognized in the faculty reward structure, including tenure, promotion and merit salary increase processes.
- There is need to review current SUS policy statements as they exist in System and universities' rules and the BOR/UFF collective bargaining agreement should be changed to ensure that they adequately address the ownership and use of intellectual property as those issues arise in developing and delivering distance learning.

Florida needs a mechanism for addressing these and other issues both within and between sectors.

In the past different organizations have focused on different aspects of distance learning. As a result, there is a danger that expansion of Florida's distance learning will result in redundant services, incompatible delivery systems, and excessive costs to deliver needed services.

Florida now has the opportunity to address distance learning in a comprehensive way in order to develop an infrastructure that supports all of these dimensions. Major advances in technology, discussed later, are blurring the distinctions between video, data, and voice. Now is the time to begin planning for a comprehensive infrastructure to address educational and state needs for distance learning.

2. DESCRIPTION OF FLORIDA'S TELECOMMUNICATIONS INFRASTRUCTURE

2.1. Some Organizations Involved in Distance Learning

Florida has many organizations involved in distance learning. These include the Florida Remote Learning Service, public television, all education sectors, the Division of Communications, the Department of Corrections, the Division of Management Services, Human Resource Services, FIRN and many others.

2.1.1. Florida Remote Learning Service (FRLS)

Florida Remote Learning Service (FRLS) uses existing delivery systems, such as public broadcasting, instructional television, satellite, videoconferencing, and FIRN, to provide instructional programming at the local level. Reporting to the Florida Department of Education Bureau of Educational Technology, the mission of FRLS is to:

> *provide and deliver quality educational material and programming via distance learning technologies to individuals located in educational facilities, business, community facilities, homes, libraries, and prisons.*

This is a very broad mandate which requires close coordination with the State University and Community College Systems. To facilitate such coordination, a State FRLS Advisory Council was recently established to provide guidance to FRLS. The Council is composed of K-12, community college and university educators, and business and community leaders.

FRLS provides statewide licenses for long-term use of specific video resources. For example, they purchased 5,000 hours of programming from the Distance Learning Associates. Acquiring such rights to video resources provides substantial cost savings for local districts and should be encouraged.

FRLS also negotiates with school districts, community colleges, universities, public television stations, and private companies to provide programming and support.

2.1.2. Public Television

The Office of Public Broadcasting in the Department of Education is authorized to direct the Florida Public Broadcasting Program System. There are thirteen public television and twelve public radio stations locally licensed and controlled.

This decentralized system allows for local program production as well as simultaneous broadcast of programs to a statewide audience through an interconnection system. The interconnect system uses satellites to distribute programs.

The Office contracts with the Florida Public Broadcasting Service governed by station managers for the production and transmission of statewide public affairs programs to local stations. Many programs produced for general viewing are used in the

classroom. An increasing number of programs are being broadcast to support specialized areas of instruction.

The Florida educational institutions with public broadcasting television stations are:

- Pensacola Jr. College
- Florida State University (plus repeater)
- University of Florida
- University of South Florida (plus repeater)
- Dade County School Board

Note that these count as seven of the eleven Florida Public Broadcasting Service television stations because the repeaters are licensed as an additional station.

2.1.3. Higher Education

Florida's State University System (SUS) and Community College System provide important and extensive distance learning opportunities. The University of Florida, Florida State University, and Florida A&M have a statewide mission. The other universities have regional missions except in unique program areas where they also have a statewide mission. The community colleges primarily have a regional focus. Both statewide and regional programs can benefit from the use of distance learning, although delivery systems for each might be different.

One of the oldest distance learning initiatives is the Florida Engineering Education Delivery System (FEEDS) which provides live and video-taped courses. Today FEEDS offers approximately 100 courses consisting of 4,000 hours of interactive instruction to about 1,400 registrants per year. They have awarded 525 masters degrees through these programs.

FEEDS uses the "candid classroom" technique where instructors deliver their regular courses to people at remote locations. Students are able to see and talk back to the instructor. Additional interaction between instructors and students is through voice mail and electronic mail. FEEDS employs a variety of delivery technologies, primarily ITFS, but also fiber optic cable, and T1 leased lines.

All higher education institutions are connected by a data network. Responsibilities for data networking is shared among the universities, regional data centers, FIRN, and the Division of Communications within the Department of Management Services. The Southeastern University Research Association Network (SURAnet), the old National Science Foundation regional network recently purchased by the commercial Internet provider BB&N, provides Internet access to Florida's education community.

Florida Center for Library Automation (FCLA) maintains the software systems for library automation on behalf of the state university libraries. The Library User Information Service (LUIS) provides access to each university's library collection and to additional information resources.

The technical infrastructure to support the crediting of distance learning courses among institutions could be easily put in place through FASTER (see FIRN). Electronic transcripts now facilitate movement of students from high school to

community colleges and universities and from one higher education institution to another. A common course numbering system eases articulation between and among the Community Colleges and State University Systems.

Many institutions are already working cooperatively on a regional basis. For example, Florida Atlantic University, Florida International University, the University of Central Florida and the University of South Florida have formed a new alliance to expand program availability through distance education techniques. These universities serving Florida's largest combined metropolitan areas are forging a new human and technical network known as MetUNET. It seeks to:

- increase access
- decrease involuntary delays in time to graduate
- provide a seamless vertical integration of academic institutions

Every community college has a director of distance learning. Many community colleges have multiple campuses and use distance learning between them. Extensive use is made of ITFS for delivery of courses. For their distance learning courses, community colleges tend to target the older adult with the maturity to learn.

The legislature directed the Board of Regents to amend its master plan to better address coordination issues among the education sectors. The resulting *Addendum to the State University System of Florida 1993-98 Master Plan*, recommends the creation of a public corporation called the Florida Distance Learning Network (FDLN). The FDLN would link the various existing resources of the state to plan, design and deliver credit and non-credit distance learning programs. FDLN would be accountable to a Board of Governors composed of representatives from K-12, Community Colleges, State Universities, public agencies, and the private corporate sector.

It further proposed the establishment of a Coordinating Center for distance Learning (CCDL) to administer FDLN and assist in the design and implementation of demonstration projects. CCDL would have the following units and associated advisory committees:

- Planning and Evaluation
- Program and Course Design and Development
- Media and Course Delivery
- Instruction and Learner Support
- Training Services
- Information Clearinghouse

2.1.4. Division of Communications

The Florida Division of Communications within the Department of Management Services uses the state's buying power to provide a wide range of voice, data, and videoconferencing services through SUNCOM to the state and its political subdivisions. SUNCOM serves state agencies, 62 of 67 school districts, all 28 community colleges, and all 10 state universities.

The Division of Communications oversees the state Centrex. It also manages a statewide data network connecting a broad range of computers in different agencies.

The Department of Management Services and the Department of Education have established a videoconference room within the Florida Education Center for use by education and other agencies. Other locations operated by the Division of Communications include:

- Tampa
- Orlando
- Jacksonville
- Miami
- West Palm Beach
- Ft. Meyers

Five additional locations are planned for FY 1995-96.

The videoconference system provides live two-way video and audio conferencing between two or more sties. The current equipment allows up to eight sites to participate in a single videoconference. The videoconferencing system can be used for meetings, professional training/distance learning and other agency specific uses. Organizations lease the videoconference sites or provide 'heir own..

Full motion digital video can require connections of tens of millions of bits per second. Compression can be used to reduce the bandwidth required. However compression beyond a certain point results in an increasing reduction of picture quality. Thus there is an inherent relationship between speed and picture quality. All other things being equal, the higher the speed of connection the better the quality of the picture. Although videoconferencing can be achieved using speeds as low as 112 kbps, effective use for distance learning usually requires speeds of at least 384 kbps.

The SUNCOM videoconferencing system uses compressed video over dedicated terrestrial point-to-point and multi-point lines. The SUNCOM has adopted the International Telecommunications Union (ITU - formerly CCITT) H.261 standard for videoconferencing. It uses 384 kbps (1/4 T1), 768 kbps (1/2 T1) and 1.544 mbps (T1) connections for videoconferencing.

In general, education uses SUNCOM for voice and video, while it uses FIRN for data communications.

2.1.5. FIRN

FIRN (Florida Information Resource Network) is a model for the nation in providing electronic services among individuals, schools, districts and the state agencies involved in education. FIRNMAIL provides e-mail and Internet access free of charge to all public educators. All school districts use FIRN and many of the schools within districts have a high number of regular users.

Florida's libraries use FIRN to interconnect their library systems. FIRN provides access to online catalog systems for the State University System (LUIS), the Community Colleges System (LINCC), and the State Library.

A large number of useful information services and instructional resources are available to school staff via FIRN. All data sources point to the effectiveness of FIRN in the field as well as in streamlining data collection from districts. Sixty-three percent of responding schools rated FIRN as either good or excellent.

The FIRN Coordinating Council provides guidance to and advice to FIRN on policy matters. The Council has representatives from each level of education plus DOE staff members in ex-officio capacities

FIRN operates the data transport facility linking all 67 school districts, 28 community colleges, and 10 state universities. A local or toll-free dial-in access to FIRN is available throughout the state. FIRN has 40 local dial sites throughout the state, 21 of which are at community colleges, and 240 dialup lines soon to be expanded to 400. Usage of FIRN has doubled every year.

FIRN operates FASTER (Florida Automated System for Transferring Educational Records). FASTER provides for the electronic exchange of student transcripts among Florida's school districts, community colleges, and universities.

2.2. Technology Oversight

Florida has established several oversight organizations become involved in distance learning projects.

2.2.1. Public Service Commission

The Public Service Commission (PSC) oversees the regulation of two-way telephone communications in the state. New legislation passed in May 1995 significantly changes the way telephone companies are regulated by the PSC. It found that competition in the provision of local exchange telecommunications services is in the public interest. As a result it will end the existing monopoly for local phone service on January 1, 1996, except in territories of small telecommunications companies which do not elect to replace the current "rate-of-return" regulatory approach with the new "price" regulation..

Competition, with the exception noted, will now be the rule in Florida. The new local exchange competition joins the previously permitted competition between local exchanges within each of Florida's eleven LATAs (Local Access Transport Areas). Communications between the LATAs is governed by the Federal Communications Commission (FCC) which allows competition between LATAs.

Of particular interest for distance learning is the requirement for local exchange telecommunications companies that provide video programming to designate capacity for public use. This provision is similar to one for cable TV.

The Office of Public Council was created by statue in the late 70s as a public advocate. It can appeal decisions of the PSC.

2.2.2. County Cable Authorities

The County Cable Authorities oversee cable TV franchises and receive up to 5% of the cable fees. Today 85% of the schools are connected to cable and 52% of Florida's classrooms are wired for video.

2.2.3. Information Resource Commission

All state agencies are required to develop Information Resource Management plans that must be approved by the Information Resource Commission (IRC).

Approval of Information Resource Management Plans for the State University System has been delegated to the Board of Regents. The IRC does not review the community college technology plans, although it does review the Division of Community Colleges' plan.

2.3. Technology Resources

2.3.1. Telephone Networks

Southern Bell serves about 55% of Florida's customers, with GTE serving about 25%, and Sprint, United, and Sprint-Centel approximately 12% collectively. Nine others server less than 1%. Each phone company is regulated separately.

The telephone companies in Florida are permitted to provide "video dial-tone" service to any customer within their local service area. With additional permission of the Federal Communications Commission (FCC), they are able to sell access to video networks and other video program suppliers. The first permanent video dial-tone authorization by the FCC (June 1994) in Dover Township, NJ now provides 384 channels to 38,000 homes. GTE has a video trial in Tampa. Bell South is working on a video trial in Atlanta.

Under current Federal Communications Commission (FCC) rules, local exchange carriers are prohibited from making connections between LATAs. Long distance companies such as AT&T, LDDS, Sprint, MCI, and many other carriers perform this function and may also compete in interexchange connections.

Collectively they provide a wide range of circuit switched, packet switched, and non-switched services at speeds up to 45 mbps that are the fundamental building blocks for telephone technology based voice, data, and video networks.

2.3.2. ITFS

ITFS (Instructional Television Fixed Service) is a low power microwave broadcast technology. Although it is limited to line-of-site (generally a radius of about 25 miles), Florida's flatness makes this an economical delivery system for one-way video.

2.3.3. Satellite

SUNSTAR is a multi-site teleconferencing service based on a satellite network of 34 receiving sites located within 50 miles of every Floridian. Designed originally as a service primarily for private business, SUNSTAR has also been used to deliver services to Florida educational, medical, business, and government communities.

To date SUNSTAR has been underutilized and its equipment is outdated and cannot be cost effectively repaired. Business has not used it as extensively as originally hoped.

When SUNSTAR was created, each site was given a steerable dish and required to provide a room and maintenance, along with the ability to rent the receive site. The original agreements have expired.

Florida has signed an agreement to purchase a transponder for $10 million on Telstar 401. This "Florida Transponder" will provide the ability to distribute programming widely at a price currently below market rates of other providers. Due to the failure of another satellite, Florida's transponder was bumped by a higher priority service. Until Florida takes possession of the transponder (expected in 1996), it is receiving rebates from AT&T that can be used to purchase time on other satellites. The Division of Management Services is responsible for the operation of the transponder.

2.3.4. Cable TV

The Cable TV Association has 165 cable system members. It has a studio which produces the all Florida Sunshine Network to 95% of its members providing sports and public affairs programming. They expect that all cable TV headends will be interconnected within the next five years.

Almost all cable TV companies are working to "fiberize" their network, which means breaking their network into coaxial segments serving 500-1,500 customers and linking each segment to the cable headend via fiber optic cable. This will dramatically enhance cable TV's ability to provide video-on-demand and 500 channels. Time-Warner is running a trial of this network in Orlando.

2.3.5. Direct Broadcast Satellites

Direct broadcast satellites are an emerging technology. The direct broadcast digital satellites use a high power transmitter, allowing the use of smaller receive dishes (as small as 18 inch). Since it potentially reaches a broader audience the cost for a channel is priced by the providers at several times the going rate for conventional satellite time. In addition, the current service providers require that organizations wishing to use their services must establish and pay for a direct high speed digital link to their satellite up-link facility.

Today direct broadcast satellites do not have a place in the delivery of distance learning. This is not because the technology is flawed but results from the way this industry is currently focused on high revenue entertainment services. For now, this is not an option that is affordable for distance learning applications in Florida.

2.3.6. Digital Satellites

Today most users of satellite systems are moving to digital signals. (See the earlier section on the Division of Communications for a discussion of digital video and compression). The Public Broadcasting System has adopted the General Instruments Digicypher II system which uses the Motion Picture Expert Group (MPEG) II video compression and provides for access control (scrambling) of the digital signal.

With a digital satellite the transponder is divided into multiple digital channels supporting different bandwidth and picture quality requirements. MPEG II allows degrees of compression, resulting in corresponding degrees of picture quality, as shown below:

Channel Type	Bandwidth	Picture Quality
A Channel	11 mbps	"broadcast" quality
B Channel	6 mbps	good quality
C Channel	3 mbps	VCR quality

Depending upon the satellite design, three B channels are available (Galaxy) or two A channels and one C channel.

Prices for transponder time have recently skyrocketed to $1,000 per hour due to high demand and launch failures resulting in limited satellite capacity. Often time is not available even at this price. It is more economical to lease a transponder at $185-210,000 per month. It is also possible to rent portions of a transponder, with 1/3 transponder (B channel) going for $70-80,000 per month.

Costs for upgrading to digital are about $1,300 for receive sites and $135,000 for originating sites, plus installation. Access control to scramble the signal costs an additional $70,000 for the originate site, but is included in the receive site costs. Although dishes can cost less, a $3,000 steerable dish will allow use of any satellite and minimize satellite power requirements, and thus minimizing ongoing costs.

2.4. National Initiatives

2.4.1. National Information Infrastructure Initiative

An Executive Order on September 15, 1993 established an Advisory Council on the National Information Infrastructure (NII), defining the NII is "the integration of hardware, software and skills that will make it easy and affordable to connect people with each other, with computers and with a vast array of services and information resources."

The NII, lead by the U.S. Department of Commerce, will create a seamless web of communication networks that will put vast amounts of information at users fingertips. When fully implemented, NII will:

- ensure that information is available at affordable prices
- act as a catalyst to promote technology innovation
- guarantee information security and network reliability

Recently the NII appears to have been put on the back burner. However many of its policies, such as "commercializing" the Internet and research into high speed networks, are laying the foundation for dramatic advances orchestrated by state and commercial interests.

2.4.2. National Learning Infrastructure Initiative

Educom started the National Learning Infrastructure Initiative (NLII) as a response the challenges and opportunities for distance learning inherent in the NII. The goals of the NLII are to:

- promulgate a vision of a National Learning Infrastructure and devise strategies to make it a reality
- harness federal, state, and corporate interest to realize return on current and future investments in instructional applications of information technology
- create a forum for re-engineering instruction in higher education
- endorse and support demonstration projects that advance the vision of NLI

The University of Central Florida is one of the founding members of the NLII.

2.5. Telecommunications in Other States

Many states have struggled to establish public policies and implementation strategies to ensure the affordability of distance learning and educational telecommunications. Although policy goals are very similar throughout the states, there appears to be no consensus on the best way to implement those goals. The following are a sample of just a few of some of the more important approaches.

2.5.1. North Carolina

The state that once called itself the "Good Roads State" as a strategy to entice businesses to relocate is now trying to repeat its success by encouraging the creation of a statewide cutting edge information highway. The state convinced 28 phone companies to participate in the North Carolina Information Highway (NCIH) project.

The state is acting as the "anchor tenant" for a new high speed public digital transport service known as Asynchronous Transfer Mode (ATM). Initially the NCIH will provide two-way video and data, with voice to be added later. By guaranteeing a certain number of sites, North Carolina expects this high speed network to be rapidly and affordability extended throughout the state, resulting in improvements and competitive advantages to its research, medical, educational, and business communities.

NCIH provides 155 mbps of bandwidth over an optical carrier (OC3) to each site at a cost of $4,000 per month. This cost does not include required site equipment. Usage above a defined level per month is at additional charge.

Although the cost of providing the service by the phone companies varies widely between rural and urban areas, the state has adopted "distance-neutral" pricing. This means the price is the same regardless of location in the state or the telephone company. All revenues are collected in a single pool, then allocated to the individual

telephone companies based on their cost to provide the service. This ensures the more rural areas are not priced out of the information highway.

To be fully connected to the highway, currently each site must acquire a:

- $22,000 service multiplexors to interface with the fiber ATM network
- $10,000 analog -- video to digital -- video converter (codec) for each (45 mbps) video channel
- $3,000 router for connection to the site's local area network (1.5 mbps)
- $35-85,000 video-conferencing classroom, including 3 cameras, audio system with echo cancellation, multiple monitors, video switcher and control computer, lighting, facility upgrade, etc.

Due to the high cost of startup and operation, the legislature established a $7 million appropriation to provide one-time grants of up to $100,000 to assist sites connecting to the NCIH. As of February 1995, there were 58 sites on the NCIH, largely financed through this appropriation.

The network currently allows up to five locations to be conferenced together in "continual presence", which means each site can see all four other sites all of the time. A local control panel allows each site to control the number of sites shown on the monitor at any one time.

In order to ensure coordinating its distance learning activities, the governor of North Carolina has recently directed the state school board, community college board and higher education board meet twice a year to address distance learning issues that transcend each sector. They reportedly will be addressing such issues as full-time-equivalent (FTE) fund allocation for distance learning students receiving services from a different institution and the copyrights of institutions and faculty course developers.

2.5.2. California

California is an interesting contrast to North Carolina. Rather than jumping directly to the high capability and high costs of a statewide ATM network, they are starting at the slower and cheaper end of digital networking - but with plans to scale up as demand grows. Key to the strategy of getting entry level digital networking throughout the state is California Education First.

The California Education First, initiated by regional Bell operating company Pacific Bell (PacBell), provides free digital service for one year for telecomputing and interactive telelearning. The offer includes free installation to schools, community colleges, and libraries of up to four digital ISDN lines and waives monthly and usage charges for one year. PacBell will extend intra-building wiring at up to two sites at each public school and library. Offer good to December 1996. PacBell is working with the Public Utilities Commission to develop an education rate that will be affordable and predictable.

This initiative helps PacBell implement ISDN service more quickly throughout the state in advance of anticipated demand by businesses and residences. In California Pac Bell is dominant, particularly when compared to Southern Bell which serves just over 50% of Florida residents. In California a single phone company can take such

initiatives. However, in Florida such a statewide effort would require a state level organization to coordinate all 14 of Florida's telephone companies.

2.5.3. Texas

Texas took the approach of ordering all providers to provide discounts for services used for distance learning. Although this was an appealing approach several years ago, deregulation at the Federal level and in Florida make this less tenable today as a solution to Florida's needs.

The Texas Public Utilities Commission was ordered by the state legislative to reduce costs 24% for services used predominantly for distance learning. The initiative requires a sworn affidavit stating the intended use(s). Distance learning must exceed 50% of the traffic to qualify. The distance learning tariff applies to video, data, voice, and/or electronic information.

2.5.4. Iowa

Iowa decided to construct a private fiber optic video network for distance learning that would interconnect all high schools, state universities, and community colleges at a cost estimated to be $100 million. This new network would provide two-way video between sites and among up to six sites. Existing satellite and ITFS services will still be used.

This approach can give public organizations access to video-conferencing, however it does nothing to build infrastructure for business and industry. This approach is not recommended for Florida.

3. RECOMMENDATIONS FOR INFRASTRUCTURE DEVELOPMENT

Distance learning can be used in Florida to further several public policy agendas:

- increase student access to education
- reduce time needed to obtain a degree by allowing students to take required classes via distance learning that would normally not be available
- reduce the demand to build additional post-secondary education classrooms

Distance learning can help the state achieve these goals. However, costs will be excessive unless duplicative services are rationalized, highly effective programs are produced, and programs are delivered in the most cost-effective manner.

Technology to support distance learning is changing rapidly. Over the next several years video programming is expected to migrate to digital technology. Digital video makes editing faster and effectively increases the number of channels available on existing satellite, cable TV, and ITFS systems. The industry is expected to standardize on the Motion Picture Expert Group (MPEG) II standards for pre-recorded programs and the International Telecommunications Union (ITU) H.320/T.120 standards for live video conferencing.

Much of the cost of digital video today results from the need to convert the signals to analog for viewing on standard television monitors. Such conversion costs will be eliminated over the next five to ten years as new televisions based on the digital high-definition television (HDTV) standards become common.

Many new technologies recently deployed in at least some areas of the country could be used to deliver digital video signals. Technology developed originally at Bell Labs for telephone companies, called asynchronous transfer mode (ATM), promises to integrate the transmission of voice, data, and video over the same high-speed channels. Cable TV operators are preparing to deliver 500 channels of programming into homes by combining fiber optic cable, their existing coaxial cable, and digital video. Direct satellite broadcasters are beaming digital video signals into homes today. "Wireless cable" operators are making arrangements with educational organizations to convert their ITFS channels to digital and deliver the institution's signals along with many others into homes.

In May 1995, significant changes in Florida's regulation of telephone companies was passed by the legislature. For the first time, it allows competition in providing local dial tone. However, this change makes it all the more important for the needs of education in general and distance learning in particular be coordinated to ensure they are effectively addressed. This can most effectively be made at a statewide level.

Today it is difficult to tell which competing technology or industry will dominate, or which combinations of technologies will provide the best combination of cost and performance. However, it is possible to predict that the real winners will be the customers who will have new services at effective prices due to the unprecedented competition due to deregulation and the new technical alternatives.

The first step in developing Florida's plan should be to articulate the educational goals for distance learning. The second is to establish processes to identify existing programs or develop new ones

that address the educational goals. In identifying these programs, special attention must be paid to:

- what should be taught
- to whom should it be taught
- how should it be taught
- how will it be supported

These efforts will define the distance learning services required. The distance learning delivery infrastructure should be developed to support these programs. However coordination with other education sectors and state agencies is needed to:

- eliminate duplication
- become highly cost-effective
- improve coordination among sectors

The most difficult barriers to achieving these goals are likely to be jurisdictional and organizational. In contrast, the delivery infrastructure should simply use the most cost effective delivery systems available.

3.1. Organizational Recommendations

1. *A single organization should provide the coordination for distance learning services across all sectors of education*

   As mentioned earlier, many organizations in Florida are involved in the production and delivery of distance learning. The state needs some mechanism for coordinating these separate and independent distance learning providers to eliminate unnecessary duplication and to facilitate the recognition of credits awarded by one organization by the others. Funding and cost issues such as which institution get the state funds associated with the student and which provides support services, must be addressed in a coordinated and systematic way.

   The single organization should coordinate:

   - policy development
   - program development
   - scheduling
   - delivery systems

   It should:

   - encourage cross-institutional program development
   - use competitive bid for program development
   - allow public and private providers to bid
   - review program content for quality and effectiveness

   The Board of Regents *Addendum* recommends a new public corporation with broad representation and a new center to implement the policies. The state should carefully

look at FRLS to see if it has the capacity to be the coordinating unit for distance learning for K-12, postsecondary, and adult education. FRLS's current advisory committee is not at the right level to become the needed board of directors.

All organizations involved in distance learning could schedule time on the new transponder through the single organization. Allocation policies would be established by the oversight board.

2. *A business plan should be developed for the use of the state's new satellite transponder.*

Florida should continue its plans to use its new satellite transponder but should require that a business plan be developed for the new transponder to ensure its effective use. If the state is unable to develop and deliver sufficient course material to fully utilize the transponder, it could lease some of the time to other organizations. With a $10 million cost and a potential 10 years of operation, the state could lease the entire transponder out for about $2.4 million a year, resulting in a 15% return on investment assuming no increase in monthly income over the life.

Satellite delivery of programs should continue today as the most cost cost-effective system for statewide delivery of the same program to a large number of individual sites. Digital technology is increasing the capacity of satellite delivery systems allowing simultaneous broadcast of multiple channels on a single transponder.

However, satellites may not always be the best method of delivering courses to multiple sites. As an example, if the cost to lease a satellite transponder ($200,000/month) is instead applied to a North Carolina Information Highway type connection ($4,000/month), it would provide 50 sites with at least two broadcast quality two-way video circuits and high speed data. It is unlikely that such technology will be widely deployed in Florida during the next 10 years.

3. *The recognition of distance learning credit courses should be facilitated.*

Currently, there is a common course numbering system throughout the state universities and community colleges, with reciprocal agreements on the transferability of courses. Although such a system was designed to allow a student attending one institution to transfer to another with as many credits as possible, it could be augmented to allow a student attending one institution to take courses from other institutions that would count towards a degree or certificate. If for-credit distance learning courses are to become sufficiently common to impact some of the state's high priority needs, such recognition of credits must become automated.

3.2. Procurement Recommendations

4. *Whenever possible, competition within and among industries should be encouraged in distance learning delivery systems through public bids.*

There is no one technology today that can provide superior and cost-effective service in all distance learning situations. As a result, the state should be technology neutral in its approach to delivering distance learning services. The state should determine a level of service and features required and publicly solicit competing proposals from:

- within industries (different telecommunications companies)
- among industries (telephone, cable TV, satellite, wireless)

For example, if an institution wishes to provide in-service training to teachers in schools, proposals should be solicited from cable TV operators, phone companies, ITFS vendors, and others for proposals on how to deliver the service at the lowest cost.

All sectors should investigate the greater use of cable TV for distance learning. The increased competition of including cable TV as an option for delivery of distance learning should result in lower costs for delivery. Cable TV may require the use of pay-per-view technology to ensure only students enrolled in the course can participate.

5. *The state should use the technology with the lowest total life-cycle cost that meets the distance learning requirements.*

The life-cycle cost should include purchase and installation, training, maintenance, staff support to monitor or maintain or manage the equipment over the useful life of the equipment.

6. *Florida should contract for distance learning delivery services rather than developing them itself whenever possible..*

Staff in colleges, universities, and schools should primarily focus on delivery of education rather than support of technology. The hiring of support staff dedicated to specific technologies makes it difficult for institutions to switch to more cost-effective technologies in the future. Staff once hired for one purpose are difficult to re-deploy into other areas.

In those cases where it makes sense to evaluate "make versus buy", staff costs should be calculated at their full costs. The full costs include salary, benefits, employer FICA and general overhead (space, utilities, office equipment, etc.). To minimize calculations for general overhead, institutions could use the overhead rate negotiated with the federal government for federal contracts.

3.3. Technology Recommendations

7. *Florida should develop a plan for migrating towards the use of digital video.*

Video is becoming another data stream that can be transported over a wide range of terrestrial and satellites delivery systems. The trend towards digital broadcasting, particularly of interconnect networks, is accelerating.

Florida already uses digital video in SUNCOM videoconferencing. Florida should plan to move digital video first for networks connecting principal program distributors and local distributors, i.e., the interconnect networks. The state should follow national and international standards to ensure interoperability with the widest range of equipment.

8. *Distance learning projects should incorporate data network access, library access, and voice messaging in its service plans.*

   Many courses today need computers and /or access to library resources. People using distance learning in remote locations should not be barred from these essential tools for educational achievement. Voice messaging can improve communications between the distance learning students and faculty.

   Data communications services can play an important role in delivering distance learning in Florida. It can be used to distribute materials, coordinate sites, assign and collect homework, continue discussions between course broadcasts and survey student satisfaction upon completion.

9. *SUNCOM should adopt the ITU H.320/T.120 standards for videoconferencing to maximize compatibility with non-state entities.*

   The state videoconferencing systems should migrate to the H.320 standard for videoconferencing (note that H.261 is one component of the H.320 standard) so it can be used with other public and private organizations not connected to SUNCOM throughout the state and nation. As ISDN becomes more widespread, dial up videoconferencing should be explored for locations with only occasional videoconferencing needs. By using an inverse multiplexor, three ISDN lines can be tied together to provide picture quality equivalent to the existing dedicated 1/4 T1 service.

10. *FIRN should focus on delivering educational services and support rather than operating a data network.*

    Although FIRN's Internet service arrangement with SURAnet provides relatively low prices for school districts and institutions with T1 lines, the Internet access and network operation should be bid out in conjunction with similar services needed by SUNCOM. The old regional National Science Foundation (NSF) sponsored networks such as SURAnet are quickly moving away from a collegial academic network created because no one else was interested in providing the service into a commercial enterprise of broad scope.

    FIRN should investigate the development and implementation of methods to provide "just-in-time" training. This could be implemented via a World Wide Web server holding a wide variety of training materials for FIRN and other applications.

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The FIRN Report: Reaching New Horizons for Education, Florida Education Department, December 1994

The Department's Educational Technology Initiatives, Florida Education Department, August 5, 1994

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Name	Title	Organization
Bill Schmid	Director	FIRN
Charlie Beck	Deputy Public Counsel	Office of the Public Counsel
Clay Phillips	Staff Director	House Utilities and Telecommunications Committee
Don Crosby	Analyst	House Utilities and Telecommunications Committee
Tom Pennavarian	Analyst	House Utilities and Telecommunications Committee
Drew Barret	Director	Florida Engineering Education Delivery System (FEEDS)
Dave Shepherd		Automated Education Information Commission
Glen Mayne		Division of Communications
Janice Caluda	Vice President/Operations	Florida Cable Television Association, Inc.
John Opper		PEPC
John ?		GIS?
Karen Stolting		Joint Committee on Information Technology Resources
Martha Fields	Director IRM	State University System
Mike Hale		Information Resource Commission

Notes from Interviews in November, 1994

Name	Title	Organization
Richard Madus		Tallahassee Community College
Walter Bolter		Flagler College
Steve Botts	Director	Northwest Florida Regional Data Center
John Alexion		Miami Dade Community College
Sybil Mobley	Dean	Florida A&M
Robert Arnold		University of Central Florida

APPENDIX B

SURVEY DATA

INSTITUTION:_____

DISCIPLINE:_____

FLORIDA POSTSECONDARY TECHNOLOGY SURVEY

DIRECTIONS:

Part I USE OF PROGRAMS PROVIDED BY THE STATE

The institution uses these state-funded technology programs:

TECHNOLOGY DEVICES	No Answer	Don't Have or Don't Use	A few times/yr.	At least once/mo.	At least once/wk.	Freq.
1. Desktop Computer	6	100	20	24	112	575
2. Laptop Computer/notebook	10	606	54	45	64	58
3. Personal Digital Assistant (i.e, Apple	13	794	11	7	3	9
4. Laserdisc players	8	626	100	52	34	17
5. CD-ROM players	10	487	101	88	87	64
6. Technology Image Projection Equipment (e.g., Apple Newton, TYHCO, etc)	15	662	47	40	47	26
7. Calculators	8	122	65	101	224	317
8. Data Collection Probes	29	687	36	36	29	20
9. Public Television	8	386	176	93	93	81
10. Video Cassette Recorder	8	177	189	212	172	79
11. Video Camcorder	9	524	155	88	44	17
12. Satellite Dish	11	708	74	17	13	14
13. Satellite Uplink	17	704	68	16	17	15
14. Telecomputing (e.g., Internet, KidsNet, FIRN) World Wide Web	10	452	75	71	89	140
15. Cable Television	19	515	110	55	52	86
16. Optical Imaging/Scanners	493	208	55	38	28	15
TECHNOLOGY APPLICATIONS						
17. Word processing	7	69	23	50	139	549
18. Database	12	266	127	148	134	150
19. Electronic Mail	10	323	50	52	79	323
20. Spreadsheet	15	300	112	152	126	132
21.Graphics Programs	13	305	128	141	135	115
22. Presentation Software (e.g., Persuasion, Power Point, etc.)	16	556	77	78	62	48
23. Hypermedia/multimedia	16	564	95	69	54	39

TECHNOLOGY DEVICES	No Answer	Don't Have or Don't Use	A few times/yr.	At least once/mo.	At least once/wk.	Freq.
24. Desktop Publishing	16	492	107	85	89	48
25. Computer-Assisted instruction (e.g., Drill and Practice, Simulations)	13	415	105	123	101	80
26. Integrated Learning Systems	26	661	62	49	21	18
27. Telecommunications Programs (Smart Com, Mosaic, etc)	15	631	45	47	36	63

Part II FACULTY ACCESS TO TECHNOLOGY

***During the day**, how frequently do you use computers located in the following areas for instructional preparation and administrative purposes:*

TECHNOLOGY DEVICES	No Answer	Don't Have pr Don't Use	A few time/yr.	At Least once/mo.	At least once/wk.	Freq.
28. Classroom	16	475	72	51	89	134
29. Workroom/Lounge	18	549	44	36	71	119
30. Library/Media Center	8	308	205	173	103	40
31. Department	15	216	54	60	104	388
32. Computer Lab	16	319	148	101	121	132

***After the day**, how frequently do <u>you</u> have access to computers for instructional preparation and administrative purposes*

TECHNOLOGY DEVICES	No Answer	Don't Have or Don't Use	A few time/yr.	At Least once/mo.	At least once/wk.	Freq.
33. In the classroom, workroom/lounge, library/media center, departmental area, or computer lab	13	193	48	58	84	441
34. From the institution to use at home	12	613	33	33	41	105
35. Through call-in access to a network, FIRN, etc.	16	561	38	46	50	126

Part III QUALITY OF STATE TECHNOLOGY PROGRAMS

Faculty members at this institution would rate these state-funded technology programs

TECHNOLOGY DEVICES	No Answer	Very Poor	Poor	Fair	Good	Excellent
36. FIRNMAIL	313	148	62	148	115	51

TECHNOLOGY DEVICES	No Answer	Very Poor	Poor	Fair	Good	Excellent
37. Florida Educational Technology Conference (FETC)	393	161	44	125	79	35
38. SUNSTAR (Florida Satellite Network)	436	196	41	107	47	10
39. ITV Video	428	199	38	114	46	12
40. Access to other Telecommunication Services via FIRN	380	178	48	123	83	25
41. Distance Learning Programs (Satellite Education Resource Consortium, Distance Learning Associates)	383	183	51	131	61	28
42. Public Television	254	109	45	132	166	131
43. Florida Department of Education Software Catalog	426	193	53	94	47	24

Part IV STUDENT USE OF COMPUTER TECHNOLOGY

How often are these classroom computers used by students for:

TECHNOLOGY DEVICES	No Answer	Don't Have or Don't Use	A few time/yr.	At Least once/mo.	At least once/wk.	Freq.
44. Computer-Assisted Instruction (e.g., Drill and Practice, Simulations)	78	281	93	103	106	176
45. Word Processing	74	230	48	85	140	260
46. Database use	104	382	81	88	67	115
47. Spreadsheet use	102	377	77	82	87	112
48. Desktop Publishing	10	458	83	70	43	73
49. Hypermedia/multimedia (e.g., CD-ROM, laserdisc)	110	493	90	57	39	48
50. Telecomputing (e.g., Email, electronic pen pals)	108	541	58	41	47	42
51. Integrated Learning Systems (ILS)	133	579	49	37	18	21

Part V INFLUENCES ON THE USE OF TECHNOLOGY

ASSESS THE DEGREE TO WHICH THE FOLLOWING PRESENT BARRIERS/PROBLEMS for faculty in their use of technology for instruction in your institution:

TECHNOLOGY DEVICES	No Answer	Not a Barrier	Little	Somewhat	Considerable	Great Barrier
52. Access to technology	35	135	83	208	157	219
53. State policies	169	237	145	159	72	55
54. Administrative support	53	214	137	208	121	104

TECHNOLOGY DEVICES	No Answer	Not a Barrier	Little	Somewhat	Considerable	Great Barrier
55. Intellectual property rights or copyright	96	286	174	166	64	51
56. Lack of funds	42	40	34	96	152	473
57. Time to learn, practice and plan	36	74	79	210	207	231
58. Curriculum integration training and/or staff development	57	94	102	248	189	147
59. Credit toward tenure and promotion	80	314	92	131	85	135
60. Lack of faculty interest	43	261	157	239	87	50
61. Lack of technology coordinator	53	219	128	183	110	144
62. Availability of other appropriate resources	76	106	104	202	151	*198*

Part VI FACULTY TRAINING AND STAFF DEVELOPMENT IN TECHNOLOGY

Rate the quality of training provided in the following technologies:

TECHNOLOGY DEVICES	No Answer	Not applicable	Poor	Fair	Good	Excellent
63. Basic Computer Technology Orientation and Awareness	66	72	148	183	222	146
64. Personal Productivity Tools (e.g., word processing, database, spreadsheet)	66	85	163	179	214	130
65. Telecomputing (e.g., Internet, Kidsnet)	90	239	223	149	85	51
66. FIRN Training	118	304	225	115	48	27
67. Desktop Publishing	98	280	211	125	76	47
68. Evaluation of Educational Software	105	255	270	133	41	33
69. Hypermedia (e.g., HyperCard or Linkway)	118	386	198	78	31	26
70. Technology Integration Strategies and Techniques	114	302	253	95	53	20
71. Distance Learning Equipment	110	311	214	114	63	25
72. Audio-Visual Equipment (e.g., Television, VCR, Camcorder)	82	135	132	174	182	
73. Integrating technology into the curriculum	83	138	279	189	112	36

TRAINING AND STAFF DEVELOPMENT PROVIDERS

Rate the skills-based technology training received from the following sources

TECHNOLOGY DEVICES	No Answer	Not Applicable	Poor	Fair	Good	Excellent
74 Institution	78	141	179	176	172	91

75. University /College/faculty or staff	116	284	111	141	129	56
76. Community College faculty or staff	93	215	95	169	168	97
77. Conference workshops	97	229	128	173	150	60
78. Vendor-provided workshops.	97	335	163	124	88	30

What percent of faculty in your institution are at least moderately comfortable using the following types of technologies for instructional purposes?

TECHNOLOGY DEVICES	No Answers	UP TO 10%	11 - 30%	31 50%	51 -80%	81 - 100%
79. Computers	91	41	104	175	231	195
80. CD-ROM	118	260	206	154	71	28
81. Videodisc	131	316	161	141	63	25
82. Television/VCR	100	28	25	67	164	453
83. Telecommunications	127	256	188	166	68	32
84. Satellite/Distance Learning	132	368	182	103	38	14
85. Camcorders	124	195	167	155	127	69

PART VII TECHNOLOGY SERVICE NEEDS

Indicates the degree of need for each of the following technology-related services

TECHNOLOGY DEVICES	No Answer	NO NEED	LOW NEED	MEDIUM NEED	HIGH NEED	VERY HIGH NEED
86. Assistance with Equipment Selection	48	55	91	248	235	160
87. Assistance with Resource Selection	59	44	82	237	264	151
88. Integrating Technology into the Curriculum	59	44	82	237	263	273
89. Grant Writing and Sources	53	42	68	174	243	257
90. Student Courses via Distance Learning	60	88	128	233	181	147
91. Technology Training	53	22	29	173	265	285
92. Curriculum/Material Development	49	41	59	213	257	218
93. Telecomputering Services	68	50	83	212	233	191
94. Information Clearinghouse	71	55	82	241	206	182
95.Research Information about Effective practices	65	46	75	239	215	197

INSTITUTION:_____

FLORIDA POSTSECONDARY TECHNOLOGY SURVEY

DIRECTIONS:

Part I INSTRUCTIONAL USES OF TECHNOLOGY

How frequently do you use the following technology devices and applications for instruction at your institution:

TECHNOLOGY DEVICES	Don't Have or Don't Use	A few times/yr.	At least once/mo.	At least once/wk .	Freq.	No Answer
1. FIRNMAIL	1	6	0	9	14	1
2. ITV video	11	3	2	2	11	2
3. SUNSTAR - Florida Satellite Network	4	9	11	2	2	3
4. Access to other telecommunication services via FIRN	1	4	5	4	17	0
5. Distance Learning Programs (Satellite Education Resource Consortium, Distance Learning Associatea	13	9	3	1	2	3
6. Public Television	9	3	3	3	12	1
7. Florida Department of Education Software Catalog	11	12	2	3	0	3

PART II BENEFITS OF TECHNOLOGY USE

TECHNOLOGY DEVICES	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	No Answer
8. Thia institution haa obtained convincing evidence (e.g., test scorea, faculty observation, anecdotal records) that the use of technology haa actually improved student performance.	1	1	6	10	11	2
9. Integrated Learning Systems (ILS) have actually improved student performance (i.e., Grady Profile).	0	2	14	8	4	3
10. Instructional Management System (IMS) have actually improved student performance (i.e., Grady Profile).	1	1	15	9	1	4
11. Computer-Assisted Instruction programs have improved student performance.	0	1	2	18	8	2
12. Word Processing programa have actually improved student performance.	0	1	5	9	15	1
13. Database use haa actually improved student performance.	0	3	14	7	6	1
14. Spreadsheet use haa actually improved performance.	0	1	15	6	8	1

TECHNOLOGY DEVICES	Don't Have or Don't Use	A few times/yr.	At least once/mo.	At least once/wk	Freq.	No Answer
15. Telecomputing has actually improved student performance.	0	0	12	11	6	2
16. Video materials and/or programs have actually improved student performance.	0	0	8	9	13	1

PART III USE OF OTHER TECHNOLOGIES

Number of computer labs _____.

Average number of computers in each lab _____.

TECHNOLOGY DEVICES	YES	NO	NO ANSWER
17. Is TV/VCR equipment readily available to all classrooms when needed.	29	2	
18. Does your institution's strategic management plan include the integration of technology into the instructional program?	28	3	
19. Are adequate Distance Learning capabilities available to make courses possible	14	17	
20. Are there Telecomputing/telecommunications hook-ups (voice, video and/or data) in each classroom?	3	28	
21. Is your institution equipped with a video production studio?	22	9	
22. Are classrooms wired for cable TV?	18	13	
23. Is your institution equipped with a satellite dish?	30	1	
24. KU Band	24	3	4
25. C Band	24	2	5
26. Is your institution equipped with an integrated multi-media distribution system?	1	30	
27. Can parents communicate electronically with the institution (e.g., Voice Mail, Bulletin Board, etc.)?	12	18	1
28. *In your institution, is technology used to access resources through:*	20	9	2
29. Automated catalog within the media center?	29	2	
30. Automated catalog networked to classroom?	26	5	
31. Fax Machines?	31	0	
32. Telecomputering to other library/information sources (e.g., ERIC)?	19	12	
33. Telecomputing to online services (e.g., America On-line, Prodigy)?	20	8	3

Part V INFLUENCES ON THE USE OF TECHNOLOGY

ASSESS THE DEGREE TO WHICH THE FOLLOWING PRESENT BARRIERS/PROBLEMS for faculty in their use of technology for instruction in your school:

TECHNOLOGY DEVICES	Not a Barrier	Little	Somewhat	Considerable	Great Barrier	No Answer
34. Using telecommunications for Instructional/School Television (e.g., open broadcast or cable)?	1	2	12	9	7	0
35. Access to technology	8	6	11	3	2	1
36. Staff policies	5	9	11	3	2	1
37. Administrative support	7	10	10	2	1	1
38. Intellectual property rights or copyright	0	0	2	5	24	0
39. Lack of funds	0	1	6	13	10	1
40. Time to learn, practice and plan	1	1	9	12	7	1
41. Curriculum integration training and/or staff development	14	3	7	3	3	1
42. Credit toward tenure and promotion	4	9	14	2	1	1
43. Lack of faculty interest	7	5	10	6	2	1
44. Lack of technology coordinator	3	2	7	9	8	2
45. Availability of other appropriate resources	15	11	2	0	0	3

ALLOCATION OF TECHNOLOGY FUNDS FROM ALL SOURCES

Please estimate the proportion of available technology funds spent during the past three years for:

TECHNOLOGY DEVICES	0 - 10%	11 - 30%	31 70%	71 -90%	91 - 100%	No Answer
46. Instructional software and related materials?	23	5	0	0	0	3
47. Technology training and professional development?	7	12	8	1	0	3
48. Installation of computer technology lab(s)?	22	4	2	0	0	3
49. Maintenance of computer technology lab(s)?49	21	6	1	0	0	3
50. Installation and maintenance of computer network software?	20	7	0	0	1	3
51. Repairs and maintenance of technology equipment	20	7		0	0	3
52. Consumable technology supplies (e.g., paper, ribbons, ink jet cartridges)?	21	6	0	0	0	4
53. Classroom video equipment?	24	3	0	0	0	4
54. Distance learning equipment?	3	2	10	14	2	0

TEACHER COMPETENCE

What percent of faculty in your institution are at least moderately comfortable using the following types of technologies for instructional purposes?

TECHNOLOGY DEVICES	UP TO 10%	11 - 30%	31 50%	51 -80%	81 - 100%	No Answer
55. Computers	12	12	7	0	0	0
56. CD-ROM	18	7	5	0	1	0
57. Videodisc	3	1	3	5	19	0
58 Television/VCR	9	7	11	1	2	1
59. Telecommunications	17	8	4	1	0	1
60. Satellite/Distance Learning	11	10	8	1	1	0

PART V TECHNOLOGY PLANNING

Does your institution have an up-to-date plan for the *effective* utilization of technology applications?

TECHNOLOGY DEVICES	YES	NO
61. Camcorders	25	6
62. Does it address both Instructional and Administrative computing	25	6
63. Does it address Networking/telecommunications infrastructure (voice, video, and data)	18	13

Part VI TECHNOLOGY INFRASTRUCTURE AND CAPACITY

TECHNOLOGY DEVICES	UP TO 10%	11 - 30%	31 50%	51 -80%	81 - 100%	No Answer
64. Is it fully integrated with the institution strategic plan.	5	8	2	7	9	0
65. What percentage of the computer Workstations in the institution are networked?	12	3	2	3	9	2
66. What percent of classrooms are equipped with a television?	25	2	0	2	0	2
67. What percent of classrooms are equipped with a telephone handset?	7	3	1	8	12	0
68. What percentage of the institution is networked for data?	8	2	2	2	17	0
69. What percent of the institution is networked for voice?	13	3	6	4	4	1
70. What percent of the institution is networked for video?	12	3	0	4	12	0
71. What percent of the institution is interconnected to other college and universities in the region?	7	5	3	3	13	0
72. What percent of the institution is interconnected to the FIRN network?	13	4	2	5	7	0

TECHNOLOGY DEVICES	UP TO 10%	11 - 30%	31 50%	51 -80%	81 - 100%	No Answer
73. What percent of the institution is interconnected to national and worldwide telecommunication services?	18	4	4	2	2	1

Indicate the approximate percent of existing computers with the following minimum specifications that are located with your institution:

74. Macintosh SE/30 (circa 1988) computer or more recent model with at least a 68030 microprocessor.	2	3	6	15		0
75. DOS-based computer with at least a 386+ microprocessor (circa 1991)	12	8	7	3	1	0

PART VII TECHNOLOGY SERVICE NEEDS

Indicates the degree of need for each of the following technology-related services

TECHNOLOGY DEVICES	NO NEED	LOW NEED	MEDIUM NEED	HIGH NEED	VERY HIGH NEED	NO ANSWER
76. Assistance with Equipment Selection	9	8	8	5	1	
77. Assistance with Resource Selection	3	3	6	11	8	
78. Integrating Technology into the Curriculum	3	7	4	7	8	2
79. Grant Writing and Sources	2	4	10	7	7	1
80. Student Courses via Distance Learning	1	4	8	8	10	
81. Technology Training	2	1	5	14	8	1
82. Curriculum/Material Development	3	2	11	9	6	
83. Telecomputering Services	5	6	12	3	5	
84. Information Clearinghouse	4	6	9	7	4	1

APPENDIX C

STATEWIDE TELECOMMUNICATIONS TASK FORCE

MEMBERSHIP

TELECOMMUNICATIONS TASK FORCE

Dr. Walt Bolter
Flagler College
P. O. Box 4044
St. Augustine, FL 32085-4044
904/829-6481

Mr. David M. Eason
Bureau Chief
Educational Technology
B1-54 Florida Education Center
Tallahassee, FL 32399-0400
904/488-0980
Suncom 278-0980

Ms. Elsie Garner
WEDU-TV
P. O. Box 4033
Tampa, FL 33677-4033
813/254-9338
FAX 813/253-0826

The Honorable John Grant
State Senator, District 13
610 West Waters Avenue, Suite A
Tampa, FL 33604
813/975-6658 Suncom 571-6658
FAX SC 571-6688
Attn: Chris Hart

Mr. Don E. Holmes
Univest American Corporation
1479 Capital Circle NW
Tallahassee, FL 32303
904/574-3270
FAX 904/576-3940

Dr. Maxwell C. King
President
Brevard Community College
1519 Clearlake Road
Cocoa, FL 32922-6597
407/632-1111 ext. 2000 Suncom 361-2000
FAX 407/634-3701

Dr. William Proctor
Executive Director
Postsecondary Education Planning Commission
Florida Education Center
Tallahassee, FL 32399-0400
904/488-7894 Suncom 278-7894
FAX 904/922-5388

Dr. David Spence
Executive Vice Chancellor
State University System
1501 Florida Education Center
Tallahassee, FL 32399-0400
904/488-7702 Suncom 278-7702
FAX 904/922-2014

Dr. T. K. Wetherell, President
Tallahassee Community College
444 Appleyard Drive
Tallahassee, FL 32304
904/922-8133
FAX 904/488-2203

9/95

APPENDIX D

FLORIDA DISTANCE LEARNING NETWORK LEGISLATION

364.507 Legislative intent.—

(1) The Legislature finds that it is in the interest of the state to assure its citizens access to advanced telecommunications services since such access will complement the provision of educational and health care services, thus enhancing the health, safety, and welfare of Floridians. The Legislature further finds that the network should be available to residents of rural, suburban, and urban areas so that all citizens may benefit.

(2) It is the intent of the Legislature that all local exchange telecommunications companies, including those with less than 100,000 access lines in service which do not elect to be regulated under price regulation pursuant to s. 364.051, should be required to provide advanced telecommunications services to eligible facilities in the absence of a competitive bid to provide such services pursuant to s. 364.510(3). This obligation arises from the privileges granted such local exchange telecommunications companies under part I of this chapter.

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(3) It is the intent of the Legislature to encourage competition among providers of telecommunications services to provide advanced telecommunications services, as such competition will accelerate the deployment of advanced telecommunications services for the improvement of public education and public health services in the state.

(4) It is the intent of the Legislature to encourage joint ventures between telecommunications companies, cable companies, and other providers where such joint ventures accelerate, improve, or otherwise assist eligible facilities in receiving advanced telecommunications services.

364.508 Definitions.—As used in this part:

(1) "Commission" means the Public Service Commission.

(2) "Network" means the Florida Distance Learning Network.

(3) "Telecommunications company" means any entity certified under this chapter to provide telecommunications service.

(4) "Cable company" means a cable television company providing cable service as defined in 47 U.S.C. s. 522.

(5) "Advanced telecommunications services" are defined as network-based or wireless services that provide additional communications capabilities enabling the use of applications such as distance learning, video conferencing, data communications, and access to internet.

(6) "Plan" means the Education Facilities Infrastructure Improvement Plan, a document that includes a needs assessment report and identifies telecommunications companies', cable companies', and other providers' present and projected deployment of technologies necessary for delivery of advanced telecommunications services to eligible facilities who request such services.

(7) "Eligible facilities" means all approved campuses and instructional centers of all public universities, public community colleges, area technical centers, public elementary schools, middle schools, and high schools, including school administrative offices, public libraries, teaching hospitals, the research institute described in s. 240.512, and rural public hospitals as defined in s. 395.602. If no rural public hospital exists in a community, the public health clinic which is responsible for individuals before they can be transferred to a regional hospital shall be considered eligible.

364.509 The Florida Distance Learning Network; creation; membership; organization; meetings.—

(1) It is the intent of the Legislature to establish a coordinated system for cost-efficient advanced telecommunications services and distance education to:

(a) Increase student access to education.

(b) Maximize the use of advanced telecommunications services and their application to provide affordable distance education.

(c) Promote interagency cooperation and promote partnerships.

(d) Secure any available federal or private funds and other resources in support of advanced telecommunications services and distance education.

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(e) Coordinate all advanced telecommunications services and distance education resources to maximize return on investment with the goal of creating a financially independent, self-supporting, statewide resource for advanced telecommunications services and distance education.

(2) The Florida Distance Learning Network is hereby created for all the purposes created by the provisions of this chapter or laws amendatory hereof.

(3) The Florida Distance Learning Network is established with the necessary powers to exercise responsibility for statewide leadership in coordinating, enhancing, and serving as a resource center for advanced telecommunications services and distance learning in all public education delivery systems. The Florida Distance Learning Network shall be governed by a board of directors which shall consist of the following members:

(a) The Commissioner of Education or the commissioner's designee.

(b) The Chancellor of the State University System or the chancellor's designee.

(c) The executive director of the State Community College System or the executive director's designee.

(d) The Secretary of Management Services or the secretary's designee, who shall represent the interests of all state agencies.

(e) The President of the Independent Colleges and universities of Florida or the President's designee.

(f) The Public Counsel or his designee.

(g) A member of the Senate and a representative of the International Brotherhood of Electrical Workers who shall be appointed by the President of the Senate and serve at the pleasure of the President.

(h) A member of the House of Representatives and a representative of the Communications Workers of America who shall be appointed by the Speaker of the House of Representatives and serve at the pleasure of the Speaker.

(i) Four members of the private sector representing the cable telecommunications industry, the local exchange telecommunications industry, and the interexchange industry, two of whom shall be appointed by the Florida Cable Telecommunications Association and two of whom shall be appointed by the Florida Telephone Association.

(j) Two members from the health care community to be appointed by the Governor, one member from a teaching hospital and the other member from a rural hospital.

(k) The State Librarian or his designee.

(4)(a) The Commissioner of Education or the commissioner's designee shall serve as the initial chairperson of the board of directors to serve a term of 4 years. Thereafter, the board of directors shall biennially elect the chairperson from its membership. The board of directors shall designate a secretary-treasurer, who need not be a member of the board of directors. The secretary-treasurer shall keep a record of the proceedings of the board of directors and shall be the custodian of all books, documents, and papers filed with the board of directors, and the minutes of the board of directors.

(b) The board of directors shall meet within 30 days after the effective date of this act and shall continue to meet at least 4 times each year, upon the call of the chairperson, or at the request of a majority of the membership. The board of directors shall take official action only by consensus.

(c) Members of the board of directors shall serve without compensation, but may be reimbursed for per diem and travel expenses.

364.510 Duties of the Board of Directors of The Florida Distance Learning Network.—The duties of the Board of Directors of The Florida Distance Learning Network include, but are not limited to:

(1) Creating and facilitating the implementation of a statewide coordinated system and resource system for cost-efficient advanced telecommunications services and distance education which will increase overall student access to education.

(2) Coordinating the use of existing resources, including, but not limited to, the state's satellite transponder on Telestar 401 (the education satellite), the Sunstar Network, the SUNCOM Network, the Florida Information Resource Network (FIRN), Department of Management Services, Department of Corrections and the Department of Health and Rehabilitative Services' satellite communication facilities to support a statewide advanced telecommunications services and distance learning network.

(3) Promoting interagency activities that will provide increased access to advanced telecommunication services and to distance education.

(4) Assisting in the coordination of the utilization of the production and uplink capabilities available through Florida's public television stations, eligible facilities, independent colleges and universities, private firms, and others as may be needed.

(5) Seeking the assistance and cooperation of Florida's cable television providers in the implementation of the statewide advanced telecommunications services and distance learning network.

(6) Seeking the assistance and cooperation of Florida's telecommunications carriers to provide affordable student access to advanced telecommunications services and to distance learning.

(7) Brokering and coordinating partnerships for development, acquisition, use, and distribution of distance learning.

(8) By January 1, 1996, the Board of Directors shall assemble appropriate resources from its own technical staff to develop a needs assessment report which shall be included in the plan describing the overall advanced telecommunications services needs of education, libraries, and teaching and rural hospitals. The needs assessment report shall take into consideration any needs assessment recently conducted by any state agency or eligible facility. Such needs assessment report shall also consider interoperability of different technologies needed for delivery of advanced telecommunications services.

(9) Developing and maintaining a plan for using technology to improve the delivery of and access to education. The plan shall be developed by March 1, 1996, and be submitted to the Governor, the President of the Senate, and the Speaker of the House of Representatives. The plan shall describe what advance telecommu-

nication services shall be delivered, address the needs of all educational and health care delivery systems, and shall include the following:

(a) A component on advanced telecommunications services and on distance learning in which education and health care programs, reports of programs, and accountability data are currently delivered to individuals located in diverse settings, including, but not limited to, eligbible facilities, state agencies, community facilities, businesses, and homes. This component must consider existing public and private networks and communications systems and their potential in delivering advanced telecommunications services and distance learning applications.

(b) A component on existing rules and statutes related to the use of technology, including recommendations for consolidation and any modifications necessary to provide a statewide policy framework for using technology and telecommunications in education and health care.

(c) A statewide inventory of state-owned telecommunications receiving and transmitting equipment that could be used to assist with the distance learning network.

364.511 Powers of the Board of Directors of The Florida Distance Learning Network.—

(1) In order to enable it to carry out the purposes of ss. 364.506-364.514, the Board of Directors of The Florida Distance Learning Network has the power of a body corporate and shall have the power to:

(a) Secure and administer funding for programs and activities of The Florida Distance Learning Network, from federal, state, local, and private sources and from fees derived from services and materials. The board of directors shall also have the power to solicit, receive, hold, invest, and administer any grant, payment, or gift of funds or property and make expenditures consistent with the powers set forth in ss. 364.506-364.514.

(b) Make and enter into contracts and other instruments necessary or convenient for the exercise of its powers and functions.

(c) Sue and be sued, and appear and defend in all actions and proceedings, in its corporate name to the same extent as a natural person.

(d) Adopt, use, and alter a common corporate seal.

(e) Elect or appoint such officers and agents as its affairs require and allow them reasonable compensation.

(f) Adopt, amend, and repeal bylaws, not inconsistent with ss. 364.506-364.514, for the administration of the affairs of The Florida Distance Learning Network, and the exercise of its corporate powers.

(g) In formal agreement with distance learning providers, acquire, enjoy, use, and dispose of patents, copyrights, and trademarks and any licenses and other rights or interests thereunder or therein.

(h) Do all acts and things necessary or convenient to carry out the powers expressly granted in ss. 364.506-364.514.

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(i) In conjunction with distance learning providers, recommend to the Legislature policy regarding distance learning program funding and the protection of intellectual property rights.

(j) Coordinate a marketing program statewide, nationally, and internationally, as deemed appropriate.

(k) The Department of Management Services shall manage the state's satellite transponder resources and enter into lease agreements to maximize the use of available transponder time. All revenue realized through the leasing of available transponder time shall be recycled to support the Florida Distance Learning Network.

(l) Promote the development of multimedia courses and educational programs to be delivered through distance learning.

(m) Provide incentives for development of multimedia courses and programs to be delivered through distance learning.

(2) Under no circumstances may the credit of the state be pledged on behalf of The Florida Distance Learning Network.

(3) Nothing in ss. 364.506-364.514 shall be construed to abrogate, supersede, alter, or amend the powers and duties of any state agency, district school boards, community college boards of trustees, the State Board of Community Colleges, or the Board of Regents.

364.512 Board of Directors of The Florida Distance Learning Network; executive director.—The executive director of the Board of Directors of The Florida Distance Learning Network, who may also be designated as secretary-treasurer, shall be appointed by the Commissioner of Education. The executive director is the chief administrative and operational officer of the board of directors and shall direct and supervise the administrative affairs of the board of directors. The executive director:

(1) May contract with or employ legal and technical experts and such other employees, both permanent and temporary, as authorized by the board of directors.

(2) Shall attend all meetings of the board of directors.

(3) Shall cause copies to be made of all minutes and other records and documents of the board of directors and shall certify that such copies are true copies. All persons dealing with the board of directors may rely upon such certifications.

(4) Shall perform other duties as assigned by the board of directors.

364.513 Annual report of The Florida Distance Learning Network; audits.—

(1) Prior to December 1 of each year, The Florida Distance Learning Network, shall submit to the Governor, the President of the Senate, and the Speaker of the House of Representatives a complete and detailed report setting forth:

(a) Its operations and accomplishments during the fiscal year.

(b) Its marketing and operational plan, including recommendations on methods for implementing and funding distanca learning initiatives.

(c) Its assets and liabilities at the end of its most recent fiscal year.

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(d) A copy of an annual financial and compliance audit of its accounts and records conducted by an independent certified public accountant and performed in accordance with rules adopted by the Auditor General.

(2) The Auditor General may, pursuant to his or her own authority or at the direction of the Joint Legislative Auditing Committee, conduct an audit of The Florida Distance Learning Network.

364.514 Educational Technology Grant Program.—

(1) The Educational Technology Grant Program is created to support the development of and provide incentives for technologically delivered educational courses and programs.

(2)(a) The Florida Distance Learning Network shall annually award grants to school districts, area technical centers, community colleges, state universities, and independent institutions eligible to participate in state student assistance programs established in part IV of chapter 240. The board of directors of the corporation shall give priority to cooperative proposals submitted by two or more institutions or delivery systems. The proposals shall include:

1. Information which describes the educational significance of the program or service in addressing state educational priorities.

2. The target population for the program.

3. The program content to be transmitted.

4. The support services to be provided.

5. Provisions to use at least 20 percent of any funds awarded for training both faculty and student learners in the use and application of the products developed.

(b) Programs and courses developed through the grant program shall be marketed statewide and nationwide with a portion of any profits from the sale or use of such programs retained by the developing institutions or systems and a portion reinvested in the grant program for further program development. The distribution of any revenues received shall be determined by formal agreement between the board of directors and the developing institution.

(c) The board of directors shall identify state educational priorities and issue a request for proposals by June 1 in every year in which funds are available for grants. The board shall ensure the quality of the programs and courses produced through the grants and produce an annual status report by March 1 describing the projects funded and accounting for any proceeds.

364.515 Infrastructure investment.—

(1) Notwithstanding ss. 364.509-364-514, advanced telecommunications services shall be provided to eligible facilities in accordance with the provisions of this section.

(2) In order to be eligible under this act, an eligible facility, or a group of eligible facilities based on geographic proximity, shall submit a technology needs request to the Division of Communications of the Department of Management Services. The division shall review the technology needs request to determine if it conforms to the standards outlined in the State Education Technology Committee's plan. If the technology needs request does not conform to the plan, then the division shall return the request to the eligible facility or group for modifications. After modification of a technology needs request it can then be resubmitted by the eligible facility or a group of eligible facilities. A technology needs request shall be submitted to the division no later than July 1, 1997. Nothing in this section shall prevent the Department of Management Services from grouping eligible facilities technology requests when such grouping would result in the most efficient method to deliver advanced telecommunications services.

(3) Once a technology needs request or group request has been received and has been determined to meet the standards outlined in the plan, the Department of Management Services shall acquire advanced telecommunications services requested by an eligible facility or group of eligible facilities pursuant to chapter 287. The Department of Management Services shall establish specifications to acquire the advanced telecommunications infrastructure needed to provide advanced telecommunications services. The advanced telecommunications infrastructure used to provide such connections to the eligible facilities shall be provided at no cost in an amount not to exceed $20,000 per eligible facility. In those instances in which a competitive bid is not received, advanced telecommunications services to be provided over this communication infrastructure shall be priced below commercially available rates for comparable service and less than the statewide average of such services.

(4) Notwithstanding the requirements in subsection (3), in geographic areas where interconnection between entities is the most efficient method of providing advanced telecommunications services, the Department of Management Services may suggest, along with the commission, such interconnection arrangements.

(5) Any entity may submit a bid or proposal in response to the solicitation for services by the Department of Management Services. The Department of Management Services shall award a bid in conformity with chapter 287, and under no circumstances shall the bidder be required to install facilities until the eligible facility is ready to utilize the services. If no bids or proposals are received in response to a solicitation issued by the Department of Management Services, the Department of Management Services shall obtain the name and address from the commission of the carrier of last resort in the territory of the eligible facility and provide that carrier of last resort with a description of the advanced telecommunications services that must be provided. If no bids or proposals are submitted for the provision of advanced telecommunications services to an eligible facility, the telecommunications company serving as the carrier of last resort to such eligible facility shall provide the advanced telecommunications services.

(6) Advanced telecommunications services to be provided by the entity awarded the contract or, if no bid or proposal is received, the carrier of last resort shall be provided within 6 months or at such later date as the eligible facility may specify. In the event that a technology needs request is received by July 1, 1997, but is requested not to be completed until after January 1, 1999, the Department of Management Services shall then issue a solicitation closer to the time the advanced telecommunications services are requested. The entities providing advanced telecommunications services pursuant to this chapter shall abide by the same terms and conditions as those eligible facilities requesting such services by January 1, 1999.

(7) Advanced telecommunications services provided pursuant to this part shall not be sold, resold, or otherwise transferred to an ineligible facility.

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(8) Nothing in this part shall have an effect on advanced telecommunications services in operation as of the date this part is enacted.

(9) Nothing in this part shall preclude the Department of Management Services from combining an eligible facility with any grouping of qualified subscribers as defined in chapter 282, to create the most cost-effective and efficient access to network services.

364.516 Penalties.—

(1) In the event that the provision of advanced telecommunications services to a requesting eligible facility pursuant to s. 364.515(5) or (6) is not performed by the entity awarded the contract or by a carrier of last resort or within the date specified in the solicitation, except in those instances in which acts of God may have prevented the bidder from completing the contract, the eligible facility or the Department of Management Services may petition the commission for an order enforcing the requirements. The commission shall act upon such petition within 60 days and, in the event the commission finds that the entity that has been awarded the contract or the carrier of last resort has not performed as specified in this part, the commission shall order the entities to perform as required in the contract or by this part. In the event the entity fails to comply with the commission's order within 60 days, the commission shall impose a fine on the bidding company or carrier of last resort of $25,000 per eligible facility specified in the contract. Any fines collected under this section shall be deposited in the General Revenue Fund to be allocated back to the specific requesting area where the eligible facility is located to implement advanced telecommunications services.

Section 32. By January 1, 1996, the commission shall implement a consumer information program to inform subscribers of the possibility under the law of competitive providers of local exchange telecommunications services, their rights as customers of these alternative providers, the commission's regulatory authority over the alternative providers, and any other information the commission deems appropriate. The commission may, pursuant to this program, require all companies providing local exchange telecommunications services to provide such information in the form of a bill insert.

Section 33. A local government shall treat each telecommunications company in a nondiscriminatory manner when exercising its authority to grant franchises to a telecommunications company or to otherwise establish conditions or compensation for the use of rights-of-way or other public property by a telecommunications company.

Section 34. The Department of Labor and Employment Security shall provide assistance, pursuant to any applicable state or federal program within its jurisdiction, to any individual employed in Florida by a local exchange telecommunications company on June 30, 1995, who is displaced, dislocated, severed, or retired from employment as a result of the introduction of competition under this act. This assistance shall include maintaining a database of such workers to assist the industry in recruiting a trained workforce, if so requested by the worker. In addition, the Department of Labor and Employment Security shall coordinate with the Enterprise Florida Jobs and Education Partnership, the Department of Commerce, and the Department of Education to assist new, existing, or expanding telecommunications businesses in Florida to apply for training grants under the guide-

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lines and criteria of the Quick-Response Training Program pursuant to section 288.047 Florida Statutes.

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