DOCUMENT RESUME

ED 353 958 IR 015 917

AUTHOR	Nichols, Todd; Frazer, Linda
TITLE	Project A+, Elementary Technology Demonstration Schools, 1991-92: The Second Year.
INSTITUTION	Austin Independent School District, Tex. Office of Research and Evaluation.
SPONS AGENCY	Apple Computer, Inc., Cupertino, CA.; International Business Machines Corp., New York, N.Y.
PUB DATE	Aug 92
NOTE	46p.; For the first year report, see ED 343 553.
AVAILABLE FROM	Austin Independent School District, Office of Research and Evaluation, 1111 West 6th Street, Austin, TX 78703 (Publication Number 91.30).
PUB TYPE	Reports - Descriptive (141) -- Reports - Research/Technical (143)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	*Academic Achievement; *Age Grade Placement; Basic Skills; *Computer Assisted Instruction; Educational Technology; Elementary Education; Inservice Teacher Education; Instructional Effectiveness; Microcomputers; Postsecondary Education; *Program Evaluation; Program Implementation; *School Business Relationship; School Surveys
IDENTIFIERS	Austin Independent School District TX; *Project A Plus Elemen Techn Demonstration Schools

ABSTRACT

The Elementary Technology Demonstration Schools program, where four elementary schools were equipped with computer hardware and software, was made possible by grants from IBM and Apple, Inc. The goals of the program were, in 3 years, to reduce by 50% the number of students not in their age appropriate grade level and those students not achieving on grade level in the areas of reading, writing, and mathematics; develop a comprehensive teacher training program for effective implementation and classroom use of technology; and demonstrate to the community the educational benefits of technology. This report uses ROPE (Report on Program Effectiveness) comparisons, ROSE (Report on School Effectiveness) scores and comparisons, and standardized test results to describe student achievement after the second year of implementation and the first full year of computer usage by the students. A description of project implementation includes logs of computer use and employee survey responses as well as discussions of campus computer issues, training, parent take-home computers, telephone installation, and restructuring issues. Noting that the program has not yet provided the benefits envisioned, the report suggests that a long term view may be necessary to judge program effects adequately. Recommendations are given based on the findings of this report. Six appendixes contain the statistical data collected and 20 figures illustrate the findings. An executive summary of the report is also provided. (Contains 4 references.) (ALF)


The
Office of Research and Evaluation
Austin Independent School District
Austin, Texas

Project A+
Elementary Technology Demonstration Schools, 1991-92:
The Second Year

Austin Independent School District
Department of Management Information
Office of Research and Evaluation

Executive Summary

Authors: Todd Nichols and Linda Frazer

Background

This is the second year of the Elementary Technology Demonstration Schools program and the first full year of computer usage by the students. This program was made possible by a $4.4 million dollar grant from IBM and a $74,000 grant from Apple, Inc. These grant monies were used to equip four elementary schools with computer hardware and software. The program proposal contains four specific goals.

1. In three years, reduce by 50% the number of students who are not in their age appropriate grade level.
2. In three years, reduce by 50% the number of students who are not achieving on grade level in reading, writing, and mathematics.
3. Develop a comprehensive teacher training program to ensure effective implementation and classroom use of technology.
4. Demonstrate to the community the educational benefits of technology, thereby obtaining support for districtwide implementation.

Major Findings

At this point in the Elementary Technology Demonstration Schools program, technology in the classroom has not yet provided the benefits envisioned. The evidence is not clear on the project's long-term effects, but some trends are beginning to emerge.

1. Student achievement results, as measured by the Report on Program Effectiveness (ROPE) and the Report on School Effectiveness (ROSE), are mixed. Of students at the school three consecutive years, 3 ROPE comparisons out of 24 exceed the predicted gain and one score is below the predicted gain. ROSE results of all students indicate 5 out of 40 comparisons exceed the predicted gain and six are below the predicted gain (pp. 3-9).
2. ROPE results for summer school students show that out of 38 comparisons, zero exceed the predicted gain and seven are below the predicted gain (pp. 15-17).
3. Portions of the project are not fully implemented. Logged computer time is low at all three IBM campuses. Some teachers still resist implementing the Teaching and Learning with Technology instructional delivery system. Telephones are not yet installed. One in five teachers say follow-up training is inadequate (pp. 17-25).
4. The percent of overage students has decreased in some cases due to increased enrollment, but the number overage has not decreased (pp. 26 and 36).
5. The number of students below the 30th percentile in reading and mathematics has increased. The number of students failing the reading, mathematics, or writing section of the TEAMS/TAAS is increasing (pp. 27-28).
6. The number of at-risk students is increasing (p. 37).

From this short-term perspective, it appears students at the Apple school are improving achievement more than students at the IBM schools. The approach at the Apple school relies almost exclusively on pull-out instruction in laboratories, which has aided earlier implementation. The approach at the IBM schools, by placing computers in classrooms as well as laboratories, requires classroom restructuring. The demands of restructuring have delayed complete implementation. A longer-term view is necessary to judge program effects adequately.

A copy of the full report for which this is the Executive Summary is available as Publication Number 91.30 from:
Austin Independent School District
Office of Research and Evaluation
1111 West 6th Street
Austin, Texas 78703
(512) 499-1701

Recommendations

Based on the findings contained in this report, we make the following recommendations.

1. The computer technology needs to be fully implemented. Full implementation includes all students using the computers in an instructional setting on a regular, daily basis for an amount of time specified by the school.
2. All schools need to set time-on-task goals and monitor their completion. Where such goals do not exist, principals need to lead the staff in setting the goals.
3. Teachers need to use the computers in instructional activities. Use of the computers as a reward or a discipline tool needs to be eliminated.
4. The logging system at the IBM schools needs to function accurately. All technical and user problems need to be resolved.
5. The amount of follow-up training given to teachers needs to be increased. This will aid overall project implementation.

Budget Implications

Mandate:
Required by School Board
Funding Amount:
Summer School $50,000
Training N/A
Maintenance N/A
Funding Source:
Local and external (private)
Implications:
The District is bound by an agreement with the two major fund providers of this project, IBM and Apple, to continue supporting the project and to continue evaluation. As the District examines ways to use State and local money for technology, the insights gained from the technology strategies employed in this project will be vital.

PROGRAM EFFECTIVENESS CHART

EFFECT	COST	PROGRAM
0	$$	Elementary Technology Demonstration Schools

Effect is expressed as contributing to any of the 5 AISD strategic objectives.

+	*Positive*, needs to be maintained or expanded
O	*Not significant*, needs to be improved and modified
-	*Negative*, needs major modification or replacement
BLANK	*Unknown*, may have positive or negative impact on other indicators; however, impact on the five AISD strategic objectives is unknown.

Cost is the expense over the regular District per-student expenditure.

0	*No cost* or minimal cost
$	*Indirect costs* and overhead, but no separate budget
$$	*Some direct costs*, but under $500 per student
$$$	*Major direct costs* for teachers, staff, and/or equipment in the range of $500 per student or more

TABLE OF CONTENTS

LIST OF FIGURES

OPEN LETTER

The overall goal of the Elementary Technology Demonstration Schools project is to accelerate the learning of low achieving at-risk students and to enhance the learning of high achiving students so that all students are functioning at or beyond age appropriate grade level. Technology is one tool to attain this goal. While technology can be used for improvement in other areas, including acquisition of other skills (e.g., problem-solving and keyboarding skills), improving discipline and attendance, and enhancing self esteem, these are not included in the Project A+ goals. The project goals clearly state the aim of the technology in the context of Project A+, and the project must be evaluated in relation to these goals.

Schools involved in the project do not use uniform methods. Schools employ two separate and distinct approaches to integrating technology into instructional activities. This crucial point should not be overlooked when examining the project, just as the particularities of each approach should not be overlooked when judging the program's effectiveness. Other differences exist between the two approaches, most importantly the software and the software management system, but this report focuses on the approach used to integrate computers into instruction.

Galindo pursues a strategy of placing computers in laboratories. Students are pulled out of the classroom setting, much like they are pulled out for art, music, and physical education activities, to work on the computers. The classroom is unaltered, and the computers are used primarily for supporting existing curriculum.

Three schools, Andrews, Langford, and Patton, pursue a mixed approach that includes placing computers in the classroom in addition to laboratories. The project design calls for the classroom computers to be integrated into instruction through a centers-based approach, where groups of four to five students rotate through several learning stations, one of which is computers. Teachers may use the computers primarily to support existing curriculum, or they may choose to use the computers in a lead role. This more complex approach raises the demand on teachers, at least in the short run, and requires their willingness to become involved with changes in the classroom.

The mixed approach is more difficult to implement. Placing computers in the classroom and integrating them through a centers-based approach necessitates a restructuring of the classroom environment from teacher centered to student centered. The new demands on teachers have been met with enthusiasm in many cases, with resistance in some. This resistance to the new methods is understandable; teachers learned whole-group instruction methods and have used them for many years. Nonetheless, this resistance inhibits complete implementation and obstructs proper evaluation of the two approaches.

Given the differences between the two instructional technology approaches, and the increased complexity of implementing the mixed approach, it is not surprising that two years into the project students at Galindo are improving achievement more than students at the other schools. This conclusion at the end of a relatively short time span should not invite the conclusion that the laboratory-only approach is better than the mixed approach. However, it remains to be seen if the schools and teachers can successfully implement the mixed approach. Continuing evaluation and study are needed to determine long-term effects.

INTRODUCTION

The Elementary Technology Demonstration Schools (ETDS) program of Project A+ began in the Austin Independent School District (AISD) in the 1990-91 school year. This is the second evalution report for the project. See *Project A+ Elementary Technology Demonstration Schools, 1990-91: The First Year* (ORE Publication No. 90.32) for evaluation of the first year of the program.

Project A+, an AISD/IBM initiative established in the spring of 1989, is designed to improve the District's educational environment by acting as a catalyst for change and marshalling community resources. ETDS was made possible by a $4.4 million grant from IBM and a $74,700 grant from Apple, Inc. These grants were used to equip four elementary schools with computer hardware and educational software. ***The primary purpose of ETDS is to demonstrate the effectiveness of technology in accelerating the learning of low achieving at-risk students and enhancing the education of high achieving students.***

The project plan for ETDS spells out four specific goals for the computer technology program. These form the basis for the evaluation of the project contained in this report. Figure 1 displays the goals and how progress toward their achievement is measured.

Figure 1
ETDS Goals and Effectiveness Measures

Project Goal	Measure of Effectiveness
In three years, reduce by 50% the number of students who are not in their age appropriate grade level	Number of students overage one or more years
In three years, reduce by 50% the number of students who are not achieving on grade level in reading, writing, and mathematics	1) Number of students below 30th percentile in reading and mathematics on the ITBS/NAPT 2) Number of students failing reading, mathematics, or writing section of TEAMS/TAAS
Develop a comprehensive teacher training program to ensure effective implementation and classroom use of technology	1) Employee surveys 2) Teacher interviews
Demonstrate to the community the educational benefits of technology, thereby obtaining support for districtwide implementation	Degree to which project is fully implemented and its goals are reached

Last year's evaluation report contained only preliminary results regarding the impact of the project on student achievement because the computers were not fully networked until midway through the year. The report presented baseline achievement data and detailed the implementation process.

This year's evaluation report is the first report following a full year of computer usage by the students. The report begins with a section on student achievement at the schools. It presents achievement data from several angles, including ROPE/ROSE, TAAS/TEAMS, and ITBS/NAPT. This section includes a review of the achievement of students involved in the summer school program. The report then examines the level of project implementation. It expands on the concept of project implementation contained in the previous report by including not only what equipment is in place at the schools but what level of usage that equipment is receiving. This section reviews teacher survey results, progress on telephone installation, and other items relating to project implementation. The next section evaluates how the project is succeeding in meeting its specified goals. The report concludes by presenting recommendations for reaching the project goals more effectively.

Information for the report was gathered from several sources, including classroom observation, principal interviews, teacher interviews, District computer files, employee surveys, and campus computer logs.

STUDENT ACHIEVEMENT

The 1991-92 school year marked the first full year of computer usage by the students. In line with the District's strategic objectives, the main purpose of the technology program is to improve student achievement. This section details changes in student achievement from the year prior to project implementation through the first two years of the project. The section presents information on student achievement from several angles: ROPE/ROSE, TAAS/TEAMS, ITBS/NAPT, and summer school.

DEFINING ROPE AND ROSE

The four schools differ on many factors, and to compare achievement scores directly would be misleading. The Report on Program Effectiveness (ROPE) and the Report on School Effectiveness (ROSE) provide a more accurate interschool comparison of achievement results. ROPE and ROSE give information on how each school's students perform on standardized tests from one year to the next in relation to the rest of the District. The reports do this by combining the individual scores of each student in a school or program. ROPE and ROSE adjust the scores for factors out of the school's control before making the comparison. These factors include sex, previous achievement, ethnicity, income level, and age in grade.

ROPE and ROSE compare students' actual scores with a predicted score for each student. The difference, called a residual, is an indication of how far above or below prediction a student performed on a test compared to students with similar characteristics. The residuals of all students in a program are combined to create a program's ROPE score. The residuals of all students at a school are combined together to create a school's ROSE score. Three results are possible: exceeded predicted gain, achieved predicted gain, and below predicted gain. A score exceeding or below predicted gain is based on statistical tests to determine if the residual is significantly different from zero.

This section presents the ROPE and ROSE scores for the four elementary technology demonstration schools. ROPE and ROSE generate scores only on students who took standardized tests the previous year. Therefore, kindergarten and grade 1 students are not included in the results.

ROPE COMPARISONS

To create the ROPE score, we generated a report for students who have recorded ROSE scores at the same four elementary schools for three consecutive years, from 1989-90 to 1991-92. Under this condition, only groups of students in grades 4 and 5 in 1991-92 were large enough to meet the statistical requirement of having a minimum of 25 students to be included in this study.

ROPE reported six scores for each program. Of the 24 possible changes, three exceeded the predicted gain and one was below the predicted gain. Figure 2 displays the scores for each school.

Figure 2
ROPE Scores 1991-92

	Andrews	Galindo	Langford*	Patton
Grade 4				
Reading	=	=	=	=
Mathematics	=	=	=	↑
Language	=	=	=	=
Grade 5				
Reading	=	=	↑	↓
Mathematics	=	↑	=	=
Language	=	=	=	=

* In grade 4 at Langford, only 22 students qualified for mathematics and 23 for reading and language. Because this is below the minimum of 25, these results should be interpreted with more caution.

Key	
= Achieved Predicted Gain	↓ Below Predicted Gain
↑ Exceeded Predicted Gain	n/a Test not Given

The ROPE scores portray positively the effect of the computers on student achievement. ROPE, by looking only at students who have been influenced by the technology program for consecutive years, may be a better indicator of program effect than ROSE. Although 83.8% of the scores achieved the predicted gain, the ratio of three exceeding predicted gain to one below predicted gain is encouraging.

ROSE Scores and Comparisons

Figure 3 displays ROSE scores for the year preceding project implementation and the two years since the beginning of the project. One way to look at the ROSE scores is to analyze how a school performed in relation to the predicted gain for that school. The technology at the four elementary schools is designed to help students exceed the achievement of students at regular schools. Correspondingly, we expect the ROSE scores for the four elementary schools to exceed the predicted gain when compared to scores at nontechnology schools.

Figure 3
ROSE Scores
1989-90, 1990-91, and 1991-92

	Andrews			Galindo			Langford			Patton		
	89-90	*90-91*	*91-92*	*89-90*	*90-91*	*91-92*	*89-90*	*90-91*	*91-92*	*89-90*	*90-91*	*91-92*
Grade 2												
Reading	=	=	=	=	=	=	↓	=	=	=	=	↓
Mathematics	=	=	=	↑	=	=	=	↓	↓	=	=	=
Language	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Grade 3												
Reading	↑	↑	=	=	=	=	=	↑	=	=	=	=
Mathematics	↑	↑	=	=	=	=	=	=	=	=	↓	=
Language	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Grade 4												
Reading	=	=	=	=	=	=	=	=	=	=	=	=
Mathematics	=	↓	↓	=	=	=	=	↓	=	=	=	↑
Language	=	↓	↓	=	=	↓	=	↓	=	=	↓	=
Grade 5												
Reading	=	=	↑	=	=	↑	=	=	↑	=	=	↓
Mathematics	=	=	=	↓	=	↑	=	=	=	↓	=	=
Language	=	=	=	=	=	=	=	=	=	=	=	=

Note: The District switched to NAPT from ITBS in 1991-92 for grades 3-5. The NAPT does not measure work-study skills, so these scores from previous years have been dropped for this report.

Key
= Achieved Predicted Gain ↓ Below Predicted Gain
↑ Exceeded Predicted Gain n/a Test not Given

Each school received 10 scores—two each in grades 2 and 3 and three each in grades 4 and 5. The breakdown of the scores is provided in Figure 4.

At Galindo, the Apple school, 20% of the scores exceeded the predicted gain and 10% were below the predicted gain. At the IBM schools, 10% of the scores exceeded the predicted gain while 16.7% of the scores were below the predicted gain.

Figure 4
ROSE Scores 1991-92

	Andrews	Galindo	Langford	Patton
Exceed Predicted	1 (10%)	2 (20%)	1 (10%)	1 (10%)
Below Predicted	2 (20%)	1 (10%)	1 (10%)	2 (20%)
Equal Predicted	7 (70%)	7 (70%)	8 (80%)	7 (70%)

Another way to look at the ROSE scores is to compare this year's scores with last year's scores. This comparison indicates movement between the three possible categories. For example, grade 4 mathematics at Langford was below the predicted gain in 1990-91 and equalled the predicted gain in 1991-92. This group improved its score but did not exceed the predicted gain. A comparison of the two scores credits this improvement, and shows progress toward achieving the level of exceeding predicted gain.

Out of 10 comparisons at the Apple school (Galindo), from 1990-91 and 1991-92:

- 2 up (20.0%)
- 1 down (10.0%)
- 7 same (70.0%)

Out of 30 comparisons at the IBM schools (Andrews, Langford, and Patton), from 1990-91 and 1991-92:

- 7 up (23.3%)
- 5 down (16.7%)
- 18 same (60.0%)

No changes occurred in the majority of the comparisons: 70% of the Apple school comparisons remained constant and 60% of the IBM school comparisons remained constant. The IBM schools registered a higher percentage of change (40%) than the Apple school (30%), but almost half of the IBM changes were negative.

There were more changes this year than last year at both groups of schools and the *percentage of positive change was higher than the percentage of negative change* (see Figures 5 and 6). At the Apple school, the number of negative changes remained the same while positive changes doubled to two. At the IBM school, the number of positive changes remained the same while the number of negative changes increased from three to five. ***In other words, in 1991-92 there was an increase in the negative change compared with the first year of the program at the IBM schools and there was an increase in the positive change compared with the first year of the program at the Apple school.***

These two methods of analyzing the ROSE scores provide similar results for the Apple school. Method 1 shows that 20% of the scores exceeded the predicted gain while 10% were below the predicted gain. Method 2 shows that 20% of the scores rose in comparison to 1990-91 while 10% decreased.

The methods give different results for the IBM schools. The first method indicates that 10% of the scores exceeded the predicted gain while 16.7% were below the predicted gain. The second method shows that 23.3% of the comparisons increased from 1990-91 to 1991-92, and 16.7% of the comparisons decreased.

Figure 5
Changes in ROSE Scores, Apple School
1991-92

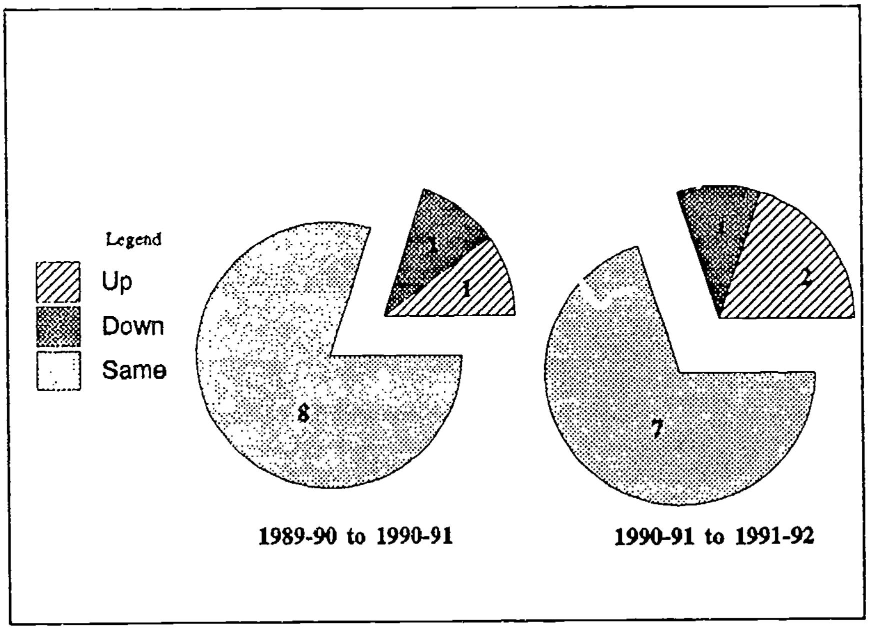


Figure 6
Changes in ROSE Scores, IBM Schools
1991-92

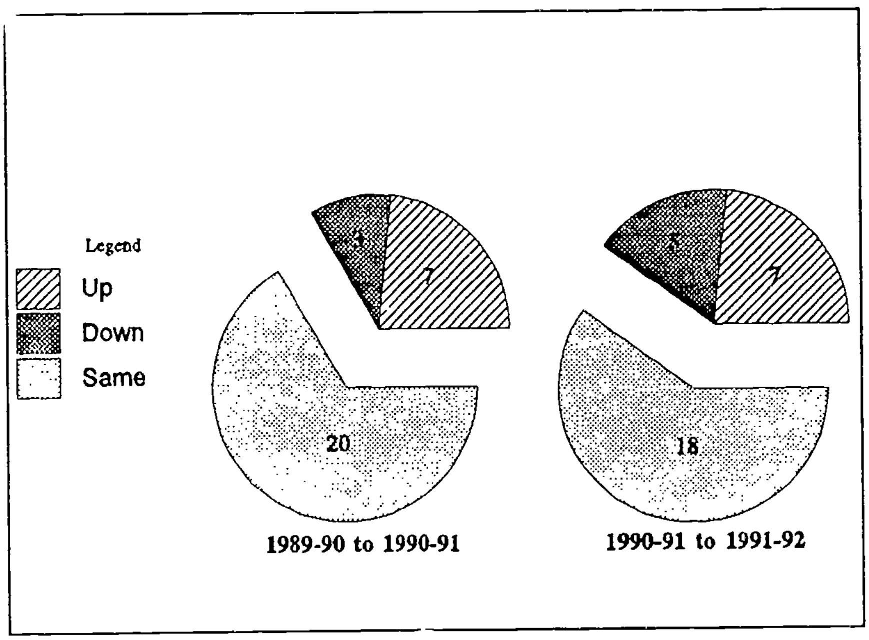


Figure 7 looks at the ROSE comparisons by grade and computer model, and shows at what grade levels and in what subjects the changes occurred. Figure 8 displays the grade in which the changes occurred for the three IBM schools.

Figure 7
ROSE Comparisons By Grade and Computer Model
1990-91 and 1991-92

Grade	Apple School	IBM Schools
2	2 same	1 down (*reading*) 5 same
3	2 same	1 up (*1 reading*) 3 down (*1 reading, 2 mathematics*) 2 same
4	1 down (*language*) 2 same	4 up (*2 mathematics, 2 language*) 5 same
5	2 up (*reading, mathematics*) 1 same	2 up (*2 reading*) 1 down (*1 reading*) 6 same

Grade 5 registered both positive changes at the Apple school, one in reading and one in mathematics. At the IBM schools the changes are spread out among all grades, with the most changes (four) occurring in 3rd (one up and three down) and 4th (four up) grades. Langford and Patton registered the most positive changes (three).

Figure 8
ROSE Comparisons By School
IBM Schools, 1990-91 and 1991-92

Andrews	Langford	Patton
1 up (*1 5th grade*) 2 down (*2 3rd grade*) 7 same	3 up (*2 4th grade, 1 5th grade*) 1 down (*1 3rd grade*) 6 same	3 up (*1 3rd grade, 2 4th grade*) 2 down (*1 2nd grade, 1 5th grade*) 5 same

Grade 4, where the highest number of positive changes occurred, consistently ranked at the top of all the tested grades at Patton and Langford in logged computer time (see p. 31). ***This points to a potential positive relationship between time on computer and improvement in test scores.*** However, grade 3 at Andrews registered two negative changes, and this grade is likewise consistently at or near the top in time on computer for this school. The evidence is inconclusive, but the potential link between logged computer time and achievement improvement exists.

To test the hypothesis that an increase in logged computer time leads to achievement improvement, we ran a regression analysis with ROSE residuals as the dependent variable and logged computer time in a particular subject as the independent variable. We ran this model for each subject and grade at each school. The model should tell if any statistical relationship exists between the two variables. This relationship is expressed in terms of R^2, which is defined as the amount of variance explained by the independent variable. The expectation is that a positive relationship exists; that the higher a student's time on the computer in a given subject, the better the student scores in relation to the predicted gain.

The analysis showed no demonstrable relationship between the two variables. The highest R^2 value obtained was .114 in grade 2 mathematics at Langford, which means only 11% of mathematics achievement is explained by time on computer in mathematics for grade 2 at Langford. The remaining R^2 ranged from 0 to .11. The failure of this model to confirm our expectations does not prove the expectations are invalid. Other factors, such as the uncertainty surrounding the logged computer times, may have negatively influenced the model.

In sum, the ROSE and ROPE comparisons do not present convincing evidence regarding the effect of technology at the four campuses. The results are mixed at best. The ROPE scores portray the effect of computers more positively. ***Overall, there is little proof as yet of the effectiveness of technology at the four campuses in improving student achievement.***

Standardized Test Results

During the 1991-92 school year, schools administered two types of standardized tests to students: a criterion-referenced test (CRT) to grades 3 and 5 and a norm-referenced test (NRT) to grades 1 to 5. As mentioned earlier, direct comparisons of these scores between schools can be misleading.

TAAS/TEAMS

The Texas Assessment of Academic Skills (TAAS), a CRT, was first administered in 1990-91. TAAS was preceded by the Texas Educational Assessment of Minimum Skills (TEAMS). Both are CRTs, which are designed to measure a well-defined set of skills and to reference students' scores to a mastery criterion for that set of skills. The skills measured are a subset of the Essential Elements adopted by the State Board of Education.

The switch to TAAS from TEAMS caused the percent passing districtwide to decrease because TAAS is more difficult. Additionally, the standards for passing were raised before the 1991 testing period, adding additional downward pressure on the percent passing. Thus, year-to-year comparisons should be made very carefully.

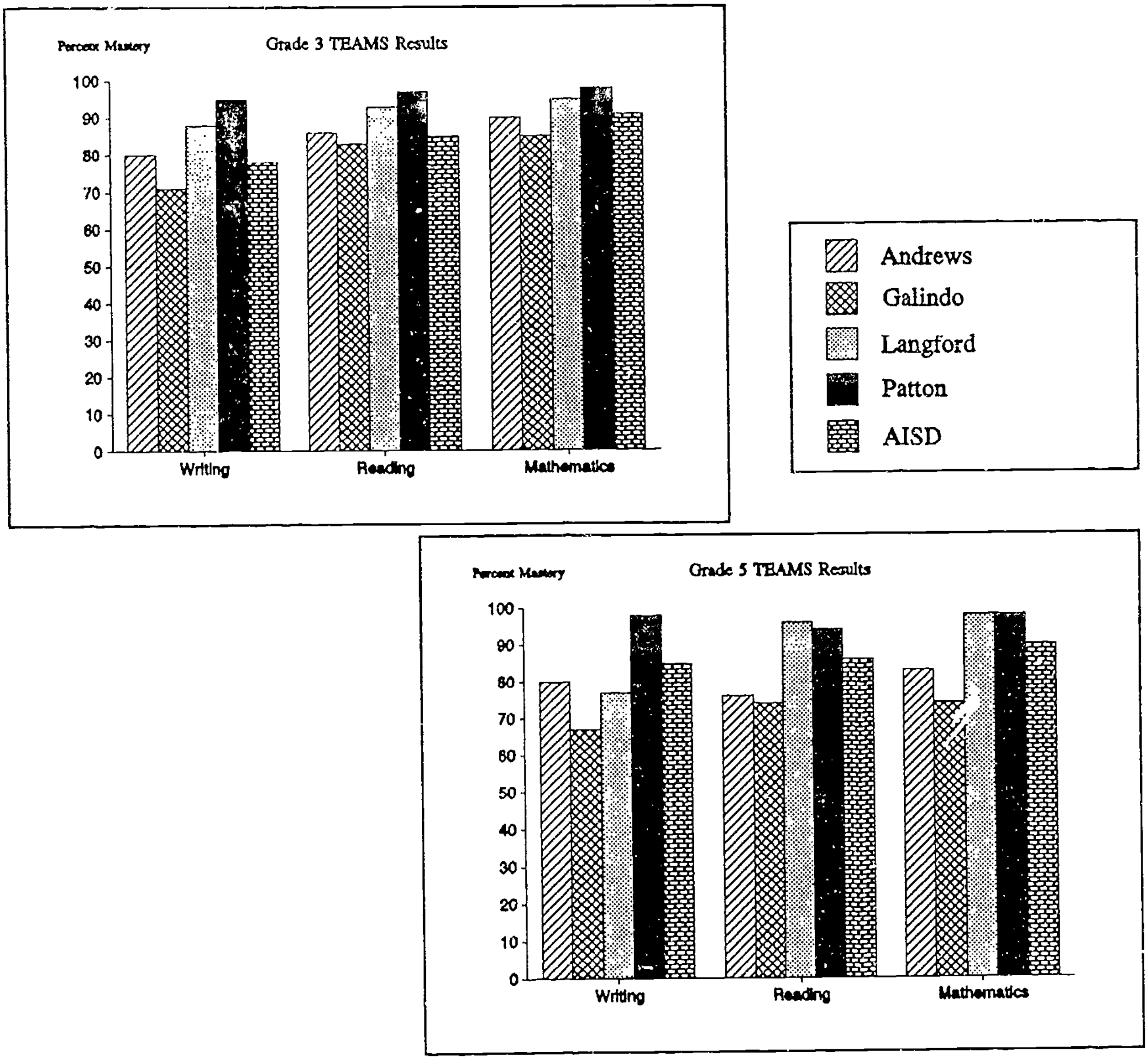
Figures 9-11 present CRT percent mastery scores for the last three school years. Again, because of different student factors beyond the control of the school, these scores should be compared with caution. Additionally, with the switch from TEAMS, a minimum skills test, to TAAS, an academic skills test, change between years is difficult to interpret.

An interesting trend appears if each school's scores are analyzed in relation to the District average.

- Andrews exceeded the District average in two sections in spring 1990, no sections in fall 1990, and no sections in 1991.
- Galindo exceeded the District average in no sections in spring 1990, three sections in fall 1990, and four sections in 1991 (equalled in one section).
- Langford exceeded the District average in five sections in spring 1990, one section in fall 1990 (and equalled the average in two sections), and no sections in 1991 (equalled in one section).
- Patton exceeded the District average in every section each year.

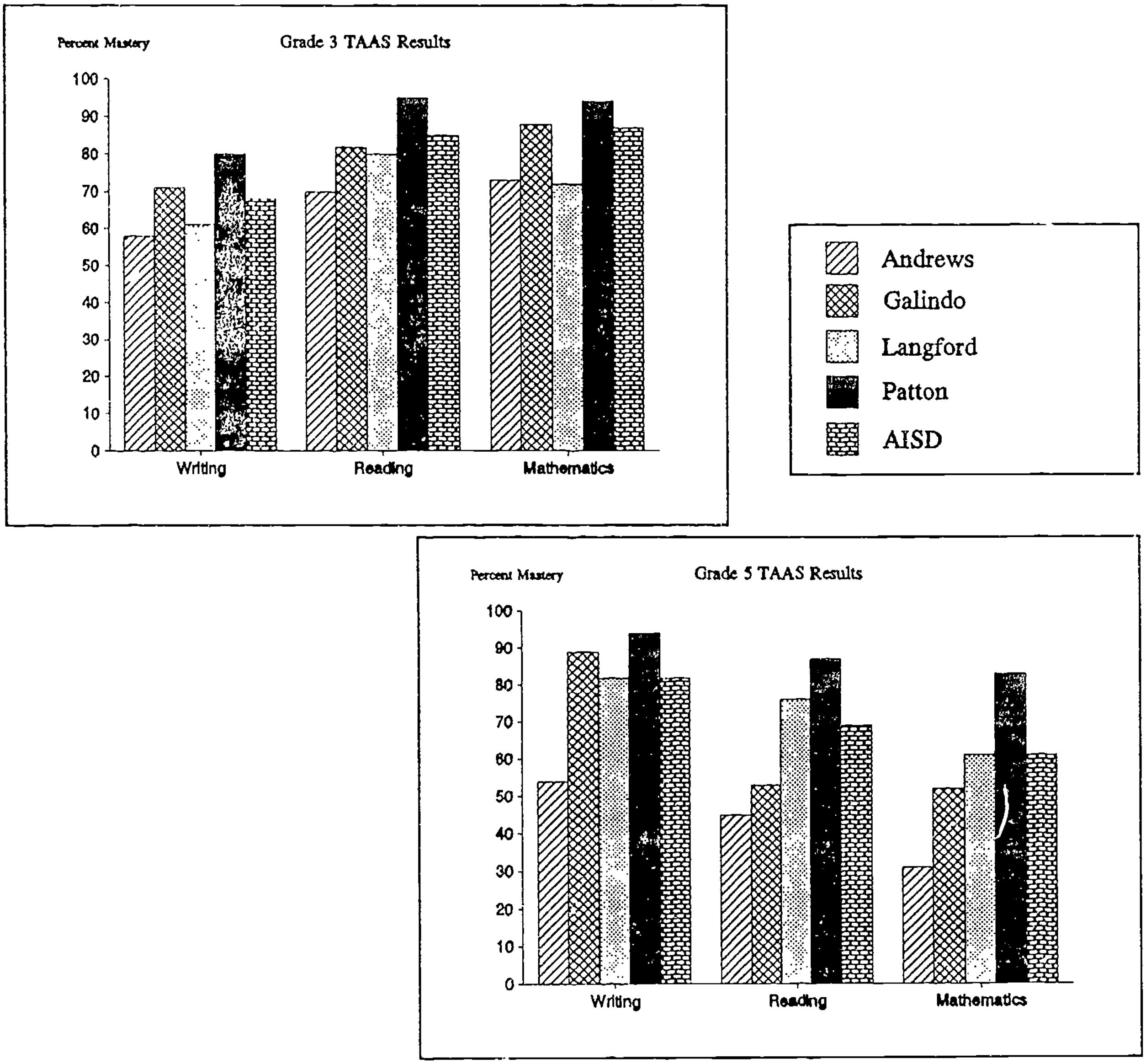
The position of the IBM schools in relation to the District average worsened over the three-year period. The position of the Apple school improved markedly over the three-year period.

Figure 9
Spring 1990 TEAMS Results
Percent Mastery



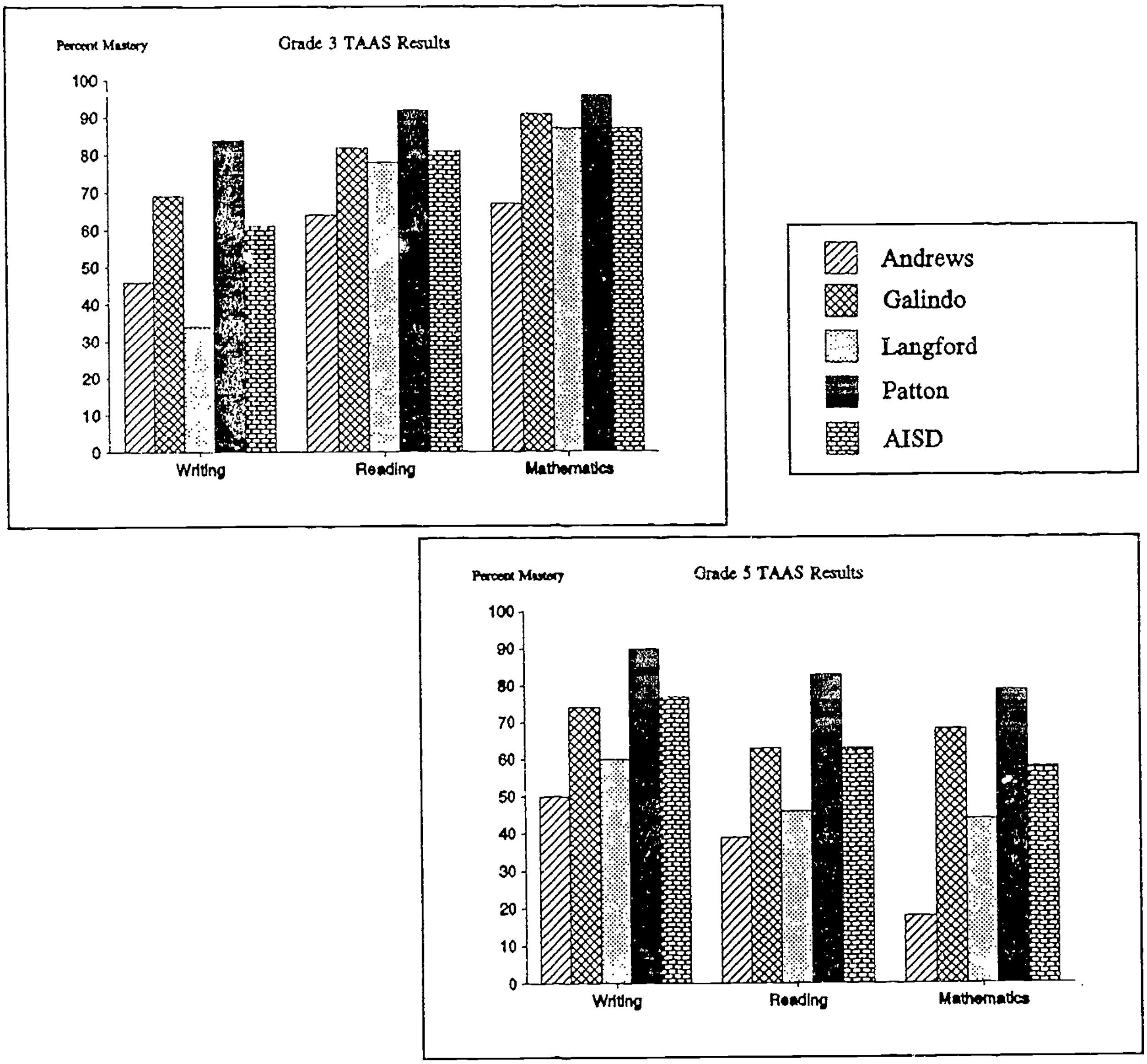
	Andrews	Galindo	Langford	Patton	AISD
GRADE 3					
Writing	80	71	88	95	78
Reading	86	83	93	97	85
Mathematics	90	85	95	98	91
GRADE 5					
Writing	80	67	77	98	85
Reading	76	74	96	94	86
Mathematics	83	74	98	98	90

Figure 10
Fall 1990 TAAS Results
Percent Mastery



	Andrews	Galindo	Langford	Patton	AISD
GRADE 3					
Writing	58	71	61	80	68
Reading	70	82	80	95	85
Mathematics	73	88	72	94	87
GRADE 5					
Writing	54	89	82	94	82
Reading	45	53	76	87	69
Mathematics	31	52	61	83	61

Figure 11
Fall 1991 TAAS Results
Percent Mastery



	Andrews	Galindo	Langford	Patton	AISD
GRADE 3					
Writing	46	69	34	84	61
Reading	64	82	78	92	81
Mathematics	67	91	87	96	87
GRADE 5					
Writing	50	74	60	90	77
Reading	39	63	46	83	63
Mathematics	18	68	44	79	58

ITBS/NAPT

Two NRTs were administered in Austin during the 1991-92 school year. The Iowa Tests of Basic Skills (ITBS) was given to grades 1-2 and the Norm-referenced Assessment Program for Texas (NAPT) was given to grades 3-11. An NRT is designed to measure student achievement in broadly defined skill areas that cover a wide range of achievement. Scores from NRTs (e.g., percentiles and grade equivalents) compare a student's performance with that of a nationwide sample o students at the same grade. National norms provided by the test publisher are used.

ITBS/NAPT Scores by School, Grade, and Ethnicity

To examine change in test scores across time we compared the ITBS/NAPT scores by ethnicity and grade from 1989-90 to 1991-92. This comparison will help determine whether the technology has had a differential impact across ethnic groups. The analysis of the test scores gives a measure of the performance of a school, not a specific group of students, by comparing scores from the same grade in successive years. The tables are presented in Appendix B on pages 34-35.

Discerning a clear pattern from these numbers for a specific ethnic group and subject is difficult. Selected trends for specific grades and ethnic groups are presented below.

- Andrews: Grade 1 all ethnic groups improved scores except Hispanics in language; African-American scores nearly doubled in reading and mathematics.
  Grade 3 African-American scores are down in reading and language; Hispanic scores are up in reading and mathematics.
  Grade 5 Hispanic scores are down in all subjects.

- Galindo: Grade 3 mathematics scores are up for all groups; language scores for Hispanics are down.
  Grade 5 scores for Hispanics are all up.
  Composite scores for all ethnicities combined increased in every grade from 1989-90 to 1991-92.

- Langford: Grade 1 composite scores are down for all groups, due to declining mathematics and reading scores.
  Grade 2 mathematics scores are down for all groups except African-Americans.
  Grade 4 African-American scores are down in all subjects.

- Patton: In Grades 1 and 2 the majority of scores are down slightly across the board.
  Grade 3 composite scores are up, mostly on the strength of higher mathematics scores.
  Grade 4 composite scores are up.

Analyzing the scores this way points to some positive gains made by some ethnic groups in some subjects at some schools. Looking at the composite scores from 1989-90 to 1991-92 it appears scores for all ethnicities combined are up at Galindo, down at Langford, and mixed at Andrews and Patton. African-Americans may have benefitted more than other ethnic groups thus far in the project although Hispanic scores have shown postive gains. Still, it is not possible to draw hard conclusions from the available data.

SUMMER SCHOOL PROGRAM

This section of the report considers two aspects of the summer school program:

- What type of students were selected to participate in the summer school program?
- Did the summer school students' test scores improve the subsequent year?

Student Selection

One of the strategies at the schools to keep students functioning successfully at or beyond grade level is to offer summer school classes to students not on grade level. Thus, student selection for summer school is a major concern.

Ideally, 100% of the summer school students would be classified at risk. Figure 12 displays the percent of summer school students classified at risk by campus. The figure displays at-risk percentages for 1990-91 (the year prior to summer school) and for 1991-92 (the year after). The at-risk statistics are generated in October of each year, so by the time summer school student selection decisions are made in the spring, a student's actual at-risk status may have changed. Thus, the figure displays pre- and postsummer school at-risk statistics in an effort to portray more accurately the status of the students.

In no school were 100% of the summer school students classified at risk. The postsummer school at-risk statistics were higher than the presummer school statistics, reflecting the change in at-risk status during the year. The percent of summer school students classified at risk ranged from a low of 66.1% at Andrews to 93.0% at Langford.

Another way to evaluate summer school student selection is to compare the percent of summer school students classified at risk with the percent of school year students classified at risk. Reflecting the reason for summer school, to offer classes to students not on grade level, the summer school at-risk percentage should be much higher than the school year percentage.

Figure 12
At Risk Percent Comparison
1991 Summer School Students and 1990-92 School Year Students

Group	Year	Andrews	Galindo	Langford	Patton
1991 Summer School Students	1990-91	45.8	57.4	35.1	41.1
	1991-92	66.1	83.3	93.0	76.8
1991 School Year Students	1990-91	43.4	37.9	31.9	19.4
1992 School Year Students	1991-92	50.0	38.8	42.1	21.6

The percent of summer school students classified at risk is higher at all four schools than the percent of school year students classified at risk. At Langford and Galindo the summer percent is more than twice as high as the 1991-92 school year percent, and at Patton the summer percent is over three times as high. Therefore, while 100% of the summer school students were not at risk at any school, ***the percent at risk in summer school was higher than the percent at risk in the school year at all schools.***

Test Scores of Summer School Students

The best way to analyze summer school students' test scores is to use the ROPE methodology described on pages 3-4. However, ROPE requires a minimum of 25 students for the results to acquire sufficient statistical confidence. The summer school student groups studied at the A+ schools ranged from a low of 9 to a high of 20. Nonetheless, the trends in the summer school ROPE data are so clear and consistent that they warrant reviewing (see Figure 13).

Figure 13
ROPE Scores
1991 Summer School Students

	Andrews	Galindo	Langford	Patton
Grade 2				
Reading	=	=	n/a	↓
Mathematics	=	=	n/a	=
Language	n/a	n/a	n/a	n/a
Grade 3				
Reading	=	=	=	↓
Mathematics	↓	=	=	↓
Language	n/a	n/a	n/a	n/a
Grade 4				
Reading	=	=	↓	=
Mathematics	↓	=	=	=
Language	=	↓	=	=
Grade 5				
Reading	=	=	=	=
Mathematics	=	=	=	=
Language	=	=	=	=

Key
= Achieved Predicted Gain ↓ Below Predicted Gain
↑ Exceeded Predicted Gain n/a Test not Given

No group of summer school students in any grade at any school exceeded the predicted gain. Out of 38 scores, seven (18.4%) were below the predicted gain. At the three IBM campuses, six (21.4%) of the scores were below the predicted gain.

Remember, these scores are not as statistically certain as would be preferred. However, the predicted gains are based on analyses of students with similar characteristics districtwide who had no concentrated technology program and did not have the benefit of summer school. The trend toward no groups exceeding the predicted gain and seven scores below the predicted gain ***may indicate a need to reconsider the purpose or activities of the summer school program.***

PROJECT IMPLEMENTATION

This section of the report examines the level of project implementation reached as of the 1991-92 school year. Last year's evaluation report found that the delayed arrival of the computers at the campuses inhibited the evaluation of project success in terms of student achievement. This report has shown that students are not outperforming other District students at this point of the program. This section of the report asks the following two questions.

- Is it possible that the project is not yet fully implemented?
- If so, what parts of the project lack complete implementation?

In a complex project of this magnitude, having all of the computers installed, networked, and loaded with software does not ensure implementation. Other important factors must converge to reach full implementation. Students must use the instructional software, teachers must integrate the software with the curriculum, teachers must receive sufficient and appropriate training. This section gives some indication of the level of implementation of these factors.

Logs of Computer Use

The IBM-networked equipment features a logging system to track computer usage by students. This information can be partitioned into various categories, including grade and subject area. Prior to the summer session 1991, the log information was not usable by District personnel because students logged in with their name instead of the identification number. Following a switch to logging on with the identification number, summer session 1991 marked the first time we collected the log information. We also collected the logs during the 1991-92 school year.

The log system operates as follows. Individual teachers create student menus for their classroom by selecting courseware and inserting it in the menu under the appropriate subject, such as mathematics or reading. The teacher is given the option of recording logs for each courseware selected. The teachers have been instructed to chose the no-log option for some courseware, such as Writing To Read and various third-party courseware for which the system is not capable of keeping logs.

When initiating a computer session, students log on by entering their AISD identification number. The logging system then automatically records several pieces of information, including the time in, the time out, and the name of the courseware the student uses.

The evaluation associate (EA) collected the logs each six weeks by downloading them to computer diskettes. A programmer uploaded the diskettes to the AISD mainframe and analyzed the data. The EA sent preliminary analyses three times during the year--one covering the first and second six weeks, one covering the third and fourth six weeks, and one covering the fifth and sixth six weeks. For further detail on the log files and to see the preliminary analyses, see *Project A+ Elementary Technology Demonstration Schools Technical Report* (ORE Publication No. 91.N)

Several problems were encountered with the logging system. These problems can be grouped into two areas: user problems and technical problems. User problems include teachers inappropriately selecting the no-log option, students being deleted from the log files before the logs are downloaded, and students not logging in with their District identification number. Technical problems include system upgrades that erased logs, the logging system not tracking times appropriately, downtime on the servers causing log loss, and the system's inability to log multiple identification numbers for students working in pairs.

These problems added uncertainty to the information provided by the logging system. Many of the campus personnel and teachers expressed strong disagreement with the times the logs showed.

The technology facilitator called a meeting to discuss the preliminary analysis of the log information from the first and second six weeks. This meeting generated some positive results. The campus lab assistants began maintaining records of fileserver downtime to document technical problems better. IBM personnel ran simulations to see if the system was logging times correctly.

Subsequent analyses of logged computer time showed little improvement in time on task from the first analysis. Campus personnel began rethinking their perceptions of time the students spent on the computers, and some adjusted their perceptions downwards. Others showed continued resistance to the time-on-task number derived from the logs.

Despite the controversy over the logs, there are several reasons that compel their inclusion in this report. Available evidence does not yet single out the factor or factors causing a malfunction. Because there is as yet no determined pattern of logging system malfunction, we can assume that the logs are useful for interschool and intraschool comparison purposes. Finally, the logs are central pieces of information for evaluating the technology program.

Students do spend some of their time on software that is not logged. The grades most affected by this are the grades that use Writing to Read, primarily kindergarten and grade 1, and Writing to Write, primarily grade 2. Additionally, it is not certain if the logging system maintains accurate records for some of the third-party packages for which logs are kept, namely the DLM software (Number Farm, Comparison Kitchen, and Alphabet Circus). Nonetheless, only a small minority of overall students' time is spent on these packages. Figure 14 lists the logged software and gives explanations for definitions in the tables and graphs that follow.

Figure 14
Logged Courseware at IBM Schools and
Definitions for Log Tables

Mathematics
- Math Concepts
- Math Practice
- Geometry
- Algebra
- Measurement, Time, and Money
- Comparison Kitchen
- Number Farm

Reading
- Bouncy Bee Learns Letters
- Bouncy Bee Learns Words
- Stories and More
- Reading for Meaning
- Reading for Information

Language
- Spelling
- Vocabulary
- Parts of Speech
- Punctuation
- Combining Sentences
- Alphabet Circus

Primary Editor
- Primary Editor Plus
- Mi Editor Primario
- Typing
- TouchTyping for Beginners

Tools
- The Writing and Publishing Center
- LANSchool
- LinkWay

DEFINITIONS

All Grades Column:
This column is the mean time for all students with records in a specific subject. The count is unduplicated.

All Subjects Row:
This row is the mean time for all students with records in a specific grade. The count is unduplicated.

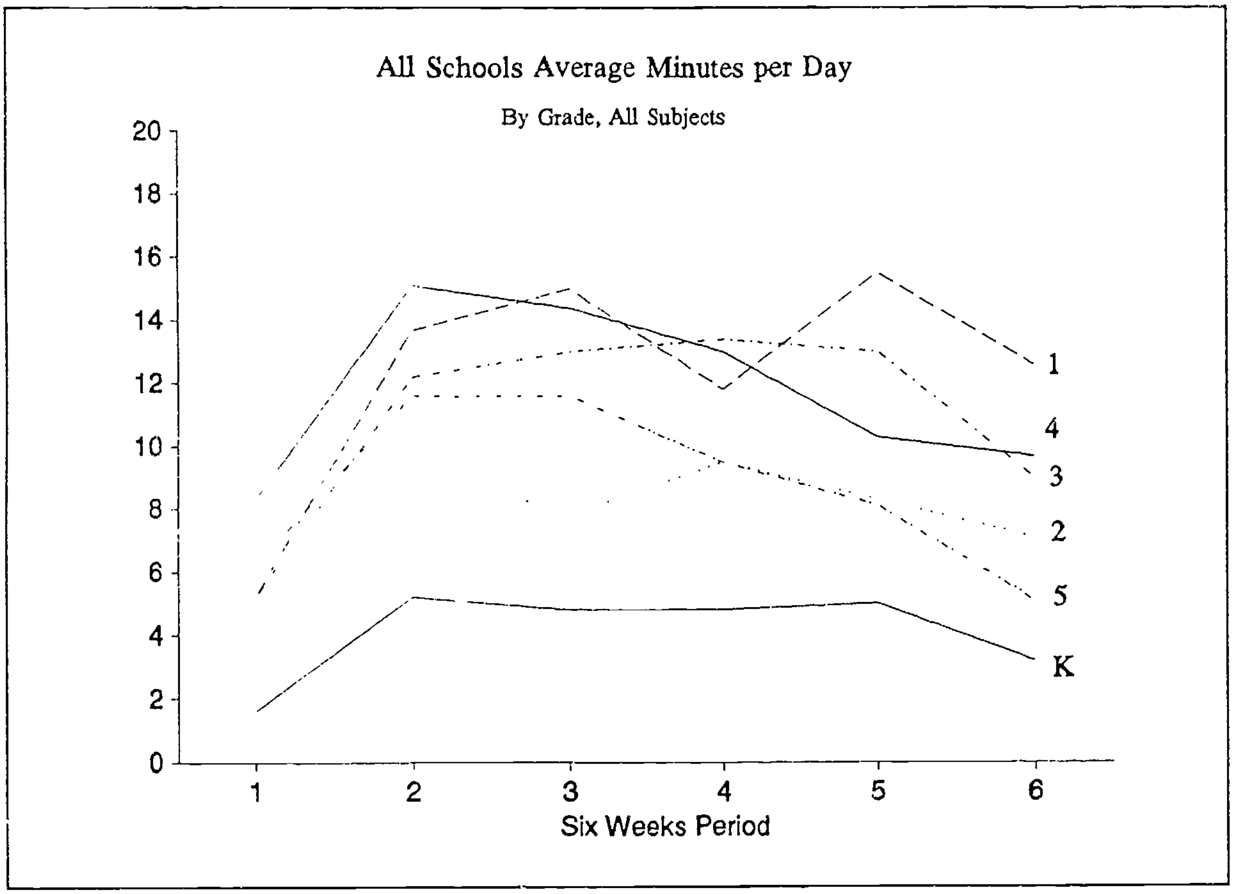
All Subjects and All Grades Cell:
This cell is the mean for all students with records in any subject. The count is unduplicated. This can be loosely interpreted as the grand total of time spent on the computer per student for that time period.

First and Second Six Weeks Combined:
For individual subjects: Includes those students with records for that subject in both six weeks.
For all subjects: Includes students with records in any subject in both six weeks. In some cases, this causes the all subjects total to exceed the sum of the individual subjects for a specific grade in the first and second six weeks combined table. The counts are unduplicated.

Because of the uncertainity associated with the logs, the absolute times on task shown in Figure 15 and in Appendixes A1-A3 should be interpreted with caution. ***The times are far below expectations for a program of this magnitude.*** Even if the logged times were doubled, the amounts would still be below expectations. The highest average daily time of any six weeks period was 19.0 minutes. The reported logged times may serve to stimulate time-on-task goal setting where such goals do not exist, and to prompt further study about time goals where they do exist.

The amount of logged time peaked at the campuses during the second and third six weeks and levelled off or declined thereafter. The peak logged time varied from campus to campus, but as mentioned above the maximum was 19 minutes per day. This low demonstrated level of use raises questions about the level of project implementation. In interviews, principals reported that some campuses do not have time targets for computer use. These targets are necessary. Moreover, reaching these targets must be enforced and monitored if the effectiveness of technology in reaching the project goals is to be tested. The computer logs provide excellent information to monitor use for this purpose, and they must be made to work correctly.

Figure 15
Average Minutes Per Day on Computer at All IBM Elementary Technology Demonstration Schools



Grade	1st Six Weeks	2nd Six Weeks	3rd Six Weeks	4th Six Weeks	5th Six Weeks	6th Six Weeks
K	1.6	5.2	4.8	4.8	5.0	3.2
1	5.2	13.7	15.0	11.8	15.5	12.6
2	2.3	9.5	7.8	9.5	8.3	7.1
3	5.2	12.2	13.0	13.4	13.0	9.0
4	8.3	15.1	14.4	13.0	10.3	9.7
5	6.2	11.6	11.6	9.5	8.1	5.1
All	5.0	11.6	11.4	10.3	10.1	8.1

Two models of computer use are presented in Figure 16. Because the school day lasts a total of six and one-half hours, excluding lunch, the maximum amount of time that can be achieved under these assumptions is 1 hour and 20 minutes per student. To achieve this, the computers must be in continuous use the entire day. Based on the information contained in the logs and obtained by observation, ***it is doubtful any classrooms are reaching this level of use.***

Figure 16
Models of Daily Student Computer Use

These models illustrate typical scenarios of classroom computer usage. The models compute how much time computers must be in use in order to reach certain time goals.

ASSUMPTIONS
22 Students
4 Classroom Computers
45 minutes lab use per student per week (990 minutes total)
6.5 hours per school day

MODEL 1: Target of 1 hour per student per school day

22 students x 1 hour each = 22 hours total daily usage
22 hours x 5 days = 110 hours (6,600 minutes) per week
6,600 minutes - 990 lab minutes = 5,610 minutes (93.5 hours) classroom usage
93.5 hours usage ÷ 5 days = 18.7 hours per day
18.7 hours per day ÷ 4 classroom computers = 4.7 hours per computer

CONCLUSION: For 22 students to use the computers one hour each, all four classroom computers would have to be in continuous usage 4 hours and 42 minutes every day, or about three-fourths of the school day.

MODEL 2: Target of 30 minutes per student in mathematics, reading, and language arts (total of 90 minutes per day)

22 students x 1.5 hours each = 33 hours total daily usage
33 hours x 5 days = 165 hours (9,900 minutes) per week
9,900 minutes - 990 lab minutes = 8,910 minutes (148.5 hours) classroom usage
148.5 hours usage ÷ 5 days = 29.7 hours per day
29.7 hours per day ÷ 4 classroom computers = 7.4 hours per computer

CONCLUSION: It is not possible for 22 students to use the computer 90 minutes daily without spending more than 45 minutes weekly in the laboratory or without having more than four classroom computers.

With these assumptions, the maximum amount of time each student could spend on a computer is 1 hour 20 minutes per day if the computers were continuously used.

EMPLOYEE SURVEY RESPONSES

Every fall the District conducts a survey of all employees. Fall 1991 marked the second time Project A+ staff has responded to the same set of questions. Responses from both years are displayed in Figure 17.

Several observations are worth noting. The percent of neutral responses decreased in every item except item 2. In most cases this decrease appeared in the agree and strongly agree responses. The major exception is item 3, which asks if the training was sufficient to appropriately incorporate the Project A+ technology into the curriculum. The percent of persons with negative responses to this item rose from 14.6% to 19.7%, the highest negative response. ***One in five people think the training is not sufficient to incorporate the A+ technology appropriately into the curriculum.***

Only item 2 about retention rates experienced a drop in the percent responding positively. This decrease may be attributable to the increased emphasis by the District on reducing retention rates, which overshadows the effect of the technology project on reducing retention rates.

Respondents were very encouraged by the academic progress made by the students using the technology (item 1). This question netted the highest positive response rate, although this supposition is not yet borne out by the data. Respondents also believed the addition of technology in the classroom had made their teaching more effective.

CAMPUS COMPUTER ISSUES

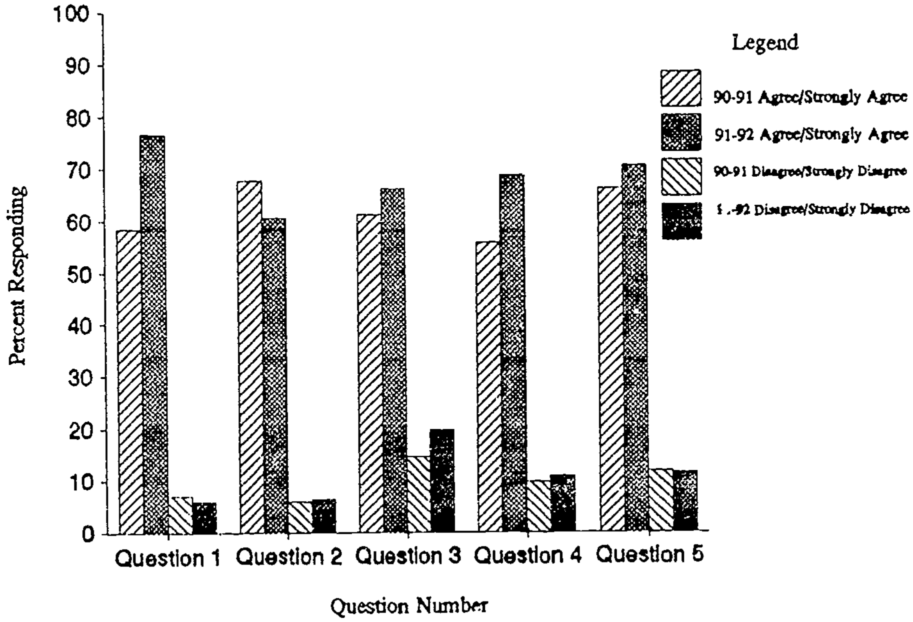
Teachers at the IBM schools completed training in the software delivery system, Teaching and Learning with Computers (TLC), during fall 1991. Teachers implement this delivery system with varying degrees of success and enthusiasm. Some teachers use the system almost exclusively in mathematics and language arts; some find the delivery system too cumbersome and use it very little.

The purpose for which the computers are used in the classroom is a major issue. Sometimes computer time is still viewed as a reward or the computer is used as a discipline tool. In interviews, one teacher stated that students perform their regular work as quickly as possible so they can get on the computer. Another stated that students that behave well can earn computer time. ***This type of usage should be eliminated.*** The computers are for all students to use. Rewarding well-behaved children or quick workers works against some of the project goals of accelerating the learning of students not on grade level and may actually even widen the gap between at-risk and not-at-risk students.

Another important issue in intergrating computers into the curriculum is the teaching method used in the classroom. One teacher commented, "There has been no effort to integrate computers in a structured way." Several teachers report still relying exclusively on direct teaching. One teacher tells of students hand writing stories on paper, then typing them in the computer.

The project is not designed to eliminate direct teach. Nor is the aim to tell teachers how to integrate the computers into the curriculum. The project is designed to integrate the computers into the curriculum in a structured way to improve student achievement. The examples listed above are inappropriate uses of the technology. This inappropriate use may be caused by several factors, including insufficient training or lax supervision. ***Computer usage needs to be structured, monitored, and consistent for its effect to be measured.***

Figure 17
1990-91 and 1991-92 Employee Survey
Teacher Responses



Percent Responding / Question Number	Valid Responses		Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	1991	1992	1991	1992	1991	1992	1991	1992	1991	1992	1991	1992
1. I am encouraged by the academic progress the students on my campus have made using the Project A+ Technology.	189	176	30.1	36.5	28.4	40.1	34.4	17.4	4.4	4.2	2.7	1.8
2. The implementation of the Project A+ Technology will help reduce retention rates on my campus.	190	179	26.2	20.6	41.5	40.0	26.2	32.9	5.5	5.3	0.5	1.2
3. I received sufficient training to incorporate appropriately the Project A+ technology into my curriculum.	193	176	21.0	27.4	40.3	38.7	24.2	14.3	8.1	13.7	6.5	6.0
4. The addition of technology in my classroom has made my teaching more effective.	193	174	23.1	31.1	32.8	37.7	34.4	20.4	7.5	7.8	2.2	3.0
5. I would recommend the Project A+ technology as it was implemented on my campus.	193	175	25.3	33.5	40.9	37.1	22.0	18.0	9.1	8.4	2.7	3.0

OBSERVATIONS

1) Teachers expressed the most agreement with item 1 and the least agreement with item 2.
2) Teachers expressed the least disagreement with item 1 and the most disagreement with item 3.
3) The number of respondents answering neutral decreased, as teachers tend to feel more strongly about the project. This is seen in the increase in the percent of respondents agreeing or disagreeing for every item but number three. For item 1 the number disagreeing decreased. For item 2 the number agreeing decreased. For item 5 the number disagreeing decreased. The number of neutral responses rose only for item 2.

Some teachers also expressed concerns about the type and quality of the courseware being used. The computers are capable of much more than drill-and-practice, but higher order activities require appropriate courseware. A teacher at one of the IBM schools claimed that Typing Tutor was the only non-drill-and-practice courseware available to the students. For the computers to reach full effectiveness, courseware that utilizes higher order skills is required.

Technical problems with the computers continued. The maintenance contract with IBM expired during the year. Maintenance switched to the District, but service delivery problems engendered a brief return to IBM-provided maintenance. At the end of the year, the District once again picked up maintenance on the computers. Principals report improved maintenance service delivery at this point.

IBM is converting all computers to token ring. Some of the initial wiring was baseband, which was too slow and caused technical problems. The switch is anticipated to be complete by the beginning of the 1992-93 school year.

TRAINING

Training for teachers at all schools continued during the 1991-92 school year, but most of it was follow-up. The major new training was for teachers at the IBM schools in Teaching and Learning with Computers for mathematics from October 29 to November 5, 1991, at IBM. Other training included Writing to Read October 22 and 23 at Langford, Writing to Write November 7 and 8 at Langford, File Management November 7 at Galindo, and Hypercard February at Galindo. In addition, IBM offered a staff development session October 14 at the Red Lion Hotel.

Approximately two teachers from each campus were trained in the Excelsior II electronic gradebook program. These teachers then served as campus resources, fielding questions from other staff members on the program.

The amount of follow-up training may need increasing. On the annual staff survey, teachers expressed the most disagreement with the statement that they received sufficient training to incorporate appropriately the Project A+ technology into their curriculum. In personal conversations, many teachers voiced their opinion that training now would be more useful than the training they received at the beginning. ***Increasing follow-up training would aid overall project implementation and improve project effectiveness.***

PARENT TAKE-HOME COMPUTERS

The three IBM technology schools began implementing the parent take-home computer program during the school year. The program allows selected students to take home computers loaded with specific instructional software designed to accelerate the students' learning. Each campus implements this program slightly differently. The ETDS technical report contains the campus take-home computer plans.

At this point there is no evaluation of the effectiveness of the take-home computer program. The schools monitor usage of the computers.

TELEPHONE INSTALLATION

The original project plan proposed to place telephones in every classroom to facilitate parent-teacher communication. Although the telephones are not yet installed, some progress toward their installation was made this year.

The telephones will operate on the same system as the central administration telephones. Galindo piloted the phone project during the year. Several staff members received telephone training and approximately five telephones were installed. At a February 1992 meeting the School Board approved a bid of $270,274 for the equipment. At a June meeting the Board approved a lease-purchase agreement.

As of this writing, telephone installation is just beginning. The system is scheduled to be fully operational by the opening of the 1992-93 school year.

RESTRUCTURING ISSUES

This report, like the project to date, emphasizes the role of technology and the computers. The computers are important to the success of the project, but they are properly viewed as only one part of an overall effort to enhance the learning of all students so that they are functioning at or beyond age appropriate grade level. An integral part of the overall effort is restructuring of the classroom and school. The aim of this restructuring its to enhance the learning of all students and to ensure that all students are functioning successfully at or beyond grade level.

During the first year of the project, 1990-91, project staff conducted regular meetings to discuss issues related to the initial implementation of technology. These meetings were abandoned during the 1991-92 school year. The results contained in this report indicate similar meetings could be useful. The meetings need to have the overall project goals as their focus. Specifically, participants should ask what can be done to better support student success at their schools and how to better meet project goals. Appropriate solutions may or may not deal with technology; for example, developing better mechanisms to accelerate an overage student's progress may include programs to advance the student through the grade levels more quickly.

PROGRESS TOWARD PROJECT GOALS

Page 1 of this report listed the four specific goals of ETDS. Now at the end of the second year of the project, it is an appropriate time to evaluate progress toward the fulfillment of these goals. This section analyzes progress toward these goals one by one.

Goal 1: In three years, reduce by 50% the number of students who are not in their age-appropriate grade level.

The percent of overage students is decreasing. The number of overage students has decreased only at Galindo.

Appendix C1 contains the number and percent of overage students as of October 30 for each of the four schools. Only one school, Galindo, shows a decrease (from 106 to 90) in the total number of overage students from 1990 to 1991. The percentage overage decreased slightly, ranging from -.07 to -2.8, at three schools. This measure counts all students in the school on October 30 each year, without considering if they have been in the school less than the entire time of the program. This dilutes the measure of program effect by looking at students who have not had time to be affected by the program.

Page 4 describes a ROPE file that contains students who have attended the same school for three consecutive years which corresponds with the year before the project and the first two years of the project. We extracted yearly overage statistics on this group of students to test the completion of the first goal (see Figure 18).

Figure 18
Overage Statistics
For Three-Year Students

		1990		1991		1992*	
		N	%	N	%	N	%
Andrews	66	9	13.6	9	13.6	9	13.6
Galindo	70	9	12.9	9	12.9	9	12.9
Langford	50	6	12.0	6	12.0	6	12.0
Patton	210	22	10.5	22	10.5	22	10.5

* Preliminary data

Of students at the schools three consecutive years, the number overage has remained constant. Of all students at the school, the number overage has remained fairly constant but the percent overage has decreased slightly due to increased enrollment (see page 36). Existing mechanisms to accelerate an overage student's movement through the grades appear insufficient to reach fulfillment of this goal. However, the number of new retainees has decreased. The reduction in the number of new retainees may be a result of the districtwide emphasis on reducing retainees and not the project.

Goal 2: In three years, reduce by 50% the number of students who are not achieving on grade level in reading, writing, and mathematics.

The schools are not on pace to achieve Goal 2.

The numbers and percentages of at-risk students at all schools increased from 1990-91 to 1991-92 (see Appendix C2). To get a more accurate picture of program effect, we analyzed the same ROPE file of students at the schools three consecutive years to test progress toward Goal 2 (see Figure 19).

Figure 19
Percent Below 30th Percentile in
Reading and Mathematics, Three-Year Students

READING		1990		1991		1992	
		N	%	N	%	N	%
Andrews	66	8	12.1	21	42.0	24	36.4
Galindo	70	11	15.7	15	21.4	10	14.3
Langford	50	8	16.0	17	34.0	12	24.0
Patton	210	22	10.5	16	7.6	8	3.8

MATHEMATICS		1990		1991		1992	
		N	%	N	%	N	%
Andrews	66	15	22.7	24	36.4	28	42.4
Galindo	70	8	11.4	8	11.4	12	17.1
Langford	50	6	12.0	14	28.0	12	24.0
Patton	210	5	2.4	10	4.8	11	5.2

The numbers in Figure 19 are derived from scores on the ITBS/NAPT. Based on these scores, only *Patton is on pace to achieve Goal 2 in reading and no schools are on pace to achieve Goal 2 in mathematics.*

Another way to test progress toward this goal is by looking at scores on the TAAS/TEAMS (see Figure 20).

Figure 20
Percent Failing Reading, Mathematics, and Writing Section of TAAS/TEAMS, Three-Year Students

READING		1989-90		1990-91		1991-92	
		N	%	N	%	N	%
Andrews	66	4	6.1	9	13.6	22	33.3
Galindo	70	9	12.9	7	10.0	10	14.3
Langford	50	2	4.0	5	10.0	16	32.0
Patton	210	4	1.9	5	2.4	18	8.6

MATHEMATICS		1989-90		1990-91		1991-92	
		N	%	N	%	N	%
Andrews	66	5	7.6	7	10.6	28	42.4
Galindo	70	5	7.1	5	7.1	9	12.9
Langford	50	1	2.0	5	10.0	18	36.0
Patton	210	2	1.0	5	2.4	25	11.9

WRITING		1989-90		1990-91		1991-92	
		N	%	N	%	N	%
Andrews	66	7	10.6	16	24.2	21	31.8
Galindo	70	10	14.3	16	22.9	16	22.9
Langford	50	1	2.0	7	14.0	13	26.0
Patton	210	7	3.3	21	10.0	24	11.4

The number of students failing the reading, mathematics, or writing section of the TAAS/TEAMS has increased at all schools during the project. The percent failing has also increased at all schools. Galindo, the Apple school, has increased less than the IBM schools.

It is important to remember that the TAAS, first administered during the 1990-91 school year, is a more difficult test than the TEAMS. Also, the passing standards were raised prior to the 1991-92 school year. Still, the increase in the number of students failing a section of the TAAS is high. ***The schools are not on pace to achieve Goal 2 of the project.***

Goal 3: Develop a comprehensive teacher training program to ensure effective implementation and classroom use of technology.

Information from the employee survey indicated that one in five teachers believed the amount of training was insufficient to incorporate the Project A+ technology into the curriculum. From personal conversations, many teachers believed the initial training was good but more follow-up training is needed. *There is progress toward completion of this goal, but more follow-up training needs to be provided.*

Goal 4: Demonstrate to the community the educational benefits of technology, thereby obtaining support for districtwide implementation.

As a demonstration project, the elementary technology demonstration schools aim to prove that technology is a viable method of instructing the children of Austin. The District is proceeding with plans to increase the amount of technology at all campuses. Funds for technology are forthcoming from the State.

Many members of the community are excited about the technology programs at these four campuses. Principals report increased parental interest in their children's scholastic activities since the initiation of the program. Many students were turned away at the beginning of the school year who do not live within the school's boundaries and have not procured the necessary transfers to attend the school. There has been some media coverage of activities at the school, all of it positive.

At this point *evidence for the educational benefits of the technology, as measured by performance on standardized tests, is minimal.* The project does have considerable support within the community, but this support is derived more from intuition about the benefits of technology than from its demonstrated effects.

CONCLUSIONS AND RECOMMENDATIONS

The 1991-92 school year was the second year of the elementary technology demonstration schools project and the first full year of computer usage by the students. The evidence is not yet clear on the project's effects, but some trends are beginning to emerge.

Student achievement for students taking summer school classes is below expectations. Student achievement for students in the schools three consecutive years indicate some positive gains. However, analyses of the at-risk status of the same students show the number overage is holding steady, while the number below the 30th percentile in reading and mathematics is rising as is the number failing the reading, writing, or mathematics section of the TAAS/TEAMS.

At this point, *it appears that students at Galindo, the Apple school, have improved achievement more than students at the IBM schools*. This is based on a higher percentage of ROSE scores exceeding the predicted gain, better improvement in TAAS/TEAMS compared to the District average, better movement towards reducing the number of overage students, and a smaller increase in the percent failing a section of the TAAS/TEAMS. The difference in success in reaching the project goals may be attributable to the differences in instructional technology approaches and to the short time horizon of the program thus far. The mixed approach used at the IBM schools may require more time to fully implement, and after full implementation the approach may generate more positive results. At this point it is not possible to say which approach has a greater long-term effect.

Based on the information contained in this report, we make the following recommendations.

1. *The computer technology needs to be fully implemented.* Full implementation includes all students using the computers in an instructional setting on a regular, daily basis for an amount of time specified by the school.

2. *Schools need to set time-on-task goals and monitor their completion.* Where such goals do not exist, principals need to lead the staff to setting the goals.

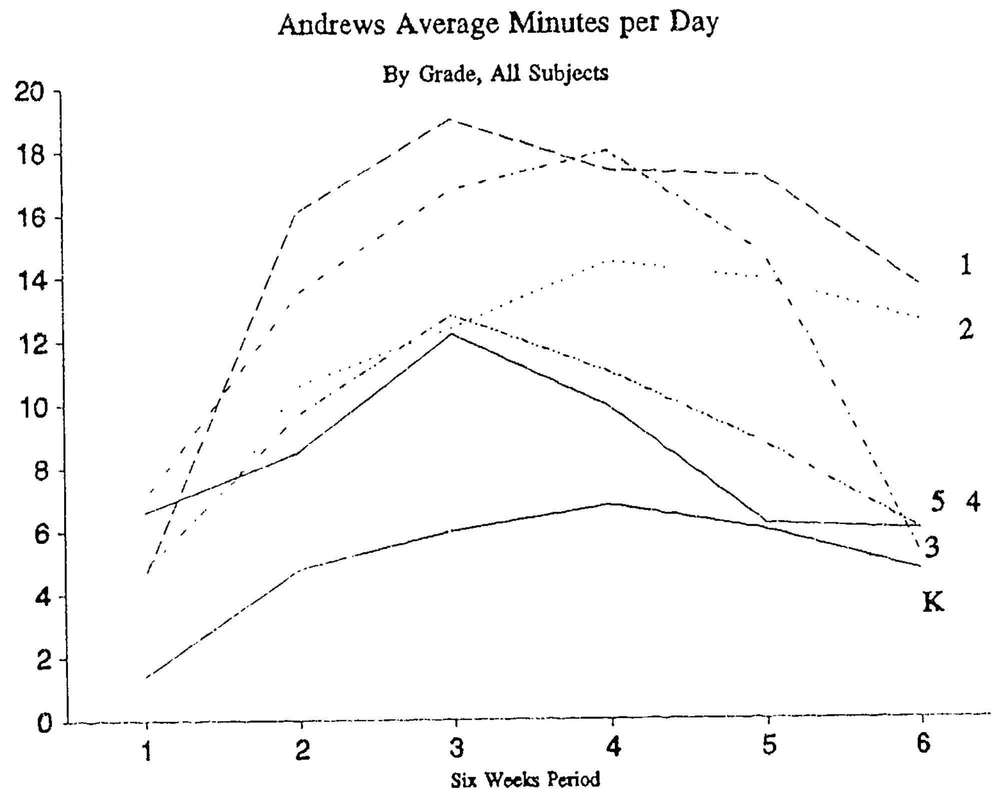
3. *Teachers need to use an instructional delivery system that incorporates the computers in instructional activities.*

4. *The logging system needs to function accurately.* All technical and user problems need to be resolved. Use of the computers needs to be monitored to ensure project implementation.

5. *Follow-up training for teachers needs to be increased.*

APPENDIXES

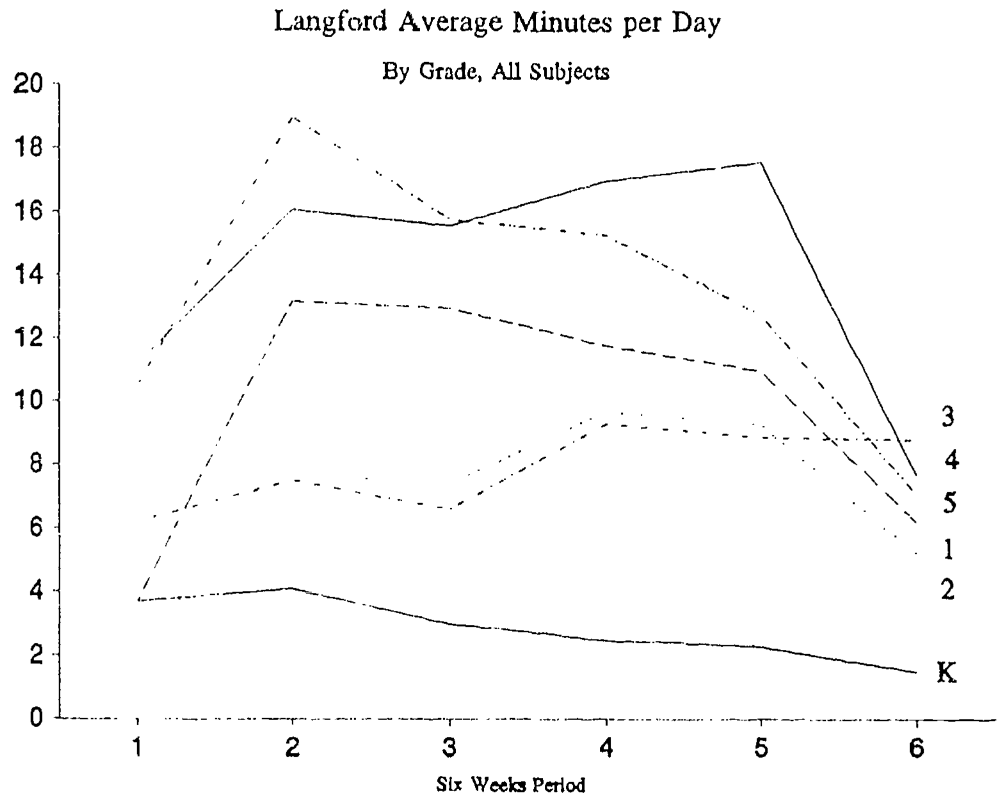
APPENDIX A1: AVERAGE MINUTES PER DAY ON COMPUTER AT ANDREWS ELEMENTARY



Grade	1st Six Weeks	2nd Six Weeks	3rd Six Weeks	4th Six Weeks	5th Six Weeks	6th Six Weeks
K	1.4	4.8	6.0	6.8	6.0	4.7
1	4.5	16.1	19.0	17.4	17.2	13.7
2	3.5	10.6	12.4	14.5	13.9	12.6
3	7.0	13.5	16.8	18.0	14.7	5.2
4	6.6	8.5	12.2	9.9	6.2	6.0
5	4.8	9.7	12.8	11.0	8.7	6.0
All	4.8	11.2	13.2	12.4	11.0	8.6

Note: The grade 1 analysis excludes the students of one teacher for the first through fourth six weeks due to improper logging procedures. Memory and tape backup problems may have caused loss of some logs from server 1 during the third and fourth six weeks. Token ring and wiring problems caused some servers to be down at various times.

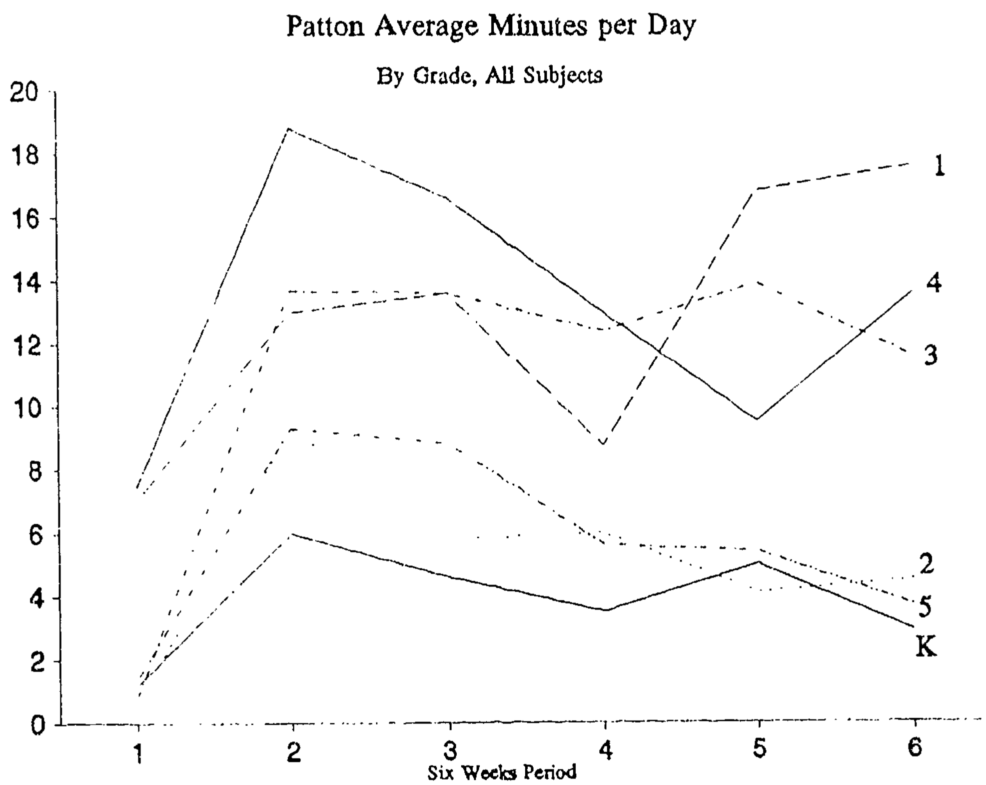
APPENDIX A2: AVERAGE MINUTES PER DAY ON COMPUTER AT LANGFORD ELEMENTARY



Grade	1st Six Weeks	2nd Six Weeks	3rd Six Weeks	4th Six Weeks	5th Six Weeks	6th Six Weeks
K	3.7	4.1	3.0	2.5	2.3	1.5
1	3.7	13.2	13.0	11.8	11.0	6.2
2	2.3	7.7	7.4	9.7	9.3	5.2
3	6.2	7.5	6.6	9.3	8.9	8.8
4	11.2	16.1	15.6	17.0	17.6	7.7
5	10.5	19.0	15.8	15.3	12.8	7.1
All	6.8	11.4	10.6	11.8	11.2	6.7

Notes: Problems with server 3 in the second six weeks may have caused a loss of some logs. Servers 1 and 3 were down at times with net mail problems during the third and fourth six weeks.

APPENDIX A3: AVERAGE MINUTES PER DAY ON COMPUTER AT PATTON ELEMENTARY



Grade	1st Six Weeks	2nd Six Weeks	3rd Six Weeks	4th Six Weeks	5th Six Weeks	6th Six Weeks
K	1.2	6.0	4.6	3.5	5.0	2.9
1	7.0	13.0	13.6	8.7	16.8	17.6
2	0.6	9.3	5.8	6.0	4.1	4.5
3	0.8	13.7	13.6	12.4	13.9	11.6
4	7.4	18.8	16.6	13.0	9.5	13.6
5	1.4	9.3	8.8	5.6	5.4	3.7
All	3.5	12.0	10.8	8.3	9.3	9.3

Notes: Server 4 crashed at the beginning of the year, causing loss of some logs. All servers were down several days in January and installation of incorect drivers caused intermittent problems during January.

Appendix B: NAPT/ITBS Scores 1989-90, 1990-91, and 1991-92

	Composite				Mathematics				Reading				Language			
	All	H	AA	O	All	H	AA	O	All	H	AA	O	All	H	AA	O
Andrews																
Grade 1																
1989-90	50	42	47	77	45	49	37	80	35	31	30	71	53	45	53	68
1990-91	64	64	63	68	67	78	61	85	50	52	50	46	63	59	64	62
1991-92	66	46	66	94	72	63	70	95	53	33	54	85	60	41	61	88
Grade 2																
1989-90	51	68	42	86	44	62	36	79	40	60	31	82	60	63	55	86
1990-91	50	38	52	71	57	55	54	79	37	26	38	63	54	32	59	73
1991-92	59	51	59	78	60	66	51	80	49	40	49	68	67	46	74	77
Grade 3																
1989-90	53	37	49	83	45	39	39	72	53	33	48	85	68	56	66	83
1990-91	50	51	45	81	46	54	39	77	47	41	44	77	67	73	63	83
1991-92	40	39	35	71	44	57	32	77	43	42	39	66	54	53	52	71
Grade 4																
1989-90	36	29	35	61	37	36	35	55	32	24	32	55	49	40	49	69
1990-91	35	24	29	78	32	22	29	76	34	24	29	77	43	31	41	73
1991-92	35	32	33	59	40	46	34	54	36	32	33	63	47	41	50	56
Grade 5																
1989-90	40	46	29	69	37	49	23	70	38	38	31	63	47	54	36	73
1990-91	27	26	26		27	31	25		27	23	28		36	31	38	
1991-92	40	22	35	78	37	21	33	73	39	26	34	68	44	31	42	68
Galindo																
Grade 1																
1989-90	61	59	41	73	63	59	48	75	46	45	21	61	67	65	46	78
1990-91	70	70	57	79	65	62	48	79	61	59	42	76	73	72	70	76
1991-92	64	59	46	77	67	67	50	73	48	42	24	67	72	67	62	82
Grade 2																
1989-90	61	53		71	64	59		73	55	46		66	64	50		61
1990-91	65	58	60	84	75	71	57	90	56	48	49	78	61	51	65	83
1991-92	65	63	64	72	61	68	67	79	51	47	47	64	74	72	79	76
Grade 3																
1989-90	54	51	34	67	51	45	36	66	49	45	30	63	70	71	61	71
1990-91	57	50	32	69	54	47	31	66	52	44	29	66	70	68	52	76
1991-92	56	48	64	71	63	59	60	73	44	36	52	59	58	57	71	58
Grade 4																
1989-90	39	35	22	51	39	36	35	46	35	30	18	49	49	45	34	59
1990-91	49	50	38	51	51	52	37	55	42	40	33	49	59	65	49	50
1991-92	51	36	71	74	48	39	58	61	38	25	59	59	42	31	55	60
Grade 5																
1989-90	38	24	35	63	35	23	34	59	40	26	34	66	45	34	47	62
1990-91	42	36	46	62	43	39	43	57	38	31	47	62	51	46	52	65
1991-92	63	56		75	60	56		67	47	45		51	54	52		58

An underlined number means fewer than 10 students took that test.

Appendix B: NAPT/ITBS Scores 1989-90, 1990-91, and 1991-92 (cont.)

	Composite				Mathematics				Reading				Language			
	All	H	AA	O	All	H	AA	O	All	H	AA	O	All	H	AA	O
Langford																
Grade 1																
1989-90	55	51	54	60	50	48	43	54	44	42	42	47	54	50	54	59
1990-91	46	36	37	56	51	41	35	63	28	19	21	37	47	40	37	54
1991-92	42	36	32	53	29	26	16	41	29	26	18	39	56	52	52	61
Grade 2																
1989-90	53	49	23	73	59	54	22	78	43	39	20	61	51	51	30	62
1990-91	48	45	35	59	51	48	36	63	43	39	34	51	43	43	34	47
1991-92	44	33	38	52	42	38	28	49	35	23	37	43	48	33	51	55
Grade 3																
1989-90	52	41	38	65	44	34	29	59	50	36	42	64	65	63	58	69
1990-91	55	53	31	69	49	50	22	64	51	49	26	71	66	68	52	71
1991-92	48	47	38	55	41	42	33	43	42	44	30	45	50	52	41	51
Grade 4																
1989-90	49	42	37	70	47	40	35	72	43	37	33	64	55	50	45	72
1990-91	36	27	24	58	34	26	25	49	37	28	26	55	41	34	27	59
1991-92	45	44	16	73	44	46	19	63	41	45	14	60	50	54	37	53
Grade 5																
1989-90	54	45	45	68	54	52	38	66	49	36	44	65	60	52	53	71
1990-91	51	45	36	68	50	44	38	68	49	42	35	68	53	50	47	61
1991-92	50	40	39	69	43	36	33	59	47	41	38	61	60	52	53	71
Patton																
Grade 1																
1989-90	85	73	77	86	86	73	71	87	79	74	75	80	75	66	73	76
1990-91	82	79	76	82	80	73	60	81	74	72	58	75	74	75	85	74
1991-92	81	61	71	82	77	47	78	78	73	57	62	74	77	68	72	77
Grade 2																
1989-90	84	73	47	87	89	85	70	90	77	61	40	80	75	58	45	78
1990-91	84	71	63	86	86	76	79	87	79	64	59	82	76	70	34	78
1991-92	83	81	78	83	82	75	71	83	77	75	62	77	77	86	91	75
Grade 3																
1989-90	78	60	64	80	73	52	63	75	73	56	55	75	83	75	79	84
1990-91	81	75	70	82	77	68	66	78	76	72	68	77	86	83	81	87
1991-92	89	79	70	91	83	71	64	84	79	68	56	81	84	76	64	86
Grade 4																
1989-90	74	52	57	77	74	49	49	78	70	51	55	74	73	56	62	76
1990-91	73	48	61	77	74	44	63	78	70	43	59	73	74	62	67	75
1991-92	88	83	80	89	79	76	72	80	74	67	66	76	84	83	83	84
Grade 5																
1989-90	78	61		79	78	53		80	74	56		77	78	70		79
1990-91	77	52	73	81	79	51	82	82	73	47	66	77	77	59	63	79
1991-92	82	52	83	85	71	51	59	74	67	46	59	70	78	70		79

An underlined number means fewer than 10 students took that test.

BEST COPY AVAILABLE

APPENDIX C1: NUMBERS AND PERCENT OF OVERAGE STUDENTS

Andrews

	October 30, 1990			October 30, 1991		
Grade	Enrollment	Overage	% Overage	Enrollment	Overage	% Overage
K	110	5	4.5	136	0	0.0
1	113	8	7.1	124	9	7.3
2	105	15	14.3	126	15	11.9
3	108	23	21.3	111	24	21.6
4	111	34	30.6	111	31	27.9
5	92	25	27.2	125	37	39.6
Total	709	110	15.5	833	116	13.9

Galindo

	October 30, 1990			October 30, 1991		
Grade	Enrollment	Overage	% Overage	Enrollment	Overage	% Overage
K	125	1	0.8	120	0	0.0
1	128	18	14.1	119	5	4.2
2	99	16	16.2	122	18	14.8
3	113	31	27.4	90	22	24.4
4	79	20	25.3	93	24	25.8
5	85	20	23.5	86	21	24.4
Total	678	106	15.6	702	90	12.8

Langford

	October 30, 1990			October 30, 1991		
Grade	Enrollment	Overage	% Overage	Enrollment	Overage	% Overage
K	79	2	2.5	74	5	6.8
1	78	11	14.1	92	8	8.7
2	85	11	12.9	82	14	17.1
3	79	15	19.0	83	13	15.7
4	72	20	27.8	81	16	19.8
5	57	14	24.6	67	17	25.4
Total	510	73	14.3	538	73	13.6

Patton

	October 30, 1990			October 30, 1991		
Grade	Enrollment	Overage	% Overage	Enrollment	Overage	% Overage
K	151	7	4.6	153	5	3.3
1	190	25	13.2	188	22	11.7
2	164	21	12.8	185	24	13.0
3	159	27	17.0	163	24	14.7
4	160	10	6.3	161	25	15.5
5	181	21	11.6	158	12	7.6
Total	1005	111	11.0	1,008	112	11.1

APPENDIX C2: NUMBERS AND PERCENT OF AT-RISK STUDENTS

Andrews

	October 30, 1990			October 30, 1991		
Grade	Enrollment	At Risk	% At Risk	Enrollment	At Risk	% At Risk
K	128	33	25.8	142	41	28.9
1	120	69	57.5	140	51	36.4
2	118	42	35.6	134	69	51.5
3	118	48	40.7	113	72	63.7
4	113	63	55.8	112	78	69.6
5	95	60	63.2	128	94	73.4
Total	764	332	43.5	869	441	50.7

Galindo

	October 30, 1990			October 30, 1991		
Grade	Enrollment	At Risk	% At Risk	Enrollment	At Risk	% At Risk
K	126	15	11.9	120	23	18.7
1	135	81	60.0	119	18	14.4
2	102	26	25.5	122	65	48.9
3	120	50	41.7	90	50	52.1
4	87	41	47.1	93	61	60.4
5	94	42	44.7	86	53	56.4
Total	714	269	37.7	702	284	38.2

Langford

	October 30, 1990			October 30, 1991		
Grade	Enrollment	At Risk	% At Risk	Enrollment	At Risk	% At Risk
K	89	9	10.1	85	15	17.6
1	79	39	49.4	96	17	17.7
2	90	21	23.3	85	42	49.4
3	85	27	31.8	88	55	62.5
4	78	33	42.8	84	48	57.1
5	65	32	49.2	74	44	59.5
Total	546	175	32.1	572	238	41.6

Patton

	October 30, 1990			October 30, 1991		
Grade	Enrollment	At Risk	% At Risk	Enrollment	At Risk	% At Risk
K	152	9	5.9	153	6	3.9
1	194	69	35.6	190	29	15.3
2	168	28	16.7	190	49	25.8
3	167	36	21.6	168	45	26.8
4	162	20	12.3	172	58	33.7
5	184	38	20.7	161	36	22.4
Total	1027	200	19.5	1,034	223	21.6

REFERENCES

Frazer, L. (1992). 1991-92 at risk report (ORE Publication No. 91.12). Austin, Texas: Austin Independent School District, Office of Research and Evaluation.

Marable, P. & Frazer, L. (1991). Project A+ Elementary Technology Demonstration Schools, 1990-91: The First Year (ORE Publication No. 90.32). Austin, TX: Austin Independent School District, Office of Research and Evaluation.

Nichols, T. (1992). Project A+ Elementary Technology Demonstration Schools technical report (ORE Publication No. 91.N). Austin, TX: Austin Independent School District, Office of Research and Evaluation.

Nichols, T. and Frazer, L. (1992). Large-scale campus computer technology implementation: Lessons from the first year (ORE Publication No. 91.16). Paper presented at the annual meeting of the Southwest Educational Research Association, Houston, TX.

AUSTIN INDEPENDENT SCHOOL DISTRICT

Department of Management Information
Dr. Glynn Ligon, Executive Director

OFFICE OF RESEARCH AND EVALUATION
Dr. Evangelina Mangino, Assistant Director

AUTHORS:
~ dd Nichols, Evalutaion Associate
Dr. Linda Frazer, Research Analyst

CONTRIBUTING STAFF:
Stacy Buffington, Programmer Analyst
Ruth Fairchild, Secretary

Publication Number 91.30
August, 1992