DESIGN AND EVALUATION OF A STAFF DEVELOPMENT PROGRAM FOR TECHNOLOGY IN SMALL SCHOOLS

DISSERTATION

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF EDUCATION

By

Cheri Floyd Halderman, B.A., M.Ed.
Denton, Texas

December, 1992

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Technology experts suggest that one barrier in implementing technology has been a lack of appropriate training for teachers. Past efforts have been few in number, poor in quality, and uncoordinated. Some large school districts are developing comprehensive programs. However, few models exist and none are suitable for small school districts.

The purposes of this study were: (1) to survey 53 small school districts in Texas to identify hardware and software configurations, patterns of recent technology staff development, and needs for future technology staff development; (2) to design a staff development program which addresses these technology needs; and (3) to evaluate the program in a small school district.

The subjects for the survey were 53 administrators and 100 teachers in 53 small schools. The survey data provided the design for a Technology Staff Development Program for Small Schools which consisted of two phases. Phase 1 recommended preliminary steps before delivering technology

training to teachers; Phase 2 recommended a comprehensive plan to deliver technology training to teachers.

The phases were implemented in a small school district which had 337 students and 28 teachers. The Computer Attitude Scale by Brenda Loyd was administered as a pre/post test to measure changes in teacher computer attitudes. The Computer Knowledge Test developed by the Texas Computer Education Association measured the teachers' knowledge of technology. Changes in the teachers' use of technology was evaluated with assistance requests, classroom observations, and journal entries.

Based upon data analysis, the following conclusions were made: (1) Educators in small schools are interested in improving their technology use. (2) Given an appropriate model, educators in small schools can perceive technology staff development needs. (3) Small schools can improve technology staff development without large budgets and staff. (4) Teachers in small schools can develop positive attitudes and increase their knowledge and use of technology. (5) Small schools can benefit from a comprehensive staff development program for technology.

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CHAPTER 1

INTRODUCTION TO THE STUDY

The microcomputer, introduced in the late 1970s, has found a valid and valued place in education. It is no longer a fad--a new educational fancy. Microcomputers are used at most grade levels, in most content areas, and for most ability levels. Microcomputers are used as a base for other technologies such as telecommunications by modem, video and audio peripherals (CD-ROM, videodiscs, scanners), and advanced software such as hypermedia.

Many national and state policymakers have recommended that the microcomputer be used as both a tool and as a foundation for other technologies needed to restructure and improve schools. The Long Range Plan for Technology published in 1988 by the Texas State Board of Education predicts:

> In the long run, the technologies promise to alter what is taught (curriculum), how it is taught (pedagogy), where it is taught (in schools, alternative educational settings, workplaces, homes, or elsewhere), when it is taught (during school hours, weekends, or summers), and may induce debate on the whys of education (in terms of life skills, economic competiveness, and personal enrichment). (Long Range, 1988, pp. 41-42)

The International Society of Technology in Education (ISTE) published a recent report, Vision: TEST--The New Rs

for Education, which urged policymakers to use technology to revitalize both our nation and the economy. The report also advocated technology training for teachers at all levels, from preschool to university and from preservice to inservice. ISTE was concerned that learning on a national basis was still largely unaffected by technology (Vision: TEST, 1990).

Many educators have believed that this slow rate of technology integration into the school and curriculum was caused by a lack of effective preservice and inservice teacher training. The vast majority of teachers still have had little or no training in the effective use of technology-- either in college preparatory programs or in staff development activities in the school districts (Coburn, Kelman, Roberts, Snyder, Watt, & Weiner, 1984; Maddux, 1989; Main & Roberts, 1990; Office of Technology Assessment (OTA, 1988).

The 1988 OTA study found that although almost all American schools have microcomputers, only half of the teachers report having used them. Only one-third of all K-12 teachers have had as much as ten hours of microcomputer training (OTA, 1988).

Other studies show that the majority of teachers want to use microcomputers and other technologies in their classrooms. Many teachers are using their own time and money to help overcome problems such as lack of equipment,

anxieties about new technologies, and inadequate training (Bruder, 1989; Coe & Butts, 1991; OTA, 1988; Roblyer, Castine, & King, 1988).

School administrators and staff development specialists should support these grassroots efforts with a comprehensive program of staff development which is designed to educate teachers in the specific technology competencies needed for their content area and/or grade level. Many staff developers have not yet produced this type of program, perhaps because they have been reactive to state laws and educational regulations and not proactive to emerging need for urgent changes in the schools (Kleene, 1990; Orlich, 1989).

A comprehensive staff development program for technology also presented new challenges for school districts. Because microcomputers are necessary, training must move beyond the use of typical training resources such as print materials and overhead projectors. Microcomputers have not been standardized, however, thus adding complications such as different sizes, brands, operating systems, peripherals, and software. Because smaller school districts might have less funds available than larger schools, the quantity and quality of these new resources might also vary.

Before designing and implementing a new program, staff developers need to determine the type, number, and location

of hardware and software, as well as answering the typical staff development questions such as:

1. What workshops have already been delivered?

2. What are district needs as perceived by teachers and administrators? (Beattie & Preston, 1990; Main & Roberts, 1990; OTA, 1988; Watson, 1990).

A few large school districts throughout the country have been studying and testing this comprehensive type of technology staff development program. These large districts (including Washington D.C., New York City, Los Angeles Unified, Philadelphia, and Broward County in Florida) have been fortunate to have both the budget and the appropriate staff to meet program requirements. In Texas, only the Houston Independent School District has been reported as having a comprehensive technology program (Buchsbaum, 1992). Small-to-medium sized school districts in Texas, as well as in other states have not been reported as having comprehensive technology staff development programs.

In order to receive technology allotment monies from the State for the 1992-93 school year, Texas school districts have submitted five-year technology plans. A section of the Executive Summary which must be attached to the technology plan has required an outline of technology-oriented staff development for the entire school year. Therefore, district administrators have now begun to

consider how to deliver staff development for technology on a year-long basis.

Unfortunately, in the 1063 school districts in Texas, few technology staff development models have existed to guide administrators. This problem was especially critical for 77% of them because they were the 816 small school districts with fewer than 2,499 students (Texas Education Agency, 1991-92).

Purposes of the Study

This study proposes:

1. To survey the 53 small school districts in the Texas Region 10 Education Service Center area in May, 1991, in order to identify: (a) the current hardware and software configurations available, (b) current patterns of staff development activities for computer-based technologies, and (c) instructional technology needs for staff development as perceived by administrators and teachers.

2. To design a technology staff development program which addresses these identified computer-based technology needs.

3. To establish, during the 1991-1992 school year, a program in one Region 10 small school district with a K-12 configuration, and to evaluate that program according to the criteria developed during this study.

Research Questions

1. What were the hardware and software configurations in the 53 small school districts in Region 10?

2. What provisions were made in the small school district technology plans for staff development of teachers?

3. What patterns of staff development were used for training in technology in the small school districts?

4. What technology training needs for teachers were perceived by teachers?

5. What technology training needs for teachers were perceived by administrators?

6. What pattern of staff development did the surveyed administrators and teachers perceive as needed in districts with fewer than 2,499 ADA?

7. What changes occurred in the teachers' knowledge of technology as a result of the program?

8. What changes occurred in the teachers' attitudes toward technology as a result of the program?

9. What changes occurred in the teachers' use of technology as a result of the program?

Significance of the Study

During the past 20 years, there has been a tremendous increase in the use of educational technology; decision-makers have purchased hardware and software in substantial quantities. However, teachers have been given only cursory

training in the operation and integration of this technology.

Currently, many states--including Texas--have begun to investigate and design new systems to deliver technology staff development in a more comprehensive manner. The larger school districts have taken the lead because they have large budgets and department staffs. However, there continues to be a paucity of guidance, models, and evaluation data for all districts--especially for the smaller districts.

Definition of Terms

A small school district is one with fewer than 2,499 students.

An inservice workshop involves a planned learning opportunity engaged in by education professionals during their service and designed to contribute to their improvement on the job (Harris, 1980; Howey & Gardner, 1983; Texas Education Agency, 1982).

Microcomputer infusion means simply that computers are physically present in schools. Ratios (i.e. 25:1) relate the number of students to the number of computers (Lockard, Abrams, & Many, 1990).

Technology integration implies that teachers teach children to use technology as tools in the study of the various disciplines (Anderson, 1991; Maddux, 1989).

A beginner is one who is familiar with the use of some technology, but has had limited formal technology training.

Dominance is the state or quality of being preferred or used more often.

CHAPTER 2

REVIEW OF LITERATURE

In the 1980s, legislators and administrators expected that an immediate increase in student scores on standardized tests would justify the expense of technology. When scores were not improved immediately, some of the money was redirected to other programs. Kleene reported that these policymakers overlooked one obvious barrier to successful implementation of the microcomputer--the untrained teacher. He wrote that teachers were neither provided adequate support nor given time to integrate the technology (Kleene, 1990).

Teachers Have Been the Key

Teachers have been the key to unlocking the potential of computer-based technology in the classroom. Technically competent teachers, supported by appropriate hardware and software, should be able to provide an effective and flexible, interactive, learning environment.

In 1990, the International Society for Technology in Education (ISTE) published a report which stated:

> Teachers are the key to success in any educational change. They must be trained in the change. They must

> be supported in implementing the change. They must be provided with adequate resources to create the change. (Vision: TEST, 1990, p. 15)

The 1988 Texas Long Range Plan for Technology cautioned that all professionals would require "substantial training in integrating technology effectively into instruction and management" (Long Range Plan, 1988, p. 25). Power On!, the Office of Technology Assessment (OTA) report, recommended that teachers be allowed to make the choices on how to use technology in their classrooms. However, it also stated that teachers had to be qualified as well as willing to make these choices (OTA, 1988). Teacher training for technology usage was a major source of concern throughout the eighties, and promises to remain so during the nineties (Bracey, 1989; Dede, 1990; Kinnaman, 1990; Kleene, 1990; Lockard, Abrams, & Many, 1990).

Teachers Resist Training

Part of the challenge of training teachers to use technology has been the fears teachers have. Because early microcomputer advocates suggested computer-aided instruction would eliminate many teachers, some teachers feared the loss of their jobs. This has not proven true (Coburn, Kelman, Roberts, Snyder, Watt, & Weiner, 1984; Flemister, 1988). Some teachers feared anything new or any change to the familiar classroom routine--especially if

there was no reward structure provided by the district (Lieberman & Miller, 1984; Stieglitz & Costa, 1988). Other fears cited included bad experiences when first learning the microcomputer and a bias against mathematics operations used in some computing operations such as programming (Flemister, 1988).

Many teachers feared changing the role--due to technology--between themselves and their students. With the potential of technology for individualing education came the realization that the teacher's role would change from expert/dispenser of knowledge to a facilitator/guide in technology oriented instruction.

The technological classroom would focus on helping the students to determine their own learning. Students would be active participants, not passive receptors. Some students would eventually know more than the teacher in some areas (Bracey, 1989; Kleene, 1990; Lockard, Abrams, & Many, 1990; Wolk, 1991). Fletcher of the Office of Technology for the Texas Education Agency (TEA) discussed this role change in a speech given in Dallas, December, 1989. He said a teacher would become a "guide on the side and not a sage on the stage" (Fletcher, 1989).

Technology Configurations from 1981 to 1991

Hardware

During the past 10 years, teachers and their students have encountered different technology configurations.

During the 1981-82 school year, Ingersoll conducted a national microcomputer survey involving samples of administrators and teachers of schools from kindergarten through the twelfth grade. The results of this early survey helped to illustrate the rapid changes in the microcomputer field (Ingersoll, Smith, & Elliot, 1983).

This 1981 survey found that 32.6% of the respondents had at least one microcomputer in their school, with those microcomputers more likely to be available at the secondary level. Larger schools were more likely than smaller schools to have a microcomputer. The survey also found that microcomputers were more likely to be placed in media centers in elementary schools and in separate classrooms in middle and high schools (Ingersoll, Smith, & Elliot, 1983).

At the elementary level, Apple had a 38% share of the market; Tandy had 26%; Commodore had 19%; and others (IBM, TI, Atari) had 18%. At the middle school level, Apple had a 45% share of the market; Tandy had 24%; Commodore had 19%; and others had 12%. At the high school level, Apple had a 40% share of the market; Tandy had 31%; Commodore had 14%; and others had 15%.

In 1988, Hayes reported that a study by Quality Education Data, Inc. showed that 95% of the nation's schools had at least one microcomputer--an increase from the 32.6% reported in the Ingersoll study (Hayes, 1988). The OTA reported that schools were decentralizing

microcomputers (away from the laboratory setting), which created an effective natural environment to support various learning and teaching styles. Validating the Ingersoll study, OTA also reported that high schools were more likely to have the greatest number of computers (OTA, 1988).

In absolute numbers, smaller schools had fewer microcomputers than larger schools, but proportionally (student/computer ratio) more microcomputers than larger schools. In 1988, schools with 100-199 students had a ratio of 20 students to one microcomputer; schools with over 2500 students had a 70:1 ratio. This enrollment penalty factor meant that students in small schools might have greater computer access. OTA did not report on vendor share of the market.

Several states have been undertaking surveys of the educational technology in their public schools. California completed one in 1990, and Texas was in the process of compiling the data from a survey taken during 1990-91 as well as from data submitted by public school districts while formulating their technology plans.

California reported almost 40 microcomputers per school site or about one per classroom. The microcomputers were distributed: classrooms--47.6%, laboratory--38.3%, library/media center--4.4%, other (administration and teacher preparation areas)--9.7%. The 1981 national survey placed a greater emphasis on media centers, but had no

reporting of laboratories (Main, 1990, Ingersoll, Smith, & Elliot, 1983).

In the 1990 California survey, vendor market share was quite different from the 1981 national survey which included a 19% share for the Commodore and none for the Macintosh--which had not yet been invented. In 1990 the Apple II series computers had a 61% share of the market, with Macintosh having an additional 6%; MS-DOS machines (IBM and Tandy) had 24%; and others 9% (Main & Roberts, 1990).

Software

Texas produced a final report in late 1991, but Duffey reported some preliminary figures in her speech at the 1991 Texas Computer Education Association State Conference in Corpus Christi on June 27. School districts reported spending 50% of their budgeted technology funds for integrated learning systems (ILS), networks, and standalones. Using the ILS (a computer-assisted instruction laboratory system) appeared to be the trend (Duffey, 1991). This differed from the California study which reported 38% of its school computers in laboratories and 48% in classrooms (Main & Roberts, 1990).

Software acquisition and evaluation have been important components of educational technology in schools. Duffey reported that Texas schools did not address this topic

adequately in their technology plans. Software evaluation decisions have been made by various personnel. In the 1981 national survey, the respondents reported that teachers made 49.2% of the purchasing decisions, administrators made 21.3%, and the remainder were made by librarians and media specialists.

Since that early survey, new entities have become involved in the software eveluation process, and new school positions have been created. In the 1990 California survey, the respondents reported that teachers made 45% of the purchasing decisions, district and school committees made 19%, technology specialists made 12%, vendors made 3%, and others made 21%. Technology configurations have certainly changed during the past 10 years. Staff development for this technology must also change (Duffey, 1991, Ingersoll, Smith, & Elliot, 1983; Main & Roberts, 1990).

Staff Development for Technology

Many states have been producing long-range, state-wide technology programs, and developing policies. These programs and policies have assisted local school districts in planning for staff development as well as in purchasing technology. Twenty-four states, including Texas, had plans in place in 1987. Thirteen other states were developing their plans (OTA, 1988).

Programs and Policies

The 1988 Texas Long Range Plan for Technology required each district to develop its own plan for technology, to provide staff training to use technology, and to provide incentives for the staff to become trained. Duffey (1991) reported that by May, 1991, 90% of the districts reported they did have technology plans for their districts. She also reported, that many of the plans did not include important items such as staffing, staff development strategies, evaluation strategies, and overall expenditures. Duffey said that 22% of the technology training for teachers was provided by the Education Service Centers, 21% by the local districts, and the remainder by vendors and universities (Duffey, 1991).

Developing a district-wide strategy to implement staff development for technology has been a complex task which required careful planning. Kleiman (1984) recommended this type of strategy for technology implementation. Others agreed: "Until we have real, regular integration of computer [technology] use in ongoing instruction, we cannot expect to see much meaningful change in students, teachers, or curriculum" (Plump, Steerneman, & Pelgrum, 1988, p. 8).

District Recommendations

Many authors have advocated establishing a district inservice program which would expand into at least a

year-long program (Diem, 1981; Kleene, 1990; Stasz & Shavelson, 1985). In his conclusions from a project for the Minnesota Educational Computing Consortium (MECC) Center for the Study of Educational Technology, Kleene reported that integration took time. Kleene stated that it was difficult to provide a time-frame for any individual teacher, but most teachers would need more than one year.

The Power On! report addressed this concern:

> Inservice training in technology has unique requirements that distinguish it from traditional inservice activities. . . . [I]nservice training in technology must often overcome the experienced teacher's varying levels of "technology anxiety" [sic]. Moreover, studies point to the critical importance of follow-up and continuing assistance. (OTA, 1988, pp. 16-17)

Revenaugh also recommended that workshops be planned carefully to allow for repeat sessions throughout the school year. "One shot training experiences don't work. . . . It takes time to get comfortable and to integrate new information" (Revenaugh, 1989, p. 22). Revenaugh cited a national technology consultant's suggestion that "districts establish their own professional training institute for technology" (Revenaugh, 1989, p. 27).

One such professional training institute model (although specific to microcomputers only) might be the Computer Edification Program (CEP) promoted by Flemister at the University of Illinois. He described the CEP as a staff development program that provided a year-long

sequence of workshops designed to train teachers in the instructional uses of microcomputer hardware and software (Flemister, 1988).

Teacher Knowledge and Skills

District staff development programs for technology should first recognize the needs of their teachers. To help in this activity, many studies have identified knowledge and skills that are needed by technology-using teachers (Baum, 1978; Bracey, 1989; Diem, 1981; Fish & Feldmann, 1990; Stasz & Shavelson, 1985). These knowledge and skills are similar to ones reported in a study by TEA , which identified 55 microcomputer skills/competencies for all public school educators (Texas Education Agency, 1983).

In 1985, Olson verified these competencies by surveying teachers, campus-level administrators, computer specialists, college instructors, and computer vendors. The 55 competencies were grouped into 10 categories:

1. Educational applications: to use microcomputers for instructional purposes.
2. Implementation: to plan and execute activities to help ensure appropriate and successful uses of microcomputers in instruction.
3. Attitudes: to reflect positive attitudes about computer technology.
4. Software: to select and use appropriate software.
5. Programming: to adequately cause microcomputers to do basic tasks appropriate to teaching.

6. Hardware: to properly use computer devices in teaching.
7. Computers in society: to teach about a variety of positive and negative societal influences that computer technology may have on people.
8. General application: to teach about how computers work and how they are used.
9. Information resources: to locate and use information about computer technology relevant to instructional activities.
10. Future trends: to make intelligent decisions about projected uses of technology in education. (Olson, 1985)

Since the mid-1980s, researchers as well as teacher practitioners have reported that computer technology competencies for teachers have changed. Niess (1990) compared a 1989 project funded by Oregon State University with the Northwest Council for Computer Education's updated 1983 study. Three important changes were reported:

1. Keyboarding should be taught as early as possible.

2. Programming was not required for today's computer-using teacher.

3. Teaching technology integration was necessary because no longer was simply teaching academic skills acceptable to today's teachers.

Program Organization

Many experts, including Kleiman, have discussed how to organize a staff development program for technology. Kleiman suggested that there might be three stages for a year-long program: awareness, comfort, and integration. The program would begin with technology awareness

sessions. After the teachers were introduced to concepts and terminology, they would proceed to technology comfort sessions. These sessions would instruct teachers on how to operate software as well as hardware. If they wanted further training, teachers could advance to technology integration sessions which would provide curriculum as well as instructional modification strategies (Adams & Fuchs, 1986; Kleiman, 1984).

A State teacher training effort in Rhode Island designed four-level workshops: (a) to train teachers in basic microcomputer operations, (b) to provide teachers with knowledge of available education software, (c) to acquaint teachers with the specialized applications of microcomputers, and (d) to provide specific curricula integration techniques (Stieglitz & Costa, 1988).

Instead of teaching everything about all technologies, a district might organize its yearly staff development program around a target. Instead of doing too much, the aim would be to concentrate on one content area, or one idea. To help teachers feel more comfortable, many staff developers as well as district administrators recommended that training workshops be held at the campus site. Districts should select a resource person at each building to provide information and assistance. This would promote campus site collegiality and, therefore, better use of technology (Collis, 1988; Revenaugh, 1989).

Within each workshop, presenters should provide teachers with hands-on experience, and should demonstrate both hardware and software. Teachers would develop the basic technology skills needed to progress to advanced software--such as hypermedia, and hardware--such as multimedia (Lockard, Abrams & Many, 1990; OTA, 1988; Stasz & Shavelson, 1985).

Stasz and Shavelson (1985) suggested ongoing multi-session workshops to provide time for teachers to learn, practice, master, and apply what has been learned. Lockard and his co-authors recommended viewing videotapes as a form of modeling. The majority of teachers in Flemister's 1988 survey wanted sessions taught after school, both on inservice days and throughout the year.

Instructional Features

Once a program has been organized, other decisions have to be made about instructors, workshop designs, and inservice topics. "School districts . . . assume teachers will absorb the necessary operating skills by osmosis or by simply booting up" (Woolcott, 1991, p. 36).

Flemister's study reported that educators seemed to favor having teachers train teachers because they might have more credibility. Outside consultants were also important. Teachers wanted resource guides and practical information about operation of technologies and about their

instructional uses, evaluation of hardware and software, and design of technology lesson plans (Flemister, 1988; Kleiman, 1984; Revenaugh, 1989; Salomon, 1990; Wilson, 1986).

Recent surveys reported that teachers should be provided with the means to evaluate software for their students and classroom settings (Mokros & Russell, 1986; Niess, 1990). Printed checklists should be available for use during this process. Teachers read the documentation, viewed the operation of the software, then checked off various attributes such as age levels, difficulty levels, and cost. However, some evidence has indicated that software should also be evaluated on the basis of student learning styles (auditory, visual, and kinesthetic) or according to Gardner's multiple intelligences (MI) theory (Blythe & Gardner, 1990; Gardner, 1983; Vockell, 1990).

Districts should consider training teachers to use word processors in their classrooms. A meta-analysis of 85 research studies on microcomputers in the classroom reported that this kind of application seemed to be most effective. Word processing with writing skills was recommended because research has shown significant effects; students feel more positive toward the writing process when using word processors (Roblyer, Castine, & King, 1988).

In a 1987 study, the Educational Testing Service produced a workshop design. Revenaugh adapted it for technology in 1989.

1. Make sure your objectives for the course are clear and relevant.
2. Keep a balance between lecture and hands-on practice.
3. Be sure to have lesson plans, curriculum guides, and other handouts available.
4. Relate your instruction to common classroom practices.
5. Allow plenty of opportunities for peer interaction.
6. Consider whether the program will meet the needs of advanced microcomputer users as well as those of beginners.
7. Employ solid follow-up strategies once the program is over. (Revenaugh, 1989, p. 22)

Participation Features

Many experts have recommended that teachers be asked to volunteer for technology training. Mandatory requirements were unlikely to motivate them. Teachers should be encouraged through the formation of their own campus technology support groups. These support groups might meet periodically to discuss technology problems; teachers might be more comfortable admitting problems or mistakes among peers than among staff development specialists. Teachers might also be more willing to share new ideas on implementing technology into their instruction and curriculum (Collis, 1988; Flemister, 1988; Lockard, Abrams, & Many, 1990; Revenaugh, 1989; Strong, Silver, Hanson, Marsano, Wolfe, Dewing, & Broch, 1990).

According to Flemister (1988), incentives encouraged participation in technology training workshops. A successful program of staff development involved credible instructors as well as incentives such as:

1. Pay for technical expertise,
2. Released time during the school day,
3. Computer access at home and school,
4. Grants to purchase software,
5. Summer employment to develop applications,
6. Support to attend conferences,
7. Master teacher status and salary. (OTA, 1988, p. 116)

Summary

To unlock the potential of computer-based technology in the classroom, teachers should be supported by a well-planned, year-long program of staff development. Teachers might overcome their own fears if given: (a) choices of appropriate technology, (b) time to learn and master the technology, (c) reasonable funding for software purchases, (d) documentation to help integrate the technology into their classrooms, (e) on-site support personnel, (f) hands-on initial as well as continual technology training by experts, and (g) incentives to encourage attendance at training sessions.

CHAPTER 3

RESEARCH METHODS AND PROCEDURES OF THE STUDY

This study involved three purposes, with different research methodologies for each purpose. This study--begun in the spring of 1991 and completed in June of 1992--helped identify:

1. The technology training needs as perceived by both the teachers and administrators. The hardware and software configurations available in the districts as well as the pattern of activities for staff development in the use of computer-based technologies.

2. The design of a staff development program for year-long, technology training based on the perceived needs of the administrators and teachers surveyed in the summer of 1991.

3. The implementation and evaluation of the technology staff development program, during 1991-1992, in a school district with fewer than 2,499 in the Region 10 service area.

Samples

The survey was administered to two samples: 53 superintendents or their designees, and 100 elementary and

secondary teachers in selected school districts with fewer than 2,499 ADA in the Region 10 Education Service Center (ESC) area. The distribution of student population was developed by using the 1990-1991 Public Education Information Management System (PEIMS) data. PEIMS, a computerized, networked database, was designed by the Texas Education Agency (TEA) to standardize the format of data which was forwarded to the State by the public school districts (McCollough, 1991; Profile: School Districts 1990-1991, 1990).

Table 1

Distribution of Students in 79 Region 10 School Districts

Student Population	[a]No. Districts
1-299	8
300-999	31
1,000-2,499	14
2,500-4,999	14
5,000-9,999	4
10,000-24,999	4
25,000+	4

[a]N = 53

The 53 superintendents, or their designees, for districts with student populations of fewer than 2,499 were surveyed. One hundred teachers (50 elementary and 50 secondary) in these school districts were also surveyed. Because the teachers had shown a willingness to further their professional education by participating in Block Grant Cooperative (BGC) workshops, the sample was selected from those teachers in the 53 school districts who were BGC participants from August 1990 through March 1991. One district had fewer than 2,499 students, but its teachers were not included in the sample because they did not participate in any of the BGC workshops.

The BGC has been the largest instructional staff development program at Region 10, with services available to all the teachers in the 79 school districts. Workshops have been designed--by program coordinators and consultants --to fit the needs as expressed by local administrators as well as by teachers at the kindergarten through the 12th grade level.

For purposes of the study, the districts were divided according to those that had sent elementary teachers and those that had sent secondary teachers to the BGC workshops. The grade level of these teachers was determined by the name and content of the workshop they had attended. Fifty of the 53 districts had sent elementary teachers; the fourth teacher's name on each district list

was selected. Forty-seven of the 53 districts had sent secondary teachers; the second name on each district list was selected. Three additional secondary teachers were selected by pooling the remaining secondary teachers and selecting every 15th name.

Evaluation of Preliminary Survey Instrument

In March, 1991, a preliminary four-page survey instrument was developed (see Appendix A). The survey elicited information concerning demographics, technology plans, computer and computer staff, software evaluation, technology staff development for the school years 1989-1990 and 1990-91, as well as suggestions for future technology staff development.

Copies were sent to a validation panel of eight administrators and staff developers who were knowledgeable about educational technology. They were asked to complete the instrument as if they were an actual participant in the study. The panel noted any area of difficulty, made suggestions for revision, and made suggestions about the amount of time needed to complete the survey.

This validation panel included: Olson, Curriculum Director, Allen ISD; Borland, Elementary Principal, Howe ISD; Howard, Staff Developer, Mesquite ISD; Dreyer, Technology Coordinator, Denton ISD (formerly of Lancaster ISD); Puster, Superintendent, Lovejoy ISD; Pisacki,

Instructional Technology Director, Richardson ISD; Duffey, Office of Technology--subsequently Technology Applications--TEA, Austin; and Maddox, Director of Instructional Services, Region 10 ESC, Richardson. A final survey instrument was developed by the researcher after receiving the revised, preliminary survey instruments from the validation panel.

Administration of Final Survey Instrument

The superintendents or their designees were asked to respond to the complete survey; teachers were asked to respond to only the two pages which contained an the information section, the technology assessment section, and the section concerning eliciting information about texhnology topics for future staff development technology workshops. The mailing lists for both the samples of superintendents and of teachers were developed from information provided by Region 10 ESC.

Cover letters (see Appendix B)--with appropriate instructions--were attached to the final survey instruments, and the packets were sent via Region 10 vans in April, 1991. The superintendents and teachers were asked to return the completed survey instruments to the Region 10 offices in Richardson, Texas, by May 15, 1991--either via the Region 10 delivery system or via United States mail. Two weeks later, follow-up letters

and additional copies of the survey instruments were sent to those who had not responded.

Methods for Analysis of Survey Data

Depending upon the section, survey data were analyzed by various methods. Superintendents had been requested to answer all the sections; secondary and elementary teachers were asked to answer only three special sections. For most sections, the means for all surveyed districts with fewer than 2,499 students were reported.

Administrators' Survey

Section 1: Information. The administrator surveys were disseminated to 53 school districts according to three size categories with fewer than 2,499 ADA; respondents selected the appropriate size category. Data from other sections were compared according to these three size categories.

Section 2: Technology plan. The data from these questions were analyzed and reported as frequencies and means, with yes and no for each category. If the district did not have a technology plan, only Question 4 was answered.

Section 3: Technology and staff assessment. If the district did not have a district or campus technology coordinator, respondents answered Question 11. If the district did not have a district or campus coordinator, or another person to coordinate purchasing of technology, they also answered Question 12.

Questions 13, 14, and 15 elicited data on the number of instructional microcomputers at three grade levels: elementary, middle/junior high, and senior high. Responses relating to the placement of these microcomputers were reported according to frequencies and means for each size category. The number of computers for each level was averaged and compared with ADA figures for 1991-1992 to obtain the student/computer ratio for each size category.

Questions 16-18 elicited information about the types of computers used at each grade level. The data were reported according to frequencies and means for each size category.

Section 4: Software evaluation. Question 19 elicited data about a current software evaluation process according to means of the overall, as well as the per size, categories, using yes, no, or don't know.

If the respondents answered yes, they responded to only one of Questions 20-24. The data were reported by frequencies and means according to which individuals were in charge of the process.

Section 5: Past and present inservice topics. Questions 25 and 26 were reported according to the mean number of technology workshops per year and were compared for increase or decrease. Two questions per respondent were also added, and the mean was reported for the two-year time period.

Questions 27 and 28 were analyzed, and means were reported for both blocks of time as well as for presentation times. Question 29 was analyzed and a mean was reported to determine the importance of separating learners with different knowledge levels. The data from these questions were analyzed and reported as frequencies and means, with yes and no for each size category.

Questions 30-37 were analyzed and frequencies as well as means were reported to determine the significant trainers. Questions 38-45 were analyzed, and frequencies and means were reported to determine the significant past topics. Questions 46-53 were analyzed and reported as frequencies and means to determine the significant incentives.

Section 6: Future Workshops. Respondents were asked to evaluate a list of technology topics for future workshops--by four categories: software/curriculum, hardware, instruction, and administration. The respondents used a Likert-type summated rating scale to rate attitude

items. Responses were in degrees of importance for teachers (not important = 1 point, important to all = 5 points). The scores of the items were reported as means.

Teachers' Survey

Section 1: Information items. The respondents identified the name of their district as well as the student population for the district. The size categories were used as a point of comparison for other item responses.

Questions 5 and 6 detailed the number of responses for teachers--separated into either elementary or secondary. Questions 7-10 were analyzed and reported as frequencies and means categorized by years in teaching.

Section 2: Technology Assessment. Questions 11-14 and 15-19 were analyzed, and frequencies and means were reported according to the teachers' personal assessment of technology knowledge and skills as well as their attendance at technology workshops during the past year.

Questions 20 and 21 offered the teachers an opportunity to express their preferences for blocks of times, as well as for presentation times, for workshops. Preferences ranged from 1 to 4, with 1 being the primary preference.

Section 3: Possible Future Technology Workshops. The respondents were asked to evaluate a list of technology

topics for future workshops in four categories: software/curriculum, hardware, instruction, and administration. The respondents used a Likert-type scale, a summated rating scale, to evaluate attitude items. Responses were in degrees of importance for teachers, from not important to important to all. The scores of the items 22-37 were reported as means.

Comparisons of Data from Two Samples

Comparison 1

The means for blocks of time as well as presentation times were compared by the two samples (superintendents and teachers).

Comparison 2

The means for possible future staff development technology workshops were compared according to the two samples (superintendents and teachers).

Developing a Technology Staff Development Program for Small Schools

A Technology Staff Development Program for Small Schools (Program) was designed by the researcher according to the perceived needs of administrators and teachers who responded to the survey. The analyzed survey data was used to provide information about preliminary steps to the

development of a Program. The preliminary steps included: (a) the development of a technology plan, (b) the appointment of district and/or campus coordinators, (c) the development of a software evaluation, (d) the coordination of software evaluation, and (e) the assessment of the number, type, and placement of computers.

The year-long technology program was to be delivered by a system developed from the analyzed survey data. This system considered: (a) incentive preferences, (b) trainer suggestions, (c) separation of learners with different knowledge levels, (d) the number and kinds of past years' technology workshops, and (e) the time of day and blocks of time preferences.

The technology topics for the staff development program were sequenced based upon the importance given to them by the respondents. Those technology topics for possible future workshops that averaged between 4 and 5 on the Likert-type scale (important to all and important to most) were given priority and scheduled first. Those topics that averaged 3 (important to many) were scheduled next. Those topics that averaged 2 (important to a few) were scheduled if the district administrators decided that those few teachers needed the training. Those topics that averaged between 1 and 1.9 were not scheduled due to lack of perceived need.

Collecting and Analyzing Evaluation Data

The superintendent and the board of trustees of Trenton Independent School District (TISD) in Fannin County gave permission for the researcher to use their district to evaluate the Technology Staff Development Program for Small Schools during the 1991-1992 school year. TISD had 41 professionals, an ADA of 335, and occupied two campuses--one containing grades K-6 and one containing grades 7-12.

Changes in the TISD teachers' attitudes toward technology were evaluated by both pre-and-post testing. The Computer Attitude Scale (see Appendix C) had been found to be reliable in measuring teachers' attitudes toward microcomputers, as well as differentiating effectively among teachers with different amounts of microcomputer experience (Loyd & Loyd, 1985).

Changes in the teachers' use of technology were evaluated by three methods: (a) journals for self-assessment, (b) invited observations, and (c) technical assistance request logs. Journals for self-assessment were maintained by some of the teachers. The teachers made an entry into a technology journal once every six weeks during the school year, for a possible total of six entries per teacher. A journal entry consisted of completing a Journal Entry Page developed by the researcher (see Appendix D) containing of a series of

prompts and open-ended questions which could track the progress of each teacher in the use of technology.

These forms were analyzed for an increase in (a) the number of times each teacher used technology both in preparation for as well as in the classroom, (b) the number of times the students used technology in the classroom, (c) the number of minutes a teacher used technology in preparation for class as well as in the classroom, and (d) the number of minutes students used technology in the classroom. Other prompts on these journal entries included: (a) attendance at technology workshops plus the number of hours, (b) purchase of personal microcomputers or other technology, (c) requested purchase of technology for classroom, (d) registration and attendance at college technology courses, and (e) requests for technical assistance or follow-up from the workshop.

Each of the teachers was asked to invite the researcher to one class once a semester. During the invited observations, the researcher completed a Classroom Technology Observational Guide (see Appendix E) developed for this study, consisting of prompts to verify the use of technology. Questions concerned: (a) the lesson topic, (b) instruction style, (c) type of technology used, (d) how many minutes the technology was used, and (e) use of teaching models provided during inservice training. Other questions which could have been asked during or after the

lesson included: (a) the need for further technology training, (b) changes in thinking as a result of training, and (c) further technology support needed to be effective.

The researcher and technology coordinators logged the number and type of requests by teachers for technical assistance as well as for follow-up sessions concerning implementation of technology inservice information. This Technical Assistance Form (see Appendix F), developed by the researcher, recorded the type of technology assistance requested (computer, printer, CD-ROM, laserdisc, modem, etc.) as well as the type of workshop activity utilized (instruction, administration, or management).

Technology training activities were conducted throughout the school year. After each activity, the teacher completed a Participant Evaluation Form (see Appendix G) concerning (a) the inservice objectives, (b) the presenter, (c) the ideas and activities covered, (d) the relevance to teaching assignment, and (e) the overall value of the workshop. The form, designed by the researcher, also included open-ended questions asking for comments and suggestions.

Evaluation of each workshop was reported on a Likert-type scale of 1 to 7. The instruments were similar to those already in use at Region 10 for evaluating instructional workshops. The scores were summed and averaged per question. These averages were analyzed for

increases during the school year as the teachers participated in technology workshops.

Changes in the teachers' knowledge of technology was evaluated through pre-and-post testing. The Computer Knowledge Test (see Appendix H) had been used by the Texas Computer Education Association in their 1986 computer literacy student contest. The researcher modified this test by eliminating questions pertaining to programming languages, retaining 47 multiple choice questions with four answer choices per question.

Summary

In May 1991, surveys were sent to 53 administrators and 100 teachers, in 53 small school districts, to determine their perceived need for a technology staff development program. These perceived needs, as well as data from other technology studies and writings of technology experts, provided the basis for designing a year-long technology staff development program for small schools. During 1991-1992, the researcher was asked to serve as district technology coordinator--assisting in the Program's implementation in one of the 53 small schools. Various evaluation instruments monitored the changes in teachers' attitudes toward technology, teachers' use of technology, and teachers' knowledge of technology.

CHAPTER 4

PRESENTATION AND DISCUSSION OF DATA

The presentation and discussion of data have been separated according to the three purposes of this study:

1. To survey the 53 small school districts in the Texas Region 10 Education Service Center (ESC) area in May, 1991, in order to identify: (a) the current hardware and software configurations available; (b) their current patterns of staff development activities; and (c) instructional technology needs for staff development as perceived by administrators and teachers.

2. To design a staff development program which addressed these identified computer-based technology needs.

3. To evaluate the program in a Region 10 school district with a K-12 configuration during the 1991-1992 school year.

Analyses of Data from the Survey Instrument

The survey instrument was sent to the 53 superintendents in the 53 school districts with fewer than 2,499 ADA in 1990-91. Table 2 has shown that 40 surveys were returned by

superintendents or their designees--a response rate of 75%. (See Appendix I for a list of the 40 small school districts.) The survey was also sent to a sample of 50 elementary and 50 secondary teachers in these 53 small school districts. Table 2 has shown that 74 surveys were returned for a response rate of 74%. (See Appendix B for copies of the survey instrument for both superintendents and teachers.)

Table 2

Small School Districts in Region 10, 1990-91

Group	ADA	No. Small School	No. Superintendents	No. Teachers
1	1-299	8	8	11
2	300-999	31	22	44
3	1,000-2,499	14	10	19
	Total	53	40	74

For comparisons and analyses, the 53 small school districts were clustered into three groups according to average daily attendance (ADA). Group 1 had from 1 to 299 ADA, Group 2 had from 300 to 999 ADA, and Group 3 had from 1,000 to 2,499 ADA.

Presentation and analyses of data included all small schools with ADA from 1 to 2,499. The data from both the superintendents' and the teachers' surveys have been presented separately, and selected data from both superintendents and teachers have been presented as well as compared.

Technology Plan

Survey item: Do you have a district technology plan?" Thirty one (78%) of the superintendents reported that their school districts had technology plans (see Table 3). In the survey cover letter, a district technology plan was defined as a written plan required by the Texas Education

Table 3

Small School Districts with Technology Plans, May 1991

Group	ADA	n	No. Plans	% Plans
1	1-299	8	5	63%
2	300-999	22	20	91%
3	1,000-2,499	10	6	60%
	Total	[a]40	31	78%

[a] N=53

Agency (TEA). The plan might be in progress, written and not yet approved by the Board, or written and approved by the Board. These technology plans could provide guidance in the acquisition and integration of technology and could involve either a single year, or a multi-year, time frame.

Table 3 has also shown that 91% of Group 2 had technology plans, as compared with Groups 1 and 3 with 63% and 60% respectively. The 31 schools with technology plans reported additional information about staff development activities which had been included in their plans. Eighteen plans (58%) required teacher training for the operation of technology; 11 plans (35%) required teacher training for the evaluation of software; 13 plans (42%) required teachers to attend an introductory technology orientation; and 14 plans (45%) provided on-site support by trained teachers or coordinators.

Technology and Staff Assessment

Survey item: Do you have a district or campus technology coordinator? Table 4 has shown that 63% of the districts had district-level technology coordinators, but fewer than half of the districts (45%) had campus-level technology coordinators.

The survey cover letter defined a district technology coordinator as a full-time or part-time position. However, for the purposes of this survey, the position could not be

Table 4

Districts with Technology Coordinators, May 1991

Group	ADA	n	District		Campus	
			No.	%	No.	%
1	1-299	8	5	63	2	25
2	300-999	22	16	52	13	42
3	1,000-2,499	10	4	40	3	33
	Totals	[a]40	25	63%	18	45%

[a] N=53

filled by a volunteer. A campus technology coordinator was defined as a full-time or part-time position, but the position may be filled by a certified teacher who performed this function along with regular teaching duties.

If the superintendents responded that the district did not have a district or campus technology coordinator, they were asked to provide other information. Eight superintendents reported that other personnel in the district handled technology activities. These personnel included: three superintendents, three assistant superintendents, one librarian, and one director of instruction.

Although they had no one coordinating technology in their districts, five superintendents reported that they

did see a definite need. Only one superintendent reported having no need for the coordination of technology.

Table 5 has shown the placement of instructional computers in the small school districts. The survey cover letter defined instructional computers as all computers available for students in all content areas at each level (including the special education department). The majority of computers were placed in separate classrooms or laboratories (68% in elementary schools and 76% in both the middle and high schools.) The elementary schools placed more instructional computers in individual classrooms; almost one-third (29%) of all computers were in classrooms. Group 2 reported 42% of its computers were in individual classrooms--a substantial difference from the other groups.

An important factor when assessing computer distribution has been the comparison of the number of students in a school district with the number of instructional computers available. Table 6 has shown that the lowest ratio (5:1) occurred in the schools in Group 1. The ratio for all small schools was 12:1. However, the survey did not ask the age or the state of repair of computers used by the district.

Other factors in assessing computer distribution were the type or brand of computers, as well as computer location at grade levels. School districts have purchased

Table 5

Placement of Instructional Computers, May 1991

Facility	[a]All Schools		ADA Groups 1		2		3	
	No.	%	No.	%	No.	%	No.	%
Elementary								
lab	667	68	69	63	214	55	384	80
classroom	288	29	33	30	166	42	89	18
media ctr.	29	3	8	7	12	3	9	2
Middle School								
lab	456	76	69	77	205	77	182	75
classroom	85	14	15	17	35	13	35	14
media ctr.	59	10	6	7	27	10	26	11
High School								
lab	681	76	71	84	342	76	268	73
classroom	188	21	10	12	85	19	93	25
media ctr.	32	4	4	5	23	5	5	1

Note: One district did not furnish data.

[a]N=53, n=39

Table 6

Student to Computer Ratios, May 1991

	[a]All Schools	ADA Groups		
		1	2	3
No. Computers	2,485	285	1,109	1,091
1990-91 ADA	29,146	1,478	12,580	15,088
Ratio	12:1	5:1	11:1	14:1

Note. One district did not provide data.

[a]N=53, n=39.

both Apple IIs and IBM/compatibles in the past. However, many schools have begun to consider purchasing Macintosh computers; therefore, the Macintosh was included in the survey. Table 7 has shown the distribution of computers by grade levels.

Table 7 has shown a listing for other as a category for computers. Types of instructional computers that were listed in this category included Tandy, Texas Instruments, Radio Shack, Commodore 64, Pet 64, and unknown.

At the elementary level for all school districts fewer than 2,499 ADA, the Apple II or compatible was the computer of choice (ratio of 2:1). The Apple IIs constituted 52% of the computers, and the IBM or

compatibles 26%. At the middle school level, Apple IIs were preferred (3:1) or 67% to 22%. At the high school level, the IBM or compatible machines made up 59% of the computers as contrasted to the Apple at 35%.

Table 7 has also shown that at the elementary and high school levels the Macintosh was used by school districts in Group 3 at 4% and 5% respectively. The middle schools reported no Macintosh computers. The group with the largest percentage of other computers was Group 1. Approximately one-fifth of these schools used machines other than IBM/compatibles or Apple IIs.

Software Evaluation

Survey item: Is there a process within the district/campus that provides for the evaluation of software before it is purchased for use in the classroom? Table 8 has shown the percentage of small school districts that had an evaluation process for software as well as a person who coordinated the process. Sixty-eight percent of small school districts had a process in place to evaluate and purchase software for computers. The percentages decreased as the ADA increased (75% in the smaller Group 1, 60% in the larger Group 3).

No librarians coordinated the process. District administrators as well as combinations of personnel coordinated the process in Groups 2 and 3. The teachers in Group 1 evaluated computer software in their districts.

Table 7

Types of Instructional Computers, May 1991

	[a]All	ADA Groups		
Instructional Computers	Schools %	1 %	2 %	3 %
Elementary				
IBM/compatible	26	28	21	30
Apple II/compatible	52	52	51	53
Macintosh	2	0	1	4
Other	19	20	27	12
Middle School				
IBM/compatible	22	36	19	19
Apple II/compatible	67	46	71	71
Macintosh	0	0	0	0
Other	11	19	10	10
High School				
IBM/compatible	59	39	59	65
Apple II/compatible	35	41	38	30
Macintosh	3	0	2	5
Other	2	20	1	0

[a]N=53, n=40

Table 8

Software Evaluation Process and Coordinators, May 1991

	[a]All	ADA Groups		
Software	Schools	1	2	3
Information	%	%	%	%
Evaluation Process				
for Software	68	75	68	60
Coordinator				
Librarian	0	0	0	0
Campus Admin.	15	0	20	17
District Admin.	22	0	27	33
Teachers	26	67	13	17
Combination	37	33	40	33

[a]N=53, n=40

Staff Development Technology Workshops, 1989-90 and 1990-91

Survey item: How many 1989-90 and 1990-91 inservices were given that provided training on technology operation and integration? Table 9 has shown the average number of technology workshops in the small school districts for the years 1989-90 and 1990-91.

Table 9

Technology Workshops

Years	[a]All Schools	ADA Groups 1	2	3
n	40	8	22	10
1989-90	1.1	.8	.9	1.7
1990-91	1.5	1.1	1.6	1.5

[a]N=53

There was a slight increase (from 1.1 to 1.5) in the number of technology workshops for all small school districts from 1989 to 1991. However, Group 3 reported a small decrease.

Survey item: Rank as to dominance the blocks of time as well as the presentation times that were used when providing the training? Table 10 has shown the preferred times for technology workshops as reported by superintendents of small school districts. The blocks of time included workshops that lasted for one hour, two hours, three hours, and four or more hours. Superintendents

Table 10

Dominance Scales for Technology Workshops, May 1991

Inservice Factors	[a]All Schools	ADA Groups 1	2	3
n	24	6	13	5
Blocks of Time				
one hr.	2.1	1.8	2.3	2.2
two hrs.	1.7	1.3	2.0	1.6
three hrs.	2.8	3.3	2.5	2.8
four or more	3.3	3.5	3.2	3.4
n	20	5	11	4
Presentations				
after school	2.9	2.8	2.5	2.3
Saturdays	4.4	4.8	3.6	4.8
early release	2.7	2.0	2.7	3.8
inservice days	2.0	1.8	2.2	1.8
Summer	3.6	3.6	4.0	2.5

[a]N=53

each block from 1 to 4, with 1 being dominant. The presentation time factor included the time of day, day of the week, and time of the year that superintendents preferred to schedule technology workshops. Presentation times were rated from 1 to 5, with 1 being dominant.

Superintendents in all ADA groups preferred the two-hour block of time (1.7), with the one-hour block of time ranked next (2.1). Blocks of time were based on a 4-point scale, with 1 being dominant. Presentation time values were based on a 5-point scale, with 1 being dominant. Several school districts did not respond to this section of the survey.

Table 10 has shown that the superintendents' least preferred presentation times were Saturdays and Summers (4.4 and 3.6 respectively). Superintendents chose inservice days as the preferred presentation time.

Survey item: Were there separate inservices for teachers with varying levels of technology knowledge? Thirty of the 40 superintendents replied to this question. Thirty (23%) replied that the school districts had separate sessions.

Survey item: Check the individuals who have provided or are providing the technology training for teachers in the two school years--1989-90 and 1990-91). Table 10 has

Table 11

Trainers in Technology During 1989-90 and 1990-91

	[a]All Schools	ADA Groups		
Trainers		1	2	3
	%	%	%	%
n	33	7	20	6
District personnel	67	71	50	100
Teachers	42	29	60	0
Consultants	64	57	70	50
Hardware vendors	61	71	50	67
Software vendors	42	29	35	83
College faculty	3	0	5	0
Parents	15	0	15	33

[a]N=53

shown the technology trainers used by small school districts during those two years.

Software vendors and parents were used as trainers more frequently as the number of students increased in the district. All of the six school districts in Group 3 that responded to this section of the survey reported that they used district personnel, but not district teachers, as

trainers. Only one school district reported using college faculty as trainers. Sixty-four percent of the school districts used Region 10 consultants; 61% of the schools used hardware vendors.

Survey item: Check any topics that were presented in your technology inservices during the past two years (1989-90 and 1990-91). Table 12 has shown technology inservice topics presented in small schools between 1989 and 1991. Technology operation was reported by 82% of all the respondents, and was the item reported most often in all ADA groups.

Superintendents (63% and 71%) in the two largest ADA groups reported high percentages of technology integration, but Group 1 reported no workshops. Programming (11%) was reported as a topic only in Group 2. Networking (14%) was reported only in Group 3.

Survey item: Check the incentives provided for teachers to attend technology inservice. Superintendents reported the incentives that were provided to encourage teachers to attend technology workshops in their schools during the school years between 1989 and 1991. Table 13 has shown the six types of incentives, with none if no incentive was given.

Table 12

Technology Workshop Topics Presented in 1989-90 and 1990-91

Topics	[a]All Schools	ADA Groups		
		1	2	3
	%	%	%	%
n	33	7	19	7
Software selection	42	29	53	29
Technology operation	82	86	84	71
Applications	61	57	63	57
Keyboarding	58	57	68	29
Integration	52	0	63	71
Programming	6	0	11	0
Disk operating sys.	18	14	21	14
Other: networking	3	0	0	14

[a]N=53

Eighty-six percent of the schools in Group 3 in Table 13 used no incentives to encourage their teachers to receive technology training. The remainder of this group used only two incentives: released time and payment. Released time was the most popular incentive, with 50% of the respondents providing it. AAT credit was used as the

Table 13

Incentives for Attending Workshops During 1989-90 and 1990-91

Incentives	[a]All Schools	ADA Groups		
		1	2	3
	%	%	%	%
n	34	7	20	7
Released time	50	43	60	29
AAT credit	35	43	45	0
None	35	29	20	86
Compensatory time	24	29	30	0
Payment	12	0	15	14
Recognition status	6	0	10	0
Summer curriculum development job	3	14	5	0

[a]N=53

incentive in 35% of the school districts. Thirty-five percent of the responding schools provided no incentives. Recognition status (10%) was given only by the superintendents in Group 2.

Future Staff Development Technology Workshops

Survey item: Please rate the following types of technology inservices for teachers as possibilities for the next three school years. Responses were based on a 5-point scale of importance with 1 being not important and 5 being important to all. Table 14 has shown the responses according to four subsections of software/curriculum, hardware, instruction, and administration. Values were reported on the scale: 1 as not important, 2 as important to a few, 3 as important to many, 4 as important to most, and 5 as important to all.

Superintendents believed that most of their teachers should be trained in these technology topics: (a) software evaluation, (b) matching software and curriculum goals, and (c) teacher tools. They believed many of their teachers should have technology training in (a) software exploration, (b) applications in the content area, (c) elementary keyboarding, (d) CD-ROM, and (e) laserdisc. Superintendents also believed that many of their teachers should be trained (a) to use cooperative learning strategies with computers, (b) in separate sessions for different technology skill levels, and (c) in the induction year. Superintendents also thought that many teachers should be trained in organizing computers in laboratories and classrooms.

Superintendents believed that a few teachers should be trained in ESL software, programming, and the use of the

Table 14

Means of Topics for Future Workshops (Superintendents), May 1991

Topics	[a]All Schools	ADA Groups		
		1	2	3
Software/Curriculum				
Software evaluation	4.1	4.0	4.1	4.0
Software exploration	3.9	3.3	3.9	4.2
Matching software & curriculum	4.2	4.0	4.4	3.9
Applications in the content area	3.6	3.6	3.6	3.7
ESL software	2.3	1.9	2.4	2.6
Keyboarding	3.4	3.5	3.6	3.1
Programming	2.6	2.8	2.6	2.4
Hardware				
telecommunications	2.9	3.0	3.1	2.5
CD-ROM and laserdisc	3.6	3.4	3.8	3.8
Instruction				
Cooperative learning & computers	3.7	3.0	3.8	4.1
Separate sessions for different levels	3.8	3.0	3.9	4.0
Induction year	3.4	2.9	3.9	2.7
Administration				
Teacher tools	4.0	3.1	4.2	4.3
Lab organization	3.5	2.9	3.7	3.4
Classroom organization with computers	3.7	3.0	3.8	4.0

[a] $N=53$, $n=40$

modem and telecommunications. There was no topic that the superintendents considered to be unimportant for their teachers.

Training in ESL software ratings increased as the size of the school district increased--from 1.9 to 2.6 as seen in Table 14. Other similar increases included software exploration, cooperative learning and computers, separate skill sessions, teacher tools, and classroom organization with computers.

Teacher Demographics

Survey item: Check your present teaching assignment and total number of years teaching. Table 15 provided information about the 74 teachers who returned the survey instrument. The largest number of respondents was in Group 2, which had 44 teachers. However, this group also had 31 school districts, the largest of any of the groups. Group 1 had 8 school districts, and Group 3 had 14 school districts.

As shown in Table 15, the elementary teachers represented 53% of the sample, and the secondary teachers represented 47% of the sample. Nineteen percent of the teachers sampled had been teaching for 1-2 years, 32% had been teaching for 3-9 years, 31% had been teachers for 10-19 years. Eighteen percent had over 20 years of teaching experience.

Table 15

Profile of Teachers in Small Schools in Sample, May 1991

Information Items	[a]All Teachers	ADA Groups 1	2	3
	%	%	%	%
n	74	11	44	19
Grade level				
Elementary, K-6	39	5	24	10
Secondary, 7-12	35	6	20	9
Years Teaching				
1-2 years	14	5	6	3
3-9 years	24	2	18	4
10-19 years	23	4	13	6
20+ years	13	0	7	6

[a]N=100

Technology Assessment by Teachers

Survey item: Check your personal assessment of your knowledge and skills pertaining to technology. The categories for this item were defined in the survey cover

letter. An expert had extensive knowledge and skills about several types of microcomputers and other technologies. An intermediate had used a few sophisticated technologies on a regular basis. A beginner was familiar with the use of some technology. Someone designating no skills had never operated a microcomputer. Table 16 presented this data from the teachers.

Sixty-one percent of all the teachers classified themselves as beginners, with a significantly higher number (73%) in Group 1. Intermediates for all levels made up 22%; experts made up 5%; and 12% reported that they had no previous technology skills and had never operated a microcomputer.

Survey item: How many total hours of technology inservices did you attend during 1990-91? Table 17 has shown that 74% of the sampled teachers had no technology training in 1990-91 with the percentage increasing as the ADA increased until the larger schools reported 84% with no training. Only 26% of the teachers had some technology training. No teachers reported that they had between 7-12 hours training. Only two teachers had over 13 hours of technology training.

Survey item: Rank the blocks of time and presentation times that you would like used to provide technology training. Table 18 has shown that for all of the ADA

Table 16

Teachers' Self Assessment of Technology Skills, May 1991

Information Items	[a]All Teachers	ADA Groups 1	2	3
	%	%	%	%
n	74	11	44	19
Expert	5	9	5	5
Intermediate	22	9	25	21
Beginner	61	73	59	58
No skills	12	9	11	16

[a]N=100

groups, the teachers preferred 2 and 3 hour blocks consistently. The teachers preferred not to have a one-hour technology workshop. Blocks of time values were based on a 4-point scale where 1 was dominant. Presentation time values are based on a 5-point scale where 1 is the most dominant.

Teachers across all groups reported that they preferred presentation times to be on inservice and early release

Table 17

Hours of Workshops Teachers Attended, 1990-91

	[a]All Teachers	ADA Groups		
Technology Training Hours	%	1 %	2 %	3 %
n	74	11	44	19
None	74	64	73	84
1-3	9	24	9	0
4-6	14	9	16	11
7-12	0	0	0	0
13+	3	0	2	5

[a]N=100

days. Saturdays were the least preferred times for technology training; the average for all groups for Saturdays was 4.4 out of a possible 5 points.

Survey item: Please rate the following types of technology inservices for teachers as possibilities for the next three school years. Table 19 has shown that the topics

Table 18

Preferred Blocks of Time and Presentation Times, May 1991

Technology Training factors	[a]All Teachers	ADA Groups 1	2	3
		Means		
n	64	10	38	16
Blocks of Time				
one hour	3.2	3.2	3.3	3.1
two hours	2.3	2.3	2.2	2.4
three hours	2.0	2.0	1.9	2.1
four + hours	2.5	2.5	3.1	2.4
n	67	11	39	17
Presentation Times				
after school	3.1	2.8	3.3	3.0
Saturdays	4.4	4.4	4.7	4.4
early release	2.2	2.1	2.3	2.0
inservice days	1.5	1.8	1.3	1.9
Summer	3.7	3.9	3.7	3.7

[a]N=100

that teachers felt were important to most teachers included: (a) matching software and curriculum, and (b) teacher tools. Important topics for many teachers included: (a) software evaluation, (b) software exploration, (c) applications in the content area, (d) elementary keyboarding, (e) modem and telecommunications, and (f) CD-ROM and laserdisc. Teachers also wanted help in their induction year, with separate sessions for levels of knowledge, with cooperative learning and computers, and with organizing labs and classrooms. Values in Table 19 were reported on a scale from 1 to 5, with 1 as not important, 2 as important to a few, 3 as important to many, 4 as important to most, 5 as important to all.

In Table 19, the responses with consistent ratings above 4 showed that the teachers were concerned with matching software and curriculum as well as with teacher tools. The responses of the teachers to elementary keyboarding and applications in the content area decreased in values as the ADA increased.

Comparison of Data for Superintendents and Teachers

Table 20 compared the two samples as to blocks of times and presentation times for technology workshops. The teachers and superintendents agreed that Saturdays and Summers were the least preferred presentation times. They

Table 19

Preferred Topics for Future Workshops, May 1991

Technology Topics	[a]All Teachers	ADA Groups 1	2	3
			Means	
Software/Curriculum				
Software evaluation	3.5	3.6	3.5	3.7
Software exploration	3.9	4.1	4.0	3.7
Matching software and curriculum	4.1	4.1	4.2	4.0
Applications/content	3.8	4.1	3.8	3.4
ESL software	2.6	2.7	2.8	2.5
Keyboarding	3.1	3.6	3.1	2.9
Programming	2.6	3.1	2.5	2.9
Hardware				
Telecommunications	3.2	3.8	3.1	3.1
CD-ROM & laserdisc	3.7	4.0	3.6	3.6
Instruction				
Cooperative learning and computers	3.5	3.6	3.5	3.6
Separate sessions /different levels	3.9	4.1	4.0	3.7
Induction year	3.1	3.5	2.9	3.2
Administration				
Teacher tools	4.0	4.2	4.0	4.1
Lab organization	3.2	3.3	3.0	3.5
Classroom organization	3.6	3.8	3.6	3.6

[a]N=100, n=74

Table 20

Teachers/Superintendents on Blocks of Times/Presentation Times for Workshops

Technology Training Factors	Overall Means: [a]Superintendents' Means	Overall Means: [b]Teachers' Means
n	24	64
Blocks of Time		
one	2.1	3.2
two	1.7	2.3
three	2.8	2.0
four +	3.3	2.5
n	20	67
Presentation Times		
after school	2.9	3.1
Saturdays	4.4	4.4
early release	2.7	2.2
inservice days	2.0	1.5
Summer	3.6	3.7

[a] $N=53$, [b] $N=100$

preferred inservice days and early release times for the presentation of technology training.

Table 20 has shown that teachers preferred at least a three-hour block of time and reported a one-hour block of time as the least preferred. Superintendents preferred the two-hour block and reported the one-hour block as a second choice. The four-hour training session was least preferred by the superintendents.

Table 21 compared the two samples as to their rating of topics for future technology workshops. The teachers and superintendents responded consistently on most topics. Blocks of time values are based on a 4-point scale, with 1 being dominant. Presentation time values are based on a 5-point scale, with 1 being dominant. Values in Table 21 are reported on a scale from 1 to 5: 1 as not important, 2 as important to a few, 3 as important to many, 4 as important to most, 5 as important to all.

Technology Staff Development Program

In their responses to the survey instrument, teachers and superintendents of small schools provided information concerning past as well as current technology activities and made suggestions for future technology workshops. This information provided the foundation for designing a Technology Staff Development Program for Small Schools (Program). Recommendations from other technology studies

Table 21

Topics for Future Technology Workshops, per Teachers and Superintendents

Technology Topics	Overall Means: [a]Superintendents' Means	Overall Means: [b]Teachers' Means
Software/Curriculum		
Software evaluation	4.1	3.5
Software exploration	3.9	3.9
Matching software and curriculum	4.2	4.1
Applications/content	3.6	3.8
ESL software	2.3	2.6
Keyboarding	3.4	3.1
Programming	2.6	2.6
Hardware		
Modem/telecommunications	2.9	3.2
CD-ROM and laserdisc	3.6	3.7
Instruction		
Cooperative learning and computers	3.7	3.5
Separate sessions/ different knowledge levels	3.8	3.9
Induction year	3.4	3.1
Administration		
Teacher tools	4.0	4.0
Lab organization	3.5	3.2
Classroom organization with computers	3.7	3.6

[a] $N=53$, $n=40$; [b] $N=100$, $n=74$

and experts were also used to construct the framework of the Program.

The Program was divided into two phases: Phase 1 recommended preliminary steps to take before the delivery of technology training to teachers; Phase 2 recommended the organization of the delivery of technology training to teachers.

Technology Program: Phase 1

The steps in Phase 1 involved technology plans and provisions for staff development of teachers, district and/or campus technology coordinators, a software evaluation and coordination process as well as the kinds, numbers, and placement of computers.

Table 22 has shown a summary of the appropriate survey data which served as the bases for the Program's development.

Developing a technology plan with staff development activities. Technology plans were reported by 78% of the superintendents in small schools in the sample (see Table 22). In addition, they reported that the plans provided for staff development activities such as technology operation, software evaluation, and technology orientation.

The 1988 Texas Long Range Plan for Technology recommended that districts develop their own plan for

Table 22

Survey Items, Phase 1

Survey Items	[a]Superintendents' Responses	
	No.	%
Technology plans	31	78
Technology coordinators:		
District	25	63
Campus	18	45
Software evaluation:		
Process	27	68
Coordinators:		
Campus administrators	4	15
District administrators	6	22
Teachers	7	26
Combination	10	37
Computer factors:		
Elementary: Apple II/compatible	513	52
Middle school: Apple II/compatible	402	67
High school: IBM/compatible	535	59
Computer placement:		
Elementary laboratories	667	68
Middle school laboratories	456	76
High school laboratories	681	76

[a]$N=53$, $n=40$

Note: Student/computer ratio = 12:1.

technology, including incentives and staff training (Long Range Plan, 1988). The survey in this study was taken in May, 1991. Subsequently, the Texas Education Agency has required all Texas school districts to develop and submit a five-year technology plan before obtaining technology funds from the State. In each of the five years, the school districts are expected to submit information on technology-related staff development activities (TEA, 1992).

Selecting technology coordinators. Table 22 has shown that 63% of the superintendents had selected a district technology coordinator; and 45% had selected a campus technology coordinator. Revenaugh recommended that schools at least have a building-level resource person to help promote collegiality and better use of technology (Revenaugh, 1989).

Software evaluation and coordination. According to Table 22, 68 percent of the superintendents in small schools reported having a process to evaluate software. The largest group of staff (37%) responsible for coordinating this process were administrators and teachers. The 1981 national survey and the 1990 California survey supported this data; they reported that both teachers and administrators were involved in making

decisions about software purchases (Ingersoll, Smith, & Elliot, 1983; Main & Roberts, 1990).

Numbers, types, and placements of computers. Table 22 has shown that at the time of the survey in May, 1991, the student to computer ratio for small schools was 12:1. School leaders should anticipate a continuing improvement in that ratio due to a trend reported in the 1981 and 1990 national surveys. The 1981 survey reported that one third of the nations' schools had one computer. In 1988, the Office of Technology Assessment reported 95% of the nation's schools had one computer, with some schools having a 70:1 ratio. The California survey in 1990 reported one computer per classroom or about a 25:1 ratio (Ingersoll, Smith, & Elliot, 1983; Main & Roberts, 1990; OTA, 1988).

Table 22 has shown that the Apple II or compatible was selected by 52% of the elementary schools and 67% of the middle schools. The IBM or compatible was selected by 59% of the high schools in small districts. If the trends reported in the 1981 and 1990 surveys continue, administrators in small schools should expect continuing changes in the types of computers offered to educators. The 1981 survey reported market shares by vendors--Commodore, Texas Instruments, and Atari (Ingersoll, Smith, & Elliot, 1983). The 1990 California survey reported market shares by Commodore (Main & Roberts, 1990). The Texas Instruments

computers are no longer being manufactured, and the Atari and the Commodore were being replaced in most schools. New computers, such as the Macintosh, continue to be invented as well as adapted for the education market. Computers are being redesigned in smaller form, such as laptops and powerbooks.

Table 22 has shown that at all levels computers are being placed more often in school laboratories, from 68% at the elementary school level to 76% at the high school level. Duffey, from the Texas Office of Technology, reported that Texas school districts spent 50% of their budgeted technology funds in the 1990-91 school year for integrated learning systems (ILS) which are laboratories of networked computers (Duffey, 1991).

Administrators in small schools should carefully consider whether computers should be placed in laboratories, or whether individual computers could be put to better use in separate classrooms and library/media centers. In 1988, the OTA reported a decentralizing of computers--away from laboratories--thus creating an effective natural environment for the support of various learning and teaching styles. The 1990 California survey reported that 48% of their school computers were in classrooms and 38% were in laboratories (Main & Roberts, 1990; OTA, 1988).

Technology Program: Phase 2

The organization of the delivery of technology training to teachers involved: (a) delivery system, (b) timeframe, (c) levels of presentation, (d) workshop design (follow up), (e) blocks of time, (f) presentation times, (g) trainers, (h) incentives, (i) past history (number, topics), (j) separation for differing knowledge and skills and (l) future topics.

Table 23 has shown appropriate survey data, and other tables previously cited, have served as the bases for recommending the components of the staff development program. In Table 23, blocks of time have been based on a 4-point scale, with 1 being preferred. Presentation times were based on a 5-point scale, with 1 being preferred. Past history was a mean of two school years, 1989-90 and 1990-91.

Organization and Delivery of Technology Training

The 1988 Texas Long Range Plan for Technology and the TEA Handbook for Technology Planning both recommended that each Texas school district develop a plan for technology, and that the district technology plan should contain provisions for training teachers in technology. The Executive Summary (see Appendix J) required districts to itemize staff development activities planned for 1992-93.

Table 23

Survey Items, Phase 2

Survey Items	Responses
Superintendents/teachers preferences (mean of both samples)	
Blocks of time for technology training	
Two hours	2.0
Three hours	2.4
Times for technology training	
Inservice days	1.8
Early release	2.5
Incentives to attend technology training	
Release time	50%
AAT credit	35%
None	35%
History of scheduled technology training	
Number of training sessions (mean of two years)	1.3
Teachers' self assessment/technology skills	
Beginner	61%
No previous hours of technology training	74%

Collis and Kleiman also recommended a district-wide system for technology implementation (Collis, 1988; Kleiman, 1984; Long Range Plan, 1988; Handbook for Technology Planning, 1991).

Many experts argued for a district inservice program which would expand into at least a year-long program (Diem, 1981; Kleene, 1990; Stasz & Shavelson, 1985). Both the Texas Long Range Plan and the TEA Handbook for Technology Planning recommended at least a five-year district plan (Long Range Plan, 1988; Handbook for Technology Planning, 1991).

Past History of Number and Topics for Technology Workshops

Table 23 has shown that the surveyed small schools reported an average of 1.3 workshops for the school years 1989-90 and 1990-91. Table 12 has shown that the surveyed small schools delivered several technology topics more frequently: 82% presented technology operation; 61% presented application software; 58% presented elementary keyboarding, and 52% presented technology integration.

Self-assessment of Skill Level

Fifty-eight percent of the superintendents responding to the survey stated that in the past two school years their districts did provide separate sessions for teachers with varying levels of technology knowledge. Table 23 has

shown that as of May, 1991, 61% of the teachers assessed themselves as beginners, while 74% reported that they had received no previous formal technology training. The term beginner had been defined in the cover letter as someone familiar with the use of some technology. It might be to a district's advantage to place the beginners (61%) and more advanced users (39%) in separate workshops.

Incentives to Attend Technology Training

Table 23 has shown that 50% of the superintendents offered released time from school duties as an incentive. AAT credit was given by 35% of the superintendents; however, 35% gave no incentives at all. Flemister (1988) and the OTA (1988) recommended offering incentives for voluntary participation and supported released time during the school day.

Scheduling for Technology Training

Table 23 has shown the combined responses of both teachers and superintendents. On a 4-point scale with 1 being preferred, the two-hour block of time received a 2.0; the three-hour block of time received a 2.4. Stasz and Shavelson (1985) recommended multi-session workshops to provide time for teachers to learn, practice, master, and apply what has been learned.

Both teachers and superintendents reported a preference for special inservice days or early release days. In Table 23 on a 5-point scale, with 1 being preferred; inservice days averaged 1.8 and early release days 2.5. The majority of teachers in Flemister's 1988 survey also wanted sessions taught after school and during inservice days.

Trainers for Technology Workshops

District personnel and outside consultants were reported by Flemister (1988) and Revenaugh (1989) as favored by teachers for training. Table 11 has shown that 67% of the school superintendents used district personnel other than teachers; 64% used Region 10 consultants; and 61% used hardware vendors.

Prioritize Technology Topics

Table 24 has shown the means for technology topics as prioritized by the superintendents and teachers in Table 21. Averages above 3.8, reported as important to most, were scheduled first. Averages between 3.0 and 3.6, reported as important to many, were scheduled next. Averages that fell below 3.0, reported as important to a few, were scheduled as needed.

Provide Multi-level Technology Training

Kleiman (1984) recommended three stages of technology training: introduction to concepts and terminology;

Table 24

Technology Topics for the Technology Staff Development Program for Small Schools

Technology Topics	Mean of Both Superintendents and Teachers
Software/Curriculum	
ESL software	2.5
Programming	3.3
Elementary keyboarding training	3.3
Applications in the content area	3.7
Software evaluation	3.8
Software exploration	3.9
Matching software and curriculum	4.2
Hardware	
Modem and telecommunications	3.1
CD-ROM and laserdisc	3.7
Instruction and Administration	
Induction year	3.3
Cooperative learning and computers	3.6
Separate sessions for different levels	3.9
Lab organization	3.4
Classroom organization with computers	3.7
Teacher tools	4.0

Note: Values are reported on a scale from 1 as not important to 5 as important to all.

instruction on operation of hardware and software; and training on instruction and curriculum modification strategies. Stieglitz and Costa (1988) recommended four levels: introduction to computer operations; software evaluation and exploration; an applications level; and a level for integration techniques into specific curricula. Table 25 has shown the three levels of organization of the Technology Staff Development Program for Small Schools:

1. Basic Technology Literacy contained introductions to hardware and software as well as to concepts and terminology.

2. Professional Applications contained training in application software, new technologies such as modems and laserdisc players, and laboratory/classroom organization and management.

3. Instructional Application/Integration contained techniques to integrate software as well as visual technologies into curriculum areas.

Summary of Phase 1: Preliminary Steps

Before implementing the delivery of technology training to teachers, small school districts should: (a) develop a technology plan which contains appropriate staff development activities for teachers, (b) select a district technology coordinator and consider selecting a campus technology coordinator, (c) develop a software evaluation

Table 25

Technology Training by Levels and Topics

Title	Level
Basic Technology Literacy	Level 1
General technology knowledge	
Basic hardware operation	
Software evaluation/exploration	
Professional Applications	Level 2
Teacher tools, i.e. gradebook	
Application software tools	
Lab/classroom organization and management	
Induction year training	
Operation of modem and visual technologies	
Instructional Application/Integration	Level 3
Matching software to curriculum	
Applications in content area	
Collaborative learning with computers	
Integrating visual technologies	
Elementary keyboarding training	

Note. Levels 1 and 2 might need separate sessions.

and coordination process, and (d) carefully consider the numbers, types, and placements of computers.

Summary of Phase 2: Program Organization

Small school districts should: (a) organize in a district-wide delivery system, (b) organize in at least a one-year timeframe, (c) consider their recent past history for the number and topics of technology workshops to be delivered to their teachers, and (d) separate teachers in selected workshops based upon previous technology training and self-assessment of skills.

Small school districts should also (a) provide incentives to encourage the teachers to attend technology workshops, (b) present technology workshops in two to three hour blocks of time, (c) schedule technology workshops on inservice or early release days, (d) use a variety of trainers for technology workshops, and (e) prioritize those technology topics that their teachers and administrators reported as most important.

CHAPTER 5

IMPLEMENTATION OF THE TECHNOLOGY STAFF DEVELOPMENT PROGRAM FOR SMALL SCHOOLS: TRENTON

The Technology Staff Development Program for Small Schools (Program) was designed from survey data provided by teachers and administrators in Region 10 small schools. The researcher decided that it was appropriate to implement and evaluate the Program in one of these small schools. Therefore, during the school year 1991-92, the Program was implemented in the Trenton Independent School District (TISD) in Fannin County, northeast of Dallas. Evaluation data was collected throughout the school year; various instruments monitored changes in the teachers' knowledge of technology, the teachers' attitude toward technology, and the teachers' use of technology.

Trenton Demographics

The City of Trenton, a rural community with farming and a few manufacturing firms, had a population of 700. Trenton also had a bank, a post office, a pharmacy, five churches, two restaurants, and one grocery store. Many citizens were retired, and many commuted to Dallas and Sherman to work.

TISD was a small school district that encompassed 49 square miles, had 337 students and 41 professionals of whom 28 were teachers. TISD had two campuses: one containing grades K-6 and one containing grades 7-12. Both campuses had been built on one site.

The secondary building contained an indoor gymnasium, library, and administrative offices. Additional nearby buildings housed science and agriculture programs. The elementary building contained a cafeteria and the administrative offices. A two-room portable was placed nearby for the kindergarten class as well as a science classroom where one teacher taught all the science curriculum for grades 1-6.

TISD was selected for several reasons. It received recognition by the Governor's Educational Excellence Committee in the fall of 1991 for showing sufficient gains in performance on the TEAMS test across three previous years. As part of the recognition, they received a $10,000 award. Tthe district bought new computers and printers with most of the money. TISD had also participated in a pilot science program which trained selected teachers in an interactive approach to teaching science, including the use of laserdisc players and courseware.

Implementation: Phase 1

Meetings were held in Spring, 1991, with the superintendent and trustees of the school board. Permission was

granted to set up the Program. At that time the superintendent did not have technology coordinators, but agreed to select two campus coordinators and to organize a District Technology Committee to review the existing two-year district technology plan.

On May 20, 1991, at the first meeting, a District Technology Committee was established that was designed to continue into the next school year (1991-92). Members of the committee included: (a) the superintendent, (b) the two principals, (c) the secondary special education teacher, (d) the computer literacy teacher, and (e) the elementary computer aide.

The meeting's agenda included: (a) an overview of the Program, (b) an announcement by the superintendent of the names of the campus technology coordinators for the following school year, and (c) a tour of the campuses to locate and assess existing technologies. Because the district had plans to purchase several computers during the summer, a formal survey of the technologies was not made at that time.

Technology Plan

TISD had developed a technology plan for 1990-92 (see Appendix K). The plan called for staff development of teachers at both the elementary and secondary levels; however, training was not specified. The software

component established a software checkout system through the library. The plan also identified campus committees to facilitate its technology goals.

The TISD Technology Plan was revised during the 1991-92 school year by the District Technology Committee. The committee met seven times and expanded its membership to include the librarian and the secondary business teacher. A five-year technology plan which included a statement of philosophy, a district vision for technology, four goals, 16 objectives, and 16 plans of action was developed (see Appendix L).

In June, 1992, TISD's Technology Plan and an Executive Summary were submitted to the Texas Education Agency in order to obtain technology monies offered by the state for the 1992-93 school year (see Appendices M and N).

One of the TISD's plan goals was:

> To provide district personnel, parents, and volunteers with appropriate staff development opportunities in the use of technology and on-site support (Trenton Independent School District Technology Committee, 1992a, p. 2).

Five objectives were listed, including: (a) keyboard training for all personnel, (b) training on application software and other technologies, (c) a checkout system for hardware and software to reinforce staff development activities, (d) training for volunteers in computer laboratories, and (e) support for the technology

coordinators to receive continual training (Trenton Independent School District Technology Committee, 1992a).

The Executive Summary listed staff development activities for 1992-93, including: (a) training for teachers on computers, printers, projection panels, laserdiscs, CD-ROM, and modems. Training would also be given to volunteers and to technology coordinators. (Trenton Independent School District Technology Committee, 1992b).

Technology Coordinator

During 1991-92, the Trenton superintendent asked the researcher to be the district technology coordinator. He appointed two campus technology coordinators: the computer literacy teacher at the secondary level, and the computer aide at the elementary.

These campus technology coordinators were responsible for (a) helping teachers at their grade levels on a daily basis, (b) facilitating during technology workshops, (c) disseminating information about upcoming technology activities, (d) answering questions after technology activities, (e) attending District Technology Committee meetings, and (f) assisting the researcher in other tasks as needed. At the end of the 1991-92 school year, the superintendent appointed the secondary special education teacher as district technology coordinator for 1992-93.

Software Evaluation and Coordination

During the 1991-92 school year, a team of teachers and administrators evaluated and purchased computer software. This was a continuation of the policy from previous years. According to the 1992-97 TISD Technology Plan, the technology coordinators as well as district-level and campus-level committees were to be responsible for evaluating and coordinating the purchase of software to support the new hardware purchases: computers, modems, laserdiscs, and CD-ROMs. To reinforce staff development activities, the technology coordinators and campus principals would develop a system for software check-out over weekends and summers (Trenton Independent School District Technology Committee, 1992a).

Numbers, Types, and Placements of Computers

Table 26 has shown an assessment of instructional technology taken at both TISD campuses in December, 1991. TISD had 45 computers: 19 Apple IIs, 8 Macintosh computers, and 18 IBM PCs. Therefore, with an enrollment of 337 students, Trenton ISD had a student-to-computer ratio of 7.5 to 1. According to the survey, the average small school student-to-computer ratio was 12:1. All of TISD's computers were placed in laboratory settings which included two special education labs, one computer literacy lab, one business lab, and one elementary lab which would be available for any elementary class of students.

Table 26

TISD Instructional Technology Hardware

Technology	Type	Number	Location
Elementary School			
Computers	Apple II	6	Lab
	IBM PC	13	Lab
Printers	Dot matrix	6	Lab
Laserdisc	Pioneer 2200	2	Class
Secondary School			
Computers	Apple II	13	Lab
	Macintosh	8	Lab
	IBM PC	5	Lab
Printers	Dot matrix	19	Lab
	Laser	1	Lab

Implementation: Phase 2

The Technology Staff Development Program for Small Schools was implemented at a district level during the 1991-92 school year. The school year began for teachers on August 19, 1991, and for students August 20, 1991. There were six 6-weeks grading periods, 180 instructional days, and three teacher work days. The school year ended for students on May 27, 1992 (see Appendix O).

Technology Staff Development History

The Trenton superintendent supplied information about past staff development activities for technology. There were no technology workshops during 1989-90 and three in 1990-91; the district averaged 1.5 for the two years. These workshops were presented in one and two hour blocks of time, after school and on early release days. The workshops were taught by district teachers and by Region 10 consultants; teachers were offered incentives of released time, compensatory time, and AAT credit. Technology topics included: elementary keyboarding, selection and evaluation of software, and methods for integrating technology into the curriculum.

Teacher Information

During a faculty meeting on August 26, 1991, teachers were asked to provide information on their backgrounds in education and technology. Table 27 has shown that the typical teacher at TISD was a female between 41 and 50, with either a bachelors or a masters degree, and with less than a month of computer experience. Fifty-two percent of the teachers had less than one month of computer experience; 70% had less than one year experience. One non-certified teacher aide was included because she was the elementary computer aide, the elementary technology coordinator, and a preservice student. One teacher was not present because he drove the school bus.

Table 27

TISD Teacher Demographics, August 1991

Profile Item	Data
Gender	
Males	7
Females	20
Education level	
Bachelors	13
Masters	13
Preservice	1
Age	
23-30	5
31-40	7
41-50	12
51 plus	3
Self-assessed computer experience	
1 week to 1 month	14
1 month to 1 year	5
1 year plus	8

To assess their attitude toward computers as well as their computer knowledge, the teachers were also asked to take two pre-tests. Table 28 shows the data provided by the Computer Attitude Scale and the Computer Knowledge Test (see Appendices C and H). In the Computer Attitude Test, a maximum of 40 points could be scored in each subarea. Higher scores indicated more positive attitudes. In the Computer Knowledge Test, the maximum score was 46 correct answers.

Teachers indicated on the computer attitude pre-test, shown in Table 28, that they generally considered computers to be useful, but they did like them. Secondary teachers scored at least three points higher on all subarea tests than did elementary teachers. With a possible 46 answers on the computer knowledge pre-test, the teachers had a mean score of 22 correct answers. Secondary teachers had a higher mean score than elementary teachers, scoring three points higher with 51.7% correct answers.

Technology Workshops

When the Program was first discussed with the superintendent, he scheduled early release days on October 17 and February 26 when technology topics would be presented. Each early release time would be 2.5 hours--from 1 to 3:30 p.m. The superintendent explained that he would require each teacher to accumulate at least

Table 28

Computer Attitude and Computer Knowledge of TISD Teachers, August 1991

	Scores/Points		
Test Items	Mean	Elementary	Secondary
Computer Attitude			
Anxiety	28.3	26.0	30.6
Confidence	27.7	25.6	29.8
Liking	27.8	25.9	29.7
Usefulness	32.1	30.3	33.9
Computer Knowledge			
Highest individual score		36	38
Lowest individual score		8	6
Mean of correct answers	22.2	20.5	23.8
Mean percentage	48.2	44.6	51.7

five hours of technology staff development for the year; these two early release days would provide that opportunity.

The Program was discussed with the secondary and elementary principals. Each principal then explained campus improvement goals for the year and how the Program

could help in attaining those goals. The researcher and the principals began scheduling technology workshops for their teachers. Other technology workshops were scheduled during the year as the need and opportunity arose.

For various reasons, it was more feasible to separate teachers by grade level than by knowledge level. In reviewing the pre-test computer attitude and the knowledge pre-tests, the teachers seemed to separate by grade level. Secondary teachers appeared to be more knowledgeable and positive about computers than elementary teachers.

There was also a distribution of different computers by grade level. The elementary campus had Apple IIs, but they were restricted to the special education room. The elementary principal would not let anyone else use them. The IBM PCs were located in a lab setting which could be used by all students at various times. Therefore, the elementary teachers wanted training on IBMs and available compatible software.

The secondary campus had Apple IIs in a lab setting, but computers could be moved to other rooms for special projects. The secondary principal had made a decision to eventually distribute all the Apple IIs to individual classrooms and to purchase Macintosh computers for the computer literacy laboratory. Therefore, the secondary teachers wanted training on both the Apple and the Macintosh as well as their available software. IBM PCs

were located in the secondary special education lab; only special education students could use them.

Table 29 has shown a summary of the technology workshops presented during the 1991-92 school year (see Appendix L). During the school year 1991-92, twelve technology workshops were presented for teachers. Participation incentives included: (a) five with no incentives, (b) one with free software, (c) two with AAT credit, and (d) four during early release days. Presentation times were either after school or during early release days. Blocks of time ranged from one hour to 2.5 hours. A variety of trainers presented the technology workshops, including hardware and software vendors, campus and district technology coordinators, district teachers, and Region 10 consultants.

Several computer workshops to train aides were scheduled by the elementary campus coordinator in the district. These workshops were at Level 1: Basic Technology Literacy in the Technology Staff Development Program, and were held for 45 minutes at the end of the school day.

The teachers were asked to complete a Participant Evaluation Form at each workshop; on three occasions the evaluation forms were not available: hardware operation, vendor software exploration, and laserdisc and science workshops. However, participants did complete evaluations

Table 29

Technology Workshops at TISD

Technology Workshop	No.	Incentive	Hours	Time	Trainer
Hardware oper.	1	none	1	AS	H-vendor
Software explo.	1e	ER	2.5	ER	C-coord.
	1	free software	2	AS	S-vendor
Software appl.	3s	ER/none	2/2.5	ER/AS	D-coord.
	2e	AAT	2	AS	D-coord.
Laserdisc & basic math	1e	none	2	AS	R10
Laserdisc & science	1e	none	2	AS	R10 & D-teach.
Teacher tools	2	ER	2.5	ER	D-coord.
Computing (aides)	4	ER	.75	ER	C-coord.

Note: Abbreviation key:

e - elementary teachers only

s - secondary teachers only

ER - early release

AS - after school

D-teach. - district teacher

R10 - Region 10 consultant

C-coord. - campus technology coordinator

D-coord. - district technology coordinator

H-vendor - hardware vendor

S-vendor - software vendor

at other workshops. One evaluation item gave an overall inservice rating on a Likert-type scale of 1 to 7, with 1 being of no value and 7 being very high.

The software exploration session was rated as 5.3; the software application workshops as 6.1; the laserdisc and basic math session rated 6.8; and the teacher tools session as 6.4. Follow-up activities to the workshop as well as technical assistance were provided by the researcher, who served as acting district technology coordinator. The follow-up activities included: (a) providing additional training on Appleworks to two teachers, (b) helping a math teacher evaluate a new software package which would assist students prepare for the TAAS test, and (c) evaluating a new software package which produced basketball statistics after a game for a coach who was also a special education teacher.

Technical assistance activities included: (a) demonstrating the laserdisc technology in two senior classes--English and History, (b) providing the secondary science teacher with some public domain science software, (c) assisting the secondary math teacher with software that came with her new math books, and (d) trying to install a speech synthesizer to the computer of the elementary special education teacher.

Table 30 was an expansion of Table 26 which presented the levels and groupings of topics for the Program. Table

30 added the dates when the topics were presented in both the structured inservice and to the follow-up sessions at TISD.

Several components of the Program were not scheduled in TISD during 1991-92. The induction-year training component was inappropriate because there was only one new teacher, and he was an experienced teacher. He attended the scheduled workshops with the other teachers. The elementary keyboarding training component had been provided to the elementary teachers during the previous school year, 1990-91. The collaborative learning with computers component was not scheduled due to lack of interest by the teachers.

Use of Technology by Teachers

Changes in the Trenton teachers' use of technology were evaluated through three forms: technical assistance requests, invited observations, and journals for self assessment.

Technical Assistance Requests

The district and campus technology coordinators completed a technical assistance request form whenever teachers asked for help with technology (see Appendix F). TAble 31 has shown that during the first semester of 1991-92, 19 of the 28 teachers (69%) requested technical

Table 30

Organization of Technology Training

Level	Title	Date
Level 1	Basic Technology Literacy	
	General technology knowledge	all
	Basic hardware operation	9/16/91
	Software evaluation	10/17/91, 4/2/92
Level 2	Professional Applications	
	Teacher tools, (gradebook)	2/26/92
	Application software tools	10/17/91, 11/11/91
		11/25/91, 12/9/91
		4/22/92
	Lab/classroom organization & management	3/4/92
	Induction year training	N/A
	Operation of modem & visual technologies	12/6/91, 1/30/92
		1/31/92, 2/18/92
Level 3	Instructional/Integration	
	Matching software/curriculum	11/22/91, 12/6/91
	Applications in content	11/22/91
	Collaborative learning	N/A
	Integrating visual technologies	12/6/91
		1/30/91
		2/18/92
	Elementary keyboarding training	1991

assistance. During the second semester, 12 of the 28 teachers requested help--a decrease between the first semester and the second semester in both the total number of teachers requesting assistance and in the total number of requests.

Nine teachers requested assistance during both semesters; 13 other teachers asked questions at least once. Therefore, 22 teachers (79%) at TISD requested technology assistance at least once during the school year.

The majority of requests from the elementary teachers were for follow-up assistance after the gradebook workshop. Other assistance requests by elementary teachers included: (a) questions concerning TAAS math software, (b) installation of a speech card in the special education classroom, and (c) enquiries about how to operate the CD-ROM player and disks that the campus ordered during the second semester.

The majority of requests from the secondary teachers involved operation of the Macintosh computers (which were new to the campus) and the Apples. Other assistance requested by secondary teachers included questions about obtaining public domain and commercial software for content areas, SAT preparation software for juniors and seniors, and application software functions.

Table 31

Teachers' Technical Assistance Requests

	First Semester		Second Semester	
Items	Teachers	Requests	Teachers	Requests
Elementary	8	21	6	8
Secondary	11	26	6	11
Totals	19	47	12	19

Invited Observations

Each of the teachers was asked to invite the researcher to observe one class per semester; the teachers demonstrated the use of technology. During each observation, the researcher completed a Classroom Technology Observational Guide (see Appendix E).

Teachers in eight classes during the first semester and teachers in nine classes during the second semester invited

the researcher to observe technology in their classrooms. Table 32 has shown a summary of information from these classroom observations, including the type of technology, the campus, the class, and the topic.

During the first semester, the researcher observed that the teachers and students were using new technologies: Macintosh, Pagemaker software, Microsoft Works software, and Optical Data laserdiscs. The classes were taught separately when learning about the new technologies. However, during the second semester, the researcher observed that three teachers worked together on a computer project: (a) the social studies teacher assigned a research paper, (b) the computer teacher taught the students how to format the paper and allowed them to use class time to type them, and (c) the study hall teacher also allowed students to use class time to type the papers.

Journal Entries

The teachers were asked to complete a journal entry (see Appendix D) once every six weeks--six entries per teacher. The teachers were asked to respond to various technology questions; the answers provided information on changes in their use of technology during the school year.

This activity was voluntary; therefore, not every teacher participated every six weeks. One teacher did not fill out any journal entries, and five teachers filled out

Table 32

Computer Usage in TISD, 1991-92

Technology	Campus	Class	Topic
First Semester			
Laserdisc	Elementary	Science	Planets
Apple IIe	Elementary	Special Ed.	Math practice
IBM PC	Elementary	Second grade	Spelling
TI-IN	Secondary	Spanish II	Grammar
Macintosh	Secondary	Microcomputers	Letter writing
IBM PC	Secondary	Special Ed.	Enrichment
Macintosh	Secondary	Annual	Pagemaker
Apple IIe	Secondary	Computer Lit.	Programming
Second Semester			
Apple IIe	Elementary	Special Ed.	Math practice
Laserdisc	Elementary	Science	Animals
IBM PC	Elementary	Kindergarten	Science
TI-IN	Secondary	Spanish II	Pop quiz
IBM PC	Secondary	Special Ed.	Math practice
Apple II	Secondary	Reading Impr.	Reading
Macintosh	Secondary	Microcomputers	Term papers
Macintosh	Secondary	Study Hall	History
Macintosh	Secondary	Computer Lit.	Microsoft Wks.

only one. Several elementary teachers did not complete the forms because they sent students to the computer lab every week and expected the computer aide to keep track of the time. (That was not the expectation of this study.)

Table 33 has shown the numbers and percentages of responses for each six weeks grading period. Generally, the percentages of responses increased between the first 6 weeks grading period and the last. The high percentage at the sixth 6 weeks may have been the result of the teachers' attendance at the final faculty meeting.

Table 34 showed a summary of information that teachers provided in the Classroom Use of Technology section of the Journal Entry Page. The table has shown that TISD teachers used different types of hardware and software to instruct their students in a variety of lessons. The technologies were used most often to help teach mathematics (readiness and operations) and language arts (word processing, spelling, reading, literature, and the alphabet). The secondary teachers used specialized software to teach home economics, SAT, and programming.

Table 35 summarized the use of technology by TISD teachers who completed the Journal Entry Form during each of the six weeks grading periods during 1991-92. Secondary classes began the year with an average of 7 minutes of technology use during a six weeks' grading period; secondary classes reached an average high of 23 minutes per grading period.

Table 33

TISD Teachers Completing Journal Entries

Teachers	n	Six Weeks Grading Period					
		1st	2nd	3rd	4th	5th	6th
Elementary	14	6	7	7	6	6	14
Secondary	14	6	10	9	12	11	12
Total		12	17	16	18	17	26
Percentages		43%	61%	57%	64%	61%	93%

The elementary classes averaged more time using technology than the secondary classes. Their average minutes per time remained consistent at about 20 minutes.

Table 36 has shown a summary of the information that teachers provided in the Additional Technology Information section of the Journal Entry Page. The information was totaled for all the six-weeks grading periods. Therefore, by May, 1992, 75% of the 28 TISD teachers had attended a technology workshop, and 43% of the teachers had asked for follow-up assistance.

Table 34

Hardware, Software, and Lesson

Teachers	Technology	Software	Lesson
Elementary	IBM PC	games	reading impr.
		prob. solv.	alphabet
		TAAS math	math readiness
		TAAS lang.	spelling
		games	math operations
	Apple IIe	games	math operations
	CD-ROM	PC States	states/capitals
	Laserdisc	Optical Data	science
Secondary	IBM PC	games	reading impr.
		application	word processing
		desktop publ.	word processing
	Apple II	TAAS math	9th grade
		application	word processing
		tutorial	foods/clothing
		tutorial	SAT prep.
		BASIC	programming
	Macintosh	application	word processing
		desktop publ.	annual
	Laserdisc	Anne Frank	literature

Table 35

Classroom Technology Use by Teachers

	Six Weeks Grading Periods					
Classes	1st	2nd	3rd	4th	5th	6th
Elementary						
Avg. times	51	48	35	48	52	27
Avg. minutes per time	18	18	16	20	22	20
Secondary						
Avg. times	23	14	16	14	16	21
Avg. minutes per time	7	18	23	21	23	19

Sixty-four percent of the teachers used some type of technology in preparation for teaching their students; three teachers had purchased personal computers. Twenty teachers had asked for technical assistance from the

Table 36

Teachers' Technology Information

Teachers	Wkshp.	Prep.	T.A.	F.U.	Pers.	Purch.	Coll.
Elementary	10	9	11	7	2	10	0
Secondary	11	9	9	5	1	7	0
Total	21	18	20	12	3	17	0
Percents	75	64	71	43	11	61	0

Notes: Abbreviations key:

Wkshop. - attended a technology workshop

Prep. - used technology in preparation for class

T.A. - asked for technical assistance

F.U. - asked for follow up after workshop

Pers. - purchased a personal computer

Purch. - requested technology purchase for class

Coll. - attended a technology class in college

technology coordinators. Sixty-one percent of the teachers had requested technology purchases for their classes.

Teacher's Attitudes and Computer Knowledge

Table 37 compared the computer attitude and computer knowledge pre and post test means for 26 teachers in TISD. The difference in computer knowledge means was statistically significant at $p < .05$; therefore, the difference was presumed to be due to the implementation of the Program.

Table 37 showed that the subareas of the computer attitude test varied between the pre and post tests. The difference in the anxiety subarea proved statistically significant at $p < .05$. Because of the implementation of the Program, the TISD teachers had become less anxious about computers. However, the differences of the means in the other subareas might have occurred by chance and should not be attributed solely to the implementation of the Program.

The standard deviation values of the computer attitude subareas and computer knowledge pre and post tests showed considerable variability around the mean. The TISD teachers reported a broad range of scores; for example, the standard deviation for their computer confidence at pre-test was 6.6, and at post-test it was 6.2.

Table 37

Test Scores for TISD Teachers

Test Items	Pre-Test Mean	SD	Post-Test Mean	SD	T-Test Statistic*
Computer Attitude					
Anxiety	28.1	6.8	30.4	5.8	2.5
Confidence	27.5	6.6	29.3	6.2	1.8
Liking	27.7	6.5	28.3	7.0	0.6
Usefulness	32.2	5.7	31.2	5.7	-1.1
Computer Knowledge					
Mean/correct ans.	22.0	8.8	27.6	5.9	3.2
Highest ind. sc.		38	38		
Lowest ind. score		6	13		
Percentage mean		48.2%	60.3%		

*$p < .05$.

Discussion of Findings From Program Implementation

After the implementation of the Program during the 1991-92 school year, many changes occurred in the TISD

teachers' attitude towards the computer, knowledge of the computer, and use of technology. At the beginning of the school year in August of 1991, few teachers had reported having had access to, or used, instructional technology. The superintendent and the principals developed a brief district technology plan and made the majority of the purchasing decisions. No organized technology effort permitted teacher leadership, or even teacher participation. Even though computers were available in the district, the principals restricted their use to the State mandated programs of special education and computer literacy.

The majority of the teachers reported that they had less than one month's computer experience--adding together all their hours using a computer totaled less than one month. Previous technology staff development activities were limited to the mandated elementary keyboarding training and on-site instruction by the elementary computer aide. There were few training efforts for the secondary teachers.

The Program provided a structure for coordinating technology efforts and supporting participation by teachers. A five-year comprehensive District Technology Plan was developed by a representative committee; this Plan authorized continual staff development activities for all teachers, as well as for parents and volunteers. Two

teachers were selected as campus technology coordinators, and were asked by the district administrators to provide leadership for training and assistance to other teachers, as well as to provide expertise when purchasing hardware and software.

Technology workshops were scheduled during 1991-92, but participation by the teachers was voluntary. The only requirement by the superintendent was that each teacher obtain five hours of technology training during the year--not necessarily provided by the Program. Therefore, the 12 technology workshops in the Program were neither attended consistently nor sequentially by the teachers. However, 21 of the 28 teachers said that they did attend a technology workshop sometime during the school year.

The best-attended technology workshop with the most follow-up assistance requests was the early release day on gradebooks. The elementary teachers discovered that the gradebook could help them maintain and reproduce their grades; there were campus copies of one IBM gradebook program for the teachers to use immediately. The secondary teachers saw the value in gradebooks, but there were no Apple or Macintosh gradebook programs available for their immediate use.

The documentation of the use of technology through journal entries was maintained by an average of only 64% of

the teachers. A reason for this percentage was supplied by some of the elementary teachers, who reported that they did not think they were supposed to maintain the records because they sent their students to a laboratory setting. However, the percentage of participation in maintaining journal entries did increase to 93% by the year's end.

Technical assistance requests did involve 79% of the teachers, but several teachers made only one request for the year. Many teachers reported in their journal entries that they had requested assistance more times than were logged by the technology coordinators. This discrepancy might have resulted from the system used to collect this type of information; the coordinators might have forgotten, or thought it was too much trouble, to complete a Technical Assistance Form.

Eight different teachers invited the researcher to observe their students using technology in the classroom. This was only 29% of the TISD teachers. Because of the difficulties in moving their students into the computer labs or of moving computers from the labs into their classrooms, many of the teachers in classrooms without computers were reluctant to use computers for instruction.

There were no other technologies besides computers available to the secondary teachers. After the elementary school received a CD-ROM player and the elementary aide demonstrated its operation in the second semester, the

elementary teachers began to use it for social studies and language arts units. The laserdisc players used at the elementary level were restricted to the science room. The player could have been used by other teachers if the science room had not been set up in a portable classroom outside the main building.

The results of the pre and post tests as well as other evaluation documents at the end of the school year in MaY, 1992, showed that the teachers were less fearful when using computers after the implementation of the Program. They were more willing to try to use the computers and other technologies for instruction and classroom administration. The changes that occurred in the teachers' attitudes--about liking computers, being confident in using computers, or the usefulness of computers--cannot be attributed solely to the implementation of the Program. However, during informal end-of-the-school-year conversations with the researcher, the superintendent, principals, and individual teachers reported that they would now consider technology as a viable option in the classroom.

The increase of computer knowledge by TISD teachers between the pre and post tests was attributed to the implementation of the Program. On an individual basis, three teachers who had scored in the single digits on the pre-test increased their post-test scores an average of 21 points. Other experts report that knowledge of computers and other technology would increase as their use increased.

The secondary teachers had greater access to computers than the elementary teachers. The secondary teachers had two labs; the computers and printers in one lab could be moved to other classrooms and used after school and during the summers. Nine secondary teachers reported using computers for lesson preparation, but only four teachers reported using them in the classroom. Several of these teachers were also coaches who reported using computers to help with game statistics and record keeping.

Previously, the elementary teachers did not have access to any computers because the computers were restricted to the special education laboratory. During the summer before the 1991-92 school year, the district purchased 11 new IBM PCs for another laboratory in the elementary school. The elementary teachers sent their students to this lab to be taught by a computer aide; the teachers neither accompanied nor stayed with their students. Neither did they help select the software for their students. Therefore, the elementary teachers were not using the computer for lesson preparation or grade reporting until second semester. However, their students did have regular times every week to operate the computer. As Table 35 has shown, elementary students averaged more times per six weeks than did the secondary students.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

During the past 20 years, increased emphasis has been placed on the study and use of technology in schools. Policymakers, researchers, and practitioners have all advocated the use of technology to increase learning for school children as well as to promote efficiency in the management of their schools.

Therefore, decision-makers in the school districts have purchased hardware and software in substantial quantities, placing them in laboratories and classrooms at all grade levels. However, evaluation data have not shown a corresponding increase in learning nor in efficient management.

Experts have begun to suggest that the barrier has been a lack of appropriate training for those involved--the classroom teachers. The challenge of training teachers has been to overcome their fears--fears such as changes to their classroom routines. Another challenge has been the rapid innovation in technology, which has resulted in new computers, modifications to existing computers, and the integration of technologies.

Past technology training efforts for teachers have been few in number, poor in quality, and lacking coordination. Large school districts have instituted comprehensive programs for technology training for teachers, they also have adequate funds and appropriate staffs to support these programs. Small to medium sized schools in Texas, as well as in other states, do not have these advantages.

The purposes of this study were:

1. To survey the 53 small school districts in Region 10 Education Service Center of Texas area during May of 1991 in order to identify (a) the current hardware and software configurations available, (b) the existing patterns of staff development activities for computer-based technologies, and (c) instructional technology needs for staff development as perceived by administrators and teachers.

2. To design a staff development program which addressed these identified computer-based technology needs.

3. To establish and evaluate the program in a Region 10 small school district with a K-12 configuration during the 1991-92 school year.

A survey was administered to a sample of 53 superintendents in the small schools in Region 10 and to a sample of 100 teachers in those same small schools. The survey had a 75% response rate from the superintendents and a 74% response rate from the teachers.

The information from the survey provided the foundation for designing a Technology Staff Development Program for Small Schools (Program). The Program was divided into two phases: Phase 1 recommended the preliminary steps to take before delivering the technology training to teachers, and Phase 2 recommended the organization of the delivery of technology training to teachers.

Phase 1 suggested that small school districts develop a technology plan, appoint technology coordinators, design a software evaluation and coordination process, and carefully consider the numbers, types, and placements of computers. Phase 2 suggested that small school districts organize their technology training program at the district level, within a one-year timeframe. The teachers should be separated for instruction according to skill level and offered incentives for attendance. The workshops should be scheduled in two and three hour blocks of time on inservice or early release days. A variety of trainers should present the most important topics first.

The two phases of the Program were implemented in the Trenton Independent School District (TISD) in Texas during the 1991-92 school year. TISD had 337 students, 28 teachers, and two campuses. The City of Trenton was a rural community in Fannin County, northeast of Dallas.

The implementation of Phase 1 resulted in the development of a five-year comprehensive technology plan,

the appointment of two campus technology coordinators (with the researcher serving as district technology coordinator), the development of a software evaluation process coordinated by a District Technology Committee, and the compilation of data about the numbers, types, and placements of technology.

The implementation of Phase 2 resulted in the delivery of 12 technology workshops to teachers. Computer attitude and computer knowledge assessed during pre and post tests were used to evaluate the effects of the technology training. Data showed that teachers were less anxious about using the computer after the implementation of the Program. Data also showed that, as a result of the Program, teachers had increased their knowledge about the computer usage during the school year.

The teachers' use of technology was evaluated by tracking the numbers and kinds of technical assistance requests, classroom observations, and journal entries. The majority of teachers asked for technical assistance at least once during the school year. Eight different teachers invited the researcher to observe the use of technology in their classrooms.

A majority of the teachers maintained journal entries about the use of technology by their students and themselves. Technology was used most often to teach mathematics and language arts at both the elementary and

secondary levels. Classes of elementary students used the computers more often than classes of secondary students.

Conclusions

Based on the findings of this investigation, these conclusions seemed justified:

1. The teachers and administrators in small school districts were interested in improving their use of technology. Significant data resulted both from responses of teachers (74%) and superintendents (75%) during May of 1991--a busy month at their schools.

2. The teachers and administrators in small school districts could perceive some of their own technology staff development needs based upon past technology activities. The Program was derived from the perceptions of both groups, as well as from other technology studies and technology experts, and was implemented successfully at one of these small school districts.

3. Small school districts can improve teacher technology attitude, knowledge, and use even without considerable budgets and specialized staffing such as those available to larger school districts. TISD did not hire any new personnel; the researcher--who volunteered as the district technology coordinator--was the only new person. The position of district technology coordinator was

retained for 1992-93, and assigned to a secondary teacher. There was no increase for additional technology purchases in the 1991-92 budget.

4. Teachers in small school districts can increase their knowledge and overcome their fears about technology. By the end of the school year, teachers in TISD had developed a more positive attitude about technology and had increased their knowledge and use of technology. Initial skeptical reactions toward technology by some teachers were overcome--especially when the gradebook software package was demonstrated.

5. Small school districts can benefit from a year-long, comprehensive staff development program for technology. Evaluation data and observations by the researcher and administrators had shown that TISD was now prepared to continue technology planning and training for the next five years.

Recommendations for a Technology Staff Development Program for Small Schools

In order to prepare their teachers to deliver technology learning experiences to the students in their charge, small schools districts should:

1. Develop a technology plan which contains appropriate staff development activities for teachers.

2. Develop a software evaluation and coordination process.

3. Carefully consider the numbers, types, and placements of computers.

4. Organize technology training in a district-wide delivery system.

5. Organize the delivery of technology training in at least a one-year timeframe.

6. Consider their recent past history for the number and topics of technology workshops delivered to their teachers.

7. Separate teachers in selected workshops based upon previous technology training and self-assessment of skill level.

8. Provide incentives to encourage the teachers to attend technology training.

9. Present technology training in two and three hour blocks of time.

10. Schedule technology training on inservice or early release days.

11. Use a variety of trainers for technology workshops.

12. Prioritize those technology topics that their teachers and administrators report as most important.

13. Provide for multi-level technology training.

Recommendations for Practice

Based upon results of this study, several recommendations are offered for implementing a comprehensive staff development for technology for small schools.

1. Technology coordinators should assist the teachers in filling out evaluation forms. Directions should be very clear, and frequent opportunities should be given for teachers to ask questions.

2. The word technology should be carefully defined for teachers. There are levels of technology. Low-level technologies included VCRs as well as overhead, slide, and movie projectors. High-level technologies included computers, laserdiscs, and CD-ROMs.

3. Incentives were very important for encouraging teachers to take advantage of technology training opportunities. Besides the particular incentives used in this study, other incentives might include free software, free or reduced-cost hardware, paid registration for technology conferences, or paid subscriptions to technology associations and periodicals.

4. Administrators might consider a combination of required and voluntary technology training hours. Some teachers in the study did not take advantage of any technology training; a baseline of technology knowledge has not been established for all teachers.

5. Even though the survey results indicated a preference for the separation of teachers by knowledge level, the teachers in TISD preferred a separation by grade level. Because of the smaller number of teachers in the district, separation by grade level might be more applicable to technology training in small schools.

6. Technology coordinators might publicize the technology training for other staff as well as teachers. In this study, elementary aides volunteered for technology training, and the campus coordinator developed training on her own.

Recommendations for Further Study

These recommendations are based upon findings from this study.

1. A second-year study should be conducted to continue training the Trenton teachers in technology. Some of the components, such as induction year training and cooperative learning with computers, were perceived as important in the survey but could not be put in place this first year.

2. To determine if the findings from this study varies by school districts, this study should be replicated in a different small school.

3. Another survey should be taken in May, 1993, to compare differences in responses on technology issues--both before receiving State distributed technology monies.

4. A longitudinal study should be conducted to follow the progess of the teachers surveyed by this study

Final Summary

Like the horseless carriage and the Wright brothers' newfangled flying machine--which were both thought to be interesting but passing fads--computers have only begun to show their potential in human development. Always it is the children who will grow up and bring these technologies to fruition.

But all children must be given opportunities to learn how to use computers. Our childrens' electronic future will be unlike the present. As guardians of all children, we must prepare them for their new world by equipping them with the best tools we can provide. Those children who are not prepared might as well be driving a horse-drawn cart to market.

APPENDIX A

COVER LETTER AND PRELIMINARY SURVEY INSTRUMENT TO VALIDATION PANEL

TECHNOLOGY QUESTIONNAIRE

Section 1. Information Items

_____ Superintendent's Name

_____ Name and title of person who filled out survey if different from Super.

_____ School District

_____ mailing address

_____

_____ area code and phone number

Directions: Place a check on the line which is appropriate for your school district's 1990-1991 student population:

01 less than 299 ADA _____
02 between 300 and 999 ADA _____
03 between 1,000 and 2,499 ADA _____

Section 2: Technology Plan

Directions: Place a check by the appropriate answer to the following questions:

04 Do you have a district Technology Plan? ___ yes ___ no

If you answered "no" to #04, skip to Section 3:

05 Does the Plan identify teacher training for technology operation? ___ yes ___ no

06 Does the Plan identify teacher training for software evaluation? ___ yes ___ no

07 Does the Plan require all teachers to attend an introductory orientation? ___ yes ___ no

08 Does the Plan provide for on-site support by trained key teachers or coordinator? ___ yes ___ no

Section 3: Technology and Staff Assessment

Directions: Place a check by the appropriate answer to the following questions:

09 Do you have a district technology coordinator? ___ yes ___ no

10 Do you have a campus technology coordinator or coordinators? ___ yes ___ no

11 If you answered "no" to both 09 and 10, does your district presently have someone who coordinates technology acquisition and staff training? ___ yes ___ no
Title:_____

12 If you answered "no" to the previous three questions is there a need presently or in the future for this person? ___ yes ___ no

Directions: Place your answers on the appropriate lines. How many instructional computers do you have available at each level? Place a 0 on each line that is not applicable for your school district.

13 Elementary (Grades K - 5) _____
What percentage (%) of these computers are in:
14 separate classroom (lab) _____
15 individual classrooms _____
16 library/media center _____

17 Middle/junior (Grades 6 - 8) _____
What percentage (%) of these computers are in:
18 separate classroom (lab) _____
19 individual classrooms _____
20 library/media center _____
21 Senior (Grades 9 - 12) _____
What percentage (%) of these computers are in:
22 separate classroom (lab) _____
23 individual classrooms _____
24 library/media center _____

Directions: Check the dominant type of instructional computer on each grade level. Check only one type per grade level.

25 Elementary: IBM/compatible _____
26 Apple II series/compatible _____
27 Macintosh _____
28 Other: _____ _____
29 Middle/junior: IBM/compatible _____
30 Apple II series/compatible _____
31 Macintosh _____
32 Other: _____ _____
33 Senior: IBM/compatible _____
34 Apple II series/compatible _____
35 Macintosh _____
36 Other: _____ _____

Section 4: Software Evaluation

Directions: Check the appropriate answer.
37 Is there a process within the district/campus that provides for the evaluation of software before it is purchased for use in the classroom? ___ yes ___ no _____ don't know

Directions: If you answered "yes" to 37, check only one of the following answers.
Who is in charge of the evaluation process?
38 Librarian _____
39 Campus Administrator _____
40 District Administrator _____
41 Teacher _____
42 Other _____
Title: _____

Section 5: Staff Development Technology Inservices for the School Years 1989-90 and 1990-91

43 How many 1989-90 inservices were given that provided training on technology operation and integration? _____

44 How many 1990-91 inservices were given or are presently scheduled that provide training on technology operation and integration? _____

Directions: Check the individuals who have provided or are providing the computer training for teachers in the two school years. Check any that are appropriate.

45 District personnel (other than teachers) _____
46 District teachers _____
47 Region 10 consultants _____
48 Hardware vendors _____
49 Software vendors _____
50 College faculty _____
51 Parents _____
52 Other _____
Title:_____

Directions: Check any topics that were presented in your technology inservices during the past two years.

53 Selection and evaluation of software _____
54 Hardware operation _____
55 Applications (i.e. spreadsheet, database, word processing) _____
56 Elementary keyboarding training _____
57 Methods for integrating computers into the curriculum _____
58 Programming languages (i.e. Pascal, BASIC) _____
59 Disk operating system (MS-DOS, ProDos) _____
60 Other _____
Explain:_____

61 Were there separate inservices for teachers with different levels of computer knowledge? ___ yes ___ no
Comment:_____

Directions: Check the incentives provided for teachers to attend these inservices. Check any that are appropriate.

62 Released time _____
63 Compensatory time _____
64 Payment _____
65 AAT credit _____
66 Summer curriculum development jobs _____
67 Master teacher or recognition status _____
68 None _____
69 Other _____
Explain:_____

Section 6: Possible Future Staff Development Computer Inservices:

Directions: Please rate the following types of inservices as possibilities for computer inservices the next three school years based upon a 5-point scale of importance.

1 = not important
2 = important to a few
3 = important to many
4 = important to most
5 = important to all

Software/Curriculum

70	Software evaluation sessions, including how to evaluate them in terms of students' different learning styles	1	2	3	4	5
71	Exploration sessions of all kinds of software (simulations, tutorials/CAI, problem solving, and hypermedia)	1	2	3	4	5
72	Sessions on how to match software to stated curriculum goals (i.e. desktop publishing software to help teach the writing process)	1	2	3	4	5
73	Sessions on how to use application software in areas, such a database activities in grades 1-6 for science	1	2	3	4	5
74	Sessions on how to evaluate and use appropriate software for ESL students	1	2	3	4	5
75	Sessions on the training of teachers to teach elementary keyboarding	1	2	3	4	5

Hardware

76	Sessions on how to operate a computer with a modem for telecommunications activities	1	2	3	4	5
77	Sessions on how to operate a computer with audio and visual players for classroom activities	1	2	3	4	5

Instruction

78	Sessions on cooperative learning with computers	1	2	3	4	5
79	Separate sessions for teachers with different levels of computer knowledge	1	2	3	4	5
80	Sessions on teacher induction year computer training	1	2	3	4	5

Administration

81	Sessions on teacher tools (i.e. computerized gradebooks and word processing for developing curriculum materials)	1	2	3	4	5
82	Sessions on how to organize and manage a computer lab environment	1	2	3	4	5
83	Sessions on how to organize and manage individual classrooms with one or more computers	1	2	3	4	5
84	Other Explain:_____	1	2	3	4	5

APPENDIX B

COVER LETTERS AND FINAL SURVEY INSTRUMENTS

FOR BOTH SUPERINTENDENTS AND TEACHERS

April, 1991

Administrator:

Texas school districts are integrating technologies, such as microcomputers, CD-ROM, laserdiscs and hypermedia, into their classrooms. However, after purchasing and installing the hardware and software, many administrators do not know how to provide effective technology staff development for their teachers. Technology experts and recent research suggest that teachers should be supported with substantial instruction for a long period of time.

The attached questionnaire is A VERY IMPORTANT part of an assessment of the current status and future trends in the instruction of teachers to use technology in the classroom in selected Region 10 schools. Your responses as district administrators to the questionnaire will be analyzed carefully and used to develop a year-long staff development program for training teachers to operate and integrate technology.

I would truly appreciate your assistance in this important study. The results of this questionnaire and subsequent program should be of assistance to those who are responsible for providing technology inservices for teachers. If you would like to receive a summary statement of the results, please indicate this as a note at the top of the first page of the questionnaire.

Your participation is voluntary and the data provided about your school district will remain confidential. Please take 20 minutes to respond to the questionnaire and mail it back in the enclosed envelope by May 15, 1991, by Region 10 van delivery system.

Use the following definitions to help you in responding:
A microcomputer is a standalone or networked personal computer.
Technology plan involves a written plan required by TEA and may be in progress, written and not yet approved by the Board, or written and approved by the Board. A district technology coordinator may be a full-time or part-time position. However, this position for the purposes of this survey may not be a volunteer. A campus technology coordinator/teacher may be a full-time or part-time staff position. It may also be a certified teacher who performs this function along with regular teaching duties.
Technology inservice involves a formal, structured class which presents instruction about microcomputers and other technologies.

Sincerely,

Cheri Halderman
Doctoral Candidate
University of North Texas

TECHNOLOGY QUESTIONNAIRE

Section 1. Information Items

_____ Superintendent's Name

_____ Name and title of person who filled out survey if
_____ different from Super.

_____ School District

_____ mailing address
_____

_____ area code and phone number

Directions: Place a check on the line which is appropriate for your school district's 1990-1991 student population:

01 less than 299 ADA _____
02 between 300 and 999 ADA _____
03 between 1,000 and 2,499 ADA _____

Section 2: Technology Plan

Directions: Place a check by the appropriate answer to the following questions:

04 Do you have a district Technology Plan? ___ yes ___ no

If you answered "no" to #04, skip to Section 3:

05 Does the Plan identify teacher training for technology operation? ___ yes ___ no
06 Does the Plan identify teacher training for software evaluation? ___ yes ___ no
07 Does the Plan require all teachers to attend an introductory orientation? ___ yes ___ no
08 Does the Plan provide for on-site support by trained key teachers or coordinator? ___ yes ___ no

Section 3: Technology and Staff Assessment

Directions: Place a check by the appropriate answer to the following questions:

09 Do you have a district technology coordinator? ___ yes ___ no
10 Do you have a campus technology coordinator or coordinators? ___ yes ___ no
11 If you answered "no" to both 09 and 10, does your district presently have someone who coordinates technology acquisition and staff training? ___ yes ___ no
Title:_____
12 If you answered "no" to the previous three questions is there a need presently or in the future for this person? ___ yes ___ no

Directions: Place your answers on the appropriate lines. How many instructional computers do you have available in all content areas at each level (including special populations)? Place a 0 on each line that is not applicable for your school district.

13 Elementary (Grades K - 5) _____
How many of these computers are in:
separate classroom (lab) _____
individual classrooms _____
library/media center _____

14 Middle/junior (Grades 6 - 8) _____
How many of these computers are in:
separate classroom (lab) _____
individual classrooms _____
library/media center _____

15 Senior (Grades 9 - 12) _____
How many of these computers are in:
separate classroom (lab) _____
individual classrooms _____
library/media center _____

Directions: How many of the following types of instructional computers do you have at each grade level in your district.

16 Elementary: IBM/compatible _____
Apple II series/compatible _____
Macintosh _____
Other: _____ _____

17 Middle/junior: IBM/compatible _____
Apple II series/compatible _____
Macintosh _____
Other: _____ _____

18 Senior: IBM/compatible _____
Apple II series/compatible _____
Macintosh _____
Other: _____ _____

Section 4: Microcomputer Software Evaluation

Directions: Check the appropriate answer.

19 Is there a process within the district/campus that provides for the evaluation of software before it is purchased for use in the classroom? ___ yes ___ no _____ don't know

Directions: If you answered "yes" to 19, check only one of the following answers.

Who is in charge of the evaluation process?

20 Librarian(s) _____
21 Campus Administrator(s) _____
22 District Administrator(s) _____
23 Teacher(s) _____
24 Combination of persons above _____
Specify: _____

Section 5: Staff Development Technology Inservices for the School Years 1989-90 and 1990-91

25 How many 1989-90 inservices were given that provided training on technology operation and integration? _____

26 How many 1990-91 inservices were given or are presently scheduled that provide training on technology operation and integration? _____

27 Rank the following blocks of time that were used to provide the training as to dominance from 1 to 4 with 1 being the most dominant. Dominance is the state or quality of being preferred or used more often.

one hour _____
two hours _____
three hours _____
four or more hours _____

28 Rank the following presentation times that were used to provide the training as to dominance from 1 to 5 with 1 being the most dominant.

after school _____
on Saturdays _____
on early release days _____
on inservice days _____
during the summer _____

29 Were there separate inservices for teachers with varying levels of technology knowledge?

___ yes ___no

Comment:_____

Directions: Check the individuals who have provided or are providing the technology training for teachers in the two school years. Check any that are appropriate.

30 District personnel (other than teachers) _____
31 District teachers _____
32 Region 10 consultants _____
33 Hardware vendors _____
34 Software vendors _____
35 College faculty _____
36 Parents _____
37 Other:_____ _____

Directions: Check any topics that were presented in your technology inservices during the past two years.

38 Selection and evaluation of software _____
39 Technology operation _____
40 Applications (i.e. spreadsheet, database, word processing, telecommunications) _____
41 Elementary keyboarding training _____
42 Methods for integrating technology into the curriculum _____
43 Programming languages (i.e. LOGO, BASIC) _____
44 Disk operating system (MS-DOS, ProDos) _____
45 Other _____
Explain:_____

Directions: Check the incentives provided for teachers to attend these inservices. Check any that are appropriate.

46 Released time _____
47 Compensatory time _____
48 Payment _____
49 AAT credit _____
50 Summer curriculum development jobs _____
51 Master teacher or recognition status _____
52 None _____
53 Other _____
Explain:_____

Section 6: Possible Future Staff Development Technology Inservices:

Directions: Please rate the following types of technology inservices for teachers as possibilities for the next three school years based upon a 5-point scale of importance. Importance is the state or quality of being significant or possessing consequence.

1 = not important
2 = important to a few
3 = important to many
4 = important to most
5 = important to all

Software/Curriculum

54	Software evaluation sessions, including how to evaluate them in terms of students' different learning styles	1	2	3	4	5
55	Exploration sessions of all kinds of software (simulations, tutorials/CAI, problem solving, and hypermedia)	1	2	3	4	5
56	Sessions on how to match software to stated curriculum goals (i.e. desktop publishing software to help teach the writing process)	1	2	3	4	5
57	Sessions on how to use application software in areas, such a database activities in grades 1-6 for science	1	2	3	4	5
58	Sessions on how to evaluate and use appropriate software for ESL students	1	2	3	4	5
59	Sessions on the training of teachers to teach elementary keyboarding	1	2	3	4	5
60	Sessions on how to teach programming (i.e. LOGO, Pascal, BASIC)	1	2	3	4	5

Hardware

61	Sessions on how to operate a computer with a modem for telecommunications activities	1	2	3	4	5
62	Sessions on how to operate a computer with audio and visual players for classroom activities	1	2	3	4	5

Instruction

63	Sessions on cooperative learning with technology	1	2	3	4	5
64	Separate sessions for teachers with different levels of technology knowledge	1	2	3	4	5
65	Sessions on teacher induction year technology training	1	2	3	4	5

Administration

66	Sessions on teacher tools (i.e. electronic gradebooks and word processing for developing curriculum materials)	1	2	3	4	5
67	Sessions on how to organize and manage a technology lab environment	1	2	3	4	5
68	Sessions on how to organize and manage individual classrooms with one or more computers with attached technologies	1	2	3	4	5
69	Other Explain:_____	1	2	3	4	5

April, 1991

To the Teacher Addressed:

Texas school districts are integrating technologies, such as microcomputers, CD-ROM, laserdiscs and hypermedia, into their classrooms. However, after purchasing and installing the hardware and software, many administrators do not know how to provide effective technology staff development for their teachers. Technology experts and recent research suggest that teachers should be supported with substantial instruction for a long period of time.

The attached questionnaire is A VERY IMPORTANT part of an assessment of the current status and future trends in the instruction of teachers to use technology in the classroom in selected Region 10 schools. Your responses as classroom teachers to the questionnaire will be analyzed carefully and used to develop a year-long staff development program for training teachers to operate and integrate technology.

I would truly appreciate your assistance in this important study. The results of this questionnaire and subsequent program should be of assistance to those who are responsible for providing technology inservices for teachers.

Your participation is voluntary and the data provided about yourself will remain confidential. Please take 10 minutes to respond to the questionnaire and mail it back in the enclosed envelope by May 15, 1991, by Region 10 van delivery system.

Use the following definitions to help you in responding:
A microcomputer is a standalone or networked personal computer.
Technology includes the microcomputer, as well as those technologies that use the microcomputer as a foundation such as laserdiscs, CD-ROMS, printers, etc.
Technology inservice involves formal, structured classes which present instruction about microcomputers and other technologies. Trainers might include vendors, outside consultants, or district personnel.

Technology user definitions include: An expert has extensive knowledge and skill about several microcomputers and other technologies. An intermediate has used a few sophisticated technologies on a regular basis. A beginner is familiar with the use of some technology. Someone with no skills has never operated a microcomputer.

Sincerely,

Cheri Halderman
Doctoral Candidate
University of North Texas

TEACHER QUESTIONNAIRE

Section 1: Information Items

01 Name of District _____

Please check one of the following for the size of your district based upon the 1990-1991 district student population.

02 1 - 299 _____
03 300 - 999 _____
04 1,000 - 2,499 _____

Please check your present teaching assignment (check the highest level which applies.

05 Elementary (K-6) _____
06 Secondary (7-12) _____

Please check your total number of years teaching (including the present year).

07 1 - 2 years _____
08 3 - 9 years _____
09 10 - 19 years _____
10 20+ years _____

Section 2: Technology Assessment

Check your personal assessment of your knowledge and skills pertaining to technology.

11 expert _____
12 intermediate _____
13 beginner _____
14 no skills _____

How many total hours of technology inservices did you attend during 1990-91?

15 none _____
16 1-3 hours _____
17 4-6 hours _____
18 7 - 12 hours _____
19 13+ hours _____

20 Rank the following blocks of time that you would like used to provide technology training from 1 to 4 with 1 being your primary preference.

one hour _____
two hours _____
three hours _____
four or more hours _____

21 Rank the following presentation times that you would like used to provide technology training from 1 to 5 with 1 being your primary preference.

after school _____
on Saturdays _____
on early release days _____
on inservice days _____
during the summer _____

Section 3: Possible Future Staff Development Technology Inservices:

Directions: Please rate the following types of technology inservices for teachers as possibilities for the next three school years based upon a 5-point scale of importance. Importance is the state or quality of being significant or possessing consequence.

1 = not important
2 = important to a few
3 = important to many
4 = important to most
5 = important to all

Software/Curriculum

22	Software evaluation sessions, including how to evaluate them in terms of students' different learning styles	1	2	3	4	5
23	Exploration sessions of all kinds of software (simulations, tutorials/CAI, problem solving, and hypermedia)	1	2	3	4	5
24	Sessions on how to match software to stated curriculum goals (i.e. desktop publishing software to help teach the writing process)	1	2	3	4	5
25	Sessions on how to use application software in areas, such a database activities in grades 1-6 for science	1	2	3	4	5
26	Sessions on how to evaluate and use appropriate software for ESL students	1	2	3	4	5
27	Sessions on the training of teachers to teach elementary keyboarding	1	2	3	4	5
28	Sessions on how to teach programming in BASIC, Pascal, or LOGO.	1	2	3	4	5

Hardware

29	Sessions on how to operate a computer with a modem for telecommunications activities	1	2	3	4	5
30	Sessions on how to operate a computer with audio and visual players for classroom activities	1	2	3	4	5

Instruction

31	Sessions on cooperative learning with technology	1	2	3	4	5
32	Separate sessions for teachers with different levels of technology skills	1	2	3	4	5
33	Sessions on teacher induction year technology training	1	2	3	4	5

Administration

34	Sessions on teacher tools (i.e. electronic gradebooks and word processing for developing curriculum materials)	1	2	3	4	5
35	Sessions on how to organize and manage a technology lab environment	1	2	3	4	5
36	Sessions on how to organize and manage individual classrooms with one or more computers with attached technologies	1	2	3	4	5
37	Other Explain:_____	1	2	3	4	5

APPENDIX C

COMPUTER ATTITUDE SCALE

SURVEY OF ATTITUDES TOWARD LEARNING ABOUT AND WORKING WITH COMPUTERS

Brenda H. Loyd and Clarice P. Gressard
University of Virginia

The purpose of this survey is to gather information concerning people's attitudes toward learning about and working with computers. It should take about five minutes to complete this survey. All responses are kept confidential. Please return the survey to your instructor when you are finished.

Please check the blank which applies to you.

1. Age: ( ) 22 or less ( ) 23-25 ( ) 26-30
( ) 31-35 ( ) 36-40 ( ) 41-45
( ) 46-50 ( ) 51-55 ( ) 55+

2. College level completed: ( ) 1st year ( ) 2nd year ( ) 3rd year ( ) 4th year
( ) Bachelors ( ) Masters ( ) Doctorate

3. Major area of study: _____

4. Sex: ( ) Male ( ) Female

5. Experience with learning about or working with computers:
( ) 1 week or less ( ) 6 months to 1 year
( ) 1 week to 1 month ( ) 1 year or more
( ) 1 month to 6 months

Briefly state the type of computer experience: _____

COMPUTER ATTITUDE SCALE

Below are a series of statements. There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Place a check mark in the parentheses under the label which is closest to your agreement or disagreement with the statements.

		Strongly Agree	Slightly Agree	Slightly Disagree	Strongly Disagree
1.	Computers do not scare me at all.	( )	( )	( )	( )
2.	I'm no good with computers.	( )	( )	( )	( )
3.	I would like working with computers.	( )	( )	( )	( )
4.	I will use computers many ways in my life.	( )	( )	( )	( )
5.	Working with a computer would make me very nervous.	( )	( )	( )	( )
6.	Generally I would feel OK about trying a new problem on the computer.	( )	( )	( )	( )
7.	The challenge of solving problems with computers does not appeal to me.	( )	( )	( )	( )
8.	Learning about computers is a waste of time.	( )	( )	( )	( )
9.	I do not feel threatened when others talk about computers.	( )	( )	( )	( )

		Strongly Agree	Slightly Agree	Slightly Disagree	Strongly Disagree
10.	I don't think I would do advanced computer work.	( )	( )	( )	( )
11.	I think working with computers would be enjoyable and stimulating.	( )	( )	( )	( )
12.	Learning about computers is worthwhile.	( )	( )	( )	( )
13.	I feel aggressive and hostile toward computers.	( )	( )	( )	( )
14.	I am sure I could do work with computers.	( )	( )	( )	( )
15.	Figuring out computer problems does not appeal to me.	( )	( )	( )	( )
16.	I'll need a firm mastery of computers for my future work.	( )	( )	( )	( )
17.	I wouldn't bother me at all to take computer courses.	( )	( )	( )	( )
18.	I'm not the type to do well with computers.	( )	( )	( )	( )
19.	When there is a problem with a computer run that I can't immediately solve, I would stick with it until I have the answer.	( )	( )	( )	( )
20.	I expect to have little use for computers in my daily life.	( )	( )	( )	( )
21.	Computers make me feel uncomfortable.	( )	( )	( )	( )
22.	I am sure I could learn a computer language.	( )	( )	( )	( )
23.	I don't understand how some people can spend so much time working with computers and seem to enjoy it.	( )	( )	( )	( )
24.	I can't think of any way that I will use computers in my career.	( )	( )	( )	( )
25.	I would feel at ease in a computer class.	( )	( )	( )	( )
26.	I think using a computer would be very hard for me.	( )	( )	( )	( )
27.	Once I start to work with the computer, I would find it hard to stop.	( )	( )	( )	( )
28.	Knowing how to work with computers will increase my job possibilities.	( )	( )	( )	( )
29.	I get a sinking feeling when I think of trying to use a computer.	( )	( )	( )	( )
30.	I could get good grades in computer courses.	( )	( )	( )	( )
31.	I will do as little work with computers as possible.	( )	( )	( )	( )
32.	Anything that a computer can be used for, I can do just as well some other way.	( )	( )	( )	( )

		Strongly Agree	Slightly Agree	Slightly Disagree	Strongly Disagree
33.	I would feel comfortable working with a computer.	( )	( )	( )	( )
34.	I do not think I could handle a computer course.	( )	( )	( )	( )
35.	If a problem is left unsolved in a computer class, I would continue to think about it afterward.	( )	( )	( )	( )
36.	It is important to me to do well in computer classes.	( )	( )	( )	( )
37.	Computers make me feel uneasy and confused.	( )	( )	( )	( )
38.	I have a lot of self-confidence when it comes to working with computers.	( )	( )	( )	( )
39.	I do not enjoy talking with others about computers.	( )	( )	( )	( )
40.	Working with computers will not be important to me in my life's work.	( )	( )	( )	( )

APPENDIX D

JOURNAL ENTRY PAGE

TRENTON ISD
JOURNAL ENTRY PAGE

Six-weeks (check one) ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ 5th ☐ 6th

Name _____

Teaching Assignment _____

CLASSROOM USE OF TECHNOLOGY

1. Name the lesson title(s) where technology was used. _____
2. Name the type(s) of technology used. _____
3. Name the software used, if applicable. _____
4. Estimate the number of times technology was used by teacher _____ used by students _____
5. Estimate the number of minutes technology was used by teacher _____ used by students _____

ADDITIONAL TECHNOLOGY INFORMATION

6. Attended technology workshop(s) titled _____ Number of hours _____
7. Used technology in preparation for use in classroom? yes __ no___ Number of times _____ Number of minutes _____
8. Asked for technical assistance from technology coordinators? yes___ no_____ Number of times _____
9. Asked for follow-up to inservice from technology coordinators? yes___ no_____ Number of times _____
10. Purchased a personal computer/other technology? yes ___ no_____
11. Requested purchase of technology for classroom? yes ___ no ____
12. Registered for/attended college course with technology? yes ___ no___

APPENDIX E

CLASSROOM TECHNOLOGY OBSERVATIONAL GUIDE

CLASSROOM TECHNOLOGY OBSERVATIONAL GUIDE*

☐ 1st Semester ☐ 2nd Semester

Date: _____
Teacher Name: _____
Teaching Assignment: _____

1. What was the topic of the lesson for the day?

2. Circle the style(s) of instruction that the teacher used?
   small group, large group, individual, "hands on"

3. Circle the part(s) of the lesson cycle where technology was used:
   focus introduction guided independent evaluation closure

4. What type(s) of technology were being used?

5. How many minutes was technology used?
   by teacher?

   by students?

6. Was the teacher using technology information provided in an inservice training?

During the lesson or after the lesson--

7. Where would you like to go from here with technology?

8. Did an inservice change your thinking about teaching? How?

9. What kind of support do you need to make the inservice training more effective?

*Modified from Stecher and Solorzano 1987 study, Characteristics of Effective Computer In-Service Programs

APPENDIX F

TECHNICAL ASSISTANCE FORM

TRENTON ISD
TECHNICAL ASSISTANCE FORM

☐ Technical Assistance ☐ Follow Up to Inservice

Date _____

Teacher Name _____

Teaching Assignment _____

Type of Technology (check as many items as applicable)

☐ Operation of computer

☐ Operation of: printer, CD-ROM, laserdisk, modem, other (circle one)

☐ Software/curriculum (i.e. evaluation)

☐ Instruction (i.e. cooperative learning, sequence of presentation)

☐ Administration/teacher tools

☐ Organization/management of technology in classroom

Comments:

APPENDIX G

PARTICIPANT EVALUATION FORM

TRENTON ISD
TECHNOLOGY INSERVICE
PARTICIPANT EVALUATION FORM

PROGRAM TITLE _____

POSITION (Check One)

____Teacher
____Principal
____Aide
____Superintendent
____Counselor
____Librarian
____Parent/Volunteer
____Board Member
____Student
____Other

PROGRAM EVALUATION

DIRECTIONS: Please circle the number which best represents your reaction to each of the items below:

1.	The objectives of this program were:	Clearly Evident 7	6	5	4	3	2	Vague 1
2.	The work of the presenter used in this inservice was:	Excellent 7	6	5	4	3	2	Poor 1
3.	The ideas and activities in this program were:	Very Meaningful 7	6	5	4	3	Meaningless 2	1
4.	The relevance to my teaching assignment was:	Very Beneficial 7	6	5	4	3	Not Beneficial 2	1
5.	Overall, I consider the value of this inservice to be:	Very High 7	6	5	4	3	Of No Value 2	1

APPENDIX H

COMPUTER KNOWLEDGE TEST

COMPUTER KNOWLEDGE TEST*

DIRECTIONS: Select the one choice for each of the following items that best completes the sentence or answers the question. Your score will be the number of items that you answer correctly.

You are not expected to know the answer to every question. Do as well as you can on the items you attempt.

PART I - COMPUTER-RELATED TERMINOLOGY AND USE

1. Computers that compare measurements of temperature, fuel, speed, pressure and/or weight are:

   A. analog computers
   B. digital computers
   C. microcomputers
   D. pocket calculators

2. One trillionth of a second is sometimes called a:

   A. microsecond
   B. millisecond
   C. nanosecond
   D. picosecond

3. Which is these is NOT a peripheral?

   A. monitor
   B. modem
   C. microprocessor
   D. keyboard

4. The UPC codes are read by:

   A. an optical scanner
   B. an optical mark reader
   C. a bar code wand
   D. MICR reader

5. Baud rate is measured in:

   A. bits per second
   B. bytes per second
   C. nanoseconds
   D. megabytes

*The "Computer Knowledge Test" is adapted by the author from the Texas Computer Education Association's Computer Literacy Contest Examination of December, 1986.

6. The concentric circular recording positions on a computer disk are called:

   A. record areas
   B. sectors
   C. cylinders
   D. tracks

7. The two most commonly used auxiliary storage devices are:

   A. printers and card readers
   B. input units and output units
   C. floppy-disk readers and card readers
   D. magnetic tape and magnetic disk devices

8. The number system a computer usually uses is:

   A. binary
   B. decimal
   C. base three
   D. octal

9. How many bits make a byte?

   A. 128
   B. 64
   C. 8
   D. 6

10. The peripheral device used to send data over telephone wires is a:

   A. mouse
   B. modem
   C. printer
   D. none of the above

11. Software is:

   A. computer paper
   B. instructions that tell the computer what to do
   C. the computer instruction manual
   D. none of the above

12. The idea of storing a program in a computer was contributed by:

   A. Charles Babbage
   B. Grace Hopper
   C. Ada Lovelace
   D. John von Neumann

PART II - HISTORY AND DEVELOPMENT OF COMPUTERS

13. The person who is generally credited as being the "first programmer" was:

    A. Charles Babbage
    B. Ada Lovelace
    C. John William Mauchly
    D. John von Neumann

14. A distinguishing characteristic of first-generation computers was the use of:

    A. integrated circuits
    B. transistors
    C. vacuum tubes
    D. VLSI circuits

15. The code used on punched cards today was devised by:

    A. Joseph Jacquard
    B. Herman Hollerith
    C. John Presper Eckert
    D. Howard Aiken

16. Herman Hollerith is remembered for:

    A. mechanizing the 1890 census
    B. inventing the tabulating machine
    C. organizing the Tabulating Machine Company, which later became IBM
    D. all of the above'

17. What replaced the vacuum tube in second-generation computers?

    A. integrated circuit
    B. batteries
    C. transistors
    D. silicon chips

18. Fifth generation computers will:

    A. use more than one microprocessor
    B. change their own programs as the situation demands
    C. simulate human intelligence
    D. reintroduce vacuum circuitry

19. Which of the following is considered the oldest man-made calculator?

    A. Napier's Bones
    B. the Analytical Engine
    C. ENIAC
    D. the abacus

20. Who is credited with designing the first counting machine that had gears?

    A. Herman Hollerith
    B. Grace Hopper
    C. Joseph Jacquard
    D. Blaise Pascal

21. Which of the following statements is true with regard to the various sizes of computers?

    A. Minicomputers are the smallest computers.
    B. Microcomputers are the largest computers.
    C. Mainframe computers are smaller than microcomputers.
    D. Computers of today have become smaller and more powerful.

PART III - THE USE OF THE COMPUTER AS A TOOL

22. An electronic filing system that uses computers to keep records is called a:

    A. spreadsheet system
    B. recording system
    C. database system
    D. datasheet system

23. The lining up of the text of the margins of a document is called:

    A. justification
    B. marginal direction
    C. text lineation
    D. pagination

24. Look at the following spreadsheet:

	A	B	C	D
1	Player	1st game	2nd game	Average
2				
3	Susie	90	80	85
4	John	92	78	85
5	Mary	100	96	98

What formula could we expect to see in cell D3?

A. 85
B. @AVG(B3...C3)
C. @SUM(B3...C3)
D. B3/C3

25. Application software refers to programs that:

A. aid in the operation of the computer system
B. can be used on special-purpose computer systems designed for one application only
C. are built into the computer system to control the internal operations of the computer
D. written for certain purposes, such as programs to process a company's payroll

26. In data filing systems, a field is defined as:

A. a grouping of records
B. a collection of files related to a specific unit of information
C. the information gathered prior to preparing an input file
D. one unit of data

27. Electronic mail allows people to:

A. send and receive messages by computer
B. pay bills no matter how much money they have
C. study at their own desks
D. all of the above

28. Which of the following is NOT an example of editing a word processing document:

A. printing text
B. inserting text
C. moving text
D. deleting text

29. To combine information from two or more files is to:

A. merge
B. search and replace
C. edit
D. justify

30. Which application would be best to use for calculating computer payroll?

    A. data base
    B. spreadsheet
    C. word processor
    D. graphing program

31. A newspaper publisher has the following information about subscribers stored in the computer: name, address, and renewal data. How would you sort the information to be most useful to the delivery person?

    A. ordered by street name and house number
    B. ordered by street name
    C. ordered alphabetically
    D. ordered by renewal date

32. If the same file name (NEWS) is saved twice on a data disk, you would:

    A. have only the first NEWS file saved
    B. have two NEWS files
    C. have only the last NEWS file saved
    D. have saved neither file

33. The best application for writing a book report is a :

    A. data base
    B. spreadsheet
    C. graphing program
    D. word processor

34. Which of the following is true concerning the proper care of a disk?

    A. Do not touch the oval head access opening.
    B. Use a pencil to label a disk.
    C. Heat can ruin a disk; cold cannot.
    D. Both A and C above.

35. Which of the following best describes good keyboarding technique?

    A. Keep your back straight.
    B. Curve your fingers over the home row keys.
    C. Keep your feet flat on the floor.
    D. All of the above.

36. The best software for your address book list is a:

    A. data base
    B. spreadsheet
    C. graphing program
    D. word processor

PART IV - PROBLEMS AND ISSUES OF COMPUTER USE IN SOCIETY

37. Illegally entering a database is sometimes referred to as:

    A. deprogramming
    B. hacking
    C. data blasting
    D. stealing bases

38. A program may be copied legally if it is classified as:

    A. freed software
    B. unprotected software
    C. public domain software
    D. copyrighted software

39. Much of the information held in data banks is personal information. How is it protected?

    A. It is priced so high that no one could afford to buy the data.
    B. Laws have been passed to prohibit any transfer of personal data.
    C. Laws have been passed allowing only screened data to be purchased by companies.
    D. Each company or person has a code of honor, which prohibits any abuse of information.

40. The use of a password is:

    A. an attempt to maintain data security
    B. an adventure game for hackers
    C. always effective
    D. never effective

41. Computers lack the ability to:

    A. manipulate numbers quickly
    B. make yes/no choices
    C. consider the feelings of others
    D. analyze words

42. It is legal to make a copy of commercial software to:

    A. sell to a friend
    B. use as a backup copy
    C. give to a friend as long as you don't sell it
    D. rent to a friend you're sure will return it

43. In 1990, what percentage of all jobs involved the use of computers?

    A. about 50%
    B. 100%
    C. over 80%
    D. about 70%

44. The following is true of computers and jobs in the future?

    A. Computers will replace some of the jobs today.
    B. New jobs will be created because of computers.
    C. It will be increasingly important for people to understand computers.
    D. All of the above.

45. Working from your home with a computer and modem is:

    A. telecomputing
    B. telecommuting
    C. telephoning
    D. telecommunicating

46. Artificial intelligence is the ability of computers to:

    A. think as humans do
    B. talk to other computers
    C. play interactive games
    D. talk to humans

47. How could a hospital use a computer?

    A. to diagnose illness
    B. to keep an inventory of supplies
    C. to keep track of a patient's temperature

APPENDIX I

NAMES OF SURVEYED SMALL SCHOOL DISTRICTS

Table I-38
Names of School Districts Surveyed by Size Categories

Student Populations (ADA)		
1-299	300-999	1,000-2,499
Avalon	Anna	Bonham
Boles Home	Bells	Commerce
Dodd City	Blue Ridge	Crandall
Ector	Caddo Mills	Ferris
Melissa	Campbell	Frisco
Milford	Celeste	Kaufman
Savoy	Celina	Mabank
Tioga	Collinsville	Princeton
	Farmersville	Whitesboro
	Gunter	Wylie
	Honey Grove	
	Howe	
	Italy	
	Leonard	
	Lone Oak	
	Lovejoy	
	Pottsboro	
	Scurry Rosser	
	Tom Bean	
	Trenton	
	Van Alstyne	
	Whitewright	

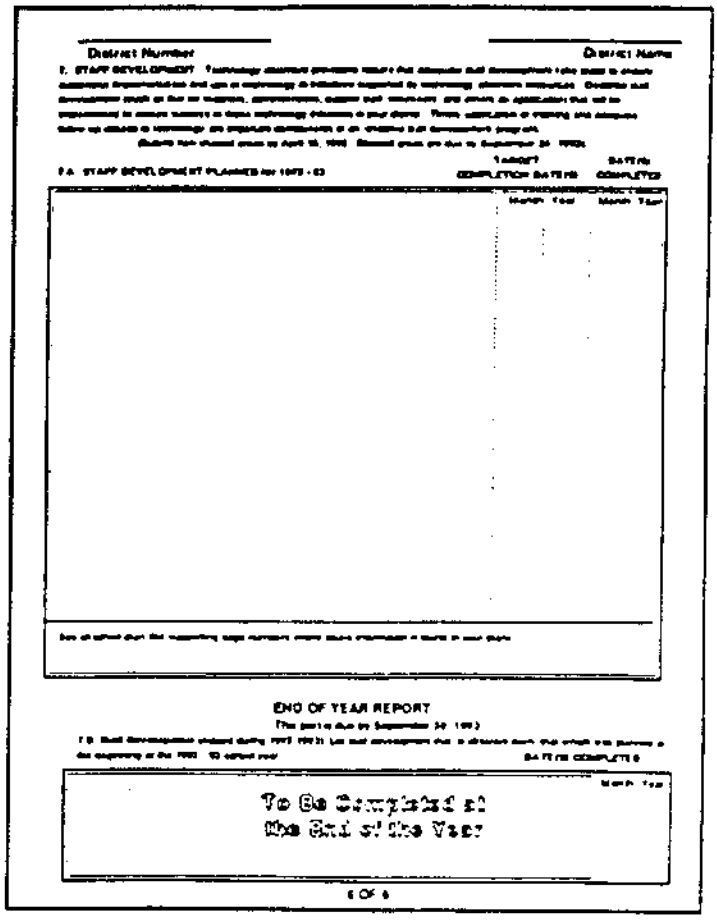
Source: Profile: School districts 1990-91, 1990.

APPENDIX J

EXECUTIVE SUMMARY, PAGE 6

ITEM 7. STAFF DEVELOPMENT

Technology allotment provisions require that adequate staff development take place to ensure successful implementation and use of technology in initiatives supported by technology allotment resources. Describe staff development (such as that for teachers, and administrators, support staff, volunteers, and others as applicable) that will be implemented to ensure success of those technology initiatives in your district. Timely application of training and adequate follow-up access to technology are important components of an effective staff development program. Section 7A should include all staff development activities planned for your district with target completion dates. The shaded portions should not be completed until September 30, 1993. At that time, indicate dates of staff development efforts that were completed. Section 7B should include additional staff development activities that were completed during the 1992-1993 school year. These may be the result of ongoing monitoring and evaluation that revealed additional needs or different applications of technology as well as follow-up training.



APPENDIX K

TRENTON ISD TECHNOLOGY PLAN

FOR 1990-1992

TRENTON ISD

DISTRICT-WIDE PLANNING FOR TECHNOLOGY

Statement of Philosophy

The Trenton Independent School District believes that the curriculum of its schools must keep abreast of and be responsive to the rapidly changing demands of our increasingly complex informational society. Computer technology is viewed by the district as a viable tool to provide students with the necessary technological skills they need to be successful members of our society. These computer skills, which should be introduced in school at an early age and developed through the years for application to the curriculum, will serve as a means to broaden the interest and learning horizons of all students.

Goals

By the end of the 1991-92 school year, the district will:

(1) provide computer activities in the basic skills curriculum to all elementary students (K-6); begin entry level computer keyboard instruction in grade two; and expect correct keyboard skills throughout the remaining school years.

Objectives: (K-6)

1990-91:

1. Each teacher in grades K-6 will receive staff development on computer assisted and computer managed instruction to facilitate Goal 1.

2. An elementary software library will be established for checkout by teachers. To be eligible for software checkout, teachers will be required to attend an orientation session.

3. The elementary campus will establish a Campus Committee for Technology to facilitate Goal 1, to identify specific needs and to plan for those needs.

:991-92:

1. Establish an elementary computer lab. Labs will be supervised by identified teachers or aides for scheduled visits by students. Activities will include keyboarding, basic TAAS skills, and problem solving.

(2) provide computer activities in a wide range of curriculum areas for grades seven and eight: computer applications for problem solving, programming, utilization of data bases, word processing, and communicating.

Objectives: (7-8)

1990-91:

1. Provide teachers in grades seven and eight with staff development on computer assisted and computer managed instruction to facilitate Goal 1.

2. Provide software for library checkout by teachers. To be eligible for software checkout, teachers will be required to attend an orientation session.

3. Establish Committee for Technology to facilitate Goal 2, to indentify specific needs and to plan for those needs.

4. Make computer lab available for use throughout the school day. It will be supervised by identified teachers or aides for scheduled visits by students.

1991-92:

1. Secure funding for additional staff member to supervise computer.

2. Secure funding for additional software.

(3) provide specific technology application instruction to all grade nine, ten, eleven, and twelve students on problem solving acquiring job skills, and learning how to learn for continued education.

Objectives: (9-12)

1990-91:

1. Each teacher in grades 9-12 will be provided staff development on computer managed instruction to facilitate Goal 3.

2. Provide software for library checkout by teachers. To be eligible for software checkout, teachers will be required to attend an orientation session.

3. Provide high school teachers to assist in Committee for Technology to facilitate Goal 3.to identify specific needs and to plan for those needs.

1991-92:

1. Develop specifications and secure funding for additional staff member, computer hardware and software to meet the needs at the high school as indicated in Goal 3.

APPENDIX L

TRENTON ISD TECHNOLOGY PROGRAM CALENDAR

TECHNOLOGY PROGRAM
CALENDAR

August		
14	Superintendent Meeting	Plan for Implementation
26	Faculty Meeting	Pre-Tests
September		
3	Tech Committee Meeting	Overview of Tech Model Results of Pre-Tests
10	Principals Meetings	Plan for Implementation
16	Tech Workshop	Hardware operation/vendor
October		
17	Tech Workshop/early r.	Software Exploration Appleworks
17	School Board Meeting	Introduction of Program
November		
11	Tech Workshop/after sc.	Appleworks
22	Tech Workshop/day	Follow up to Appleworks
25	Tech Workshop/after sc.	Microsoft Word
December		
2	Tech Committee Meeting	Develop Tech Plan vision and philosophy
6	Tech Workshop/day	Content Area Software/ Laserdisc demos
9	Tech Workshop/after sc.	Microsoft Word
9	Tech Committee Meeting	Develop Tech Plan goals and surveys
January		
21	Tech Workshop/after sc. Cancelled by presenter	Microsoft Word
30	Tech Workshop/after sc.	Laserdiscs and Basic Math
31	Tech Committee Meeting with modem	Develop Tech Plan objs. and actions.
February		
18	Tech Workshop/after sc.	Laserdiscs/Teacher
18	Tech Committee Meeting	Develop Tech Plan actions and budget
26	Tech Workshop/early rel.	Gradebooks
March		
4	Tech Committee Meeting	Talk by Bruce Curran from Reg10 to explain networks
23	TISD Aide Training 10 days	Ele. coordinator teaches computers to aides
April		
1	Tech Committee Meeting	Turn Tech Plan details over to super/principals
2	Vendor Software Fair Teachers attended	Computer Tutor display at Harvey Hotel/Plano
8	Tech Workshop/after sc. Cancelled by Super	Microsoft Word
22	Tech Workshop/after sc.	Microsoft Works
May		
12	Faculty Meeting	Post-Tests
June		
18	School Board Meeting	Final Report

APPENDIX M

TRENTON ISD 1992-1997 TECHNOLOGY PLAN

TRENTON INDEPENDENT SCHOOL DISTRICT

TECHNOLOGY PLANNING PROCESS

STATEMENT OF PHILOSOPHY

The *Trenton Independent School District* believes that the curriculum of its schools must be responsive to the rapidly changing demands of our complex informational society. These technological skills, which should be introduced at an early age and developed through the years, will serve as a means to broaden the interest and learning horizons of all students. Technology is viewed by the district as a viable tool to provide students with the necessary skills needed to be successful members of our society.

DISTRICT VISION FOR TECHNOLOGY

The District Technology Committee envisions the use of technology to improve and extend the effectiveness of its students, faculty and staff. Technology can:

- improve the reasoning and problem-solving skills of its students;
- provide motivation for students to learn new skills;
- extend and reinforce basic communications skills, such as reading, writing, speaking and listening;
- support the rapid access to information for student research and post-secondary job and college selection counseling;
- contribute towards both vocational and lifelong learning of students;
- provide alternate instructional strategies for teachers in the classroom;
- equip teachers to more efficiently perform management tasks, such as grade reporting and lesson preparation;
- afford faculty and staff more current and effective staff development from many different environments;
- connect students and teachers in Trenton with other schools and other learning opportunities in Texas and the world;
- extend the district's educational focus to include parents participation in technology training.

TRENTON INDEPENDENT SCHOOL DISTRICT

TECHNOLOGY PLANNING PROCESS

GOALS AND OBJECTIVES

GOAL ONE

To provide access to technology to all students in all curriculum areas.

OBJECTIVE 1.1: An elementary laboratory of computers will be equipped to accommodate a maximum class size of thirty students. the lab will have a computer ratio of one work station to one student and printing capability for all units.

OBJECTIVE 1.2: A secondary laboratory of computers will be equipped to accommodate a maximum class size of thirty students. The lab will have a computer ratio of one work station to one student and printing capability for all units.

OBJECTIVE 1.3: Each laboratory will be equipped with a projection panel and an overhead for large group presentations.

OBJECTIVE 1.4: The district will investigate the use of other technologies (such as laserdiscs and CD-ROM) for existing course/unit offerings and for new offerings, especially at the secondary level.

GOAL TWO

To increase administrative and instructional communications outside the community.

OBJECTIVE 2.1: Two modems will be purchased and installed: one modem in the library and one in the secondary laboratory.

OBJECTIVE 2.2: The district will consider the installation of a satellite dish antenna to increase instructional options available to students, the staff development opportunities offered to district personnel, and expanding the communications capabilities of school administrators.

GOAL THREE

To provide district personnel, parents, and volunteers with appropriate staff development opportunities in the use of technology and on-site support.

OBJECTIVE 3.1: The district will provide keyboarding/training for all personnel.

OBJECTIVE 3.2: The district will provide training on application software for all personnel.

OBJECTIVE 3.3: The district will provide faculty with training on emerging technology such as CD-ROM, modems, and laserdiscs.

OBJECTIVE 3.4: The district will develop a checkout system for hardware and public domain software over weekends and summers to reinforce staff development activities.

OBJECTIVE 3.5: The district will provide training for a group of volunteers to aid teachers in the laborartories. The volunteers will be trained in basic operation and care of hardware and software, and organization of the laboratory.

OBJECTIVE 3.6: The district will support technology coordinators for both the elementary and secondary campuses to coordinate and provide technology training.

GOAL FOUR

To establish a permanent District Technology Committee which will monitor and evaluate the implementation of the Technology Plan and make recommendations, within budget constraints.

OBJECTIVE 4.1: The Committee will identify and monitor innovations and trends in technology and undertake to implement, as appropriate, new technology related to district and community.

OBJECTIVE 4.2: The Committee will develop a year-long program of staff development.

OBJECITVE 4.3: The Committee will evaluate the Technology Plan on a yearly basis and revise as necessary.

OBJECTIVE 4.4: The Committee will develop the yearly report which accounts for the use of local and state technology funds.

TRENTON INDEPENDENT SCHOOL DISTRICT

TECHNOLOGY PLANNING PROCESS

PLAN OF ACTION

OBJECTIVE 1:1: An elementary laboratory of computers will be equipped to accommodate a maximum class size of 30 students. The lab will have a computer ratio of one work station to one student and printing capability for all units.

ACTION 1.1.1:

Time Frame:	1992-1997 phase in
Soft/Courseware:	Campus level committee should be involved in the selection. Estimated cost of $5000 ($750 for 92-93).
Hardware:	Selection criteria for new equipment is to be established. Cost estimate of $65,000 ($11,050 for 92-93).
Staff Development:	Training is to be provided for each teacher scheduled to use the computer laboratory.
Evaluation:	Completion of installation and record of use.
Staff Responsible:	Campus principal and campus technology coordinator.

OBJECTIVE 1.2: A secondary laboratory of computers will be equipped to accommodate a maximum class size of 30 students. The lab will have a computer ratio of one work station to one student and printing capability for all units.

ACTION 1.2.1:

Time Frame:	1992-1997 phase in
Soft/Courseware:	Campus level committee should be involved in the selection. Estimated cost of $5000 ($750 for 92-93).
Hardware:	Selection criteria for new equipment is to be established. Cost estimate of $65,000 ($11,050 for 92-93).
Staff Development:	Training is to be provided for each teacher scheduled to use the computer laboratory.
Evaluation:	Completion of installation and record of use.
Staff Responsible:	Campus principal and campus technology coordinator.

OBJECTIVE 1.3: Each laboratory will be equipped with a projection panel and an overhead for large group presentations.

ACTION 1.3.1:

Time Frame:	1992-1993 school year
Soft/Courseware:	Campus level committee to he involved in the selection.
Hardware:	Selection criteria for new equipment is to be established. Cost estimate $2500 for new equipment (92-93).
Staff Development:	Training to be provided for each teacher.
Evaluation:	Completion of installation and record of use.
Staff Responsible:	Campus principal and campus technology coordinator.

OBJECTIVE: 1.4: Individual classrooms will be equipped with at least one computer and printer.

ACTION 1.4.1:

Time Frame:	1992-1997 phase in
Soft/Courseware:	Campus level committees will be involved in the selection.
Hardware:	Some equipment to be donated. Some equipment will be shifted from computer lab into individual classrooms. Selection criteria for new equipment is to be established. Cost estimate $5000 ($2500 for 92-93).
Staff Development:	Training is to be provided for each teacher scheduled to use the computer.
Evaluation:	Completion of installation and record of use.
Staff Responsible:	Campus principal and campus technology coordinator.

OBJECTIVE 1.5:	Each campus will establish a system for computers to be used by students for personal use at various times during the school day.
ACTION: 1.5.1:	
Time Frame:	1992-1993
Soft/Courseware:	S.udents to use available software as needed.
Hardware:	Equipment can be checked out through systematic procedure designed by campus principal and campus technology coordinator.
Staff Development:	Training is to be provided to students concerning proper use and care of equipment.
Evaluation:	Record of use.
Staff Responsible:	Campus principal and campus technology coordinator.

OBJECTIVE 1.6:	The district will investigate the use of other technologies (such as laserdiscs and CD-ROM) for existing course/unit offering and for new offerings, especially at the secondary level.
ACTION 1.6.1:	
Time Frame:	1992-1997 phase in
Soft/Courseware:	Campus level committee should be involved in the selection.
Hardware:	Selection criteria for new equipment is to be established. Cost estimate of $2500 (92-93).
Staff development:	Training is to be provided to the teacher scheduled to use the equipment.
Evaluation:	Completion of installation and record of use.
Staff Responsible:	Campus principal and campus technology coordinator.

OBJECTIVE 2.1: Two modems will be purchased and installed: one modem in the library and one in the secondary laboratory.

ACTION 2.1.1:

Time Frame: 1992-1997 phase in

Soft/Courseware: Estimated cost of $200

Hardware: Not less than 2400 baud. Estimated cost of $300.

Staff Development: Training for teachers/staff scheduled to use.

Evaluation: Record of use.

Staff Responsible: Campus principal and campus technology coordinator.

OBJECTIVE 2.2: The district will consider the installation of a satallite dish antenna to increase instructional options available to students, the staff development opportunities offered to district personnel, and expanding the communications capabilities of school administrators.

ACTION 2.2.1

Time Frame: 1992-1997 phase in

Soft/Courseware: N/A

Hardware: Selection criteria for new equipment is to be established. Cost estimate of $2500 for new equipment.

Staff Development: Training is to be provided to each staff member on use of equipment.

Evaluation: Completion of installation and record of use.

Staff Responsible: Campus principal and campus technology coordinator.

OBJECTIVE 3.1: The district will provide all personnel with technology training, such as keyboarding, application software, and emerging technology such as CD-ROM, modems, and laserdiscs.

ACTION 3.1.1:

Time Frame: 1992-1997 phase in

Soft/Courseware: Campus level committee should be involved in the selection. Estimated yearly cost of $500.

Hardware: Selection criteria for new equipment is to be established.

Staff Development: Training is to be established for each staff member using equipment.

Evaluation: Record of training and use.

Staff Responsible: District technology coordinator, campus principal and campus technology coordinator.

OBJECTIVE 3.2: The district will develop a check out system for hardware and public domain software over weekends and summers to reinforce staff development activities.

ACTION 3.2.1:

Time Frame: 1992-1993

Soft/Courseware: Existing available software to be ustilized. Campus level committees to be involved in the selection of new software.

Hardware: Existing available hardware to be utilized.

Staff Development: Training to be provided for each teacher checking out equipment.

Evaluation: Record of use.

Staff Responsible: Campus principals and campus technology coordinators.

OBJECTIVE 3.3: The district will provide training for a group of volunteers to aid teachers in the laboratories. The volunteers will be trained in basic operation and care of hardware and software, and organziation of the laboratory.

ACTION 3.3.1

Time Frame: 1992-1997 phase in

Soft/Courseware: Make volunteers aware of available software.

Hardware: Utilization of existing available hardware.

Staff Development: Training to be provided for each volunteer scheduled to use equipment.

Evaluation: Record of use.

Staff Responsible: Teachers, campus principals and campus technology coordinators.

OBJECTIVE 3.4: The district will support coordinators for both the elementary and secondary campuses to coordinate and provide technology training.

ACTION 3.4.1:

Time Frame: 1992-1997 on going

Soft/Courseware: Acquire software if needed.

Hardware: Acquire hardware as needed.

Staff Development: Continually support campus coordinators in their efforts to keep abreast of lastest developments in technology. Support theme in their efforts to make their respective campus proficient in the use of technology.

Evaluation: Yearly review of technology plan of action.

Staff Responsible: Superintendent, district technology coordinator and campus principal.

OBJECTIVE 4.1: The committee will identify and monitor innovations and trends in technology and undertake to implement, as appropriate, new technology related to district and community needs.

ACTION 4.1.1:

Time Frame:	1992-1997 on going
Soft/Courseware:	District and campus committee should be involved in the selection.
Hardware:	Selection criteria for new equipment is to be established.
Staff Development:	Training is to be provided on an ongoing basis as needed.
Evaluation:	Record of new acquisitions and record of use.
Staff Responsible:	Technology committee.

OBJECTIVE 4.2: The committee will coordinate a year long program of staff development, utilizing district personnel, vendors and Region 10 consultants.

ACTION 4.2.1:

Time Frame:	1992-1997 on going
Soft/Courseware:	Review latest available software products and acquire as recommended by district and campus committee.
Hardware:	Selection criteria for new equipment is to be established.
Staff Development:	Provide training on an ongoing basis to all staff members utilizing district personnel when possible. Keep staff members abreast of latest trends in technology and coordinate training based on apparent needs.
Evaluation:	Record of training.
Staff Responsible:	Superintendent, district technology coordinator, campus principal and campus technology coordinator.

OBJECTIVE 4.3: The committee will evaluate the technology plan on a yearly basis and revise as necessary.

ACTION 4.3.1:

Time Frame: May 1993

Soft/Courseware: As applicable

Hardware: As applicable

Staff Development: Committee will share the results of the evaluation with teachers/staff.

Evaluation: Evaluate plan and revise based on study of the effectiveness of the school district in its effort to increase achievement.

Staff Responsible: Superintendent, campus principal, district technology coordinator, campus coordinator and technology committee.

OBJECTIVE 4.4: The committee will develop the yearly report which accounts for the use of local and state technology funds.

ACTION 4.4.1:

Time Frame: May 1993

Soft/Courseware: As applicable

Hardware: As applicable

Staff Development: Committee will share the results of the yearly report with teachers/staff.

Evaluation: Check district budget summary to verify appropriate technology purchase commitments have been met.

Staff Responsible: Technology committee.

TECHNOLOGY MODEL
CALENDAR

August			
	14	Superintendent Meeting	Plan for Implementation
	26	Faculty Meeting	Introduction of Program Pre-Tests
September			
	3	Tech Committee Meeting	Overview of Tech Model Results of Pre-Tests
	10	Principals Meetings	Plan for Implementation
	16	Tech Workshop	Hardware operation/vendor
October			
	17	Tech Workshop/early r.	Software Exploration Appleworks
	17	School Board Meeting	Introduction of Program
November			
	11	Tech Workshop/after sc.	Appleworks
	22	Tech Workshop/day	Follow up to Appleworks
	25	Tech Workshop/after sc.	Microsoft Word
December			
	2	Tech Committee Meeting	Develop Tech Plan vision and philosophy
	6	Tech Workshop/day	Content Area Software/ Laserdisc demos
	9	Tech Workshop/after sc.	Microsoft Word
	9	Tech Committee Meeting	Develop Tech Plan goals and surveys
January			
	21	Tech Workshop/after sc. Cancelled by presenter	Microsoft Word
	30	Tech Workshop/after sc.	Laserdiscs and Basic Math
	31	Tech Committee Meeting with modem	Develop Tech Plan objs. and actions.
February			
	18	Tech Workshop/after sc.	Laserdiscs/Teacher
	18	Tech Committee Meeting	Develop Tech Plan actions and budget
	26	Tech Workshop/early rel.	Gradebooks
March			
	4	Tech Committee Meeting	Talk by Bruce Curran from Reg10 to explain networks
	23	TISD Aide Training 10 days	Ele. coordinator teaches computers to aides
April			
	1	Tech Committee Meeting	Turn Tech Plan details over to super/principals
	2	Vendor Software Fair Teachers attended	Computer Tutor display at Harvey Hotel/Plano
	8	Tech Workshop/after sc. Cancelled by Super	Microsoft Works
	22	Tech Workshop/after sc.	Microsoft Works
May			
	12	Faculty Meeting	Post-Tests
June			
	18	School Board Meeting	Final Report

APPENDIX N

TRENTON ISD 1992-93 EXECUTIVE SUMMARY

TRENTON ISD
District Name

Technology Allotment

074-912
District Number

District Technology Plan
EXECUTIVE SUMMARY
1992-1993

AFFIDAVIT - I hereby certify that the information is true and correct to the best of my knowledge.
INSTRUCTIONAL TECHNOLOGY CONTACT PERSON:

(Type name) Mike Call (Signature) Mike Call

Date May 28, 1992 Phone (903) 989-2242

TENET Address PO Box 5, Trenton, TX 75490

SIGNATURE OF SUPERINTENDENT

(Type name) Daniel S. Jones (Signature) Daniel S. Jones

Date May 27, 1992 Phone (903) 989-2242

TENET Address PO Box 5, Trenton, Tx 75490

District Technology Plan
ANNUAL REPORT
1992-1993

AFFIDAVIT - I hereby certify that the information is true and correct to the best of my knowledge.
INSTRUCTIONAL TECHNOLOGY CONTACT PERSON:

(Type name) _____ (Signature) _____

Date _____ Phone ( ) _____

TENET Address _____

SIGNATURE OF SUPERINTENDENT

(Type name) _____ (Signature) _____

Date _____ Phone ( ) _____

TENET Address _____

Complete each of the following Executive Summary pages (the unshaded portions), and submit with your district's five-year technology plan, by May 30, 1992, to each agency: (Shaded areas are due by May 30, 1993)

Document Control, Texas Education Agency
1701 North Congress Avenue
Austin, Texas 78701

Department of Information Resources
P.O. Box 13564
Austin, Texas 78711

Trenton ISD
District Name

074-912
District Number

Respond to each of the following in reference to your district technology plan which you must attach to this summary. Respond with a brief narrative in the space provided and reference sections of the plan which address the topic.

I. PLANNING PROCESS - (A) Briefly describe the planning process for technology use within your district. (B) Describe what members (actual names/positions or categories of people, business, teacher, etc.) of the district and community were involved in the planning, and (C) how the process will be continued.

The Trenton ISD technology committee was formed in August of 1991. Cheri Halderman, consultant for Education Service Center Region 10, served as an advisor to the district in the planning process for the school year 1991-92. Members of the committee included superintendent Dan Jones, high school principal Gary Bohannon, elementary principal Doris Reagan, counselor Karen Garcia, teachers Dortha Rounsaville, Mike Call, elemantary campus coordinator Sheila Nelson, high school campus coordinator Jan Snow, parent Linda Allison, business/community resident Bonnie Donaghey and librarian Lucy Fulton.

Periodic meetings of the committee were held throughout the year (see technology calendar). A total of seven committee meetings were held. The planning involved pre-testing, developing the tech plan vision and philosophy, developing district technology goals based on identified needs, developing tech plan objectives and actions and budgeting (see plan of action, all pages)

The process will be an ongoing one involving an expanded committee to allow for more collaboration. The committee will involve more parents, students, community members and a representative from the board of trustees. Regular technology committee meetings will be held periodically throughout the year.

See attached plan (list page numbers where above information is found in your plan)
Pg 12 (Technology Model Calendar) Pg 11 (Plan of Action)

Trenton ISD
District Name

074-912
District Number

2. MISSION/PHILOSOPHY and VISION STATEMENT - In general terms, (A) describe the focus/mission or purpose of technology use within your district. (B) What is the overall vision of technology to achieve excellence and equity in student performance? (C) How does your district plan to use technology to close the achievement gap between special populations in your district? (D) What is your district's vision of how technology can improve education? Where is this information found in your plan?

The technology committee of the Trenton ISD feels that living in our complex society be very demanding in the future. To adequately prepare our children for these demands, we must be sure that they have the technological skills that will enable them to broaden their interests and learning horizons.

The technology committee envisions the use of technology to improve and extend the effectiveness of its students, faculty, and staff.

Trenton ISD will close the achievement gap between special populations by providing every student with opportunities to become literate in the use of technology. By utilizing all technology resources, student achievement should rise among all populations within the district.

See attached plan (list page numbers where above information is found in your plan):
Pg 1 (Statement of Philosophy & District Vision)

3. GOALS- The technology allotment was established (A) to provide substantially equal access for students throughout the state to instruction of high quality, to all required courses of study, and to information resources; (B) to provide substantially equal access for teachers and administrators throughout the state to teaching tools of high quality, to efficient management systems, and to instruction in using technology in the classrooms; and (C) to improve student productivity throughout the state. Describe how you address these technology goals in your district.

The Trenton technology committee understands the provisions for equality as established on the state level. Therefore, when developing the mission statement, vision and goals, these factors were taken into account. The goals and objectives will address these factors. (see page numbers below)

See attached plan (list page numbers where above information is found in your plan):
Pg 2-3 (Goals & Obj)

Trenton ISD
District Name

074-912
District Number

4. PLAN OF ACTION - Well written plans flow naturally from the established goals into a plan of action. Provide a brief summary of your plan of action for implementing technology in your district.

The Trenton ISD plan of action was developed by the district technology committee to address four targeted goals. A series of collaborative "brainstorming sessions" were held during the 1991-92 school year to develop objectives and action plans to carry them out.

See attached plan (list page numbers where above information is found in your plan):
Pg 4-11 (Plan of Action)

5. PLAN FOR EVALUATION and REVISION - This section deals with data which has been collected in the assessment process and how change presribed by the data will affect future technology efforts. Briefly describe the evaluation revsision components of your plan.

Time frames have been established for each objective. Evaluation will take place yearly, or more often when necessary, to constantly monitor developments in the implementation of the plan and to see if the desired results are taking place.

See attached plan (list page numbers where above information is found in your plan):
Pg 3 (Goals & Obj), Pg 4-11 (Plan of Action)

Trenton ISD
District Name

074-912
District Number

6. BUDGET SUMMARY (1992-1993 YEAR) - At least 75% of your district's technology allotment expenditures must go to provide classroom instructional services and programs. Briefly outline your budget plans within your district for expenditure of requested funds.

CLASS/OBJECT CODE	Projected Technolgy Allotment Expenditures	Total Projected Technology Expenditures
6100 Payroll	0	$ 31,600
6200 Purchasing Contracted Services		List page numbers where above information isfound in your plan
6300 Supplies/Materials	$ 2000	Pg 4-8
6400 Other		Projected Technology Expenditures Other Sources
6600 Capital Outlay	$ 6600	$ 23,000
Total Allotment Expenditures	$ 8600	List page numbers where information is found in your plan Pg 4,5,8
% of the allotment spent for instruction	100%	

See attached plan (list page numbers where above information is found in your plan.
Pg 4,5,6,8 (Plan of Action)

TRENTON ISD
District Name

074-912
District Number

7. STAFF DEVELOPMENT - Technology allotment provisions require that adequate staff development takes place to ensure successful implementation and use of technology in initiatives supported by technology allotment resources. Describe staff development (such as that for teachers, administrators, support staff, volunteers, and others as applicable) that will be implemented to ensure success of those technology initiatives in your district. Timely application of training and adequate follow-up access to technology are important components of an effective staff development program.
(Submit non-shaded areas by May 30, 1992. Shaded areas are due by May 30, 1993)

7. A. STAFF DEVELOPMENT PLANNED for 1992-1993	TARGET COMPLETION DATE(S) Month	Year	DATE(S) COMPLETED Month	Year
Teachers on each campus will receive training in the use of a projection panel.	12	92	To Be Completed by May 30, 1993	
Teachers will continue to receive training in the use of computers and printers in individual classrooms.	9	92		
Laserdiscs and CD-ROM staff development training will be given to high school teachers/staff.	5	93		
Modems will be purchased and training for teachers/ staff will be given.	5	93		
Staff development training will be given to volunteers as needed to help in technology areas.	12	92		
Continued training will be given to district and campus coordinators.	9	92		

See attached plan (list page numbers where above information is found in your plan):
Pg 4-11 (Plan of Action)

ANNUAL REPORT

This part is due by May 30, 1993

7. B. Staff Development (Added during 1992-1993) List staff development that is different from that which was planned at the beginning of the 1992-1993 school year.

	DATE(S) COMPLETED Month	Year
To Be Completed by May 30, 1993		

TRENTON ISD
District Name

074-912
District Number

8. SIGNIFICANT CHANGES IN YOUR PLAN - Plans should remain dynamic, appropriate, and effective. Therefore, it is an accepted part of planning to make necessary mid-course revisions. Briefly describe changes that have been made in your technology plan since submission at the beginning of this cycle. Make copies of this form if additional space is needed. (Shaded areas are due by May 30, 1993)

To Be Completed by May 30, 1993

See attached plan (list page numbers, when applicable, where above changes have been made in your plan):

APPENDIX O

TRENTON ISD 1992-93 SCHOOL CALENDAR

Trenton Independent School District
1991-92 Calendar

Important Dates

August 19 ..... Teacher Workday
August 20 .... First Day of School
September 2 .... Labor Day Holiday
September 13 .... Progress Reports
September 27 End of 1st Six Weeks
September 30 . Begin 2nd Six Weeks
October 4 ..... Report Cards
October 18 ..... Progress Reports
November 8 .. End of 2nd Six Weeks
November 11... Begin 3rd Six Weeks
November 13 ..... Report Cards
November 27 ..... Early Dismissal
November 28-29 Thanksgiving
..... Holidays
December 6 ..... Progress Reports
December 18 ..... Early Dismissal
December 19- Christmas
January 1 ..... Holidays
January 9 ..... End 1st Semester
January 10 ..... Teacher Workday
January 13 .. Begin 4th Six Weeks
January 16 ..... Report Cards
January 31 ..... Progress Reports
February 27 . End of 4th Six Weeks
February 28 .. Begin 5th Six Weeks
February 28 ..... Report Cards
March 10 Open House,6:30-8:00 PM
March 13 ..... Early Dismissal
March 13 ..... Progress Reports
March 16-20 ..... Spring Break
April 10 ..... End of 5th Six Weeks
April 13 ..... Begin 6th Six Weeks
April 17 ..... Good Friday Holiday
April 20 ..... Bad Weather Day
May 1 ..... Progress Reports
May 17 ..... Baccalaureate
May 22 .... High School Graduation
May 25 ..... Bad Weather Day
May 27 ..... Early Dismissal
May 28 Teacher Workday/
..... 8th Grade Graduation

First Semester

First Six Weeks	28 Days
Second Six Weeks	30 Days
Third Six Weeks	32 Days
	90 Days

Second Semester

Fourth Six Weeks	30 Days
Fifth Six Weeks	30 Days
Sixth Six Weeks	30 Days
	90 Days

AUGUST 1991

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

SEPTEMBER 1991

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

OCTOBER 1991

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

NOVEMBER 1991

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

DECEMBER 1991

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JANUARY 1992

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

FEBRUARY 1992

S	M	T	W	T	F	S
						1
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

MARCH 1992

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

APRIL 1992

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

MAY 1992

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

- ☐ Student/Teacher Holiday
- ⌊ Beginning of Six Weeks
- ⌋ End of Six Weeks
- ( ) Teacher In-Service/Work Days (Student Holiday)
- [ ] Early Dismissal
- O Bad Weather Day

IMPORTANT NOTE: Calendar adopted by TISD Board of Trustees

STATE LAW: Students are required to be in attendance 80 days per semester to receive credit.

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