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ABSTRACT

During the 1993-94 school year, the Office of Research and Evaluation of the Austin Independent School District (AISD) (Texas) conducted a districtwide evaluation of instructional technology. The evaluation consisted first of an accurate count of all computers in AISD schools, and then of an in-depth evaluation of the integrated learning systems of the Computer Curriculum Corporation (CCC) and Jostens Learning. The over 11,000 computers in the Austin schools are more than twice the amount present 3 years ago. Of these, 39% are considered old. This amounts to six students for every one computer in the district. Gains in student achievement have not been significant enough to declare either of the integrated learning systems effective, but the gains made at some schools warrant their continued use. Better communication and training are needed to encourage use of laser disc technology and to ensure the effectiveness of the integrated learning systems. The district should add computers and plan to replace outdated models. Eighteen figures and two tables present evaluation findings. Four attachments provide supplemental information, including the principal questionnaire. (Contains 7 references.) (SLD)

Instructional Technology in AISD, 1993-94

Executive Summary

Austin Independent School District
Office of Research and Evaluation

Authors: Janice Curry, Melissa Sabatino

Program Description

During the 1993-94 school year the Office of Research and Evaluation, at the request of the Superintendent, conducted a districtwide evaluation of instructional technology.

The districtwide evaluation of instructional technology occurred in two stages. The first portion of the project consisted of obtaining an accurate count of all computers in AISD schools.

The second portion of the project consisted of an in-depth evaluation of integrated learning systems (ILS): Computer Curriculum Corporation (CCC), and Jostens Learning. During both portions of the project, Chapter 1 staff were responsible for collecting data for Chapter 1 schools, while a locally funded staff member gathered data for non-Chapter 1 schools.

Major Findings

1. There are 11,038 computers in AISD: 5,791 computers at the 66 elementary schools, 2,461 computers at the 15 middle/junior high schools, and 2,786 computers at the 11 high schools. This number is more than double the number of computers in AISD three years ago. (Page 4)

2. Of AISD's 11,038 computers, 4,302 (39%) are designated as "old." (Page 4)

3. There are six students for every one computer in the District. At elementary schools there are seven students per computer; six students per computer at middle schools; and five students per computer at high schools. (Page 5)

4. Two thirds (66%) of the 1,174 elementary teachers who responded to the 1993-94 ORE Coordinated Survey said they **never** use the *Windows on Science* laser disc. Only a small percentage (9%) of teachers said they use *Windows on Science* one or more times a week. (Page 6)

5. At the ILS elementary schools, the 90 ROPE comparisons showed that 15% of grades 2 through 5 exceeded the predicted gain, 82% equaled the predicted gain, and 3% were below the predicted gain on ITBS/NAPT scores. (Page 13)

6. At the five ILS secondary schools, the ROPE comparisons showed that none of the grades' NAPT scores exceeded the predicted gain, 62% equaled the predicted gain, and 37% were below the predicted gain. (Page 15)

7. At the elementary and secondary levels, TAAS passing percentages for students in Jostens and CCC were below the District average for all grades and all subjects, except grade 4 writing. (Pages 16-17)

8. Based on sample data gathered for secondary students using CCC, students averaged a .02 month grade equivalent gain in reading and .01 month grade equivalent gain in mathematics for every 15 minutes per day of computer instruction. (Page 17)

9. Observations at the elementary schools using ILS for one or more years revealed that 81% of the time allotted to ILS was used interacting with the computer on academic, technical, or procedural tasks. Only 5% of the students were involved in off-task behavior. (Page 20)

Budget Implications

Mandate:
Federal and Local

Funding Source:
Local and external (federal and private)

Implications:
As AISD examines ways to use local and external monies for technology, the insight gained from the technology strategies employed with these curricula will be vital.

Recommendations

1. The District should continue to add to the number of computers each year, while replacing those that are considered "old."

2. Better communication and training are needed to encourage teacher usage of the *Windows on Science* laser disc technology.

3. At the secondary level, the CCC program should be implemented to be used 15 minutes each day as designed.

4. Teacher training is needed to ensure the effectiveness of the ILS.

5. Schools that use an integrated learning system should not rely on the ILS alone to improve student achievement. The ILS can be used as one of many strategies to meet the needs of academically diverse children.

PROGRAM EFFECTIVENESS SUMMARY
Instructional Technology

PROGRAM	Rating	Allocation (COST)	Number of Students Served	Cost Per Student	Effect (in months)	Cost per Student for 1 month gain (COST/EFFECT)
Allison Funding Source: Federal (Chapter 1) Grades: 3 - 5 Level of Service: All day/all year	+	$3,373* Investment cost for software ONLY.	258	$13	R: 1.3 M: 2.0 Avg: 1.7	$8
Brooke Funding Source: Federal (Chapter 1) Grades: 2 - 5 Level of Service: All day/all year	+	$2,783* Investment cost for software ONLY.	217	$13	R: 2.3 M: 0.8 Avg: 1.5	$9
Brown Funding Source: Jostens Pilot Grades: 2 - 5 Level of Service: All day/all year	+	$3,869 (est)* Investment cost for software ONLY.	298	$13	R: -1.2 M: 1.3 Avg: 0.05	$260
Jordan Funding Source: Federal (Chapter 1) Grades: 3 - 5 Level of Service: All day/all year	+	$2,983* Investment cost for software ONLY.	205	$15	R: 1.2 M: -0.1 Avg: 0.6	$25
Norman Funding Source: Project Teach and Reach Grades: K - 5 Level of Service: All day/all year	+	$3,548 (est)* Investment cost for software ONLY.	293	$12	R: 1.6 M: 1.4 Avg: 1.5	$8

PROGRAM EFFECTIVENESS SUMMARY
Instructional Technology

PROGRAM	Rating	Allocation (COST)	Number of Students Served	Cost Per Student	Effect (in months)	Cost per Student for 1 month gain (COST/EFFECT)
Oak Springs Funding Source: Project Teach and Reach Grades: 3 - 5 Level of Service: All day/all year	0	$3,548 (est)* Investment cost for software ONLY.	160	$22	R: -0.7 M: -1.7 Avg: -1.2	-
Pecan Springs Funding Source: Federal (Chapter 1) Grades: 3 - 5 Level of Service: All day/all year	+	$2,412* Investment cost for software ONLY.	239	$10	R: 2.0 M: 0.8 Avg: 1.4	$7
Sims Funding Source: Jostens Pilot Grades: Pre-K - 5 Level of Service: All day/all year	+	$3,869 (est)* Investment cost for software ONLY.	264	$15	R: 3.1 M: -0.5 Avg: 1.3	$12
Travis Heights Funding Source: Local Grades: K - 5 Level of Service: All day/all year	+	$3,548 (est)* Investment cost for software ONLY.	694	$5	R: 0.3 M: 0.1 Avg: 0.2	$25
Winn Funding Source: Project Teach and Reach Grades: K, 2 - 4 Level of Service: All day/all year	+	$3,548 (est)* Investment cost for software ONLY.	281	$13	R: -1.6 M: 2.7 Avg: 0.6	$22

PROGRAM EFFECTIVENESS SUMMARY
Instructional Technology

PROGRAM	Rating	Allocation (COST)	Number of Students Served	Cost Per Student	Effect (in months)	Cost per Student for 1 month gain (COST/EFFECT)
Fulmore Funding Source: External (JTPA) Grades: 7 - 8 Level of Service: All day/2nd semester	0	$4,458** Investment cost for hardware and software.	110	$41	R: -3.8 M: -3.0 Avg: -3.4	-
Pearce Funding Source: External (JTPA) Grades: 7 - 8 Level of Service: Not Used in 1993-94	n/a	$4,458** Investment cost for hardware and software.	0	$0	R: n/a M: n/a Avg: n/a	n/a
Porter Funding Source: External (JTPA) Grades: 7 - 8 Level of Service: All day/all year	0	$4,458** Investment cost for hardware and software.	106	$42	R: -4.8 M: -2.5 Avg: -3.7	-
Crockett Funding Source: External (JTPA) Grades: 9 Level of Service: All Day/2nd semester	0	$4,458** Investment cost for hardware and software.	57	$78	R: -4.0 M: -8.0 Avg: -6.0	-
Robbins Funding Source: External (JTPA) Grades: 9 - 10 Level of Service: All day/all year	+	$4,458** Investment cost for hardware and software.	140	$32	R: 5.0 M: -1.0 Avg: 2.0	$39

PROGRAM EFFECTIVENESS SUMMARY
Instructional Technology

PROGRAM	Rating	Allocation (COST)	Number of Students Served	Cost Per Student	Effect (in months)	Cost per Student for 1 month gain (COST/EFFECT)
Reagan High School Funding Source: External (JTPA) Grades: 9-12 Level of Service: Not Used during 1993-94	n/a	$4,458** Investment cost for hardware and software.	0	$0	R: n/a M: n/a Avg: n/a	n/a
Travis High School Funding Source: External (JTPA) Grades: 10 - 12 Level of Service: All day/all year	0	$4,458** Investment cost for hardware and software.	100	$45	R: 1.6 M: -7.9 Avg: -4.8	

Notes: * The cost for the elementary CCC and Jostens laboratories includes **software ONLY**. The initial software investment was multiplied by 6.7% according to TEA guidelines concerning depreciation (TEA Procedure: SPG-702).

** The cost for the CCC laboratories at the seven secondary schools involved an initial investment of $455,711 for **hardware and software**. In 1993-94 AISD spent $10,000 to buy the seven laboratories from the Private Industry Council bringing the total to $465,711. This cost was multiplied by 6.7% according to TEA guidelines for depreciation and divided by 7 to arrive at the allocation cost for each secondary school.

Rating is expressed as contributing to any of the five AISD strategic objectives

\+ Positive, needs to be kept and expanded
0 Not significant, needs to be improved and modified
\- Negative, needs major modification or replacement

Cost is the expense over the regular District per-student expenditure of $4,000.

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.

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CONCLUSIONS AND RECOMMENDATIONS

With more and more schools purchasing computers to improve student achievement, the District realized a need to find what computers were in the schools. There was no thorough list of the numbers and types of computers at the campuses. During the 1993-94 school year, the Office of Research and Evaluation (ORE) conducted a districtwide computer inventory. The results showed that AISD has more than doubled the number of computers available to students at elementary, middle school, and high school campuses from 5,000 in 1990-91 to 11,038 in 1993-94. Of AISD's current number of computers, 39% (4,302) are designated as "old." Many of the schools continue to use Texas Instruments and Apple computers in the classroom, while most schools use the newer computers in a lab setting.

In order to ascertain the availability of computers to students, the ratio of students to computer was calculated for the District and by the type of school. **The ratio of students per computer is six students for every one computer in the District.** At elementary schools the ratio is seven to one, at middle schools the ratio decreases to six to one, and high schools have the lowest ratio, at five to one.

During the 1990-91 school year, AISD adopted *Windows on Science* for its science curriculum in kindergarten through grade 5. On the 1993-94 ORE Coordinated survey, elementary teachers were asked how often they used the *Windows on Science* laser discs. **Two out of three (66%) of the 1,174 elementary teachers who responded to the survey said they never use the *Windows on Science* laser disc technology. Only a small percentage (9%) of teachers said they use *Windows on Science* one or more times a week.**

There is a growing interest in the use of integrated learning systems (ILS) as districts are trying many alternative methods of instruction to reach children of varying achievement levels. Twenty-two AISD elementary and secondary schools used an ILS with the aim of improving student achievement in 1993-94. Computer Curriculum Corporation (CCC) and Jostens Learning were the major integrated learning systems used in the District. For the purpose of this evaluation, only the ten elementary and five secondary schools which had used ILS for one year or more were studied for effect on student achievement. The results, after one year, showed that:

- Using ROPE (Report On Program Effectiveness) at the ten elementary schools, 15% of grades 2 through 5 students exceeded the predicted gain, 82% equaled the predicted gain, and 3% were below the predicted gain on the Norm-referenced Assessment Program for Texas (NAPT) test.

- At the five secondary schools, none of the grades exceeded the predicted gain, 62% equaled the predicted gain, and 37% were below the predicted gain on the NAPT.

- There were only seven grade levels at six different elementary schools that made statistically significant achievement gains, leading to the inference that the program had a positive impact on achievement at those schools.

- At all levels, TAAS passing percentages for students using Jostens and CCC were below the District average for all grades and all subjects, except grade 4 writing.

- Observations at the elementary schools using ILS for one or more years revealed that 81% of the time allotted to ILS was used interacting with the computer on academic, technical, or procedural tasks. Only 5% of the students were involved in off-task behavior.

While the ILS programs cannot be called overwhelmingly effective, there have been some gains in student achievement. After the first year, many of the schools should reassess the usage of their ILS and search for methods of improvement.

Recommendations:

1) The District should continue to add each year to the number of computers which are available for student use, while replacing those that are considered "old." The implementation of Central Receiving during the summer of 1994 will make the task of tracking campus technology much easier.

2) Better communication and training are needed to encourage teacher usage of the *Windows on Science* laser disc technology.

3) At the secondary level, the CCC program should be implemented to be used 15 minutes each day as designed.

4) Teacher training is needed to ensure the effectiveness of the ILS.

5) Schools that use an integrated learning system should not rely on the ILS alone to improve student achievement. The ILS can be used as one of many strategies to meet the needs of academically diverse children.

INTRODUCTION

The Austin Independent School District (AISD) has a long history of applying computer technology to instruction, beginning in earnest with the District's "computer initiative" in the early 1980's. Since the mid-1980's, with the assistance of Chapter 1 and Chapter 2 monies, AISD has installed many different computer software systems -- e.g., Wicat, Writing to Read, Computer Curriculum Corporation (CCC), and Jostens at the elementary level, and Texas Learning Technology Group, Technology Learning Center, and CCC at the secondary level. Major sources of funding for instructional technology in AISD include grants from IBM, Apple, the Texas Education Agency, Pepsi Corporation, RJR Nabisco, District funds, and local Parent Teacher Association (PTA) resources. In 1993-94 AISD utilized computers for instructional purposes extensively throughout the District.

During the 1993-94 school year, the Office of Research and Evaluation (ORE), at the request of the Superintendent, conducted a districtwide evaluation of instructional technology. Local resources were allocated to evaluating instructional technology in non-Chapter 1 schools, and Chapter 1 resources were allocated to evaluating instructional technology in Chapter 1 schools. ORE staff determined what computers were in use in the District, and performed an in-depth evaluation of the effectiveness of integrated learning systems (CCC and Jostens) at schools which have utilized these systems for one or more years.

This report on instructional technology is divided into two parts. The first section reports the findings of the districtwide technology inventory. The second section takes an in-depth look at integrated learning systems (CCC and Jostens) used in AISD schools, and their effect on achievement.

INSTRUCTIONAL TECHNOLOGY IN THE SCHOOLS

METHODOLOGY

In a coordinated effort involving ORE, the Department of Management Information, and Instructional Technology, AISD attempted to obtain an accurate count of all computers in the District.

During spring 1994, Chapter 1 staff and several consultants collected information from all Chapter 1 schools, and one local staff member and several consultants collected the same information from all other schools. Instructions to those completing the inventory were to count any computer AISD is responsible for repairing. Only computers in working order or with a work order pending were counted. The information was collected on inventory sheets designed by Instructional Technology. The information collected consisted of the type and the number of models available at each school, and whether the technology was in the classroom, laboratory, or administrative offices. See Attachment A for an example of the inventory sheets. A group of individuals trained for this task visited every room in every school in the District to inventory computers. The District administration building was not included in this inventory.

NUMBER OF COMPUTERS DISTRICTWIDE

There are 11,038 computers districtwide. Figure 1 shows that there are 2,786 computers at the District's eleven high schools, 2,461 computers at the District's fifteen middle and junior high schools, and 5,791 computers at the District's 66 elementary schools. Figure 1 also shows whether the computers were in the classroom, a computer laboratory, or administrative offices. See Attachment B for a breakdown of the location of computers by school.

FIGURE 1
NUMBER OF SCHOOL COMPUTERS BY LOCATION, MAY 1994

	Classroom	Laboratory	Administrative	Total
Elementary Schools	3,042	2,405	345	5,791
Middle/Junior High Schools	939	1,236	284	2,461
High Schools	1,065	1,228	493	2,786
AISD TOTAL	5,046	4,869	1,124	**11,038**

The last technology inventory, performed in 1990-91, showed approximately 5,000 computers in the District, which is less than half of the 11,038 inventoried in 1993-94. The doubling of computers in less than three years has been supported from several sources. The Superintendent has led a movement for computers in the middle schools with the 1993-94 purchase of a writing lab for every middle and junior high school. On the spring 1994 ORE Coordinated Survey, 57% of principals said that at their school the largest portion of funds to purchase computers came from District funds. Twenty percent of principals said that the largest portion of funds to purchase computers at their school came from federal funds. The remaining 20% of principals said their school's major funding source for computers was PTA funds, private company grants, and other donations. See *Instructional Technology in AISD Technical Report* (ORE Publication No. 93.E) for a complete breakdown of the ORE Coordinated Survey responses.

NUMBER OF "OLD" VS. "NEW" COMPUTERS IN THE DISTRICT

Since it is often difficult to obtain software and repair parts for older machines, it is important to know the age of the computers used in AISD. The age of the District's computers was determined using the model type of the machine. **Of the District's 11,038 machines, 4,302 (39%) are designated as "old."** An "old" machine is defined as any IBM or IBM-compatible machine with less than a 286 based microprocessor, a Texas Instruments machine, or any Apple machine. See Figure 2 for the numbers and percentages of "old" and "new" computers in AISD.

FIGURE 2
NUMBER AND PERCENT OF "OLD" VS. "NEW" SCHOOL COMPUTERS, MAY 1994

	Total	"Old" Machines	"New" Machines Total Minus "Old"
Elementary Schools	5,791	1,819 (31%)	3,972 (69%)
Middle/Junior High Schools	2,461	1,123 (46%)	1,338 (54%)
High Schools	2,786	1,360 (49%)	1,426 (51%)
AISD TOTAL	**11,038**	**4,302 (39%)**	**6,736 (61%)**

RATIO OF STUDENTS TO COMPUTERS

In order to get an idea about the availability of computers to students, the ratio of students per computer was calculated for the District and by the type of school. **The ratio of students to computers is six students for every computer in the District.** At the elementary school level there are seven students for every computer. At middle school that ratio decreases to six students for every computer. High school has the lowest ratio, five students for every computer.

When the number of "old" computers is removed from the analysis and the ratio of students to computers is recalculated, the number of students to computers rises markedly. **When the number of "old" computers is removed from the calculation, there are 10 students for every "new" computer districtwide.** At the elementary and middle school levels there are 10 students for every computer. High school has the highest ratio with 11 students for every computer. See Figure 3 for the number of students per computer in the District.

FIGURE 3
NUMBER OF STUDENTS PER COMPUTER IN THE DISTRICT, MAY 1994

	"Total" Number of Computers	Number of "Old" Computers	"Total" Minus "Old"	Number of Students	Students Per Computer "Total"	Students Per Computer "Total" Minus "Old"
Elementary Schools	5,791	1,819	3,972	39,872	7	10
Middle/Junior High Schools	2,461	1,123	1,338	14,580	6	11
High Schools	2,786	1,360	1,426	15,313	5	11
AISD	**11,038**	**4,302**	**6,736**	**69,765**	**6**	**10**

LASER DISC PLAYERS

During the 1990-91 school year, AISD adopted *Windows on Science* for its science curriculum in kindergarten through grade 5. *Windows on Science* is a laser disc set. Every elementary school in the District was allocated a set of laser discs players. The AISD adoption was 70% for textbooks and 30% for optical discs (*Windows on Science*). The allocation formula was one laser disc player for each grade at every school. If a grade had more than four teachers, an additional laser disc player was purchased for that grade.

On the 1993-94 ORE Coordinated survey, elementary teachers were asked how often they used the *Windows on Science* laser discs. **Two out of three (66%) of the 1,174 elementary teachers who responded to the survey said they never use the *Windows on Science* laser disc technology. Only a small percentage (9%) of teachers said they use *Windows on Science* one or more times a week.**

Elementary teachers were also asked whether *Windows on Science* was an effective method of science instruction. **One in three (31%) agreed or strongly agreed that *Windows on Science* was an effective method of science instruction. Over half (55%) of the 1,120 teachers responding to the question were neutral about whether it was effective.** It is not clear if this response is due to the fact that these teachers were displeased with the quality of *Windows on Science* or that they lacked exposure to the laser disc technology.

SUMMARY

As of May 1994, there were 11,038 computers in use in AISD elementary, middle/junior high schools, and high schools. This number is more than double the number of computers in the District since the last technology inventory in 1990-91. Of this number, 4,302 (39%) are considered to be "old" machines. The ratio of students per computer is six students per computer in the District. When the number of "old" computers is removed from the calculation, there are 10 students for every "new" computer districtwide.

The *Windows of Science* laser discs is a type of technology supplied to AISD elementary schools to supplement the science curriculum in kindergarten through grade 5. Two out of three (66%) of the 1,174 elementary teachers who responded to the 1994 ORE Coordinated Survey said they never use *Windows on Science* laser disc technology. It is not clear if this response is due to the fact that these teachers were displeased with the quality of *Windows on Science* or that they lacked exposure to the laser disc technology.

THE EFFECTIVENESS OF INTEGRATED LEARNING SYSTEMS

With the current emphasis in education on heterogeneous grouping and inclusion of all students, schools are challenged to meet the instructional needs of students who are at different skill levels within the same classroom. Many schools have begun to use integrated learning systems (ILS) as one of the ways to help meet the needs of low-achieving students. The ILS allows for different levels of difficulty to be targeted at different students through the computer networking device. (Nichols, 1992)

WHAT IS AN INTEGRATED LEARNING SYSTEM?

An integrated learning system (ILS) is a computer system that provides instruction in several subject areas and practice problems covering a multiple-year curriculum sequence. Software is housed on a central file server computer linked in an electronic network to 15 to 30 student computers. Specific lessons are automatically loaded into each student's computer when that student "logs in" based on a continuous assessment of that student's previous accomplishments and current learning needs. The ILS includes a wide range of courseware with a sophisticated management system that can be tailored to District objectives. These systems use computers to diagnose, reinforce, and enhance learning. The systems monitor student achievement and provide documentation of student improvement (May, 1991).

RESEARCH ON INTEGRATED LEARNING SYSTEMS

Some issues considered in studies on ILS systems include student achievement, curriculum integration, teacher's role, financial considerations, staff training, and administrative support. Research is not conclusive about the effect on achievement for students using an ILS, but teachers, parents, and principals have stated that the ILS had positive effects on children's learning. A study by May in 1991, which compared three ILSs (CCC, Jostens, and Ideal), showed that CCC was more expensive, but students made more academic gains than with Jostens.

Research findings were supported in a 1990 paper by Alifrangis entitled *An Integrated Learning System in an Elementary School: Implementation, Attitudes, and Results*. Her study indicated that computer programs whose management is not an additional burden on the classroom teacher, match the local curricula, and address learning theory research can be implemented successfully.

The importance of a full-time laboratory operator was repeatedly noted in a study of the Albuquerque, New Mexico public schools (Resta & Rost, 1986). The authors found that the computer-assisted instruction programs were underutilized during their first year, and that the impact on mathematics achievement was generally greater than on reading.

There is a growing interest in these systems as school districts try many alternative methods of instruction to reach academically diverse children. Many of the studies are presented by vendors. A majority of the implementations seem to have been effective, although without knowing more about each setting, one cannot be sure that results were not due to other factors such as changes in educational services coincident with the implementation of the ILS (Becker, 1990).

INTEGRATED LEARNING SYSTEMS IN AISD

The two major integrated learning systems used in the AISD were Computer Curriculum Corporation (CCC) and Jostens Learning. They are similar, in that they both offer curriculum in the areas of mathematics, science, reading, and language skills. Both systems can generate reports to be used by teachers and principals to evaluate progress. CCC and Jostens are closed systems because "the system" evaluates and diagnoses the progress and places each student on a daily basis. Jostens has courseware correlating to the Texas Assessment of Academic Skills (TAAS) objectives for Texas. CCC will be introducing similar courseware in fall 1994.

There were 14 Chapter 1 schools and eight non-Chapter 1 schools in AISD which worked to boost achievement through the use of an ILS. Of the schools using ILS, 19 (86%) used CCC and 3 (14%) used Jostens. CCC was utilized at both elementary and secondary levels, while Jostens was used only at the elementary level. Among the 22 campuses using an ILS, there were 15 elementary schools, 3 middle schools, and 4 high schools.

Chapter 1 ILS Elementary Schools

The 14 Chapter 1 schools utilizing ILS were Allison, Barrington, Brooke, Brown, Houston, Jordan, Linder, Norman, Oak Springs, Pecan Springs, Sims, Winn, Wooldridge, and Wooten. Five of these schools (Barrington, Houston, Linder, Wooldridge, and Wooten) were not evaluated because their systems had been in use less than one school year. For the purpose of this evaluation, only the nine Chapter 1 campuses which had operated with CCC or Jostens for one year or more were studied (Allison, Brooke, Brown, Jordan, Norman, Oak Springs, Pecan Springs, Sims, and Winn).

An ILS may be used in a lab setting or as a distributive network in the classroom. Only two of the schools use the distributive network (Jordan and Wooldridge) while two other schools (Norman and Linder) hope to add that capability for 1994-95.

Chapter 1 ILS Grades Served

Each campus had special needs to consider when deciding which students to target to use the ILS. Some schools used the 1992-93 TAAS and NAPT scores to pinpoint areas of greatest need, while other schools focused on specific grade levels. Two schools (Sims and Norman) chose to serve the entire student population, while two schools (Linder and Wooten) served only the Chapter 1, at-risk, and below grade-level students.

In May 1994, questionnaires were sent to 15 elementary principals who currently have an ILS; nine responded for a 60% return rate. They were asked to respond to the question, *What was the initial goal for the implementation of CCC or Jostens at your campus?* See Attachment C for a copy of the Principal Questionnaire. Responses from principals included the following goals:

- To improve TAAS scores;
- To improve student achievement in the areas of reading and mathematics;
- To serve Chapter 1, at-risk, or below-grade-level students;

- To provide basic skills to students lacking them, while providing enrichment for more advanced students; and,
- To increase the use of technology as an instructional tool.

Across all schools, the grade level most targeted for ILS usage was grade 4, with an average of 142 minutes of usage each week, followed by grade 5 with 135 minutes per week, and grade 3 with 133 minutes each week. This time allotment is understandable because students begin taking the TAAS test in the grade 3. Lesser amounts of time were allotted to lower grades, with only one school (Sims) including pre-K classes. One 2nd-grade class at Winn gave up its outside time to work in the ILS lab. Figure 4 shows the amount of time that students at the nine Chapter 1 campuses used the ILS in a typical week.

FIGURE 4
CHAPTER 1 ILS USAGE,
MINUTES PER WEEK BY GRADE AND SCHOOL

SCHOOL	Pre-K	K	1st	2nd	3rd	4th	5th
Allison					120	120	120
Brooke				150	150	150	150
Brown (Jostens)				70	105	175	105
Jordan*					100	100	100
Norman		80	120	80	120	80	120
Oak Springs					150	150	150
Pecan Springs					150	150	150
Sims (Jostens)	30	25	30	35	150	205	185
Winn		45		**150	150	150	
Avg. Minutes Per Week	30	50	75	97	133	142	135

* Distributive network
** One second grade only

Non-Chapter 1 ILS Elementary Schools

The only non-Chapter 1 elementary school in the District to utilize CCC for longer than one year was Travis Heights Elementary. Travis Heights has had a CCC laboratory for two years and utilizes the lab at every grade. Pre-K and kindergarten students visit the CCC lab once a week, while students at grades 1 through 5 rotate through the lab at half-hour intervals the other four days.

Secondary ILS Schools

The District has four high schools (Crockett, Reagan, Robbins, and Travis) and three middle schools (Fulmore, Pearce, and Porter) using CCC in a lab setting. In 1991-92, these seven schools entered into a contract with the federally funded Job Training Partnership Act (JTPA) to provide job training skills to local high school and middle school students. Each school was allowed to use the lab as it deemed necessary as long as 50% of the lab users were JTPA-approved students. To become JTPA approved, each student and his or her family had to complete a questionnaire concerning family finances, employment history, and credit history.

In previous years, Communities-in-Schools personnel helped complete the paperwork to get students JTPA approved, in order for the school to use the lab. However, in 1993-94 no monies were budgeted for personnel to get students JTPA approved, and the job fell to school personnel. *This lack of additional personnel to get students JTPA approved led to little or no usage of these computers in many high schools and middle schools*. During the 1993-94 school year, only Travis High School, Robbins High School, and Porter Middle School used the computers for the entire year. Crockett High School and Fulmore Middle School were unable to use the machines for the entire year because of their inability to get the students JTPA approved. The CCC laboratories at Crockett and Fulmore were used the second semester, after students were approved. Reagan High School and Pearce Middle School did not use the CCC laboratories during the 1993-94 school year because of several hardware problems.

Secondary Grades Served

Each school is using the CCC lab in a different manner. Travis High School is using the CCC lab to help grades 10, 11, and 12 students who have not passed the exit-level TAAS. Robbins is using the CCC lab to help grades 9 and 10 students who enter the school to advance to the high school level before entering the high school curriculum. These students stay in the lab environment until their computer score shows they have maintained a grade equivalent score of 8.5. Fulmore Middle School and Crockett High School are using the CCC program to help students in grades 7 and 8, and grade 9, respectively, who have fallen behind in reading. Porter Middle School is using the CCC program to prepare grades 7 and 8 students for the TAAS test.

ACHIEVEMENT AND PROMOTION DATA

Report On Program Effectiveness

The schools studied differ on many factors, and to compare their achievement scores directly could be misleading. The Report On Program Effectiveness (ROPE) provides a more accurate interschool comparison of achievement results. ROPE gives information on how each school's students perform on standardized tests (NAPT/ITBS) from one year to the next compared to similar students across the District. The report combines the individual scores of each student in a school program. ROPE adjusts the scores for factors out of the school's control (i.e., sex, previous achievement level, ethnicity, income level, and age in grade) before making the comparison.

ROPE compares 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 scores.

Three ROPE results are possible: exceeded predicted gain, achieved predicted gain, and below predicted gain. A score of achieved predicted gain indicates that an additional program (the ILS) had no effect on student achievement above and beyond everyday classroom teaching. If the results exceed predicted gain, one can conclude that the program had a significant impact on student achievement. If the results are continually below predicted gain, the program may need to be reexamined. A score exceeding or below predicted gain is based on a statistical test to determine if the residual is significantly different from zero.

The following section presents the ROPE scores for the schools studied. ROPE generates scores only on students who have valid standardized test scores for the previous year; therefore, kindergarten and grade 1 students are not included in the results.

ROPE Scores and Comparisons

Elementary Schools

Figure 5 displays ROPE scores by test area (reading, mathematics, and language) for the 10 elementary ILS schools studied. Grades 4 and 5 showed the most scores (5 each) which exceeded the predicted gain. The analysis uses ROSE scores to evaluate how a school performed in relation to the predicted gain for that school.

Ten comparisons were a possible 10 scores--two each in grades 2 and 3, and three each in grades 4 and 5. Allison, Jordan, Oak Springs, Pecan Springs, and Winn had eight comparisons because their grade 2 students did not take ITBS. The results of the program effectiveness analyses are found in Figure 6.

FIGURE 5
PROGRAM EFFECTIVENESS BY TEST AREA, ILS ELEMENTARY SCHOOLS, 1993-94

	Allison	Brooke*	Brown*	Jordan	Norman*	Oak Springs	Pecan Springs	Sims*	Travis Heights*	Winn
Grade 2										
Reading	n/a	0	0	n/a	0	n/a	n/a	0	0	n/a
Mathematics	n/a	+	0	n/a	0	n/a	n/a	0	0	n/a
Language	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Grade 3										
Reading	0	0	0	0	0	0	0	0	0	0
Mathematics	0	0	0	0	+	0	-	0	0	+
Language	n/a	n/a	n/a	n/a	n/a	n/a	n\a	n\a	n/a	n/a
Grade 4										
Reading	0	+	0	0	0	0	0	+	0	0
Mathematics	+	0	0	0	0	0	+	0	0	+
Language	0	0	0	0	0	0	0	-	0	0
Grade 5										
Reading	0	+	0	0	+	0	+	0	0	-
Mathematics	0	0	+	0	0	0	0	0	0	0
Language	0	+	0	0	0	0	0	0	0	0

* Grades 3, 4, and 5 at Brooke; grade 5 at Brown; grades 2, 3, and 5 at Norman; grades 2, 3, and 5 at Sims; and grade 2 at Travis Heights did not have the required number of 25 students with valid NAPT scores for two consecutive years to test statistical significance. These results should be interpreted with caution.

KEY

0 Achieved Predicted Gain	- Below Predicted Gain
+ Exceeded Predicted Gain	n/a Test not Given

Figure 6 shows a total of 90 ROPE scores for the 10 elementary schools using an ILS. Fifteen percent of the grade 2 through 5 scores exceeded the predicted gain, 82% equaled the predicted gain, and 3% were below the predicted gain. The following grades and schools made gains significant enough to assume that the program had a positive impact on achievement:

Reading

Sims - Grade 4
Pecan Springs - Grade 5

Mathematics

Allison - Grade 4
Brooke - Grade 2
Pecan Springs - Grade 4
Winn - Grade 2
Winn - Grade 3

FIGURE 6
COMPARISON OF ROPE SCORES, ILS ELEMENTARY SCHOOLS, 1993-94

	Allison	Brooke	Brown	Jordan	Norman	Oak Springs	Pecan Springs	Sims	Travis Hts.	Winn
Exceed Predicted	1 (13%)	4 (40%)	1 (10%)	0 (0%)	2 (20%)	0 (0%)	2 (25%)	1 (10%)	0 (0%)	2 (25%)
Below Predicted	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (13%)	1 (10%)	0 (0%)	1 (13%)
Equal Predicted	7 (88%)	6 (60%)	9 (90%)	8 (100%)	8 (80%)	8 (100%)	5 (63%)	8 (80%)	10 (100%)	5 (63%)

In addition to examining achievement data on each elementary school using an ILS, two other types of comparisons were made: 1) each ILS program (CCC and Jostens) was looked at individually, and 2) both programs were looked at together. ROPE was used to compare program (Jostens and CCC) students. The ITBS/NAPT scores from spring 1994 were compared to predicted levels of achievement. The results of the analysis based on 10 comparisons was: 1) CCC students achieved predicted gains in all comparisons, 2) Jostens students achieved predicted gains in 8 out of 10, exceeded predicted gains in one comparison, and were below predicted gains in one comparison. ILS program students' scores are noted in Figure 7.

FIGURE 7
PROGRAM EFFECTIVENESS FOR ITBS/NAPT
ELEMENTARY CCC, JOSTENS, AND TOTAL ILS

PROGRAM	Reading	Mathematics	Language
Computer Curriculum Corporation (CCC)			
Exceeded Predicted Levels	0	0	0
Achieved Predicted Levels	4	4	2
Below Predicted Levels	0	0	0
Jostens Learning System			
Exceeded Predicted Levels	0	1	0
Achieved Predicted Levels	4	3	1
Below Predicted Levels	0	0	1
TOTAL ILS Students			
Exceeded Predicted Levels	0	1	0
Achieved Predicted Levels	4	3	2
Below Predicted Levels	0	0	0

Secondary Schools

Figures 8 and 9 display ROPE results for the secondary ILS schools studied. Reagan High School and Pearce Middle School are not included because no students were served in 1993-94 due to computer hardware problems. Further analysis of the scores is provided in Figure 10.

FIGURE 8
PROGRAM EFFECTIVENESS BY TEST AREA, ILS HIGH SCHOOLS, 1993-94

	Crockett*	Robbins*	Travis*
Grade 9			
Reading	0	0	n/a
Mathematics	-	-	n/a
Language	0	0	n/a
Grade 10			
Reading	n/a	n/a	0
Mathematics	n/a	n/a	0
Language	n/a	n/a	0
Grade 11			
Reading	n/a	n/a	-
Mathematics	n/a	n/a	-
Language	n/a	n/a	-

* Grade 9 at Robbins and grades 10 and 11 at Travis did not have the required number of 25 students with valid NAPT scores for two consecutive years to test statistical significance. These results should be interpreted with caution.

FIGURE 9
PROGRAM EFFECTIVENESS BY TEST AREA, ILS MIDDLE SCHOOLS, 1993-94

	Fulmore*	Porter*
Grade 7		
Reading	0	0
Mathematics	0	0
Language	-	0
Grade 8		
Reading	0	-
Mathematics	0	-
Language	-	0

* Grade 8 at Fulmore and grade 7 at Porter did not have the required number of 25 students with valid NAPT scores for two consecutive years to test statistical significance. These results should be interpreted with caution.

KEY

0 Achieved Predicted Gain	- Below Predicted Gain
+ Exceeded Predicted Gain	n/a Test not Given

FIGURE 10
COMPARISON OF ROPE SCORES, ILS SECONDARY SCHOOLS, 1993-94

	Crockett	Robbins	Travis	Fulmore	Porter
Exceed Predicted	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Equal Predicted	2 (67%)	2 (67%)	3 (50%)	4 (67%)	4 (67%)
Below Predicted	1 (33%)	1 (33%)	3 (50%)	2 (33%)	2 (33%)

At the five secondary schools using an ILS, none of the grades exceeded the predicted gain, 62% equaled the predicted gain, and 37% were below the predicted gain.

ROPE Results

In conclusion, the ROPE results show that ILS technology may have had a slightly positive impact on student achievement at the elementary level, while having little impact at the secondary level. In general, grades 4 and 5 showed the most improvement, with each grade exceeding predicted gains in 5 of 30 ROPE comparisons.

TAAS Comparisons

The Texas Assessment of Academic Skills (TAAS) is a criterion-referenced test which is designed to measure a well-defined set of skills and to reference students' scores to a mastery criterion. The skills are a subset of the Essential Elements adopted by the State Board of Education. TAAS reading and mathematics tests were given in spring 1994 to grades 3 through 10 (exit level), while TAAS writing was given to grades 4, 8, and 10 (exit level).

Elementary ILS Programs

TAAS comparisons were made between the two ILS programs to examine possible differences in the TAAS passing rates of their participating students. The data in Figure 11 show a greater percentage of the Jostens students passed all tests taken in grades 3 and 5 than CCC students, while grade 4 students using CCC had a higher passing percentage than Jostens' students.

Overall, AISD passing percentages for all subjects and all grades were higher than either the CCC or Jostens percentages, except at grade 4 writing. Grade 4 writing scores were higher for Jostens (61% passing) and CCC (68% passing) than the AISD average passing rate (52%). Improving TAAS scores was one of the main goals for implementing the ILS according to the principals responding the Principal Questionnaire. The emphasis on language skills may aid writing skills. However, other factors such as changes in educational services coincident with the implementation of the ILS may have impacted the result.

FIGURE 11
1993-94 TAAS PASSING RATES FOR CCC, JOSTENS, AND ALL ILS ELEMENTARY SCHOOLS COMPARED WITH THE DISTRICT AVERAGE

PROGRAM	READING			WRITING			MATHEMATICS			All Tests Taken		
	GRADE			GRADE			GRADE			GRADE		
	3	4	5	3	4	5	3	4	5	3	4	5
CCC												
# Students Tested	445	447	472	n/a	437	n/a	456	456	476	464	469	489
% Passing	58%	50%	57%	n/a	68%	n/a	37%	34%	36%	33 %	29%	33%
Jostens												
# Students Tested	72	85	56	n/a	84	n/a	72	83	58	72	89	58
% Passing	64%	42%	64%	n/a	61%	n/a	46%	20%	47%	44%	21%	45%
All ILS												
# Students Tested	517	532	528	n/a	521	n/a	528	539	534	536	558	547
% Passing	59%	49%	58%	n/a	67%	n/a	38%	32%	37%	34%	28%	34%
AISD												
% Passing	76%	71%	73%	n/a	52%	n/a	60%	53%	56%	56%	49%	53%

Secondary ILS Schools

Two of the secondary schools are using the CCC labs to help students who have not passed the TAAS tests. Figure 12 shows the percentage of secondary students passing the TAAS compared to the District average.

FIGURE 12
1993-94 TAAS PASSING RATES FOR SECONDARY ILS SCHOOLS COMPARED WITH THE DISTRICT AVERAGE

PROGRAM	READING			WRITING			MATHEMATICS			Passing All Tests Taken		
	GRADE			GRADE			GRADE			GRADE		
	7	8	Exit	7	8	Exit	7	8	Exit	7	8	Exit
All Secondary ILS												
# Students Tested	76	78	92	n/a	82	92	77	78	92	81	90	92
% Passing	39%	45%	64%	n/a	40%	62%	16%	27%	33%	16%	18%	27%
AISD												
% Passing	63%	69%	75%	n/a	62%	77%	44%	49%	54%	42%	42%	50%

All grades at the ILS secondary schools were below the District average for the percentage of students passing all TAAS tests. However, this comparison is not necessarily equitable as many of these secondary students are using the ILS programs because they have previously failed a section of the exit-level TAAS. A look at one high school that uses CCC for TAAS preparation shows that the ILS may help students who have previously failed the TAAS to pass the exit-level test. Figure 13 shows the percent of secondary students passing the TAAS after participation in the TAAS preparation course using CCC. No numbers were available for the percentages of students who pass the TAAS on the second or third attempt; therefore, no comparisons could be drawn.

FIGURE 13
PERCENT OF SECONDARY STUDENTS PASSING THE TAAS AFTER PARTICIPATION IN THE TAAS PREPARATION COURSE USING CCC

Date TAAS Taken	Reading	Mathematics	Writing
March 1994	24 (37%)	20 (22%)	14 (28%)
May 1994	4 (80%)	5 (83%)	1 (33%)

Secondary School Achievement Gains Using CCC Reports

Robbins High School and Fulmore Middle School provided data showing individual student gains from the beginning of the program along with the amount of time spent on CCC during the year. **In reading, the students averaged a gain of .02 months for every 15 minutes on the computer. In mathematics, students averaged a gain of .01 month, and in English as a Second Language (ESL), students averaged a .02 month gain for every 15 minutes of computer instruction.** Fifteen minutes was the typical length of time a CCC program runs at the secondary level. See Figure 14 for the maximum and minimum gains and the standard deviations of student gains.

If achievement gains are directly proportional to the amount of time spent in the lab, substantial gains may be possible at the secondary level if CCC is implemented 15 minutes each day as designed. A gain of 4.0 grade equivalent in reading, and 2.1 grade equivalent in mathematics may be possible in one year. ESL students could gain 4.2 grade equivalent after using CCC for one year. However, the amount of achievement gain which could be attained by increasing the number of minutes per day is unknown. Twice the number of minutes may not produce twice the achievement gain. Since none of the AISD secondary schools exceeded their predicted gain with CCC, this prediction would need to be studied further.

In addition, the reports produced internally by CCC are based on a built-in assessment scale whose psychometric characteristics (reliability and validity) are not known. Clearly, the gains predicted by the CCC assessment system are not supported by the NAPT results.

FIGURE 14
AVERAGE GAINS AND STANDARD DEVIATIONS FOR EVERY 15 MINUTES OF ILS COMPUTER INSTRUCTION FROM A SAMPLE OF SECONDARY STUDENTS

Subject Area	Average Grade Equivalent Gain Per 15 Minutes of Instruction	Maximum Gain	Minimum Gain	Standard Deviation
Reading	.023	.225	.004	.026
Mathematics	.012	.038	.002	.007
ESL	.024	.194	-.011	.184

Promotion Rate for Elementary ILS Schools

Promotion rates at elementary ILS schools were below the District average of 97.7% for 1993-94. A comparison of 1992-93 and 1993-94 promotion data was made to discover if the ILS had an impact on promotion at elementary schools using ILS. Promotion refers only to those students who have successfully completed their current grade, not students who are "placed" in the next grade. As shown in Figure 15, schools with Jostens (Brown and Sims) were the only campuses to show an increase in promotion rates from 1992-93 (95.7%) to 1993-94 (96.1%).

FIGURE 15
PROMOTION RATE BY ELEMENTARY ILS PROGRAM, 1993-94 COMPARED WITH 1992-93

PROGRAM	1992-93	1993-94	DIFFERENCE
Elementary ILS Students	95.9%	94.4%	-1.5%
Elementary CCC Students	96.0%	94.0%	-2.0%
Elementary Jostens Students	95.7%	96.1%	+0.4%
Chapter 1 ILS Students	95.1%	93.9%	-1.2%
Chapter 1 CCC Students	94.9	93.2%	-1.7%
AISD	**97.6%**	**97.7%**	**+0.1%**

ILS OBSERVATIONS

Instrument Design and Test

Staff members observed students working at the CCC and Jostens systems at the nine Chapter 1 campuses and the eight non-Chapter 1 campuses to determine time on task. A minute-by-minute observation with an additional 15-minute classroom tally was the result. Trial runs with the observation scale were conducted by ORE evaluation staff at Mathews and Wooten Elementary Schools to assure interrater reliability. Minor changes were made to the scale before the final test. See Attachment D for a copy of the observation instrument.

Procedure for Selecting Classes and Students to Be Observed

Before determining who would be observed, it was necessary to investigate how each school used the ILS. Only the classrooms that had used the ILS for at least one year would be observed. Schedules for using the CCC and Jostens labs or distributive networks were requested from each of the classrooms to be observed. It was determined that Chapter 1 staff would observe at the Chapter 1 classrooms and a local staff person would observe the non-Chapter 1 classrooms (Travis Heights Elementary School; Fulmore, Pearce, and Porter Middle Schools; and Crockett, Reagan, Robbins, and Travis High Schools). A total number of sessions per grade was tallied and a 10%-15% sample of grades served was targeted.

Figure 16 shows the total number of ILS sessions for Chapter 1 classrooms and the targeted number of observations per grade level.

FIGURE 16
ILS SESSIONS PER WEEK BY GRADE,
CHAPTER 1 SCHOOLS

SCHOOL	Pre-K	K	1st	2nd	3rd	4th	5th	Special Education	Total Sessions
Allison	-	-	-	-	24	20	20	-	64
Brooke	-	-	-	25	15	15	15	-	70
Brown	-	-	-	8	12	18	8	-	46
Jordan (Dist. Network)	-	-	-	-	15	15	15	-	45
Norman	-	7	9	7	8	6	6	2	45
Oak Springs	-	-	-	-	15	15	15	-	45
Pecan Springs	-	-	-	5	20	25	20	-	70
Sims	3	2	2	3	10	15	10	2	47
Winn	-	5	-	5	25	25	-	-	60
Total Sessions by Grade	3	14	11	53	144	154	109	4	492

Students were chosen on a random basis from the selected classes prior to the observers' visits to the campuses. A total of 63 observations was completed on the nine Chapter 1 schools, giving a 12.8% sample. The length of sessions varied from 12 minutes (Jordan) to 77 minutes (Travis High School). The average length of the ILS session was 30 minutes for all schools observed, and 27 minutes for Chapter 1 schools.

Observation Findings

Students were observed for a total of 2,228 minutes while in the CCC or Jostens labs or distributive network (Jordan) at the Chapter 1 and non-Chapter 1 schools. **Eighty-one percent of the time allotted to use of the ILS was used interacting with the computer on academic, technical, or procedural tasks.** Descriptions of these tasks are found in Attachment D. Students needed assistance from the teacher or lab aide 12% of the time.

While working with CCC or Jostens, most students were attentive to the task at hand. Only 5% of the time were students involved in off-task behavior. Non-instructional time (transition, dead time, and waiting for the teacher) comprised 9% of the time. Figure 17 summarizes the data obtained from the observations.

FIGURE 17
PERCENTAGE OF TIME SPENT ON VARIOUS TASKS DURING ILS OBSERVATIONS

VARIABLE	PERCENTAGE OF TIME*
Interaction with Computer	81.4
Academic Task	80.7
Technical Task	7.0
Procedural Task	2.2
Individual Interaction with Teacher	6.3
Group Interaction with Teacher	5.5
Interaction with Teacher-Total	11.8
On-Task Behavior	88.9
On-Task Interaction with Other Student	4.1
Off-Task Behavior	4.8
Non-Instructional Time	8.8

* Variables are combined for percentages shown. Numbers will not equal 100%.

A 15-minute tally of the entire classroom setting was made during each observation. This tally included 1,707 students, most of whom were using the ILS. The average class size at all schools was 15 students. The 113 tallies showed *74% of the students observed in the classrooms were interacting with the computer*. This percentage seems lower than expected, but the fact that at Jordan (distributive network) only one or two students at a time worked on the ILS while the rest of the class worked on classroom instruction must be taken into consideration. Eighty-nine percent of the students were engaged in on-task behavior during the 15-minute tallies. Non-instructional activities occurred 7% of the times for students. Figure 18 shows the same variables used above to illustrate the percentage of students engaged in each behavior during the 15-minute tally of classrooms.

FIGURE 18
PERCENTAGE OF STUDENTS ON VARIOUS TASKS DURING 15-MINUTE CLASSROOM TALLY

VARIABLE	PERCENTAGE OF STUDENTS AT 15-MINUTE TALLY
Interaction with Computer	74.0
Academic Task	76.9
Technical Task	2.3
Procedural Task	2.8
Individual Interaction with Teacher	3.0
Group Interaction with Teacher	4.9
Interaction with Teacher-Total	7.9
On-Task Behavior	89.1
On-Task Interaction with Other Student	7.2
Off-Task Behavior	3.7
Non-Instructional Time	7.0

* Variables are combined for percentages shown. Numbers will not equal 100%.

REFLECTIONS ON EFFECTIVENESS OF ILS

The Role of the Principal

The involvement of the principal in the selection, implementation, and utilization of the ILS is thought to be important to its success at the campus. Principals at ILS schools were surveyed in the spring 1994 ORE Coordinated Survey. Of the 98 principals who responded to the statement, *"I have been supportive of the use of an integrated learning system at my campus,"* 72% (71) agreed or strongly agreed. When asked on the 1994 ORE Coordinated Survey if their principal was supportive of the ILS technology at their school, 89% of the teachers at ILS schools responding agreed or strongly agreed. This suggests that both the principals and the teachers agree that there is support for the use of ILS at their campuses.

Principals were asked to respond to questions about the utilization and implementation of the ILS at their campus. Their input was solicited to gain from their experience. Fifteen questionnaires were sent to elementary principals who currently have an ILS, and nine responded (a return rate of 60%). Of those responding, eight (89%) were pleased with the implementation and utilization of the ILS at the campus. However, Brown Elementary School experienced frequent technical difficulties and has chosen not to have the Jostens lab for the 1994-95 school year. See Attachment C for a copy of the Principal Questionnaire. Principals had the following suggestions for schools which are considering the installation of an ILS in the future:

- Do not rely on one program to meet the needs of your slow learners.
- Utilize all the features of the program, not just reading and mathematics.
- Staff development is essential to the effectiveness of the ILS.
- Make sure your school has the hardware needed to support an ILS.
- Use reports to show and explain to parents in what area their child needs help.
- Investigate all integrated learning systems before deciding on one.
- Principal needs to be highly literate in technology to evaluate options in relation to the needs and priorities of their school.
- Have a lab aide with CCC--it will prove to be the major difference between another supplemental program and a tremendous additional asset and instructional resource.
- Watch each cost line--some items are not necessary.
- Ensure that the District has purchased a full maintenance service contract--paid by AISD.
- CCC is the better investment for the limited budget.
- Customize the program to the needs of your students and staff.
- Pay close attention to the software and hardware compatibility.
- Start planning early.
- Monitor, monitor, monitor!

The Role of the Teacher

Teachers at ILS schools received varying amounts of training. Each teacher was supposed to get one day of training. At schools where there was no lab aide, a contact person for the school received more extensive training.

Several teachers told ORE observation staff that they did not have enough training to use the system to its potential. Some teachers rarely received or used the reports generated by the ILS on student progress. In response to the statement -- *I am getting the training I need to use the ILS technology effectively*-- 65% of the elementary ILS teachers who responded agreed or strongly agreed, while 13.5% disagreed or strongly disagreed. The role of the teacher becomes even more important at schools without a lab aide.

The Role of the Lab Aide

Of the nine Chapter 1 schools studied, Brooke, Pecan Springs, and Jordan did not have lab aides. The ILS at schools with a lab aide seemed to run more smoothly. If there was a technical problem (and there were many during the observations), the lab aide could attend to it. At the schools without the aide, the teacher in the lab at the time of the problem would do what he or she could, but, if the problem was not corrected, the teacher would have to leave a message for the schoolwide ILS contact person who is also a classroom teacher. In response to the statement, "*The person who most often assists my students with computer-assisted instruction is,*" 63% of the classroom teachers at elementary ILS schools indicated that they were the ones who most often assisted their students with the ILS. Only 20% of the teachers surveyed agreed that the person who most often assisted the student was a lab aide.

The benefit of the lab aide is an issue each school should consider before implementing the ILS. There is a higher cost for the distributive network to allow for wiring throughout the school and the purchase of additional computers. In those schools without an aide, there is a contact person who has had more extensive training and deals with system problems. Teachers at the campuses must be trained to deal with the everyday use of the system.

Many schools that use the lab setting use their existing computer lab which saves money on the hardware. A teaching assistant or lab aide may assist teachers by generating reports on student progress. The lab setting can be used by all students on campus while the distributive network in classrooms must focus on specific grade levels or needs.

SUMMARY

There is growing interest in the use of integrated learning systems as school districts are trying many alternative methods of instruction to meet the needs of academically diverse children. Twenty-two of the AISD schools used an ILS with the aim of improving student achievement in 1993-94. CCC and Jostens were the major integrated learning systems used in the District.

Students were observed for a total of 2,228 minutes while in the CCC or Jostens labs or distributive network (Jordan) at Chapter 1 and non-Chapter 1 schools. Eighty-one percent of the time allotted to use of the ILS was used interacting with the computer on academic, technical, or procedural tasks. While working with CCC or Jostens, most students were attentive to the task at hand. Only 5% of the time were students involved in off-task behavior.

Gains in student achievement have not been significant enough to declare the CCC or Jostens programs effective. The gains that have been made at some schools and grade levels warrant the continued use of the systems. Review of the suggestions made by principals about implementation and utilization of the ILS would be of value for schools considering an ILS.

LIST OF ATTACHMENTS

Austin Independent School District

93.06

Attachment A
(Page 1 of 4)

School: _____

Date: _____

Completed By: _____

Computer	Classroom	Computer Lab	Administration
IBM PC (Model 5150 & 5155)			
IBM PC XT (Model 5160)			
IBM PC XT286			
IBM PC AT			
IBM PS/2 Model 25			
IBM PS/2 Model 25 286			
IBM PS/2 Model 25 SX			
IBM PS/2 Model 30 286			
IBM PS/2 Models 35 SX & 35 SL			
IBM PS/2 Model L40 SX			
IBM PS/2 Model 40 SX			
IBM PS/2 Model 55 SX & 55 LS			
IBM PS/2 Model 56 SX, 56 LS, 56 SSLC & 56 SLC LS			
IBM PS/2 Model 57 SX			
IBM PS/2 Model 70 386			
IBM PS/2 Model P70 386			
IBM PS/2 P75 486			
IBM PS/2 Model 80 386			
IBM PS/2 90 XP 486			
IBM Model PS/2 95 XP 486			
IBM PS/2 Model 60			
IBM PS/2 Model 9585			
EduQuest 30			
EduQuest 40			
EduQuest 50			
Portable/Laptop			
Other			

Austin Independent School District

93.06

School: ______________________________

Date: ______________________________

Completed By: ______________________________

Computer Brand & Model	Classroom	Computer Lab	Administration

Austin Independent School District

93.06

School: _____

Date: _____

Completed By: _____

Computer	Classroom	Computer Lab	Administration
Apple II & II+			
Apple IIe			
Apple IIgs			
Macintosh 512 & Plus			
Macintosh SE			
Macintosh Classic			
Macintosh Classic II			
Macintosh Color Classic			
Macintosh SE/30			
Macintosh LC & LCII			
Macintosh LCIII			
Macintosh LC 475			
Macintosh LC 520			
Macintosh LC 550			
Macintosh LC 575			
Macintosh IIsi			
Macintosh IIcx & IIci			
Macintosh IIvx			
Macintosh Centris 610			
Macintosh Centris 650			
Macintosh II & IIx			
Macintosh IIfx			
Macintosh Quadra 700			
Macintosh Quadra 800			
Macintosh Quadra 900			
Macintosh Quadra 950			
Macintosh (Centris) Quadra 660AV			
Macintosh Quadra 840AV			
Power Macintosh 6100			
Power Macintosh 7100			
Power Macintosh 8100			
Apple Workgroup Server 60			
Apple Workgroup Server 80			
Apple Workgroup Server 95			
Macintosh Powerbook/Portable			
Other			

Austin Independent School District

School: _____

Date: _____

Completed By: _____

Printers for IBM and compatible

Printer	Classroom	Computer Lab	Administration
Daisy Wheel			
Dot Matrix			
Ink Jet/Bubble Jet			
Laser			

Printers for Apple and Macintosh

Printer	Classroom	Computer Lab	Administration
Dot Matrix			
Ink Jet/Bubble Jet			
Laser			

Peripherals for Apple Macintosh & IBM PC's and Compatibles

Peripheral	Classroom	Computer Lab	Administration
CD-ROM Player			
Laser Disc Player			
Scanner			
External Hard Drive			

TECHNOLOGY IN AISD
INFORMATION AS OF MAY 1994

School	Classroom			Laboratory			Administrative					
	IBM/ Clone	MAC/ Apple	TI	IBM/ Clone	MAC Apple	TI	IBM/ Clone	MAC/ Apple	TI	Pre 286 Machines	Pre MAC Machines	TOTAL
Allan Elementary	0	26	8	2	25	1	3	1	0	14	12	66
Allison Elementary	0	16	5	0	50	0	1	5	0	6	9	77
Andrews Elementary	206	0	0	56	0	0	7	0	0	0	0	269
Barrington Elementary	0	12	0	0	44	0	4	0	0	0	16	59
Barton Hills Elementary	1	11	6	0	30	0	1	2	0	8	11	51
Becker Elementary	9	49	0	0	49	0	0	1	0	8	26	108
Blackshear Elementary	175	12	6	0	28	0	6	0	0	9	7	227
Bonton Elementary	0	11	4	29	0	0	6	3	0	5	13	53
Boone Elementary	0	5	0	1	46	0	4	1	0	5	27	57
Brentwood Elementary	1	35	2	0	23	0	3	0	0	4	20	67
Brooke Elementary	0	37	23	12	21	6	4	0	0	33	35	103
Brown Elementary	0	27	28	0	28	0	2	2	0	28	14	87
Bryker Woods Elementary	0	22	4	0	27	0	2	2	0	5	22	57
Campbell Elementary	1	9	8	0	27	0	3	3	1	11	11	52
Casis Elementary	8	48	8	0	28	0	3	5	0	19	14	100
Cook Elementary	0	14	1	2	26	0	5	2	0	8	12	50

School	Classroom IBM/ Clone	Classroom MAC/ Apple	Classroom TI	Laboratory IBM/ Clone	Laboratory MAC Apple	Laboratory TI	Administrative IBM/ Clone	Administrative MAC/ Apple	Administrative TI	Pre 286 Machines	Pre MAC Machines	TOTAL
Cunningham Elementary	0	6	11	0	36	0	4	1	1	15	12	59
Davis Elementary	7	21	0	0	33	0	0	5	0	2	13	66
Dawson Elementary	13	36	13	0	30	0	2	3	0	16	33	97
Doss Elementary	10	19	5	14	26	0	1	1	3	15	42	79
Galindo Elementary	0	83	1	0	92	0	4	3	0	2	79	183
Govalle Elementary	0	10	15	52	0	0	3	1	0	15	11	81
Graham Elementary	0	9	3	0	43	8	3	3	0	5	18	69
Gullett Elementary	10	19	1	0	27	0	1	0	0	11	17	58
Harris Elementary	64	14	5	38	10	0	4	3	0	7	9	138
Highland Park Elementary	0	62	1	0	27	0	0	4	0	0	17	94
Hill Elementary	1	14	3	0	54	0	4	2	0	2	32	78
Houston Elementary	19	24	14	1	69	0	1	2	0	28	16	130
Jordan Elementary	8	91	0	0	27	0	6	4	0	13	0	136
Joslin Elementary	1	18	2	0	27	0	4	1	0	6	18	53
Kiker Elementary	0	6	0	2	27	0	7	5	0	8	2	47
Kocurek Elementary	0	16	0	0	26	0	3	3	0	3	22	48
Langford Elementary	153	2	0	36	0	0	8	0	0	7	0	199
Lee Elementary	0	6	0	0	31	0	3	0	0	1	9	40

School	Classroom IBM/ Clone	Classroom MAC/ Apple	Classroom TI	Laboratory IBM/ Clone	Laboratory MAC Apple	Laboratory TI	Administrative IBM/ Clone	Administrative MAC/ Apple	Administrative TI	Pre 286 Machines	Pre MAC Machines	TOTAL
Linder Elementary	3	27	4	0	29	0	1	2	0	7	26	66
Maplewood Elementary	1	10	5	25	0	0	4	0	0	7	13	45
Mathews Elementary	0	17	0	0	28	0	1	0	0	1	12	46
Menchaca Elementary	0	28	0	0	30	0	4	0	0	3	26	62
Metz Elementary	6	58	16	0	26	0	2	4	0	24	17	112
Norman Elementary	0	23	0	20	46	0	2	4	0	21	11	95
Oak Hill Elementary	1	15	10	1	34	0	3	1	0	15	21	65
Oak Springs/Rice	14	16	17	0	51	0	3	4	1	34	11	106
Odom Elementary	3	22	8	27	0	0	4	0	0	14	16	64
Ortega Elementary	1	43	3	0	31	0	0	4	0	3	28	82
Palm Elementary	7	10	4	2	31	0	3	1	0	15	41	58
Patton Elementary	259	0	0	46	0	0	19	0	0	0	0	324
Pease Elementary	3	14	3	0	26	0	3	1	0	9	8	50
Pecan Springs Elementary	0	19	26	4	37	0	4	1	0	30	12	91
Pillow Elementary	0	25	4	5	24	0	4	1	0	11	21	63
Pleasant Hill Elementary	0	12	3	0	37	1	5	0	0	9	34	58
Reilly Elementary	5	11	3	26	0	0	2	0	0	5	11	47

School	Classroom			Laboratory			Administrative					
	IBM/ Clone	MAC/ Apple	TI	IBM/ Clone	MAC Apple	TI	IBM/ Clone	MAC/ Apple	TI	Pre 286 Machines	Pre MAC Machines	TOTAL
Ridgetop Elementary	1	8	2	27	0	0	2	1	0	4	8	41
Sanchez Elementary	0	45	0	0	25	0	5	3	0	3	23	78
Sims Elementary	7	4	14	0	27	0	1	1	0	28	5	54
St. Elmo Elementary	0	23	5	0	26	0	3	2	0	7	18	59
Summitt Elementary	0	42	2	0	25	0	4	1	0	3	41	74
Sunset Valley Elementary	0	22	12	0	29	0	1	4	0	13	13	68
Travis Heights Elementary	7	20	6	26	0	0	3	1	0	16	10	63
Walnut Creek Elementary	1	20	15	28	0	0	4	0	0	19	20	68
Widen Elementary	75	32	8	34	3	0	7	1	0	12	34	160
Williams Elementary	2	21	7	0	64	0	7	2	0	15	35	103
Winn Elementary	6	55	0	47	4	0	8	2	0	2	20	122
Wooldridge Elementary	0	52	8	0	27	0	3	1	0	11	8	91
Wooten Elementary	1	22	12	0	54	3	1	1	0	21	19	94
Zavala Elementary	37	5	1	28	14	0	2	0	0	38	18	87
Zilker Elementary	0	22	7	27	0	0	1	0	0	8	15	57
Elementary Total	**1,127**	**1,533**	**382**	**618**	**1,768**	**19**	**228**	**111**	**6**	**725**	**1,189**	**5,791**
Bailey Middle School	14	8	0	44	18	0	17	2	0	2	4	103

School	Classroom IBM/ Clone	Classroom MAC/ Apple	Classroom TI	Laboratory IBM/ Clone	Laboratory MAC Apple	Laboratory TI	Administrative IBM/ Clone	Administrative MAC/ Apple	Administrative TI	Pre 286 Machines	Pre MAC Machines	TOTAL
Bedichek Middle School	13	24	0	28	51	0	25	2	2	14	43	145
Burnet Middle School	48	18	0	2	74	0	14	0	0	6	56	156
Covington Middle School	2	76	0	0	56	0	15	8	0	14	99	157
Dobie Middle School	4	25	0	3	100	0	16	3	0	15	49	151
Fulmore Middle School	22	50	0	0	84	0	13	8	0	8	80	177
Kealing JHS	21	165	0	25	104	0	14	7	0	33	232	336
Lamar JHS	17	26	0	1	82	0	13	0	0	10	63	139
Martin JHS	7	34	0	0	82	0	6	12	0	1	61	141
Mendez JHS	4	70	0	1	59	0	19	8	0	18	179	161
Murchison JHS	22	34	0	24	59	0	19	5	0	24	59	163
O.Henry JHS	5	70	0	0	53	0	5	1	0	10	64	134
Pearce JHS	30	27	0	62	39	0	22	4	0	32	7	184
Porter JHS	12	44	0	18	112	0	16	2	0	11	110	204
Webb JHS	9	38	0	22	33	0	8	0	0	6	12	110
Middle School Total	**230**	**709**	**0**	**230**	**1,006**	**0**	**222**	**62**	**2**	**204**	**1,118**	**2,461**
Anderson HS	49	28	0	117	1	6	39	3	0	153	26	243
Austin HS	22	61	0	89	29	0	34	14	0	57	40	249
Bowie HS	33	17	0	149	4	0	56	1	0	15	13	260
Crockett HS	48	36	0	75	21	0	30	25	0	88	30	235
LBJ HS	115	36	23	154	9	3	31	13	1	239	33	385
Johnston HS	97	70	0	27	4	0	27	6	0	82	20	231
Lanier HS	52	56	0	70	24	6	42	10	0	111	49	260

School	Classroom IBM/ Clone	Classroom MAC/ Apple	Classroom TI	Laboratory IBM/ Clone	Laboratory MAC Apple	Laboratory TI	Administrative IBM/ Clone	Administrative MAC/ Apple	Administrative TI	Pre 286 Machines	Pre MAC Machines	TOTAL
McCallum HS	23	36	0	81	14	0	31	13	0	83	37	198
Reagan HS	94	46	0	97	5	0	39	7	0	88	35	288
Robbins HS	22	15	0	61	0	0	11	3	0	27	10	112
Travis HS	32	54	0	99	83	0	41	16	0	76	50	325
High School Total	587	455	23	1,019	194	15	381	111	1	1,019	343	2,786
AISD TOTAL	1,944	2,697	405	1,867	2,968	34	831	284	9	1,948	2,650	11,038

Houston

PRINCIPAL QUESTIONNAIRE

1) What was the initial goal for the implementation of CCC or Jostens at your campus? How did you chose the students to be targeted to use the ILS (Integrated Learning System)?

2) How do you feel about the implementation and utilization of the ILS at your campus? How did you chose between the lab setting and the distributive network in the classrooms? Will you change anything next year?

3) What advice could you give to schools who are considering the installation of an ILS in the future?

ILS Observations
Spring 1994

Date: _____
Time: _____
Student ID: _____
Student Name: _____
Classroom Teacher? Yes____ No____ **Lab Aide? Yes____ No____**

School: _____
Grade: _____
Observer: _____
Page 1 of _____
Other Adult? Yes____ No____

Obs. Period (min)	Task (A)	Task (T)	Task (P)	List Tch (A)	List Tch (T)	List Tch (P)	Wt Tch	Tch (A)	Tch (T)	Tch (P)	Stud (A)	Stud (T)	Stud (P)	Stud (O)	Off Tsk	Dd Tm	Trans	Comment (Include Topic)
0																		
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		

ILS Observations
Spring 1994

Date: _____ **School:** _____
Time: _____ **Grade:** _____
Student ID: _____ **Observer:** _____
Student Name: _____
Classroom Teacher? Yes____ No____ **Lab Aide? Yes____ No____** **Other Adult? Yes____ No____**

Obs. Period (min)	# on Task (A)	# on Task (T)	# on Task (P)	# List Tch (A)	# List Tch (T)	# List Tch (P)	# Wt Tch	# Tch (A)	# Tch (T)	# Tch (P)	# Stud (A)	# Stud (T)	# Stud (P)	# Stud (O)	# Off Tsk	# Dd Tm	# Trans	Comment (Include Topic)
15																		
30																		
45																		
60																		

Narrative:

ILS Observations
Definitions of Terms

Task (A)
This stands for *Task (Academic)*. Students falling in this category are those working in an academic assignment or receiving an academic presentation *on the computer*.

In order for the task to be considered *academic*, the student must be reviewing old information or receiving new information from the computer about some skill involved in reading, writing, spelling, grammar, mathematics, science, etc., or be involved in solving problems/answering questions, etc.

This category does *not* include instructions from the teacher or the computer about activities which are preparatory to beginning an academic task, or necessary for completing an academic task, such as those described under Task (T) or Task (P) below. It *does* include activities which are related to academic skills -- reading stories on the computer, playing computer games related to an academic subject, etc.

Task (T)
Students classified in this category are engaged in some technical (T) task related to the operation of the computer.

Such tasks include turning the computer on or off, finding their computer files/folders, moving through transitions from one computer file/folder to another, formatting a document to print, printing a document, or trying to figure out how to get the computer to do something. (I'd hate to know how much of our time on the computer is spent doing these kinds of things!)

Task (P)
Students classified in this category are those who are clearly engaged in some procedural activity which is preparatory to beginning an academic activity, or is necessary for finishing it. Students are not expected to spend much time in this category, but examples of activities that would be categorized here are getting out books or other materials, turning in work, or putting headings on paper.

Listn Tch (A)
Students in this category are listening to the teacher give a presentation to the whole class or a group of students in the class on an *academic subject*. Some examples of this are: the teacher lecturing to the class (or a group), teacher asking questions and responding to questions from the class (or the group), teacher giving a demonstration, teacher reading aloud, teacher checking work with the class (or the group).

Listn Tch (T)
This is similar to the above category in terms of the teacher interacting with the whole class or a group of students in the class, except that the activities deal with computer routines and procedures. Examples of such activities are the teacher explaining to the whole class or a group of students how to get to a new file/program on the computer, how to print something, or which computer keys to push for a particular purpose.

Listn Tch (P)
Again, this is similar to the above two categories in that the teacher is interacting with the whole class or a group of students. To be categorized in this category, the student must be listening to the teacher discuss something procedural.

Examples are explaining what the rules about the computer lab or student behaviors are, what will be the day's activity on the computer, how to get to an activity, when they are to move from one activity on the computer to another, when they are to quit computer work, and what to do with completed work.

This format is probably used more frequently in the beginning of the year, or with students new to the school or the computer.

Wait Tch
Students in this category are waiting for assistance from the teacher. They must have indicated (either through raising a hand, or through calling out for the teacher) that they need help to be counted in this box.

Tch (A)
Tch (T)
Tch (P)
These three categories are very similar in that they all refer to a student interacting individually with the teacher. They are different in the content of the interaction. **Tch (A)** refers to interactions about academic matters, **Tch (T)** refers to help or instructions from the teacher regarding technical matters, and **Tch (P)** is the category for coding any other interaction with the teacher, such as disciplinary interactions regarding the student's behavior.

Stud (A)
Stud (T)
Stud (P)
Stud (O)
These four areas relate to the student interacting with other student(s). **Stud (A)** is for interactions in which the student seeks help or helps another student with an academic area, **Stud (T)** is for communications about technical matters (as in "how do you print this thing?"), **Stud (P)** is for procedural matters (as in "What did the teacher say we need to be working on?"), and **Stud (O)** is for any other interactions that are *off-task*.

Off Tsk
Students are classified in this category when they are very clearly misbehaving and doing something which the teacher does not approve of. It is not essential that the teacher correct the students for them to be classified here. Examples of behaviors which would be classified here are: looking at someone else's screen when it's not allowed, playing around, daydreaming, getting into files/programs in the computer they're not supposed to, and visual wondering. *A student who is off-task because he/she is talking to another student should be classified in the* ***Stud (O)*** *category.*

Dd Tm
This stands for *Dead Time*. Students should be classified here when the observer realizes that there is nothing specific which students are supposed to be doing and when they are not engaging in unsanctioned behavior. This would include students who are waiting for a transition as part of the whole class and students who have finished all of their assigned work and who have not been given anything else to do.

Trans
This category should be used when students are changing activities. Most likely this will only occur when they first enter the lab until they are settled in their seats, and when they are getting ready to leave.

Comment
Write the *topic* or *academic area* (reading, mathematics, science, etc.) students are supposed to be working on in this box (even if the student is currently off task). Write down the academic area in the first observation period, and then again when it changes (as long as you do not indicate a new academic area, it will be assumed that it has not changed).

You may also jot down any other comments that may help you remember what was going on in the class at the time (for your narratives).

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Austin Independent School District

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